CHARLES TOWN UTILITY BOARD
AGENDA

WEDNESDAY, SEPTEMBER 28, 2022

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

CALL TO ORDER

1. **APPROVAL OF MINUTES**
   a. Approval of September 14, 2022 Regular Meeting Minutes
   2022.09.14 UB Minutes.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.

   The public is invited to attend this meeting in person or via webcast (www.ctubwv.com- Board Meetings - Meeting Agendas and Minutes 2022) or by accessing the following zoom link:

   https://us06web.zoom.us/j/84936098658?pwd=b1pxVi9aTHdwdDhvVFdhR3I2SjlpUT09

   Meeting ID: 849 3609 8658
   Passcode: 355369
   +1 301 715 8592 US

3. **UNFINISHED BUSINESS**
   a. PSC Case Updates - Possible Executive Session Under: WV State Code Section §6-9A-4(b)(9) - To consider matters involving or affecting the purchase, sale or lease of property, advance construction planning, the investment of public funds or other matters involving commercial competition, which if made public, might adversely affect the financial or other interest of the state or any political subdivision and involving contract matters.
   i. WV PSC Case No. 21-0260-S-DU Shenandoah Junction Public Sewer
   ii. WV PSC Case No. 21-0818-S-DU Cave Road Utilities, LLC
   iii. WV PSC Case No. 22-0370-S-PC-PW Cave Road Utilities, LLC/Jefferson Utilities, Inc. Transfer of Sewer Utility
   iv. WV PSC Case No. 22-0369-W-PC-PW Cave Road Utilities, LLC/Jefferson Utilities, Inc. Transfer of Water Utility

4. **NEW BUSINESS**
   a. Charles Town Wastewater Plant - Blower Motor Purchase
      Blower Motor Quotes.pdf
   b. Matter Concerning Acquisition of Property - Possible Executive Session Under: WV State Code Section §6-9A-4(b)(9) - To consider matters involving or affecting the purchase, sale or lease of property, advance construction planning, the investment of public funds or other matters involving commercial competition, which if made public, might adversely affect the financial or other interest of the state or any political subdivision and involving contract matters.

5. **MANAGER REPORTS**
   a. Utility Manager Report
   b. Chairman Report

6. **APPROVAL OF BILLS**
   a. September 28, 2022
      2022.09.28 Board Report.pdf

7. **ADJOURNMENT**

8. **INFORMATION ONLY**
   a. September 20, 2022 Technical Memorandum Water Capacity Improvement Fee (CIF) Analysis
      2022.09.20 CTUB Water Tech Memo.pdf
   b. Next Meeting - October 12, 2022 at 4:00 P.M.

September 14, 2022

The Charles Town Utility Board held a regular meeting on September 14, 2022 at 4:00 P.M. Members of the Board present were John Barkley, Duke Pierson, Tommy Stocks and Jeff Whitten. Also present were Kristen Stolipher, April Shultz, Hoy Shingleton, and Ashley Stottlemyer. The Chairman called for changes or corrections to the August 25, 2022 special meeting minutes. Motion by Mr. Stocks, second by Mr. Whitten, the Board unanimously approved the minutes as presented. The Board received public comments from Tiffany Kolosick and Ron and Bernadette Espidido.

The Board next discussed the Collection System Project Update by RK&K. John Cole, RK&K, provided an update to the Board including the latest cost estimate for the project totaling around $7 million. Brandon Felton, RK&K, mentioned the final plans should be completed by next month. Mr. Cole also provided the project should be ready to go out to bid by late Spring 2023. No action was taken by the Board.

Next, the Board discussed the Breckenridge Pump Station Upgrades Cost Estimate by RK&K. Rhiannon Dodge, RK&K, provided that a sanitary sewer evaluation was completed in this area which was incorporated into the existing sewer model. At this time, the Breckenridge pump station can handle the existing and committed capacity, plus an additional 162 EDU's from the proposed Greenhill Subdivision. Beyond that, the Breckenridge pump station and force main will need to be upgraded for any additional flow. Ms. Dodge included a cost estimate for this scenario. No action was taken by the Board.

Next discussed was the King's Crossing/Hillside Evaluation. Ms. Dodge reviewed the evaluation on the feasibility and available downstream capacity in the Greenfield pump station sewershed for the proposed Kings Crossing Subdivision, Hillside II Subdivision, and Dailey Properties. She mentioned the analysis involved expanding the sewer model by incorporating the additional areas that will be impacted by the proposed developments. Several modeling scenarios and cost estimates were provided. Mrs. Stolipher mentioned the proposed King's Crossing subdivision final plans should be completed soon and the upsizing of the force main as mentioned in the evaluation will need to be further evaluated in the near future. No action was taken by the Board.

The Chairman next opened the floor for discussion on the Permit Modification for the Hollywood Casino. Mrs. Stolipher provided that several months ago a permit modification was done for accepting flows into the CTUB sewer system from the water softening system of the Hollywood Casino. They would like to increase the flow from 2,000 to 8,000 gallons per day. If no objections from the Board, Mrs. Stolipher will submit the modification to DEP. No action taken by the Board.

The Board next discussed the Jefferson Utilities, Inc./CTUB Billing Contract. Mrs. Stolipher provided the draft contract and mentioned staff would assume the billing of these customers, but obtain the reads from Jefferson Utilities, Inc at $0.40 per read per month. She also mentioned that should the merger between Jefferson Utilities, Inc. and West Virginia American Water be approved, a contract directly with West Virginia American Water would be presented. The Board held discussions. No action taken by the Board.

Next, the Board discussed the Water Capacity Improvement Fee Revision. Mrs. Stolipher explained the Board had previously accepted the report drafted by Dewberry which proposed a water capacity improvement fee value of $5,481.00 per EDU. After reviewing several factors that went into calculating that fee, Dewberry reevaluated the parameters and revised the fee to $4,179.00 per EDU. Mrs. Stolipher provided the revised fee is more in line with how capacity improvement fee's have been applied historically. The Board held discussions. Motion by Mr. Pierson, second by Mr. Stocks,

the Board unanimously approved presenting the revised water capacity improvement fee value to City Council for approval.

The Utility Manager Report was next addressed. Mrs. Stolipher briefed the Board on this month's sewer and water efforts including hydrant flushing completion, annual chlorine burn, bond closing and pre-construction meeting for the Renewal and Replacement project, and the Washington Street paving project. The Chairman mentioned his attendance at the pre-construction meeting for the Renewal & Replacement project.

