September 27, 2019 Reference No. _____

Mr. Jason Murgia, Chairman
Chairman and Members
Niagara Falls Public Water Authority
5815 Buffalo Avenue
Niagara Falls, New York 14304

Mr. Daniel O'Callaghan, Chairman
Chairman and Members
Niagara Falls Water Board
5815 Buffalo Avenue
Niagara Falls, New York 14304

Re: Continuing Disclosure Report of the Consulting Engineer and Rate Consultant Water, Wastewater and Stormwater System

Dear Chairmen and Members of the Authority and Board:

The purpose of this letter and the accompanying 2019 Continuing Disclosure Report ("2019 CDR" or "2019 Report") is to update the conclusions of the independent engineering and financial analysis that were included in the 2018 Continuing Disclosure Report ("2018 CDR"), dated September 28, 2018.

The Niagara Falls Public Water Authority (the "Authority") and the Niagara Falls Water Board (the "Board") are required to deliver certain financial information and operating data in each fiscal year to the Electronic Municipal Market Access ("EMMA") System implemented by the Municipal Securities Rulemaking Board established pursuant to Section 15B(b)(l) of the Securities Exchange Act of 1934 or any successor thereto. This 2019 CDR is intended to meet those requirements. The information and data is for the benefit of the beneficial owners of the bonds issued for the Board by the New York State Environmental Facilities Corporation ("NYSEFC") in 2015 which were used to entirely refund the Series 2005 EFC Serial Bonds; 2014 EFC bonds, 2013 EFC Bonds and 2012 EFC Bonds; and the bonds issued by the Authority in 2016 which were used to entirely refund the 2005 Authority Bonds and 2013 (the "2016 Authority Bonds" and the "2013 Authority Bonds", respectively) collectively referred to as the "Outstanding Bonds". The Authority did not issue any bonds in 2019, as of the date of this letter. All terms referred to in this letter and the accompanying 2019 Report that are not defined herein are as defined in the Official Statements for the Outstanding Bonds.

The projections presented in this letter and the accompanying 2019 Report are preliminary in nature and are based on the recent financial experience of the Board and the Authority and assumptions regarding future policy decisions of the Board and its performance. The projections include provisions for the financing of future improvements to the Water, Wastewater and Stormwater System (the "System") of the Board as reflected in the Preliminary Capital Improvement Program (the "CIP"). The projected cash flows are also presented as a preliminary draft that is subject to change. The projected cash flows are intended to assess the ability of the Board and Authority to meet the operating costs, working capital needs and other financial requirements including the debt service requirements associated with the Outstanding Bonds and future financing for the period of 2019 through 2023 (the "Projection Period"). All references to years in the 2019 Report refer to the fiscal years of the Board and Authority which end on December 31. As Consulting Engineer to the Authority, AECOM USA, Inc ("AECOM") provides the engineering and operations-related opinions of this letter and the 2019 Report. In order to assess the anticipated operating condition of the System during the projection period, AECOM evaluated the proposed improvements and additions to the System under the CIP. Drescher & Malecki LLP, Rate Consultant to the Board, provides the financial and management consulting opinions of this letter and the 2019 Report.

In preparing this 2019 Report, we reviewed as available, to a reasonable extent, the books, records, reports, operating information and statistical data of the Authority and the Board, and conducted other investigations and analyses as deemed necessary to prepare this 2019 Report.

Based on our studies, we offer the following opinions and conclusions:

- The System is currently in adequate condition to support the delivery of water, wastewater and stormwater services and the generation of user revenues.

- The water treatment facilities are in good condition, requiring few modifications during the projection period. The water distribution system is currently in adequate condition overall although the estimated rate of leakage at 68% in 2018 is higher than typical industry averages (10% to 50%); or typical State standards for unaccounted for water (10%-20%).

- The wastewater treatment plant (the "WWTP") is in fair condition overall, but certain components are in poor condition. During the projection period, the wastewater treatment facilities will require both routine and non-routine repairs, replacements and improvements as described herein. As described in the 2018 Report, certain improvements to the wastewater treatment facilities have been recently completed addressing many components that were previously in poor condition. Additional capital improvements will be implemented in 2019 and beyond within the wastewater treatment facilities.

- The wastewater collection system is in adequate condition overall but certain facilities require capital improvements as described herein. Additional capital improvements will be implemented in 2019 and beyond within the wastewater collection system.

- Board staff, including management and operations personnel, are qualified and effectively organized.

- Through appropriate technology, staffing, tools, and equipment, the Board has operations and maintenance programs that are capable of ensuring the continued effective operation of the System. The System should continue to provide adequate levels of service with minimal disruption.

- The Board is currently in compliance with the conditions of all existing permits, regulations, and other requirements governing safe drinking water standards. The wastewater treatment facilities have been in compliance with all existing permits, regulations, and other requirements, with some exceptions. The wastewater discharge permit requires that additional improvements be made within the sewer collection system, principally relating to Sanitary Sewer Overflows (SSO). An Order On Consent requires Sanitary Sewer Overflow (SSO) abatement. Recent discussions with the NYSDEC in August 2018 and throughout 2019 indicates that the NYSDEC may require the NFWB to undertake additional efforts related to SSO abatement. As of the date of this report this issue has not yet been resolved. The Board, in conjunction with professional engineering consultants, prepared separate plans to address the CSO and SSO issues. Both plans were approved by the NYSDEC. The CIP includes funding for anticipated capital improvements that will address the requirements of the permit during the Projection Period.

- In 2004, the Board authorized the development of a Master Plan for wastewater treatment (the "Strategic Wastewater Treatment Master Plan"). The Master Plan concluded that the

upgrading of the existing wastewater treatment plant was more cost effective than other alternatives such as the construction of a new treatment plant. The Master Plan identified the need for significant capital improvements at the wastewater treatment plant. The Board has retained firms to provide engineering design services in support of the planned improvements. Improvements to the influent screens, carbon filter valves and controls and heating, ventilation and air conditioning ("HVAC") improvements in the carbon building were completed in early 2009 and 2010 (Phases 1 and 2).

Phase 2A upgrades to the WWTP were completed in the first quarter of 2013 and include upgrades and replacement to the filter backwash pumps, instrumentation, and controls. Also in 2013, a second gravity thickener for sludge processing was refurbished. Underground subsidence repairs that threatened plant utilities was also performed in 2013. Phase III rehabilitation and replacement project was completed in early 2017. The work includes carbon filter upgrades, sedimentation basin upgrades, plant water system upgrades, sludge blanket detectors in the gravity thickeners, miscellaneous heating and ventilation system upgrades, grit piping system improvements, and exterior door replacements (partial). The flood mitigation project work was completed in January 2017. This project resulted in four (4) new main pumps (pumps, motors, drives) along with new controls for both the main pumps and the intermediate pumps.

During the summer of 2013 a roof repair and replacement project was undertaken at the WWTP and included the replacement of approximately 78,000 square feet of roofs. Strategic structural repairs to building exteriors including concrete and masonry repairs were undertaken as part of this project. In the summer of 2014 additional masonry and building envelope repairs were performed to address areas in the worst condition or having a potential for building leakage. Additional roof, building envelope and masonry repairs will be required in the future and are included on the WWTP's Capital Improvement Plan.

A flood mitigation project completed design in 2019 to prevent the re-occurrence of plant flooding that occurred in 2013. Approximately 50% of the project cost is funded by FEMA and is expected to be constructed in 2020.

- A July 2014 letter received from the NYSDEC required the Board to address an ongoing turbidity issue in the lower Niagara River that is created by the wastewater treatment plant's outfall. A study to determine the impact of the outfall was completed and submitted to the NYSDEC in October of 2015. The NYSDEC has included a number of the alternatives presented in the turbidity study in the July 29, 2017 discharge incident Consent Order (see below).

- The mercury consent order was closed out by the NYSDEC in 2018. The one action item remaining from the mercury consent (installation of submersible pumps in Sedimentation Basin 5) was deferred to the July 29, 2017 discharge incident Consent Order (see below).

- The NFWB experienced an incident on July 29, 2017 that led to the discharge of dark water into the lower Niagara River. The incident received significant attention as it occurred on a Saturday during daylight hours during the peak tourist season. The NFWB was cited for this event in addition to an August 15, 2017 event that also led to an alleged visible contrast in the receiving water. The NYSDEC and NFWB entered into an Order on Consent dated December 18, 2017. The consent order requires the following:
    1. Properly operate the current WWTP.

2. Perform necessary plant and equipment upgrades to stabilize the existing treatment plant and existing technology.
3. Study methods to optimize the existing WWTP to reduce or eliminate turbidity and dark colored discharges from the WWTP.
4. Study alternative outfall options.
5. Study alternative (biological treatment) treatment technology.