The Board next discussed the Approval of Bills. Motion by Mr. Stocks, second by Mr. Pierson, the Board unanimously approved the payment of the bills.

Next, motion by Mr. Pierson, second by Mr. Whitten, the Board unanimously approved convening into Executive Session at 4:43 P.M. to discuss the following items:

- PSC Case Updates - Possible Executive Session Under: WV State Code Section §6-9A-4(b)(9) - To consider matters involving or affecting the purchase, sale or lease of property, advance construction planning, the investment of public funds or other matters involving commercial competition, which if made public, might adversely affect the financial or other interest of the state or any political subdivision and involving contract matters.
  - WV PSC Case No. 21-0260-S-DU Shenandoah Junction Public Sewer
  - WV PSC Case No. 21-0818-S-DU Cave Road Utilities, LLC
  - WV PSC Case No. 22-0370-S-PC-PW Cave Road Utilities, LLC/Jefferson Utilities, Inc. Transfer of Sewer Utility
  - WV PSC Case No. 22-0369-W-PC-PW Cave Road Utilities, LLC/Jefferson Utilities, Inc. Transfer of Water Utility
- Miller Station Development Request - Possible Executive Session Under: WV State Code Section §6-9A-4(b)(9) - To consider matters involving or affecting the purchase, sale or lease of property, advance construction planning, the investment of public funds or other matters involving commercial competition, which if made public, might adversely affect the financial or other interest of the state or any political subdivision and involving contract matters.

Motion by Mr. Pierson, second by Mr. Stocks, the Board unanimously approved to reconvene in public session with no action taken within the executive session, but action may be taken in public session. The Board declared executive session over at 5:15 P.M. Motion by Mr. Pierson, second by Mr. Whitten, the Board unanimously approved staff engaging with Bob Rodecker to provide services for PSC cases discussed and report back to the Board at the next meeting. Also, Mrs. Stolipher mentioned she will meet with RK&R to review the impacts and costs for providing infrastructure to the Miller Station Development.

With no objections, the Board adjourned the meeting at 5:17 P.M. The September 28th regular meeting will be held beginning at 4:00 P.M.

_____ _____

Chairman Secretary

22-Sep-22

CTWWTP Blower Motor quotes

Quote provider	Item Number/Series		Price
Biedlers	ECP4412T-4 Energy Efficient	$	14,196.49
Roberts Electric Motors, Inc.	ECP4412T-4 125 HP	$	16,716.00
Galco	ECP4412T-4 CP Series	$	17,830.31

4.4.1 Influent Structures and Headworks

The headworks operations are in major need of improvement. Downstream issues at the facility can be traced back to poor screening. The operation originally utilized a grinder prior to the coarse screen, which shredded the influent waste before it could be removed by the bar screen and grit removal system. There have been several modifications to the coarse screen in the past to improve operations. None of these improvements had any effect on overall process performance issues. However, the screen performs adequately with the removal of larger debris.

The grit removal system is over 15 years old and is difficult to repair due to replacement part availability. According to the operator, the base had to be welded recently because a new base could not be ordered. Additionally, the compactor on the grit system does not function properly.

4.4.2 Influent Pump Station

The influent pump station following grit removal is also in poor condition. Only one (1) of the three (3) pumps is capable of handling the incoming flows while a second is able to assist during periods of high flows. One (1) pump is not currently producing adequate flow and is scheduled to be repaired. There is an existing conduit laid on the ground with pump power and control wiring. Additionally, the control panel, level sensors and VFDs are in need of replacement. PACL 2000 is fed into the influent pump station wet well to assist in solids settling and with the removal of phosphorus within the biological reactors.

4.4.3 Biological Treatment

The ICEAS biological reactor basins consist of a pre-react zone and a main sequencing batch reactor (SBR) zone. Incoming flow to each reactor enters the pre-react zone and flows into the main SBR zone via small openings at the base of the wall separating the zones. The entirety of each basin is aerated using the same air headers. The basins also have the capability to recycle waste activate sludge (WAS) back to the pre-react zones, although this modification is seldom used. The basins operate on pre-set time intervals which dictate the duration of aeration, settling and decanting cycle processes. When influent flows increase to the programmed flow and basin levels, the cycle times decrease to allow the treatment of additional flow through the process. The system was designed specifically for nitrification; however, based on the data provided, denitrification occurs within the basins. The basins perform adequately and generally need only routine maintenance.

The blowers which supply the biological reactors with air are controlled via the SCADA system and operate solely on dissolved oxygen levels within the basin. Currently, one of the blowers has been completely removed and is waiting for a replacement motor. The blower system has only one flow transmitter which monitors air flow to basins 2 and 3. Additionally, blower 5 is currently the only one capable of suppling air to any of the basins. The other blowers are only capable of feeding to a specific basin according to the operator.

The system is controlled by an ABJ Sanitaire SCADA system. The SCADA allows the operators to view the process control parameters used by the system. Parameters that may be modified are aeration time, dissolved oxygen setpoints and sludge wasting time. However, the operators are not able to modify the overall cycle time. They can only modify time within the cycles. For example, to decrease the aeration time, the operator changes the aeration time from 40 minutes to 30 minutes. The system then takes 10 minutes from the end of aeration cycles one and two and the beginning of cycle three. The operators cannot adjust where the time is taken from within the cycle. If more control was available, the Operators could take 10 minutes of aeration from the end of cycle three to allow more time for enhanced settling.

5.4.3 Aeration Blowers

The aeration blower system for the ICEAS Biological Reactors consists of a maximum of five (5) centrifugal blowers. At the time of our site visit, the motor for blower number 3 had been removed and had yet to be replaced. The aeration blowers are 125 HP Spencer blowers capable of providing 2,340 SCFM at 8.5 psig. Three (3) blowers were originally installed in 2001 during the plant expansion. According to the operator, Blowers 1 and 4 are dedicated solely to Basin 1 and Blower 5 is capable of supplying air to any of the three basins. According to the 2001 upgrade drawings, all of the blowers discharge to a common 12-inch ductile iron air supply line with the capability of opening a valve to allow Blower 1 to supply air to any of the basins. Additionally, there is a branch line from this common discharge point which leads to an 8-inch ductile iron line to supply aeration to the three smaller aerobic digester tanks. However, the drawings depict the valve controlling this line to be normally closed. The blower system utilizes only one (1) insertion pitot tube gauge to measure air flow provided to the basins. This device only measures flow to basins 2 and 3.



Biological Reactor Blowers

5.4.4 Recommendations

5.4.4.1 ABJ Control Panel

The ABJ control panel is obsolete and should be replaced with a new Allen Bradley (or equal) PLC with HMI. All hardware and software should be updated. The estimated cost to install a new PLC to control and monitor the SBRs, including all new instrumentation mentioned below is $100,000.

5.4.4.2 Waste Sludge Metering

Currently the facility does not have a way to directly measure and record the activated sludge wasting rate from the biological reactors. It should be noted that the waste flow rate is a function of the basin level due to gravity flow. As part of the upgrades to the overall sludge handling process, we recommend installing flow meters on each of the sludge wasting lines prior to the aerobic digesters. This would involve a new larger concrete valve and meter vault. The estimated cost for a new meter vault with major piping modifications is $85,000.

5.4.4.3 Blower System Improvements

One of the blowers is currently missing a motor which should be replaced. Additionally, an air flow meter should be installed on the discharge line to Basin 1 in order to calculate the total amount of air supplied to the basins. Also, the existing air flow meter needs replaced. The blower piping requires modification and valving such that all blowers can provide air to any one (1) SBR basin. The estimated cost for a new blower motor is approximately $25,000. Additionly, the estimated cost for two (2) new mass air flow meters is $5,000. The cost estimate to make blower piping modfications is $30,000.

5.4.4.4 Submersible Mixers

It is recommended to provide two (2) mixers in each SBR basin such that the mixers are tied into the SBR control panel. The mixers should run when the blowers shut-off to keep the suspended solids mixed to provide denitrification and prevent septic conditions. Each mixer is estimated to cost $20,000. VFDs and electrical upgrades are estimated at $20,000. The total estimated cost to install six (6) submersible mixers with sensors, guide rails, cables, hoists and VFDs is $140,000.

5.4.4.5 Biological Reactor Basin Maintenance

Debris has constantly been getting through the headworks system and causing issues downstream. Following headworks improvements, the reactor basins should be drained and cleaned as part of routine maintenance. As this should be done as part of regular maintenance, no additional cost was estimated for this recommendation.

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT		AMOUNT
TEAMVIEWER GERMANY GMBH	SUBSCRIPTION: 9/2022 - 9/2	SEWER FUND	SEWER		2,483.00
				TOTAL:	2,483.00
THE CI THORNBURG CO, INC.	M2MXUSNGLPRT TRNSCVR	WATER FUND	WATER		13,999.58
	M2MXUSNGLPRT TRNSCVR	WATER FUND	WATER		5,399.84
				TOTAL:	19,399.42
TYLER TECHNOLOGIES	MAINT: 11/01/22 - 10/31/23	WATER FUND	WATER		1,620.68
	MAINT: 11/01/22 - 10/31/23	SEWER FUND	SEWER		1,620.68
				TOTAL:	3,241.36
WV BUREAU OF PUBLIC HEALTH	J.BURRIS MULT CERT RNWL	SEWER FUND	SEWER		175.00
	R.SHIPE CLS2 WW CERT RNWL	SEWER FUND	SEWER		150.00
				TOTAL:	325.00

========== FUND TOTALS ==========

50	WATER FUND	72,313.47
60	SEWER FUND	134,385.79
	GRAND TOTAL:	206,699.26

TOTAL PAGES: 3

APPROVED BY: _____

APPROVED BY: _____

This Packet: $ 206,699.26

City of Ranson: 24,375.00

Total: $ 231,074.26

Note:

Highlighted to be reimbursed with Capacity Improvement Fees

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT	AMOUNT
			TOTAL:	6,045.42
HACH COMPANY	AMMONIA TNT, ULR	SEWER FUND	SEWER	312.92
			TOTAL:	312.92
MCCARTHY TIRE SERVICE	SEWER VEHICLE WHEEL REPAIR	SEWER FUND	SEWER	1,696.42
			TOTAL:	1,696.42
NACWA	FY2023 MEMBERSHIP DUES	SEWER FUND	SEWER	750.00
			TOTAL:	750.00
PACE ANALYTICAL SERVICES, LLC	TESTING: WV3301905	WATER FUND	WATER	244.35
	TESTING: TUSC	SEWER FUND	SEWER	127.06
	TESTING: CT	SEWER FUND	SEWER	64.07
	TESTING: CT MNTHLY	SEWER FUND	SEWER	236.75
	TESTING: TUSC MNTHLY	SEWER FUND	SEWER	249.78
	TESTING: CT	SEWER FUND	SEWER	168.33
	TESTING: ROCKWOOL	SEWER FUND	SEWER	251.95
			TOTAL:	1,342.29
RAILROAD MGMT CO, IV LLC	CT, WATER PIPE LICENSE FEE	WATER FUND	WATER	608.93
			TOTAL:	608.93
CORPORATION OF RANSON	AUG UT COLLECTIONS	WATER FUND	NON-DEPARTMENTAL	2,985.59
			TOTAL:	2,985.59
RK & K ENGINEERS	TO9 PNTWTRLN & TO10 XSN2TN	WATER FUND	WATER	1,989.90
	TO5 KNGSXNG & HLLSDE	SEWER FUND	NON-DEPARTMENTAL	16,991.85
			TOTAL:	18,981.75
ROSS H BARE	CTWWTP GRIT PROPELLER	SEWER FUND	SEWER	240.00
			TOTAL:	240.00
SHENANDOAH SALES & SERVICE, INC.	SVC WATER VEHICLE	WATER FUND	WATER	128.21
	SVC SEWER VEHICLE	SEWER FUND	SEWER	987.00
	SVC SEWER VEHICLE	SEWER FUND	SEWER	809.38
	SVC SEWER VEHICLE	SEWER FUND	SEWER	175.97
			TOTAL:	2,100.56
STEPTOE & JOHNSON PLLC	GNRL FNCNG/RGLTRY MTRS	SEWER FUND	SEWER	24,565.00
	GENERAL ENVIRONMENTAL	SEWER FUND	SEWER	14,829.78
			TOTAL:	39,394.78
STH, INC.	CRANES LANE PUMP	SEWER FUND	SEWER	7,200.00
			TOTAL:	7,200.00
GERALD TAYLOR CO., INC.	VAC / TRANSPORT	WATER FUND	WATER	595.08
	PUMP / TRANSPORT	WATER FUND	WATER	529.74
	VAC / TRANSPORT	WATER FUND	WATER	250.56
	VAC / TRANSPORT	WATER FUND	WATER	532.44
	TRANSPORT	SEWER FUND	SEWER	534.60
	SUPERVAC	SEWER FUND	SEWER	2,436.48
	TRANSPORT	SEWER FUND	SEWER	427.68
	SUPERVAC LIFT STATION	SEWER FUND	SEWER	2,546.79
			TOTAL:	7,853.37