The state has approved a $500,000 grant to perform Items 4 and 5 above. The state has committed $20 million to be invested into the first phase of upgrading the NFWB wastewater infrastructure (Item 2 above). The Board has identified $27 million in necessary WWTP plant upgrades to satisfy Item 2 above, and the state has approved $13.5 million of the $20 million committed for a 50/50 funding match. This obligates the NFWB to expend $13.5 million to satisfy the 50/50 match requirement. A number of studies are proposed or underway to satisfy Items 3, 4, and 5. Engineering contracts to implement the $27 million in capital upgrades were let in 2019. Design work is underway on 8 of the 9 projects. The ninth project awaits completion of plant optimization testing (which is underway) and NYSDEC approval of the findings/recommendations.

- The Board previously reached an agreement with the New York Power Authority ("NYPA") related to the infiltration of water from NYPA's hydropower intake facilities into the Falls Street Tunnel (the "FST"). Under the terms of the Agreement, NYPA paid $19 million to the Board in November 2007; the proceeds of which were intended to reduce or eliminate the NYPA FST inflow. $8.7 million of this amount was spent implementing three (3) projects (FST Elimination, Connection Repairs, and Iroquois Sewer Lining). It appears that significant flow reductions are being achieved as a result of these three projects. No other related projects are envisioned. The remaining monies from the $19 million payment, have been largely spent on capital projects unrelated to the Falls Street Tunnel, and are related to the WWTP.

- In 2009, the Board was approved for $11 million in funding from the New York State Environment Facilities Corporation ("NYSEFC") to complete the second phase of cleaning and restoration of the North Gorge Interceptor ("NGI"). The funding, administered through the NYSEFC, was approximately $5.5 million provided in the form of a subsidized loan at 50% of the market interest, and approximately $5.5 million in principal forgiveness from an American Recovery and Reinvestment Act grant. Construction on the NGI was completed during 2011.

- In 2012 the Board undertook a project to examine the wastewater plant to look for energy saving opportunities. The study was funded by the New York Power Authority (NYPA) and the New York State Environmental Facilities Corporation (NYSEFC). As a result of that project, $2.2 million in energy saving upgrades were identified. The design of this project was completed in 2015 and construction began in 2017. The work includes the following sedimentation basin upgrades: removal of non-functional paddle flocculators, installation of baffles to promote flocculation, rebuilding sludge and grit pump and sludge screw motor controls to enable Supervisory Control and Data Acquisition (SCADA) operation, and replacement of polymer addition piping. In addition miscellaneous heating and ventilation and lighting system upgrades to promote energy efficiency were performed. Construction was completed in 2018.

- It is anticipated that the Board will fund the CIP through the following sources: existing monies in its Construction Fund; the proceeds of anticipated future bonds issued by the Authority; proceeds from the NYPA payment; $20 million grant administered by the NYSDEC and additional surplus funds generated in each year. Significant additional improvements to the wastewater treatment plant will be required both within and beyond the Projection Period.

- In April 2017, the Board reached a settlement with the collective bargaining agreements of all four of its labor unions. The new agreements will result in substantial savings in healthcare costs for the Board over the next 7 years while allowing employees and retirees to retain quality and affordable healthcare benefits. Employees share a modest 20% of costs and the Board contributes to employee Health Savings Plans to help offset costs associated with a high deductible health plan. Furthermore, the new agreement allows for an increase of $1 per hour in starting pay for new hires in 2018, 2019, and 2020 which will allow for a more competitive pay compared to private-sector wages. Without burden to rate payers, other cost-savings measures such as comprehensive training, professional development, and greater utilization of technology in daily operations are also being implemented. The Board will spearhead an aggressive and long term public relations campaign to better educate the public on future initiatives such as its aggressive pursuit of funds through the New York State Clean Water Infrastructure Act.

- Water sales to customers of the System increased in 2011, 2012, 2013 and 2014 by 3.1%, 4.2%, 7.9% and 6.7%, respectively, as compared to the demand in the prior year. Then in 2015, 2016, and 2017 water sales to customers of the system decreased by 5.4%, 1.8%, and 3.5% respectively, which was due to a number of factors. The Board's second largest customer announced their closure in 2016, which took effect in late 2016 into 2018, as complete closured took place in 2017. Additionally, at the end of 2016 the Cricket Cell Tower Lease expired. During 2018, the Board saw an increase is water sales of 5.6% from 2017 as a result of a rate increase of 2.4% coupled with an increase in consumption.

- Cash collections from customer payments, along with the Board's year-to-date expenses are comparable to expectations. Table 16 of the 2019 CDR summarizes the current preliminary estimate of revenues, expenses, debt service, other expenses and debt service coverage for 2019 through 2023. All amounts are subject to change.

- Based on the year-to-date results through June 30, 2019, the Board will have to carefully monitor its cash flows during 2019 to ensure that debt service coverage requirements are met. While current projections show the Board will meet debt service coverage requirements for 2019, there are many factors, such as declines in customer usage, weather and economic conditions, which could affect such projections. The Board should carefully monitor revenues and expenses in 2019 to ensure that debt service coverage requirements are met. Table 16 of the 2019 CDR is also reviewed with members of the Board.

- Rates for water and wastewater service in the City of Niagara Falls (the "City") for 2019 increase 2.0% from 2018. The preliminary projections of cash flows and rates for 2019 through 2023 are presented in Table 16 of the 2019 CDR.

  The projected rate increases included in Table 16 of the 2019 CDR are preliminary and subject to change. The future increases in the rates of the Board are dependent upon upcoming Board policy decisions regarding: the size, scope and timing of the CIP; the use

of the remaining monies from the NYPA settlement; and potential reductions in annual operation and maintenance expenses. Future increases in rates are also dependent upon actual experience and future assumptions regarding customer demand as well as other factors. The Board has expressed its interest in minimizing rate increases while at the same time meeting its financial, capital investment and operating obligations. As a result of all of the above considerations, actual increases adopted by the Board may differ from the amounts shown above.

- Current rates for water and wastewater service are comparable to surrounding service providers.

- Based on information provided by management, the Board appears to be in compliance with reserve fund requirements of the Resolution.

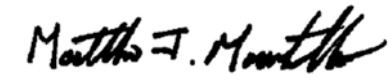
- During the analysis of 2019-2023 revenues and revenue requirements, Drescher & Malecki LLP reviewed certain assumptions with respect to conditions, events and circumstances, which may occur in the future. The firm believes that these assumptions are reasonable and attainable, although actual results will differ from those forecasted as influenced by the conditions, events and circumstances that actually occur.

We wish to extend our gratitude to the Board and the Authority for the support provided in preparing this report. We appreciate the opportunity to be of service in this important matter.

Very truly yours,

John G. Goeddertz, Ph.D.
AECOM
Consulting Engineer

Very truly yours,



Matthew J. Montalbo, CPA
Drescher & Malecki LLP
Rate Consultant

Continuing Disclosure Report
of the Consulting Engineer and Rate Consultant

Introduction

This 2019 Continuing Disclosure Report, prepared in September 2019 (the "2019 CDR" or the "2019 Report"), provides information to supplement and update information presented in the Feasibility Report of the Consulting Engineer and Rate Consultant, prepared in August 2005 (the "2005 Report"), included in the Official Statement for the 2005 Authority Bonds, the Feasibility Report prepared in June 2013, included in the Official Statement for the 2013 Bonds (the "2013 Report"), the Feasibility Report prepared in November 2016, included in the Official Statement for the 2016 Bonds (the "2016 Report"), the 2007 Continuing Disclosure Report prepared in June 2007, the 2008 Continuing Disclosure Report prepared in June 2008, the 2009 Continuing Disclosure Report prepared in July 2009, the 2010 Continuing Disclosure Report prepared in July 2010, the 2011 Continuing Disclosure Report prepared in June 2011, the 2012 Continuing Disclosure Report prepared in June 2012, the 2014 Continuing Disclosure Report prepared in July 2014, the 2015 Continuing Disclosure Report prepared in July 2015, the 2016 Continuing Disclosure Report prepared in July 2016, the 2017 Continuing Disclosure Report prepared in September 2017 and the 2018 Continuing Disclosure Report prepared in September 2018 collectively referred to as the "Prior Reports". Except where noted, the table numbers and titles used in the 2019 CDR correspond to the table numbers and titles in the Prior Reports. In matters presented in the Prior Reports where we have been advised by the Board that no material change has occurred since the preparation of the Prior Reports, no additional information is presented in this 2019 CDR. Throughout the 2019 CDR, references are made to the Water, Wastewater and Stormwater System of the Board (the "System") which serves the City of Niagara Falls, NY (the "City") and provides water service to small portions of adjacent communities.