VENDOR SORT KEY	DESCRIPTION	FUND	DEPARTMENT	AMOUNT
AUTOZONE	MOTOR OIL, QUICK FUNNEL	WATER FUND	WATER	68.96
			TOTAL:	68.96
BIEDLER'S ELECTRIC MOTOR REPAIR, INC.	CRANES LN PS	SEWER FUND	SEWER	3,536.20
	CRANES LN PS	SEWER FUND	SEWER	3,536.20
			TOTAL:	7,072.40
CHARLES TOWN SEWER	AUGUST FUNDING	SEWER FUND	NON-DEPARTMENTAL	12,983.93
			TOTAL:	12,983.93
CHARLES TOWN WATER	AUGUST FUNDING	WATER FUND	NON-DEPARTMENTAL	10,583.14
			TOTAL:	10,583.14
CITY OF CHARLES TOWN	UB COLLECTIONS AUG	WATER FUND	NON-DEPARTMENTAL	16,660.48
			TOTAL:	16,660.48
CORE & MAIN	#2ECLPSEPOSTHYD3'0"BURY2"T	WATER FUND	WATER	1,934.50
	B11-777NL 2 BLL CRB FIPT	WATER FUND	WATER	813.06
	MTRCVR, JNTRSTRNT, MNTRCVR	WATER FUND	WATER	688.86
	MTRCVR, JNTRSTRNT, MNTRCVR	WATER FUND	WATER	1,628.38
	4X2MJTAPTCAPC153IMP,UFR150	WATER FUND	WATER	75.24
	4X2MJTAPTCAPC153IMP,UFR150	WATER FUND	WATER	73.19
	CAPDIVATOR WRENCH	WATER FUND	WATER	118.00
	AFC2506MMMJRWGVOLL/ACCDIBO	WATER FUND	WATER	2,036.30
	VALVE BOX RISERS	WATER FUND	WATER	1,688.35
	L44-33NL3/4PJCTS90BND,L84-	SEWER FUND	SEWER	240.30
			TOTAL:	9,296.18
COYNE CHEMICAL	CP-837,AMMONIUMSULFATE40%N	WATER FUND	WATER	3,505.85
	CES PACL 2000	SEWER FUND	SEWER	21,486.60
			TOTAL:	24,992.45
WV DEPT OF HEALTH & HUMAN SERVICES	BACTERIOLOGICAL TEST	WATER FUND	WATER	120.00
			TOTAL:	120.00
EJ USA, INC.	1046ZUNDFRM4", 1046ZUNDFR7	SEWER FUND	SEWER	7,450.32
	1049Z FR 10"	SEWER FUND	SEWER	1,365.00
			TOTAL:	8,815.32
EXCEL COMMUNICATIONS	ZULTYS RENEWAL	WATER FUND	WATER	470.99
	ZULTYS RENEWAL	SEWER FUND	SEWER	470.98
			TOTAL:	941.97
FRONTIER COMMUNICATIONS	304-876-2120-111514-4	WATER FUND	WATER	101.81
	304-876-9970-121914-4	WATER FUND	WATER	101.81
			TOTAL:	203.62
GUTTMAN ENERGY	W/E 8/14/22	WATER FUND	WATER	969.71
	W/E 9/11/22	WATER FUND	WATER	563.91
	W/E 9/18/22	WATER FUND	WATER	1,226.03
	W/E 8/14/22	SEWER FUND	SEWER	1,527.18
	W/E 8/14/22	SEWER FUND	SEWER	62.26
	W/E 9/11/22	SEWER FUND	SEWER	938.46
	W/E 9/11/22	SEWER FUND	SEWER	34.52
	W/E 9/18/22	SEWER FUND	SEWER	658.53
	W/E 9/18/22	SEWER FUND	SEWER	64.82

Dewberry

TECHNICAL MEMORANDUM
WATER CAPACITY IMPROVEMENT FEE (CIF) ANALYSIS AND BENCHMARKING STUDY

Date: September 20, 2022

To: Ms. Kristen M. Stolipher, Utility General Manager, Charles Town Utility Board (CTUB)

From: Martin A. Kazmierczak, PE, PMP, Principal Engineer, Senior Associate, Dewberry Engineers, Inc. (Dewberry)

Subject: Water CIF Validation and Benchmarking Study

Background

The Charles Town Utility Board (CTUB) authorized Dewberry Engineers, Inc. (Dewberry) to proceed with a Capacity Improvement Fee (CIF) analysis for the CTUB and a benchmarking study of other similar district's CIFs.

Disclaimer

In evaluating the CIF presented in this report, Dewberry has used "generally accepted" engineering and rate-making principles. This statement should not, however, be construed as a legal opinion with respect to West Virginia Law. Dewberry recommends that CTUB have appropriate legal counsel review the CIF set forth in this Technical Memorandum for compliance with West Virginia Law.

Overview of Capacity Improvement Fees

Capacity improvement fees are generally defined as follows:

"One time charges assessed against new wastewater (and/or water) customers or developers/builders to recover a proportional share of capital costs incurred to provide capacity for the new utility customers.[1]"

This service capacity may be already constructed, funded, and available in existing facilities, or the service capacity may be planned and included as future capital projects in a capital improvements plan (CIP). The application of such fees has generally occurred in areas that are experiencing relatively rapid growth and development. CIFs seek to recognize equity between historical and new customers where new capital required for expanding a water system to accommodate growth is often more costly per unit of capacity than the historical costs for the original infrastructure benefitting the existing customers. CIFs are generally adopted to add equity so that "growth pays for growth" and so that existing customers do not subsidize new growth through their user rates.[2]

Capacity Fee Evaluation

Dewberry reviewed data provided by, or developed in conjunction with, CTUB including the following:

- The timing of capital projects to be implemented over the next 10 years, including water main improvements, pump station improvements, storage tank improvements, and treatment plant improvements, and the costs associated with each.
- The anticipated useful life of historical and planned assets.
- The timing of existing and future projected bond issuances.
- The historical cost for water treatment projects constructed in 2016.
- Existing water treatment plant production data.

[1] *Water and Wastewater Financing and Pricing,* Chapter 5, George A. Raftelis, CPA, 2015, CRC Press.

[2] Ibid.

While some CIFs use upwards of 20-year planning horizons for future capital projects, CTUB elected to only include projects in a 10-year planning horizon.

Dewberry applied construction cost indices from *Engineering News Record (ENR)* to determine the current asset value for historical assets and to project costs for planned capital projects over the next 10 years. Based on the ENR Index over the last 5 years, a 3.25% annual inflation rate for future construction costs was applied in the CIF evaluation. For historical assets, the asset was also depreciated to account for a reduction in asset value over time. Historical projects that were not undertaken specifically to improve system-wide capacity were not included.

The growth-related percentage for each historical or planned CIP project was determined in consultation with CTUB based upon the project's intended purpose and use.

In aggregate, $21.14 million in non-growth related costs were identified and $40.25 million in growth-related costs as shown in Attachment A. The non-growth related costs are not applied in the CIF determination.

A debt principal credit calculation was performed on existing and future projected bond-financed projects included in the CIF so that new customers paying the CIF are not charged twice – once when the CIF is paid, and a second time when user rates are paid over time to help retire the debt.[3] The debt principal credit calculation is shown in Attachment B and totals $13.34 million at an anticipated weighted average bond interest rate of 3.97 percent. The resulting net growth-related costs (including the credit) are $26.91 million.

Upon implementing the capital improvements, the equivalent average day excess capacity available in the water treatment and distribution system will be 0.99 million gallons per day (MGD) based on the CTUB's water production records. In applying the current flow per EDU of 154 gpd, 6,439 new EDUs are accommodated with the excess capacity available through implementation of the historical and planned projects.

The resulting Capacity Improvement Fee can therefore be determined as follows:

Parameter	Value	Units
Expanded Plant Capacity (Max. Day)	3.80	MGD
Current Average Plant Demand	1.70	MGD
Current Ratio of Max. Day to Average Day	1.41	
Current Max. Day Demand	2.40	MGD
Max. Day Capacity Available	1.40	MGD
Equivalent Average Day Excess Capacity Available	0.99	MGD
Average Demand Per EDU	154	gpd per EDU
Number of EDUs Supported	6,439	EDUs
Growth Related Costs per Capital Improvement Plan	$40,251,893	Dollars
Debt Principal Credit	$(13,342,067)	Dollars
Net Growth Related Costs	$26,909,862	Dollars
Calculated CIF	4,179	Per EDU
Calculated CIF	27.14	Per gpd

[3] *Water and Wastewater Financing and Pricing,* Chapter 5, George A. Raftelis, CPA, 2015, CRC Press.

Under these assumptions, each new residential EDU would be assessed a fee of $4,179. Each commercial or industrial user would be assessed $27.14 per gpd of capacity.

Care should be exercised by CTUB in the exact wording of their CIF resolution to avoid misapplication or misuse.

Comparable Water Service Providers

Comparable Water Service Providers were reviewed by looking at various utilities within a 50-mile radius of Jefferson County that have implemented a CIF (or similar fee), and those that serve populations generally between 1,000 and 100,000 customers.

Summary of CIFs for Various Water Service Providers

Using available public records, Dewberry researched the CIFs in place for water service providers and the time periods they went into effect. A table summarizing this information with a list of the water service providers and their CIFs is shown in Attachment C.

During Dewberry's research, it was also found that water service providers used varying amounts of water flow for one equivalent dwelling unit (EDU) in the calculations of their CIF. These varying flows per EDU are provided in Attachment C. For ease of comparison, Dewberry calculated a normalized CIF price expressed in terms of cost per gallon per day ($ per gpd) of water (the CIF charge divided by the respective flow per EDU) to normalize the fees.

Results

Dewberry found that there are several water service providers within the state of West Virginia that currently impose a CIF, such as the City of Martinsburg and the Berkeley County Public Service Water District. Many other water service providers from the nearby geographic regions of Virginia and Maryland include, but are not limited to, the City of Frederick, City of Hagerstown, and the Town of Leesburg. The CIFs for these providers ranged from $1,301 to $14,115, with a mean of $5,614, including the proposed CIF for CTUB. Similarly, the normalized price per gpd, based on the service provider's CIF and respective flow per EDU, ranged from $4.44 to $56.46 per gpd, with a mean of $22.50 per gpd.

Dewberry confirmed the CTUB CIF methodology per AWWA Manual M1 standards and concluded that a CIF of $4,179 per EDU or $27.14 per gpd was appropriate for CTUB (based on 154 gallons as the utility's demand per EDU). Attachment D shows a table and graph of the published CIFs of water service providers, ordered least to greatest, in comparison to that of CTUB. Attachment E, similarly, shows a table and a graph of the normalized CIFs of these varying water service providers, ordered least to greatest, in comparison to that of CTUB.

In summary, compared to others in the region, the CTUB proposed CIF is below the mean CIF value and above the mean normalized CIF value.

Dewberry

TECHNICAL MEMORANDUM
WATER CAPACITY IMPROVEMENT FEE (CIF) ANALYSIS AND BENCHMARKING STUDY

Attachments

1. **Attachment A – Capacity Improvement Fee Analysis**
2. **Attachment B – Debt Principal Credit Calculation**
3. **Attachment C – Various Water Service Providers in the Region and their CIFs**
4. **Attachment D – Various Water Service Providers' Published CIFs**
5. **Attachment E – Various Water Service Providers' Normalized CIFs**