Board and Authority Members

Mr. Daniel O'Callaghan became the Chairman of the Board in 2017. Other members of the Board include Ms. Colleen Larkin, Ms. Gretchen Leffler, Ms. Renae Kimble and Mr. Nicholas Forster.

Mr. Jason Murgia is the Chairperson of the Authority (having previously been a member of the Authority). Mr. Sanquin Starks is the Vice Chairman of the Authority and Mr. Daniel Weiss is the Treasurer of the Authority.

Organization and Staff of the Board

Mr. Patrick A. Fama was appointed Acting Executive Director of the Niagara Falls Water Board in February 2019 and later as Executive Director in March 2019. He holds a Bachelor of Science degree in Biology from Syracuse University and an Associates of Science degree from Niagara County Community College. Mr. Fama is a New York State certified water treatment plant and distribution system operator with a IA-SW/GUI Filtration Plant designation. Prior to his appointment as Executive Director, he served as the Director and Microbiologist of the Water Board's Water Treatment Plant Laboratory. He has more than 25 years of water treatment system experience with the City of Niagara Falls and the Niagara Falls Water Board.

The table presented below illustrates the staffing levels for the System as of April 30, 2019.

Table 1 – System Staffing

	Staff Positions *
Water Facilities Division	56.5
Wastewater Facilities Division	56.0
Total System	112.5

* Denotes filled positions. Authority and Board members, as well as, personnel providing support services are not included in the above figures. The above totals also do not include staff members that are currently on unpaid leave.

The City provided certain support services to the System in the form of engineering, legal, billing and collection, accounting and fleet maintenance services during the initial years of the Board's operations. Under the terms of the Operations Agreement between the City and the Board, the Board notified the City that it wished to assume direct responsibility for the support services provided by the City. For example, the Board installed a new financial management system and began billing customer accounts during 2008. The City continues to work with the Board in providing collection services for accounts and tax collection services. Under the terms of the agreement, the Board will pay the City approximately $90,000 per year for the services it receives.

Water Treatment

The average daily output from the Board's water treatment plant for 2015 through 2018 is shown in the following table.

Table 2 – Average Daily Production of Treated Water

Year	2015	2016	2017	2018
Flow (MGD)	21.33	20.33	20.06	21.35

Water Distribution System

The distribution system consists of approximately 260 miles of various diameter water mains, 2,287 fire hydrants, over 5,000 valves, two elevated water storage tanks and over 19,000 metered services. The distribution system is a single pressure system. The Water System services the City and several "out-of-town" customers adjoining the City. The Water System also has two major inter-municipal interconnections with the Niagara County Water District that allow for the purchase/sale of water in either direction for emergency or shut down maintenance events.

Treated water is pumped from the water treatment plant to the Water System's 260 miles of pipe and also to the 56th Street elevated water storage tank that has a capacity of 2 million gallons ("mg"). The elevated tank provides added reliability to the Water System, as it will transparently pick up full system demand if the high-lift pump station is shutdown. A second 2 mg elevated storage tank at Beech Avenue is currently shut down and isolated from the Water System. Demolition and replacement of the Beech Avenue water tank is included in the CIP for 2018 and 2019. The Beech Avenue water tank is being used to generate revenues through the lease of space for cellular antennas. The water distribution system utilizes various materials of construction including lined and unlined cast or ductile iron, polyvinyl chloride (PVC), reinforced concrete pressure pipe (RCPP), and high density polyethylene (HDPE) varying in size from 6 inch to 30 inch.

The following tables provide information on the water mains and the approximate age of the pipes comprising the water distribution system:

Table 3 – Water Distribution System Piping

Water Main	Material Type	Length (ft)
6-inch	PVC	1,500
8-inch	PVC	2,610
10-inch	PVC	700
12-inch	Asbestos Cement	5,500
20-inch	Cast/Ductile Iron	7,800
24-inch	RCPP	5,600
30-inch	RCPP	13,370
36-inch	RCPP	16,810
42-inch	RCPP	7,850
2-inch	Cast/Ductile Iron	700
4-inch	Cast/Ductile Iron	95,030
6-inch	Cast/Ductile Iron	596,540
8-inch	Cast/Ductile Iron	239,680
10-inch	Cast/Ductile Iron	121,455
12-inch	Cast/Ductile Iron	102,045
14-inch	HDPE	6,540
16-inch	Cast/Ductile Iron	59,660
20-inch	Cast/Ductile Iron	46,730
24-inch	Cast/Ductile Iron	26,230
30-inch	Cast/Ductile Iron	9,060
	Total	1,365,410

Table 4 – Niagara Falls Water Distribution System
Approximate Age of Pipe

Age	Feet	Percent
1890-1910	65,802	5%
1911-1930	515,179	38%
1931-1950	288,940	21%
1951-1970	251,682	18%
1971-1990	144,121	11%
1991-2016	101,772	7%
Total	1,367,496	100%

Unbilled Water

In Prior Reports, this section was described as unaccounted-for water. The term unaccounted-for water is redefined below and a definition is provided for unbilled water. The Water Facilities Division calculates the percentage of unbilled water based on the difference in quantity between the treated water pumped into the Water System and the number of billed units provided to customers, divided by the treated water pumped. Unbilled water includes both known uses that are not measured or billed (e.g., water used in firefighting and hydrant flushing) and unaccounted-for water such as losses due to leaks in the System. Unbilled water has been 60% percent or more of treated water for the last five years, a percentage that is significantly higher than typical industry averages. This percentage has been relatively the same since 2015. The table presented below shows the average percentages of unbilled water by year.

Table 5 – Unbilled Water

Year	Percent of Treated Water
2015	69%
2016	69%
2017	68%
2018	68%

The marginal cost to the Board of treating and pumping water that is not sold is relatively low. Notwithstanding the absence of a significant cost incentive, the CIP for the Water System is focused primarily on improvements to the distribution system that, over time, together with the increased focus on identifying lost water should result in a decline in unaccounted-for water. In 2012, and 2013 through 2015 the Board embarked on an aggressive meter replacement program. In 2012 a pilot study was performed that included replacement of 450 meters. In 2013 through 2015, 16,000 residential and commercial meters have been replaced. The new meters are auto-read (drive by), which will reduce labor necessary to obtain meter readings and free up personnel for more

important tasks. The objective of the meter replacement program is to improve the accuracy of the water meters as metered water use is the means by which revenue is generated. Based on the experiences of other water utilities in similar situations, the implementation of these programs should lead to a reduction in unaccounted-for water.

To improve the water distribution system, the NFWB has undertaken a program to map and hydraulically model the existing water distribution system. The hydraulic model is being used to identify areas where water pressure is insufficient and to plan for future upgrades to the distribution system. Additionally, an aggressive program has been undertaken by the NFWB to repair or replace all out-of-service fire hydrants. The objective is to return all fire hydrants to a fully functional status. Many of these hydrants that are being replaced were also a source of water leakage. During 2017 and 2018, 75 fire hydrants have been replaced or repaired. This number has increased to approximately 100 hydrants in 2019. As of the date of this report there are no known non-functional fire hydrants.

Water System Staffing

The following table illustrates the number of personnel in each of the eight (8) sections of the Water System as of April 30, 2019.

Table 6 – Water System Staffing

Section	Staff Positions
Laboratory	2.5
Administration	16.0
Information Technology	5.0
Engineering	3.0
Purification Operations	8.0
Inside Water Maintenance	5.0
Outside Water Maintenance	12.0
Meter Shop	5.0
Total Water System Staff	56.5

Based on our review of the Water System, including interviews and discussions with its management and staff, we believe that the Water System is adequately staffed and key management personnel have the qualifications and experience commensurate with their responsibilities.

Wastewater Treatment

The table on the following page identifies the historical flows through the wastewater treatment plant ("WWTP").

Table 7 – Average Daily Wastewater Volume Treated

Year	2015	2016	2017	2018
Flow (MGD)	29.10	27.15	29.28	26.30

Wastewater Facilities

The facilities of the Wastewater System include a wastewater treatment plant ("WWTP"), 8 pumping stations, over 255 miles of combined and separate sanitary sewer lines and 6 combined sewer overflow points. The Wastewater System uses a collection system of lateral, collection and trunk sewers that convey wastewater to the WWTP. The majority of the service area utilizes combined sewers that carry both wastewater and storm water in one pipe. Pipe sizes range from 8 inches to 72 inches in diameter. The Wastewater System also includes approximately 15 miles of large conveyance structures ranging in size from 36 inches to 32 feet in diameter (tunnels).

The eastern portion of the City has a separated sanitary system and storm sewer system. This portion of the Wastewater System uses pumps to alleviate sanitary sewer overflows that occur during certain wet weather events. This procedure complies with the terms of the Board's permit from the DEC. The pumping stations of the Board are listed in the table presented below.

Table 8 – Pump Station and Bypass Station Capacities

Lift Station	Location	Approximate Capacity (MGD)
Gorge	Gorge Pump Station Site	19.5
LS-1	Stephenson & 81st Streets	4.3
LS-2	Griffon Avenue	1.0
LS-3	Buffalo Avenue & 56th Street	1.7
LS-4	91st Street & Luick Avenue	1.7
LS-6	81st Street & Frontier Avenue	4.3
LS-7	Boiler Avenue & Military Road	0.8
LS-8	101st Street	1.0
BPS-1	Cayuga Drive & South Military Road	2.9
BPS-2	West Rivershore Drive	1.0

Like most urban systems of its age with combined storm water and sanitary sewer systems, the Wastewater System has incurred problems with infiltration whereby storm water and ground water enter the pipes devoted to wastewater. This has resulted in added treatment expense.

Like the Water System, the Wastewater System obtains low-cost hydropower from National Grid, which is made available through NYPA. In the case of the Wastewater System, this amounts to approximately 1.6 megawatts per year.

Wastewater System Staffing

The table presented below illustrates the number of personnel in each of the six (6) sections of the Wastewater System as of April 30, 2019:

Table 9 – Wastewater System Staffing

Section	Staff Positions
Monitoring and Compliance	4.0
Analytical Services	5.0
Sewer Collection System Maintenance (1)	10.0
Administrative / Technical	2.0
Plant Operations	17.0
Plant Maintenance	18.0
Total Wastewater System Staff	56.0

1) Includes sanitary sewers, combined sewers and storm sewers. Positions for stormwater maintenance were paid for through the City's General Fund, prior to acquisition of the System by the Board.

In the recent past the Wastewater System was understaffed and resulted in extensive overtime. In 2018, a concerted effort has been made to increase staffing to necessary levels. At present operations and maintenance are fully staffed. Key management personnel have the qualifications and experience commensurate with their responsibilities.

Wastewater System Customer Base

The Wastewater System serves the City and, through a mutual services agreement, limited portions of the Town of Niagara. The Wastewater System serves a population of approximately 48,460 according to the 2017 U.S. Census. The table on the following page shows consumption and revenue information by category of customer.

Table 10 – Wastewater Demand, Revenue and Account Information by Customer Class

Class of Customer	2014	2015	2016	2017	2018
Residential/Commercial					
Consumption (CCF)	1,346,029	1,315,516	1,343,375	1,272,267	1,299,934
Number of Accounts	18,249	18,401	17,954	17,835	17,917
Revenues	$ 6,342,644	$ 6,290,567	$ 6,646,141	$ 6,406,907	$ 6,693,730
Industrial					
Consumption (CCF)	745,073	741,580	804,241	852,457	926,684
Number of Accounts	255	258	248	261	245
Revenues	$ 3,465,432	$ 3,827,590	$ 3,963,845	$ 3,487,388	$ 4,197,516
Significant Industrial Users (SIU)					
Consumption (CCF)	1,362,443	1,209,147	1,065,322	971,721	876,822
Number of Accounts	24	24	23	23	24
Revenues	$ 7,696,309	$ 9,496,590	$ 7,915,420	$ 8,680,470	$ 8,379,467
Non-Resident Users*					
Consumption (CCF)	3,467	-	-	-	-
Number of Accounts	27	-	-	-	-
Revenues	$ (294,307)	$ -	$ -	$ -	$ -
Total					
Consumption (CCF)	3,457,012	3,266,243	3,212,938	3,096,445	3,103,440
Number of Accounts	18,555	18,683	18,225	18,119	18,186
Revenues	$ 17,210,078	$ 19,614,747	$ 18,525,406	$ 18,574,765	$ 19,270,713
Plus: Other Departmental Revenues	1,176,706	1,498,021	622,505	1,036,764	1,188,385
Less: Adjustments	(102,359)	(296,620)	(331,546)	(169,020)	(44,948)
Total Departmental Revenue	$ 18,284,425	$ 20,816,148	18,816,365	19,442,509	20,414,150

*Non-Resident Users are only water supplied, no wastewater activity in 2015, 2016, 2017 and 2018.

Preliminary Capital Improvement Program (CIP)

The Board and the Authority have the responsibility to adopt and implement the CIP for the System. Table 11 presents the CIP for the System for 2019 through 2023. The CIP is updated periodically. The updated CIP as presented herein was reviewed and approved by the Board on May 20, 2019.

Table 11 – Capital Improvement Plan ("CIP")

Description	2019	2020	2021	2022	2023	Total
COMBINED PROJECTS (WATER AND WASTEWATER)						
IT Plan Implementation	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 150,000
Meter Replacement & Upgrades	130,000	70,000	70,000	70,000	70,000	410,000
Fleet Replacement	80,000	80,000	80,000	80,000	80,000	400,000
Water/sewer GIS/GPS Mapping	5,000	5,000	5,000	5,000	5,000	25,000
Combined Projects - Miscellaneous	100,000	100,000	100,000	100,000	100,000	500,000
WASTEWATER INFRASTRUCTURE PROJECTS						
WWTP Rehab Phase 4A	1,100,000	3,000,000	3,000,000	3,300,000	-	10,400,000
WWTP Rehab Phase 4B	1,000,000	3,000,000	-	-	-	4,000,000
WWTP Rehab Phase 4C	1,800,000	-	-	-	-	1,800,000
WWTP Rehab Phase 4D	-	2,000,000	-	-	-	2,000,000
WWTP Rehab Phase 4E	625,000	625,000	-	-	-	1,250,000
WWTP Rehab Phase 4F	-	3,600,000	-	-	-	3,600,000
WWTP Rehab Phase 4G	562,500	562,500	-	-	-	1,125,000
WWTP Rehab Phase 4H	340,000	-	-	-	-	340,000
WWTP Rehab Phase 4I	-	550,000	-	-	-	550,000
WWTP SCADA Improvements	250,000	250,000	250,000	250,000	-	1,000,000
WWTP Chemical Tanks	125,000	-	-	-	-	125,000
Flood Hazard Mitifation Grant Projects	5,717,970	-	-	-	-	5,717,970
GPS Elevator	600,000	-	-	-	-	600,000
Sanitary Lift Station Electrical Upgrades	250,000	-	-	-	-	250,000
LaSalle Area Sewer Improvements (SSO)	200,000	170,000	590,000	355,000	500,000	1,815,000
Combined Sewer Overflow Long Term Control Plan	10,000	-	-	-	-	10,000
Falls Street Tunnel Regulator Repairs	50,000	-	-	-	-	50,000
Sewer/GPS Infrastructure Projects - Miscellaneous	100,000	100,000	100,000	100,000	100,000	500,000
WWTP Standby Generator	150,000	-	-	-	-	150,000
WWTP Infrastructure Projects - Miscellaneous	100,000	100,000	100,000	100,000	100,000	500,000

(continued)

(concluded)

Description	2019	2020	2021	2022	2023	Total
WATER INFRASTRUCTURE PROJECTS						
10th Street and Michigan Avenue Mains	-	-	788,000	-	-	788,000
18th Street Main - Ontario Avenue to Whitney Avenue	-	-	1,109,600	-	-	1,109,600
77th Street Main - Stephenson Ave to Niagara Falls	-	-	1,168,000	-	-	1,168,000
80th Street - Niagara Falls Blvd. to Rick Manning Drive	300,000	-	-	-	-	300,000
Bollier Avenue Main - 82nd Street to Military Road	500,000	-	-	-	-	500,000
College Terrace - Madison to College Avenue	155,000	-	-	-	-	155,000
Laughlin Drive Main - 82nd Street to Bollier Ave	-	610,592	-	-	-	610,592
McKoon Avenue Main - DeVeaux Ave to James Ave	-	-	878,302	-	-	878,302
Military Road Main - Jacob Place to Bollier Avenue	-	210,200	-	-	-	210,200
Ontario Avenue Main - 13th Street to Main Street	-	763,633	-	-	-	763,633
Van Rensselaer Ave - 900 Block	100,000	-	-	-	-	100,000
Whitney Avenue Main - 11th Street to Hyde Park Blvd.	-	-	2,219,200	-	-	2,219,200
Large Valve Replacement	100,000	50,000	50,000	50,000	50,000	300,000
Hydrant Replacement	80,000	80,000	80,000	80,000	80,000	400,000
WTP Caulking	125,000	-	-	-	-	125,000
WTP Pump Replacements	30,000	30,000	30,000	30,000	30,000	150,000
Automation & Security Upgrades at WTP	70,000	-	-	-	-	70,000
Water Treatment Plant Infrastructure Projects - Misc	100,000	100,000	100,000	100,000	100,000	500,000
Witkop Avenue and 85th Street Loop (all 8")	-	718,978	-	-	-	718,978
Water Infrastructure Projects - Miscellaneous	120,000	120,000	120,000	120,000	120,000	600,000
Total	$15,005,470	$16,925,903	$10,868,102	$4,770,000	$1,365,000	$48,934,475

On a System-wide basis, the CIP includes provisions for the implementation of new technology which is primarily focused on the monitoring and control of water and wastewater facilities. Such technology will enable Board personnel to continue to attempt to operate more efficiently and effectively. The past improvements have allowed for some significant reductions in personnel. Funds are also included each year for the replacement of Board vehicles.