Attachment A
Charles Town Utility Board
Water Capacity Improvement Fee Analysis

9/20/2022

Name of Improvement	Year Completed or Proposed	Useful Life Yrs	Total Cost of Project	Local Cost to CTUB	Notes	ENR Factor Relative to 2022	Local Replacement Value	Depreciation Percentage Relative to 2022	Replacement Cost New Less Depreciation	Percent System Improvement	Percent Non-Growth Related	Percent Growth Related	Notes	Value for Local Non-Growth System Improvement	Value for Local Growth Related Improvement
Prior Projects															
2016 Water Projects - WTP Improvements	2016	30	$ 7,695,000.00	$ 7,695,000		1.270	$ 9,772,650	20%	$ 7,818,120	100%	85.7%	14.3%	1	$ 6,701,246	$ 1,116,874
		Sub Total	$ 7,695,000	$ 7,695,000			$ 9,772,650		$ 7,818,120					$ 6,701,246	$ 1,116,874
Current & Future 10-Year CIP Projects (Opinions of Probable Cost)															
Charles Town Racetrack	2022	40	$ 88,000	$ 88,000		1.0000	$ 88,000	0%	$ 88,000	100%	50%	50%		$ 44,000	$ 44,000
5th Street Hydrant	2022	40	$ 7,000	$ 7,000		1.0000	$ 7,000	0%	$ 7,000	100%	70%	30%		$ 4,900	$ 2,100
6th Avenue Hydrant	2022	40	$ 7,000	$ 7,000		1.0000	$ 7,000	0%	$ 7,000	100%	70%	30%		$ 4,900	$ 2,100
S. Mildred Hydrants	2022	40	$ 9,000	$ 9,000		1.0000	$ 9,000	0%	$ 9,000	100%	70%	30%		$ 6,300	$ 2,700
7th Avenue	2023	40	$ 35,000	$ 35,000		1.0325	$ 36,138	0%	$ 36,138	100%	70%	30%		$ 25,296	$ 10,841
W. Avis Hydrant	2023	40	$ 9,000	$ 9,000		1.0325	$ 9,293	0%	$ 9,293	100%	70%	30%		$ 6,505	$ 2,788
W. Academy Tie	2023	40	$ 88,000	$ 88,000		1.0325	$ 90,860	0%	$ 90,860	100%	70%	30%		$ 63,602	$ 27,258
Main Zone Maintenance	2023	40	$ 28,000	$ 28,000		1.0325	$ 28,910	0%	$ 28,910	100%	100%	0%		$ 28,910	$ -
Northern High Zone Maintenance	2023	40	$ 2,000	$ 2,000		1.0325	$ 2,065	0%	$ 2,065	100%	100%	0%		$ 2,065	$ -
Huntfield Zone Maintenance	2023	40	$ 10,000	$ 10,000		1.0325	$ 10,325	0%	$ 10,325	100%	100%	0%		$ 10,325	$ -
Ameritech Street	2023	40	$ 333,000	$ 333,000		1.0325	$ 343,823	0%	$ 343,823	100%	70%	30%		$ 240,676	$ 103,147
New Well / Spring Sources	2023	30	$ 2,125,000	$ 2,125,000		1.0325	$ 2,194,063	0%	$ 2,194,063	100%	30%	70%		$ 658,219	$ 1,535,844
N. Mildred Street B	2024	40	$ 200,000	$ 200,000		1.0661	$ 213,211	0%	$ 213,211	100%	30%	70%		$ 63,963	$ 149,248
Burns St. PS Upgrade	2024	30	$ 3,526,000	$ 3,526,000		1.0661	$ 3,758,914	0%	$ 3,758,914	100%	30%	70%		$ 1,127,674	$ 2,631,240
Well Development/Spring Source Construction	2024	40	$ 1,480,000	$ 1,480,000		1.0661	$ 1,577,763	0%	$ 1,577,763	100%	25%	75%		$ 394,441	$ 1,183,322
Church Street	2025	40	$ 595,000	$ 595,000		1.1007	$ 654,918	0%	$ 654,918	100%	25%	75%		$ 163,730	$ 491,189
South George Street	2025	40	$ 279,000	$ 279,000		1.1007	$ 307,096	0%	$ 307,096	100%	80%	20%		$ 245,677	$ 61,419
Water Street	2025	40	$ 2,400,000	$ 2,400,000		1.1007	$ 2,641,687	0%	$ 2,641,687	100%	70%	30%		$ 1,849,181	$ 792,506
Route 340	2025	40	$ 1,173,000	$ 1,173,000		1.1007	$ 1,291,125	0%	$ 1,291,125	100%	0%	100%		$ -	$ 1,291,125
Raw Water Intake	2025	30	$ 1,581,000	$ 1,581,000		1.1007	$ 1,740,212	0%	$ 1,740,212	100%	30%	70%		$ 522,063	$ 1,218,148
N. Mildred Street A	2026	40	$ 648,000	$ 648,000		1.1365	$ 736,436	0%	$ 736,436	100%	30%	70%		$ 220,931	$ 515,505
E. 10th St.	2026	40	$ 298,000	$ 298,000		1.1365	$ 338,670	0%	$ 338,670	100%	70%	30%		$ 237,069	$ 101,601
Membrane / GAC Pilot	2026	30	$ 80,000	$ 80,000		1.1365	$ 90,918	0%	$ 90,918	100%	30%	70%		$ 27,275	$ 63,643
Huntfield	2027	40	$ 210,000	$ 210,000		1.1734	$ 246,416	0%	$ 246,416	100%	0%	100%		$ -	$ 246,416
Fritts & Old Town Ranson	2028	40	$ 1,295,000	$ 1,295,000		1.2115	$ 1,568,954	0%	$ 1,568,954	100%	0%	100%		$ -	$ 1,568,954
Magnolia Springs	2028	40	$ 1,085,000	$ 1,085,000		1.2115	$ 1,314,529	0%	$ 1,314,529	100%	0%	100%		$ -	$ 1,314,529
Norborne Greene	2028	40	$ 7,000	$ 7,000		1.2115	$ 8,481	0%	$ 8,481	100%	0%	100%		$ -	$ 8,481
Charles Town Infill	2028	40	$ 35,000	$ 35,000		1.2115	$ 42,404	0%	$ 42,404	100%	0%	100%		$ -	$ 42,404
Windmill Crossing	2028	40	$ 7,000	$ 7,000		1.2115	$ 8,481	0%	$ 8,481	100%	0%	100%		$ -	$ 8,481
WTP Design	2028	30	$ 1,345,000	$ 1,345,000		1.2115	$ 1,629,531	0%	$ 1,629,531	100%	30%	70%		$ 488,859	$ 1,140,672
Augustine Ave. PS Discharge	2029	40	$ 298,000	$ 298,000		1.2509	$ 372,775	0%	$ 372,775	100%	0%	100%		$ -	$ 372,775
Locust Hill	2029	40	$ 2,400,000	$ 2,400,000		1.2509	$ 3,002,214	0%	$ 3,002,214	100%	0%	100%		$ -	$ 3,002,214
Roper/Stolipher	2029	40	$ 1,243,000	$ 1,243,000		1.2509	$ 1,554,897	0%	$ 1,554,897	100%	0%	100%		$ -	$ 1,554,897
Augustine Ave. PS Upgrade	2029	30	$ 780,000	$ 780,000		1.2509	$ 975,720	0%	$ 975,720	100%	0%	100%		$ -	$ 975,720
WTP Upgrade	2031	30	$ 20,000,000	$ 20,000,000		1.3336	$ 26,671,076	0%	$ 26,671,076	100%	30%	70%		$ 8,001,323	$ 18,669,753
		Sub Total	$ 43,706,000	$ 43,706,000			$ 53,572,904		$ 53,572,904					$ 14,437,885	$ 39,135,019
		Totals	$ 51,401,000	$ 51,401,000			$ 63,345,554		$61,391,024					$ 21,139,130	**$ 40,251,893**

Capacity Improvement Fee Determination

Expanded Plant Capacity (Max. Day):	3.80	MGD	
Current Average Plant Demand:	1.70	MGD	
Current Ratio of Max. Day to Average Day:	1.41		
Current Max. Day Demand:	2.40	MGD	
Max. Day Capacity Available:	1.40	MGD	
Equivalent Average Day Excess Capacity Available:	0.99	MGD	
Average Demand Per EDU:	154	gpd/EDU	
Number of EDUs Supported:	6,439	EDUs	
Growth Related Costs per Capital Improv. Plan	$ 40,251,893		
Debt Principal Credit	$ (13,342,067)	(See Attachment B)	
Net Growth Related Costs	$ 26,909,826		
Calculated Capacity Improvement Fee	**$ 4,179**	per EDU	
Calculated Capacity Improvement Fee	$ 27.14	per gpd	

	Year	Capital Costs by Year	Growth Costs by Year
	2022	$ 111,000	$ 50,900
	2023	$ 2,715,475	$ 1,679,878
	2024	$ 5,549,889	$ 3,963,810
	2025	$ 6,635,038	$ 3,854,387
	2026	$ 1,166,024	$ 680,749
	2027	$ 246,416	$ 246,416
	2028	$ 4,572,379	$ 4,083,520
	2029	$ 5,905,605	$ 5,905,605
	2030	$ -	$ -
	2031	$ 26,671,076	$ 18,669,753
Not Included	2032	$ -	$ -
Not Included	2033	$ -	$ -
Not Included	2034	$ -	$ -
Not Included	2035	$ -	$ -
Not Included	2036	$ -	$ -
	TOTAL	$ 53,572,904	$ 39,135,019

Notes:
1. Based on current plant max. demand of 2.4 MGD versus current plant capacity of 2.8 MGD.

Attachment B
Debt Principal Credit Calculation

Year	Total Existing Debt Principal (Growth-Related Portion)	Projected New Debt Principal (Growth-Related Portion)	Total Debt Service Principal (Growth-Related Portion)	Present Value of Debt Service Principal (Growth-Related Portion)
2022	$ (27,447)	$ -	$ (27,447)	$ (27,447)
2023	$ (28,284)	$ 0	$ (28,284)	$ (27,204)
2024	$ (29,147)	$ (29,291)	$ (58,438)	$ (54,060)
2025	$ (30,036)	$ (89,864)	$ (119,899)	$ (106,682)
2026	$ (30,952)	$ (96,273)	$ (127,225)	$ (108,878)
2027	$ (31,896)	$ (100,124)	$ (132,020)	$ (108,667)
2028	$ (32,869)	$ (162,662)	$ (195,530)	$ (154,798)
2029	$ (33,871)	$ (265,143)	$ (299,014)	$ (227,685)
2030	$ (34,904)	$ (275,749)	$ (310,653)	$ (227,516)
2031	$ (35,969)	$ (600,970)	$ (636,939)	$ (448,668)
2032	$ (37,066)	$ (625,008)	$ (662,074)	$ (448,566)
2033	$ (38,196)	$ (650,009)	$ (688,205)	$ (448,466)
2034	$ (39,361)	$ (676,009)	$ (715,371)	$ (448,368)
2035	$ (40,562)	$ (703,049)	$ (743,611)	$ (448,272)
2036	$ (41,799)	$ (731,171)	$ (772,971)	$ (448,178)
2037	$ (43,074)	$ (760,418)	$ (803,492)	$ (448,086)
2038	$ (44,388)	$ (790,835)	$ (835,223)	$ (447,995)
2039	$ (45,742)	$ (822,468)	$ (868,210)	$ (447,907)
2040	$ (47,137)	$ (855,367)	$ (902,504)	$ (447,821)
2041	$ (48,574)	$ (889,582)	$ (938,156)	$ (447,736)
2042	$ (50,056)	$ (925,165)	$ (975,221)	$ (447,654)
2043	$ (51,583)	$ (962,172)	$ (1,013,754)	$ (447,573)
2044	$ (53,156)	$ (1,000,659)	$ (1,053,814)	$ (447,494)
2045	$ (54,777)	$ (1,040,685)	$ (1,095,462)	$ (447,417)
2046	$ -	$ (1,082,312)	$ (1,082,312)	$ (425,167)
2047	$ -	$ (1,125,605)	$ (1,125,605)	$ (425,290)
2048	$ -	$ (1,170,629)	$ (1,170,629)	$ (425,412)
2049	$ -	$ (1,217,454)	$ (1,217,454)	$ (425,535)
2050	$ -	$ (1,266,152)	$ (1,266,152)	$ (425,658)
2051	$ -	$ (1,316,798)	$ (1,316,798)	$ (425,781)
2052	$ -	$ (1,369,470)	$ (1,369,470)	$ (425,904)
2053	$ -	$ (1,424,249)	$ (1,424,249)	$ (426,026)
2054	$ -	$ (1,386,217)	$ (1,386,217)	$ (398,817)
2055	$ -	$ (1,249,004)	$ (1,249,004)	$ (345,620)
2056	$ -	$ (1,289,835)	$ (1,289,835)	$ (343,289)
2057	$ -	$ (1,341,428)	$ (1,341,428)	$ (343,389)
2058	$ -	$ (1,205,240)	$ (1,205,240)	$ (296,745)
2059	$ -	$ (942,166)	$ (942,166)	$ (223,116)
2060	$ -	$ (979,853)	$ (979,853)	$ (223,180)
Total Debt Principal Credit (Growth Related Portion)				**$ (13,342,067)**