The CIP for the Water System is focused primarily on distribution system improvements to enhance overall water quality, system reliability and reduce water loss, including a water main, hydrant and large valve replacement programs. In addition, the meter replacement program has become an important part of reducing the cost of reading meters and replacement of older faulty meters. The remainder of the 72nd Street water main was replaced in late 2015 and a portion of the Bollier Avenue water main was replaced in 2017. The City of Niagara Falls has/is providing design, contract administration and inspection services on both projects. The WWTP Rehab Phase 4 and the 2017 Discharge incident represent significant capital expenditures added to the CIP this year.

With $60 million of planned CIP spending through 2022, there will be a significant focus on the Wastewater System and Water Infrastructure Projects. The CIP includes $27 million over the five year period for WWTP Phase 4 discussed above to comply with the consent order. The CIP also includes funds to address the 2017 discharge incident, LaSalle area Sewer Improvements ("SSO") and projects related to the Flood Hazard Mitigation Grant. Completion of Phase 4 is expected in 2021, while completion of the CIP related to the discharge incident, the flood hazard mitigation grant, the CSO outfall structural repairs, the WWTP roof repairs and the SSO are expected in 2019, 2020, 2021, 2022 and 2023, respectively.

The Phase III WWTP upgrades ($5.4 million) also were completed in 2017. Phase III work included:

- Continued replacement of carbon filtration mechanical equipment,
- Sedimentation Basin 1 replacement of traveling bridge with chain and flight scraper system (expected to be a prototype for eventual conversion of all basins to chain and flight scraper system),
- Polymer feed and transfer pumps replacement for polymer feed to both the sedimentation basins and the belt filter presses.
- Plant water pumps, motors, and VFD replacement.
- Sludge blanket detectors in the gravity thickeners to improve thickener operation.
- Miscellaneous heating and ventilation system improvements in the Sludge and Pump Buildings.
- Minor grit piping improvements.
- Exterior door replacement.
- Additional process monitoring instrumentation.

During 2017 the WWTP constructed its Energy Efficiency Project that was funded by low cost grants from the New York Power Authority. The $2.4 million project included:

- Remove inoperable paddle flocculators in all five (5) sedimentation basins and replace with curtain baffles that promote flocculation with no required energy input.
- Relocate/replace polymer addition piping in the five (5) sedimentation basins.
- Replace heating and ventilation equipment utilizing electric heat with new units fired with natural gas.
- Install new gas fired infrared heaters in the outside sewer garage.
- Rebuild the primary sedimentation basin sludge and grit pump motor controls (17 pumps) to enable SCADA control of this equipment.
- Rebuild the primary sedimentation basin sludge screws motor controls to enable SCADA control of this equipment.
- Miscellaneous lighting upgrades to reduce electricity consumption and improve lighting.

The improvements in the Wastewater System represent the larger share of the budgeted funds for 2019 through 2023, with a recent emphasis placed upon quickly catching up with needed capital improvements at the WWTP in order to stabilize plant operations. Projects have been identified for the following plant areas:

- Sedimentation basin upgrades including scum removal.
- Gorge Pumping Station Improvements.
- Screenings and grit conveyance systems.
- Carbon filter media and underdrain gravel replacement.
- Electrical System Improvements.
- Chemical Treatment System Optimization.
- Heating and Ventilation System Upgrades.
- Replacement of Air Scour Blower.
- Plant Waterline and Process Piping Replacement.

In addition the NFWB has recently embarked on a number of new initiatives including the following:

- The NFWB has recently leased 10 new vehicles. The vehicles are more energy efficient and include two hybrids. As a result, the age of the fleet went from an average age of 12 years old to 7 years old. Over the five-year lease the NFWB is projected to save $300,000.
- The NFWB has established a hydrant truck which routinely tests fire flow's and performs hydrant maintenance. The initiative will improve the reliability of the NFWB's hydrant system.
- The NFWB has implemented a 3-D scanning project to scan existing facilities at the wastewater treatment plants. The initiative will save money in engineering design projects, provide accurate measurements for existing facilities, will be used in employee training programs.
- The wastewater treatment plant is replacing entrance gates for improved security.
- A professional development program has been financed which will include leadership training, state certified operator license training, and provide access to up-to-date training materials.

In the Water Distribution System, the CIP includes funds for five (5) specific water distribution main replacement projects, continued replacement of large valves, continued leak detection & distribution system modeling to reduce leakage rates, and funding for unplanned system repairs. The specific areas identified for replacement have been prioritized based on factors such as the history of main breaks, known areas of leakage, the need to upgrade the size or materials of the main and other factors. The continued implementation of a water main replacement program should, over time, reduce the level of unaccounted-for water in the Water System.

In the opinion of AECOM, the CIP is reasonable and will help ensure that quality water and wastewater services are provided to customers in a reliable manner. There continue to be unanswered questions regarding the potential outcome of the 2015 Turbidity Study and the related 2017 Consent Order studies pertaining to alternative wastewater treatment processes. The outcome of these will likely be mandated wastewater treatment plant capital improvements. The NFWB will seek external grants to undertake any major expenditure for changing the treatment technology at the WWTP.

Sources and Uses of Funds

Table 12 shown on the following page presents the anticipated sources and uses of funds for the CIP. The amounts shown are preliminary, pending policy decisions of the Board.

Table 12 – Sources and Use of Funds for the CIP

	2019	2020	2021	2022	2023
Opening balance, January 1:					
Remaining funds restricted for capital projects**	$12,672,427	$ 6,786,581	$11,549,528	$ 6,238,826	$ 4,108,826
Sources of CIP funds:					
Prior year coverage	1,755,000	865,000	865,000	865,000	865,000
Bonded	-	13,500,000	-	-	-
NYSED EFC Grants	240,000	105,100	2,642,400	-	-
FEMA Grant	2,853,778	-	-	-	-
DASNY Grant	4,270,846	7,218,750	2,050,000	1,775,000	-
Use of CIP funds:					
CIP spending (per Table 11)	(15,005,470)	(16,925,903)	(10,868,102)	(4,770,000)	(1,365,000)
Ending balance, December 31	$ 6,786,581	$11,549,528	$ 6,238,826	$ 4,108,826	$ 3,608,826

It is anticipated that the cash requirements of the CIP for the 2019-2023 period will be met through 1) remaining funds currently on hand with the Board received from the New York Power Authority; 2) remaining funds on hand from cash surpluses from operations of the preceding years; 3) interest on funds on hand whose use is restricted to capital improvements; and, 4) the proceeds of bonded debt to be issued by the Authority. Table 12 assumes that the Board will utilize bond proceeds beginning in 2020 to continue with the projects designated in the 2020, 2021, 2022 and 2023 CIP.

Outstanding Debt

The table on the following page summarizes the outstanding bond issues and remaining principal amounts attributable to the System as of December 31, 2018.

Table 13 –Outstanding Debt

Debt Instrument	Principal Balance December 31, 2018
Niagara Falls Public Water Authority Bonds:	
Series 2013A Bonds	$ 34,890,000
Series 2013B Bonds	4,635,000
Series 2016A Bonds	20,130,000
NYSEFC Water Revolving Funds Revenue Bonds:	
Series 2013B - Clean Water	11,290,000
Series 2013B - Drinking Water	5,580,000
Series 2013B - Drinking Water	1,000,000
Series 2013B - Drinking Water	500,000
Series 2015D - Drinking Water	4,055,000
Series 2014B - Drinking Water	3,920,000
Series 2012B - Clean Water	5,380,000
Total Amount	**$ 91,380,000**

In 2018, the Authority did not issues any new bonds. The outstanding debt decreased by $3,915,000 from 2017 to 2018 due to principal payments made in 2018.

Historical Cash Flows and Debt Service Coverage

The Board acquired the System from the City in September 2003. The Board has now completed thirteen full years as the owner and operator of the System. A summary of the financial performance achieved during the years ending December 31, 2016, December 31, 2017, and December 31, 2018 is provided in Table 14 on the following page.