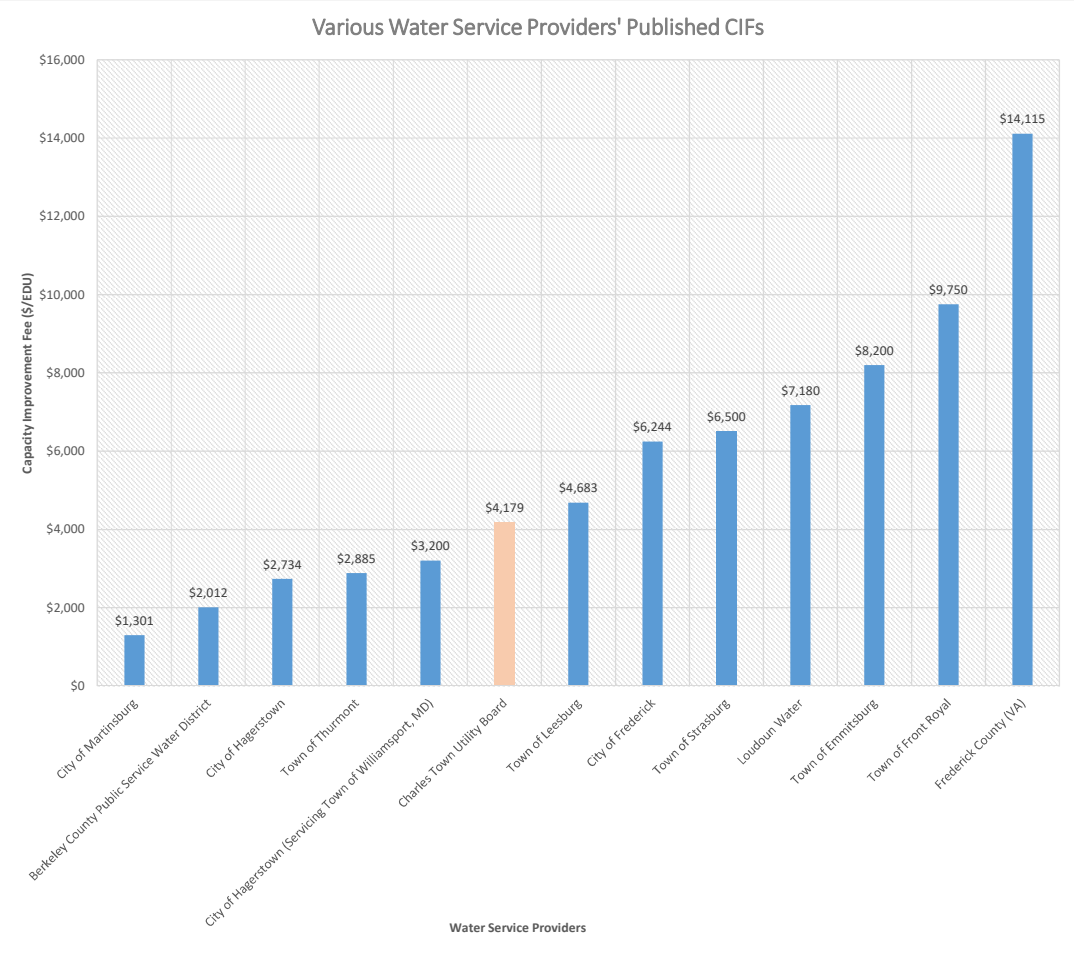
ATTACHMENT C - VARIOUS WATER SERVICE PROVIDERS IN THE REGION AND THEIR CIFS

Service Provider	Geographic Region	Number of Customers	Primary Water Source (Ground/Surface)	Effective Date of CIF	Published CIF ($/EDU)	Flow per EDU (gpd)	Normalized CIF ($/gpd)
West Virginia							
Charles Town Utility Board	Jefferson County, WV	5,890	Surface	2022	$4,179	154	$27.14
Berkeley County Public Service Water District	Berkeley County, WV	27,000	Surface	2019 - Present	$2,012	152	$13.24
City of Martinsburg	Berkeley County, WV	6,500	Ground	2020 - Present	$1,301	293	$4.44
Maryland							
City of Frederick	Frederick County, MD	48,000	Surface	2011 - Present	$6,244	250	$24.98
City of Hagerstown	Washington County, MD	89,000	Surface	July 1, 2020 - Present	$2,734	200	$13.67
City of Hagerstown (Servicing Town of Williamsport, MD)	Washington County, MD	2,139	Ground	2017 - Present	$3,200	200	$16.00
Town of Thurmont	Frederick County, MD	6,200	Ground	2013 - Present	$2,885	250	$11.54
Town of Emmitsburg	Frederick County, MD	2,821	Surface	2014 - Present	$8,200	200	$41.00
Virginia							
Frederick County (VA)	Frederick County, VA	15,911	Surface	2019 - Present	$14,115	250	$56.46
Town of Strasburg	Shenandoah County, VA	2,684	Surface	2019 - Present	$6,500	350	$18.57
Town of Leesburg	Loudoun County, VA	18,174	Surface Ground	2016 - Present	$4,683	350	$13.38
Loudoun Water	Loudoun County, VA	82,387	Surface	2020 - Present	$7,180	550	$13.05
Town of Front Royal	Warren County, VA	6,000	Surface	2013 - Present	$9,750	250	$39.00

ATTACHMENT D - VARIOUS WATER SERVICE PROVIDERS' PUBLISHED CIFS

Service Provider	Published CIF ($/EDU)
City of Martinsburg	$1,301
Berkeley County Public Service Water District	$2,012
City of Hagerstown	$2,734
Town of Thurmont	$2,885
City of Hagerstown (Servicing Town of Williamsport, MD)	$3,200
Charles Town Utility Board	$4,179
Town of Leesburg	$4,683
City of Frederick	$6,244
Town of Strasburg	$6,500
Loudoun Water	$7,180
Town of Emmitsburg	$8,200
Town of Front Royal	$9,750
Frederick County (VA)	$14,115

Mean Fee: $5,614



ATTACHMENT E - VARIOUS WATER SERVICE PROVIDERS' NORMALIZED CIFS

Service Provider	$/GPD
City of Martinsburg	$4.44
Town of Thurmont	$11.54
Loudoun Water	$13.05
Berkeley County Public Service Water District	$13.24
Town of Leesburg	$13.38
City of Hagerstown	$13.67
City of Hagerstown (Servicing Town of Williamsport, MD)	$16.00
Town of Strasburg	$18.57
City of Frederick	$24.98
Charles Town Utility Board	$27.14
Town of Front Royal	$39.00
Town of Emmitsburg	$41.00
Frederick County (VA)	$56.46

Mean Dollars per GPD: $22.50