Table 14 –Historical Financial Performance

Description	2016	2017	2018
Receipts from customers	$ 33,105,558	$ 30,701,932	$ 31,280,867
Interest earnings	525,688	459,709	647,827
Proceeds from sales of assets	33,974	11,039	8,783
Total cash receipts	33,665,220	31,172,680	31,937,477
Payments to employees	10,305,775	10,839,241	11,592,392
Payments to suppliers	9,816,935	8,686,164	9,418,908
Total operating expenses	20,122,710	19,525,405	21,011,300
Cash available for debt service (line 5 - line 9)	13,542,510	11,647,275	10,926,177
Interest payment	4,337,507	3,170,188	3,419,231
Principal payment	6,640,000	3,780,000	3,915,000
Total debt service	$ 10,977,507	$ 6,950,188	$ 7,334,231
Surplus (line 10 - line 13)	$ 2,565,003	$ 4,697,087	$ 3,591,946
Debt service coverage (line 10/line 13)	1.23	1.68	1.49

The preceding table has been prepared based on information presented in the annual financial statements of the Board. The financial statements of the Board for the year ended December 31, 2018 were audited by the firm of EFPR Group, LLP as well as the years ended December 31, 2017 and December 31, 2016.

The results for the year ending December 31, 2016 indicate that the actual debt service coverage achieved by the Board was 123%, exceeding the minimum requirement of 115% of debt service. The results for the year ending December 31, 2017 indicate that the actual debt service coverage achieved by the Board was 168%, also exceeding the minimum requirement of 115% of debt service. The results for the year ending December 31, 2018 indicate that the actual debt service coverage achieved by the Board was 149%, also exceeding the minimum requirement of 115% of debt service.

In April 2017, the Board reached a settlement with the collective bargaining agreements of all four of its labor unions. The new agreements will result in substantial savings in healthcare costs for the Board over the next 7 years while allowing employees and retirees to retain quality and affordable healthcare benefits. Employees share a modest 20% of costs and the Board contributes to employee Health Savings Plans to help offset costs associated with a high deductible health plan. Furthermore, the new agreement allows for an increase of $1 per hour in starting pay for new hires in 2018, 2019, and 2020 which will allow for a more competitive pay compared to private-sector wages. Without burden to rate payers, other cost-savings measures such as comprehensive training, professional development, and greater utilization of technology in daily operations are also being implemented. The Board will spearhead an aggressive and long term public relations campaign to better educate the public on future initiatives such as its aggressive pursuit of funds through the New York State Clean Water Infrastructure Act.

Billing and Collection

All but a limited number of water and sewer customers are billed quarterly based on actual or estimated meter reads. Significant industrial users are billed monthly based on two estimated months followed by an actual meter read in the third month.

Customers of the Board can pay their water and sewer bills either to a lockbox held by Bank on Buffalo or to the City of Niagara Falls Billing and Collection Department at City Hall. All revenues, including those collected by the City, are put immediately into the Board's depository account of the Local Water Fund. The City collects on delinquent accounts and, in particular, any unpaid balances that remain as of November 1 of each year create a lien on the property and are added to the next year's City tax bill. These liens then become due and payable with the tax collection. The City collects the funds, reconciles the tax roll and water/sewer liens and disburses a check to the Board in July and the following January for the two collection periods. These amounts are reconciled to the Board's records for verification of the receipts.

The Board has made meter replacement a major priority, since it last replaced meters in 1990 and the life expectancy of the old style meters averages just 10 years. In 2012, the Board tested a pilot program for electronic meter reading. Based on successful results, the Board has converted all water and sewer meters to electronic read only devices. The advantages of electronic meter reading include having a real-time measure of actual use, taking a fraction of the time, eliminating the need to access a customer's property, minimizing worker's compensation injuries from weather conditions or animals, and detecting continuous water leaks. The use of electronic meters during the pilot program resulted in a 5-7% increase in revenues, and the Board expects similar results for the recently completed meter replacement program.

Table 15 – Water and Sewer Billings and Cash Collections – Historical

FYE 12/31	2014	2015	2016	2017	2018
Service Billings	$ 28,331,424	$ 30,223,999	$ 30,811,823	$ 29,702,412	$ 30,512,619
Penalties	376,347	832,278	687,806	360,222	331,107
Invoice Adjustments	349,619	1,050,440	1,494,512	473,046	18,045
Total Billed	$ 29,057,390	$ 32,106,717	$ 32,994,141	$ 30,535,680	$ 30,861,771
Total Cash Collections - Billings	27,952,283	30,237,090	31,535,662	29,208,181	29,531,100
Total Cash Collections - Property Tax Bill	993,678	1,253,582	1,194,643	1,118,498	1,281,664
Total Collections	$ 28,945,961	$ 31,490,672	$ 32,730,305	$ 30,326,679	$ 30,812,764
% of Total Cash Collections to Total Billed	99.6%	98.1%	99.2%	99.3%	99.8%

Compliance with Reserve Fund Requirements

Under the terms of the Financing Agreement between the Board and the Authority, the Board is required to maintain minimum balances in reserve funds relating to its operating expenses and debt service. The amounts on deposit in the Operation and Maintenance Reserve Fund must equal or exceed two months' of the anticipated operation and maintenance expenses in the upcoming year. The amounts on deposit in the Debt Service Reserve Fund must equal or exceed the maximum annual debt service in any future year. The amounts on deposit in the Board's Operation and Maintenance Reserve Fund and Debt Service Reserve Fund as of December 31, 2018 are in compliance with the requirements of the Financing Agreement. The Board expects to continue to be in compliance with these requirements during 2019.

Projected Cash Flows and Rates

The preliminary projection of cash flows of the System is presented in Table 16. These projections are preliminary and subject to change. The future cash flows of the Board are dependent upon many factors, including economic conditions and Board policy decisions regarding the size, scope and timing of the CIP; the use of the remaining monies from the NYPA settlement and potential reductions in annual operation and maintenance expenses. Future increases in rates and revenues are also dependent upon actual experience and assumptions for regarding customer demand as well as other factors. The achievement of any projection of future conditions is dependent upon the occurrence of other future events and circumstances such as changes in the local and national economy, demographic changes, variations in interest rates and inflation, new regulatory agency initiatives and other factors that cannot be predicted. Therefore, the actual financial requirements

and performance of the System may vary from the estimates presented herein, and such variations could be material.

The year-to-date cash receipts are slightly above those of the prior year which appears to be attributed to increase in rates. However, there is insufficient data to reach any conclusions regarding usage trends for the year.

The projected cash flows in 2019 through 2023 assume that the Board will enact increases in water and wastewater rates and charges of an average of 2.0% in 2019, 2.5% in 2020, 4.2% in 2021, 2.6% in 2022 and 1.0% in 2023. The projection indicates that under the conditions reflected herein, the System will generate operating revenues of approximately $32.1 million in 2019, and approximately $35.4 million in 2023.

Taking into consideration non-operating revenues, total revenues available for debt service and expenses are projected to be $8.7 million in 2019, increasing to $10.5 million in 2023. These projections are preliminary and subject to change. The projected user payments reflect the assumption that water consumption by customers will remain stable throughout the projection period. If such projections in water sales are not achieved, then the Board will have to increase water and sewer rates at a pace that is greater than assumed and/or decrease expenses in order to achieve the debt service coverage requirement.

On a preliminary basis, operating expenses are projected to increase from approximately $23.4 million in 2019 to $24.9 million in 2023. Operating expenses in 2019 through 2023 are expected to increase with inflation, with the exception of employee benefits which are projected using historical increases (and which have increased at rates significantly higher than inflation).

The projected debt service includes principal and interest payments on outstanding bonds as well as anticipated future bonds of the Authority. It is presently anticipated that the Authority will issue $13,500,000 in additional debt in 2020, with the first interest payment due on such debt occurring in 2020, while the first principal payments is expected in 2021. These amounts and the timing of the potential issuance of debt are subject to change based on policy decisions by the Board. The proceeds of such bonds or notes will be used to pay a portion of the costs associated with the CIP.

In 2012, pursuant to its agreement with the City, the Board is obligated to make annual payments in lieu of taxes to the City. The projected amount to be paid from 2019 through 2023 is $700,000 per year.

The debt service coverage ratios in Table 16 are based on total revenues available for expenses and debt service minus Operating Expenses divided by Total Debt Service. It is projected that debt service coverage will be equal to, or greater than, the minimum requirement of 1.15 throughout the Projection Period. All projections are presented on a preliminary basis and are subject to change. This conclusion assumes the following: the Board adopts the projected rate increases described above, expenses are maintained at or below projected levels, and the future changes in customer usage are consistent with the assumed rate of change. As noted earlier, the actual financial requirements and performance of the System may vary from the estimates presented herein, and such variations could be material. With regard to the figures presented in Table 16, the preliminary projections show that debt service coverage is maintained at approximately the minimum levels required by the Bond Resolution. Drescher & Malecki LLP recommends that the Board consider taking the actions necessary such that the debt service coverage and surplus exceed the minimum requirement of 1.15 throughout the Projection Period so that if adverse changes occur (e.g., a greater than assumed decline in customer usage), the Board will have some flexibility to address such changes.

Table 16 – Preliminary Projections of Cash Flows and Rates

Line		2019	2020	2021	2022	2023
	Revenues					
1	Operating revenues	32,065,473	32,850,664	34,202,764	35,074,932	35,419,103
2	Total	32,065,473	32,850,664	34,202,764	35,074,932	35,419,103
	Operations and Maintenance Expenses					
3	Salaries and benefits	12,165,718	12,584,207	13,019,825	13,473,353	13,945,607
4	Chemicals/sludge	4,745,631	4,543,320	4,498,336	4,588,303	4,633,286
5	Insurance/safety	529,576	507,000	501,980	512,020	517,039
6	Maintenance	1,318,978	1,262,749	1,250,246	1,275,251	1,287,753
7	Utilities	1,367,610	1,309,308	1,296,344	1,322,271	1,335,235
8	Other expenses	1,668,356	1,597,232	1,581,418	1,613,046	1,628,860
9	Authority/Board expenses	919,596	880,393	871,676	889,110	897,826
10	PILOT payment to City	700,000	700,000	700,000	700,000	700,000
11	Total	23,415,465	23,384,207	23,719,825	24,373,353	24,945,607
12	**Revenues available for debt service**	8,650,008	9,466,457	10,482,938	10,701,579	10,473,496
	Debt Service					
13	Debt service on outstanding bonds	7,187,360	7,363,716	7,021,537	7,369,642	7,102,988
14	Debt service on future Authority bonds	-	275,000	1,635,000	1,570,000	1,575,000
15	Total	7,187,360	7,638,716	8,656,537	8,939,642	8,677,988
16	**Surplus (line 12 - line 15)**	1,462,648	1,827,741	1,826,401	1,761,937	1,795,508
17	**Debt Service Coverage (minimum 1.15)**	1.20	1.24	1.21	1.20	1.21
18	**Actual/Proposed Rate Increase**	2.0%	2.5%	4.2%	2.6%	1.0%

Notes:

1) Projected cash flow and rates above are subject to change.

Water Sales by Customer Class

Table 17 below illustrates the water consumption by customer class for each of the last four years.

Table 17 – Water Consumption by Customer Class
(Units in ccf (100 cubic feet)

District 1 - Residential	**2015**	**2016**	**2017**	**2018**
1st billing	106,850	108,049	100,240	102,819
2nd billing	121,561	104,043	108,303	107,658
3rd billing	100,775	108,287	103,770	107,252
4th billing	113,855	123,009	112,236	116,702
Total	443,041	443,388	424,549	434,431
District 2 - Residential				
1st billing	123,645	121,583	119,963	116,861
2nd billing	119,175	115,628	112,910	113,431
3rd billing	118,970	131,530	127,364	139,490
4th billing	135,098	147,075	122,452	122,469
Total	496,888	515,816	482,689	492,251
District 3 - Residential				
1st billing	105,873	90,166	91,737	91,913
2nd billing	75,430	89,949	87,527	91,425
3rd billing	99,512	103,073	93,276	99,438
4th billing	94,772	96,107	92,489	90,476
Total	375,587	379,295	365,029	373,252
District - Industrial				
1st billing	168,159	189,903	238,737	207,453
2nd billing	155,325	156,463	175,828	187,882
3rd billing	170,651	183,471	188,136	209,908
4th billing	247,445	274,404	249,756	321,441
Total	741,580	804,241	852,457	926,684
District - SIU				
1st billing	354,036	295,779	215,093	153,939
2nd billing	303,248	297,740	242,358	263,402
3rd billing	256,084	232,313	233,796	214,401
4th billing	295,779	239,490	280,474	245,080
Total	1,209,147	1,065,322	971,721	876,822
District - NR				
1st billing	888	1,015	1,205	569
2nd billing	1,051	1,211	950	659
3rd billing	925	1,337	790	637
4th billing	998	1,313	641	740
Total	3,862	4,876	3,586	2,605
Grand Total ccf	3,270,105	3,212,938	3,100,031	3,106,045
% Change from Prior Year	-5.41%	-1.75%	-3.51%	0.19%

In 2008 through 2010, annual water consumption decreased by approximately 13.4%, 9.8% and 3.11% respectively. Part of the decline in 2008 was attributable to the closure of Ferro Industries. The majority of the decline in 2009 was due to a change in water use by one large industrial user; instead of relying on water from the Board, the industry now draws water for its industrial processes from alternate sources. The industry is still a wastewater customer of the Board. The facilities of the former Ferro Industries (which contributed to the reductions in water demand in 2007 and 2008) resumed operation in 2010 as Tam Ceramics, thereby resuming water use and contributing to the increase realized in 2011, 2012, 2013 and 2014.

As illustrated by Table 17, water consumption in 2015 decreased 5.41% which was largely due to extreme winter conditions which caused an increase in billing adjustments. In 2016, consumption decreased by 1.75% due to loss of a major customer in the Significant Industrial Users (SIU) category. This loss caused additional losses reflected during the full year in 2017, resulting in a decrease in consumption of 3.51 %. However, following an increase in rates couple with stability in the customer base, water consumption in 2018 increased 0.19%.

The ten largest water customers and wastewater customers are listed in Table 17A below.

Table 17A – Ten Largest Water and Wastewater Customers

	Name	12/31/2018 Revenue	% of Total	4/30/2019 YTD
1	Norampac Industries #50	$ 4,653,652	41.50%	$ 2,116,695
2	Covanta Niagara, LP #32	1,003,079	8.94%	528,048
3	Seneca NF Gaming - Hotel	993,668	8.86%	377,561
4	Olin Corp #23	909,067	8.11%	385,450
5	Occidental Chemical #22	855,496	7.63%	425,158
6	Niacet Corporation #17	671,538	5.99%	234,617
7	Seneca NF Gaming - Casino	634,456	5.66%	253,111
8	Olin Corp	611,401	5.45%	303,173
9	Niagara Falls Medical Center	443,603	3.96%	159,955
10	Goodyear Tire & Rubber Co.	438,452	3.91%	193,654
		$ 11,214,412	100%	$ 4,977,422

The following table illustrates the historical trends in water consumption as well as the distribution of water sales by customer class:

Table 17B – Water Demand, Revenue and Account Information by Customer Class

Class of Customer	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Residential/Commercial										
Consumption (CCF)	1,352,563	1,423,330	1,329,279	1,344,810	1,331,527	1,346,029	1,315,516	1,338,499	1,272,267	1,299,934
Number of Accounts	18,636	18,558	18,484	18,509	18,470	18,249	18,379	17,954	17,835	17,917
Revenues	$ 4,432,216	$ 4,453,643	$ 4,221,051	$ 4,402,971	$ 4,674,230	$ 4,765,290	$ 4,728,578	$ 4,982,389	$ 4,822,853	$ 5,120,518
Industrial										
Consumption (CCF)	858,735	680,170	725,931	780,293	849,504	745,073	741,580	804,241	852,457	926,684
Number of Accounts	275	280	339	250	253	255	256	248	261	245
Revenues	$ 1,971,828	$ 1,695,393	$ 1,860,892	$ 1,875,335	$ 2,033,097	$ 1,975,744	$ 2,399,858	$ 2,956,785	$ 2,327,816	$ 2,722,250
Significant Industrial Users (SIU)										
Consumption (CCF)	883,541	686,179	820,292	868,945	1,123,975	1,362,443	1,209,147	1,065,322	971,721	876,822
Number of Accounts	26	27	23	23	24	24	24	23	23	24
Revenues	$ 1,555,631	$ 1,335,904	$ 1,456,938	$ 1,868,321	$ 2,402,154	$ 2,858,019	$ 2,553,174	$ 2,334,010	$ 2,166,094	$ 2,238,898
Non-Resident Users*										
Consumption (CCF)	3,803	5,478	6,724	8,499	11,452	3,467	3,862	4,876	3,586	2,605
Number of Accounts	27	28	27	28	27	27	27	27	27	27
Revenues	$ 19,037	$ 59,957	$ 102,362	$ 291,683	$ 289,239	$ 22,750	$ 35,981	$ 46,376	$ 30,912	$ 22,467
Total										
Consumption (CCF)	3,098,642	2,795,157	2,882,226	3,002,547	3,316,458	3,457,012	3,270,105	3,212,938	3,100,031	3,106,045
Number of Accounts	18,964	18,893	18,873	18,810	18,774	18,555	18,686	18,252	18,146	18,213
Revenues	$ 7,978,712	$ 7,544,897	$ 7,641,243	$ 8,438,310	$ 7,544,897	$ 7,641,243	$ 8,438,310	10,319,560	9,347,675	10,104,133
Plus: Other Departmental Revenues	1,522,722	1,864,175	1,423,258	2,091,531	4,016,732	3,981,869	3,466,847	1,137,966	1,497,008	1,450,379
Less: Adjustments	(291,091)	(319,574)	(140,271)	(121,154)	(149,000)	(100,245)	(82,143)	(311,134)	(304,026)	(25,013)
Total Departmental Revenue	$ 9,210,343	$ 9,089,498	$ 8,924,230	$ 10,408,687	$ 11,412,629	$ 11,522,867	$ 11,823,014	$ 11,146,392	$ 10,540,657	$ 11,529,499

Rates for Water Service and Wastewater Service

The rates for water service and wastewater service in 2019 increased 2.0 percent for both customers within and outside the City. The Board provides wastewater service to Town of Niagara customers outside of the City. The Board reached an agreement with the Town of Niagara in 2015 that includes the use of wastewater flow meters for measuring actual wastewater volumes discharged to the NFWB collection system. These two changes should result in increased revenues from these Out of District users. In addition, the Board is aggressively pursuing water theft and the potential under-recording of water use to ensure that every customer pays their fair share. This includes timely investigation of low or zero meter readings and the recently completed meter replacement program. Water and wastewater rates for 2019 and 2018 are provided in the financial statements of the Board for the year ended December 31, 2018 and are not repeated here. The consumption-

related water rates of the Board for 2018-19 are shown in Table 17C below. Historical rate increases for water and wastewater customers are presented in Table 18 that follows.

Table 17C – 2019 Rates for Water Customers

	Inside City ($/ccf)	Outside City ($/ccf)
First 20,000 CF	3.42	9.13
Next 60,000 CF	2.96	7.97
Next 120,000 CF	2.51	6.64
> 200,000 CF	2.08	5.59

Table 18 –Historical Percentage Increases in Rates for Water and Wastewater Customers

2012	2013	2014	2015	2016	2017	2018	2019
1.0%	6.0%	2.6%	0.0%	4.4%	0.0%	2.4%	2.0%

The rate structure for sewer service consolidates all consumers into two classes: Significant Industrial Users (SIU), and Commercial, Small Industrial, and Residential Users (CSIRU). The user charge system includes ten Substance of Concern charges that are assessed exclusively within the SIU class.

The 2019 wastewater user charges for the CSIRU class of customers are summarized in Table 19.

Table 19 – 2019 Wastewater Rates for CSIRU Customers

Minimum Charge	Volume Charge
All meter sizes and flow up to 1,300 cf	Usage in excess of 1,300 cf per quarter (per 100 cf)
$58.79	$7.97

Three of the wastewater user charges for the SIU class of customers in 2019 are summarized in Table 20.

Table 20 – 2019 Wastewater Rates & Charges for SIU Customers

Flow Charge ($/MG)	Solids Charge ($/lb)	SOC Charge ($/lb)
3,180	1.02	1.76

Interest Earnings

The System will earn interest on the funds maintained by the Board and the Authority. Based on the anticipated balances in each fund and the current investment rates, Table 21 presents the estimated interest earnings for 2019.

Table 21 – Estimated Interest Earnings - 2019

Fund	Average End of Month Balance	Interest Earnings Rate	Estimated Annual Earnings
Debt Service restricted cash	$ 19,206,511	Varies	$ 586,146
Capital Project restricted cash	12,672,427	0.25%	31,681
Operating cash	20,000,000	0.15%	30,000
			$ 647,827

Interest earnings rates have been increasing in 2018. This situation is affecting the revenue of water utilities across the country.

System Operating Expenses

The System's expenses include the costs associated with the operation, maintenance and administration of the water treatment facilities and distribution system, as well as the costs associated with the operations of the wastewater collection and treatment facilities and stormwater facilities. The principal components of operating expenses other than labor as projected for 2019 are shown in Table 22

Table 22 – Major Components of Expenses Other Than Labor - 2019

Item	Amount
Chemicals	$ 4,745,631
Utilities	1,367,610
Maintenance	1,318,978
Computer Service Contracts / Supplies / Professional Services	1,688,356
Insurance	529,576

Chemicals are used in both the water treatment and the wastewater treatment processes although the majority of the cost of chemicals is wastewater related. The System receives low cost hydroelectric power from the New York Power Authority which significantly reduces its electrical costs relative to market rates. The Board will be proactively seeking opportunities to further reduce

such costs. Other expenses are assumed to be affected by inflation as well as the results of cost saving initiatives of the Board during the projection period.

The total operating expenses of the Board in 2016, 2017 and 2018 were approximately $28.2 million, $29.2 million and $29.2 million respectively.

ECONOMIC AND DEMOGRAPHIC DATA

The following information was provided by other sources and provides updated information regarding the Board's Service Area. Since the Service Area consists primarily of the City of Niagara Falls, the information is limited to that portion of the Service Area that is within the boundaries of the City.

Major Employers in Niagara Falls Area

City / County	Employer	Employees
County	Niagara Falls Air Reserve Station	3165
City	Seneca Niagara Casino and Hotel	2528
City	Fashion Outlets of Niagara	2027
County	Niagara County	1425
County	General Motors Components Holdings, LLC	1400
City	Niagara Falls City School District	1200
City	Niagara Falls Memorial Medical Center	1029
County	Niagara County Community College	700
City	City of Niagara Falls	645
City	Mount St. Mary's Hospital	627

Source: emma.msrb.org/EP1038205-EP804313-EP1205830.pdf

Population

Changes in the City's population compared to changes in the population of the County, the State and the United States are as follows:

	1990	2000	2010	% of Change 1990-2000	% of Change 2000-2010
City	61,840	55,593	50,193	-10.10%	-9.71%
County	220,756	219,846	216,469	-0.41%	-1.54%
State	17,990,455	18,876,457	19,378,102	4.92%	2.66%
United States	248,709,873	281,421,906	308,745,338	13.15%	9.71%

Source: United States Bureau of the Census

Civilian Labor Force – Annual Average (thousands)

	2014	2015	2016	2017	2018
City	21.6	21.5	21.2	21.1	21.0
County	101.5	101.1	100.1	99.3	99.1
State	9,529.4	9,561.9	9,557.1	9,561.4	9,574.7

Source: New York State Department of Labor, Bureau of Labor Statistics, Information not seasonally adjusted (note that "City" refers to Niagara Falls city, NY Statistical Area).

Yearly Average Unemployment Rates

Year	City	County	State
2014	8.6%	6.5%	6.2%
2015	7.6%	6.2%	5.3%
2016	7.2%	5.8%	4.8%
2017	7.9%	6.2%	4.7%
2018	6.7%	5.2%	4.1%

Source: New York State Department of Labor, Bureau of Labor Statistics, Information not seasonally adjusted (note that "City" refers to Niagara Falls city, NY Statistical Area)

Monthly Unemployment Rates

Month	City	County	State
January, 2019	7.4%	5.9%	4.6%
February	6.9%	5.6%	4.4%
March	6.6%	5.3%	4.1%

Source: New York State Department of Labor, Bureau of Labor Statistics, Information not seasonally adjusted (note that "City" refers to Niagara Falls city, NY Statistical Area).

Comparative Housing, Income and Population Data (as of December 2013)

	City	State	U.S.
Age Distribution:			
% under 5 years	5.6	6.0	6.4
% 20 to 64	61.0	80.0	80.2
% 65 and over	15.0	13.8	13.4
Median age	39.4	38.1	37.3
Person / Household	2.28	2.61	2.63
Housing:			
% owner occupied housing units	55.8%	54.2%	64.9
Median value housing ($)	66,600	288,200	176,700
Median gross rent ($)	718	1,109	962
% housing built 1990 - 2000	7.0	6.0	13.9
% housing built before 1939	33.2	33.1	13.7
% with 5 or more units in structure	14.1	34.9	24.5
Income:			
Per capita income ($)	20,549	32,382	28,155
Median family income ($)	32,326	58,003	53,046
% below poverty level	24.9	15.3	15.4

Source: Census of Population and Housing, U.S. Department of Commerce, Bureau of Census (note that "City" refers only to Niagara Falls)