FINAL REPORT

RATE SUFFICIENCY ANALYSIS

PREPARED FOR

City of St. Louis, Missouri, Water Division

20 NOVEMBER 2017

BLACK & VEATCH
Building a world of difference.

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November 20, 2017

Mr. Curtis B. Skouby, P.E.
Director of Public Utilities / Water Commissioner
City of St. Louis, Water Division
1640 S. Kingshighway Blvd.
St. Louis, Missouri 63110-2285

Subject: Adequacy of Current Water Utility Revenues Letter Report

Dear Mr. Skouby,

Enclosed for your consideration is Black & Veatch Management Consulting, LLC's ("Black & Veatch") letter report concerning the sufficiency of current water utility rates for the City of St. Louis Water Division. This report updates our May 2015 report.

In preparation of this report, we have reviewed the records and reports of the Water Division, reviewed the City's Indenture of Trust, and conducted financial analyses for the purpose of addressing the adequacy of current Water Division rates.

As discussed within this report, Black & Veatch estimates the need for revenue increases in Fiscal Years (FY) 2019 through 2023 in order to provide sufficient funding for all operating and capital expenses and to maintain required fund balances. An important driver of the projected revenue increase requirement is the historical and anticipated continued decline in metered water usage. This trend is affecting water utilities across the country, and is also occurring in St. Louis. In addition, while the number of flat rate accounts has also declined over the past several years, Black & Veatch anticipates that flat rate customers will remain stable at the current level during the study period.

Over the study period, Black & Veatch observes that while projected revenues under existing rates will to continue to decline slightly, the Water Division's annual expenditures will increase over the same period. These increases in operating expenditures support the Water Division's activities in maintaining levels of service. In addition, the Water Division is projecting the need for certain important capital projects, required in order to allow the utility to maintain itself as a sound, viable utility. Under the City's current plan, these capital projects will be funded by a mix low interest loans, revenue bonds, annual revenues ("pay-as-you-go" financing), and existing fund balances. In accordance with that plan, the City anticipates debt service payments on the anticipated revenue bond issuance beginning in FY 2021.

Based on our analyses, and under the assumptions described in this report, Black & Veatch presents the following findings:

1. Throughout the study period, Black & Veatch estimates that the Water Division's projected net revenues will be sufficient contingent upon on enactment of 9.0 percent annual rate increases in FY 2019, FY 2020, and FY 2021. We do not project the need for rate increases for FY 2022 or FY 2023 at this time. These increases are necessary, as indicated in this

2. report, for the Water Division to comply with the requirements outlined in the Master Indenture.
3. The Water Division maintains its operating balance at or above 120 days of operating and maintenance expenses throughout the study period, as encouraged by the City's financial advisor, Public Financial Management.
4. The Water Division meets annual debt service coverage requirements with debt service coverage levels at or above 150 percent throughout the forecast period.
5. Based on the City's financing plan, the Water Division will need to issue approximately $77 million in revenue bonds in FY 2021 to fund the Capital Improvement Program proposed by Water Division management.

Black & Veatch wishes to acknowledge the cooperation and assistance provided by Water Division staff during this engagement. We greatly appreciate this opportunity to be of service to the Water Division. If you have any questions about this report, please call Pam Lemoine at (636) 536-5813.

Very truly yours,

BLACK & VEATCH MANAGEMENT CONSULTING, LLC

Ann Bui
Managing Director

Enclosure

cc: Ms. Perla Burk, City of St. Louis Water Division
Ms. Pam Lemoine, Principal Consultant, Black & Veatch Management Consulting, LLC

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1.0 Introduction

1.1 PURPOSE AND LIMITATIONS

The City of St. Louis, Missouri, Water Division (the "Water Division") engaged Black & Veatch Management Consulting, LLC (Black & Veatch) to study, through financial analyses, the revenues and revenue requirements of the Water Division from July 1, 2017 through June 30, 2023 (the "Study Period"), comprising the Water Division's Fiscal Years (FY) 2018-2023. The purpose of this report (the "Report") is to summarize findings of the financial analyses and to provide recommendations that result regarding the sufficiency of the Water Division's water rate revenue as compared to the requirements of the Master Indenture and other financial criteria as set forth in the Report.

In conducting its analyses and in forming an opinion of future operating expenses and revenues summarized in this Report, Black & Veatch has made certain assumptions with respect to conditions, events, and circumstances that may occur in the future. This Report summarizes such assumptions and methodologies. While Black & Veatch believes the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur. The methodology utilized by Black & Veatch in performing the analysis follows generally accepted water industry practices for such projections.

Use of this report or reliance on any information contained herein constitutes a waiver of and release of Black & Veatch from and against all claims and liabilities, including, but not limited to, liability for special, incidental, indirect, or consequential damages in connection with such use. In addition, use of this report or any information contained herein constitutes agreement to defend and hold Black & Veatch harmless from and against any claims and liability in connection with such use to the extent permitted by law.

1.2 PRIMARY ASSUMPTIONS

In preparation of this Report, Black & Veatch has relied on certain historical, financial, and statistical data supplied by the Water Division and not within the control of Black & Veatch. While Black & Veatch considers such data to be reliable, Black & Veatch has not made an analysis or independently verified the validity of such data. While Black & Veatch believes that the information, data, and opinions contained herein will be reliable under the conditions and subject to the limitations set forth herein, Black & Veatch does not guarantee the accuracy thereof to the extent that such information, data, or opinions were based on information provided by others.

The following are primary assumptions used in the forecast of future expenses and revenues:

1. The City's estimates of content, scheduling, and cost of the six-year capital improvement program (the "CIP") present a reasonable projection of the future construction program.

2. City staff will recommend the indicated revenue increases to the Board of Aldermen in time for their stated implementation.

3. The Board of Aldermen will approve the indicated revenue increases and the issuance of the proposed new debt in FY 2021 required to finance the CIP.

4. Debt service for the proposed revenue bonds will be approximately as estimated.

5. The City will provide a minimum operating reserve balance by the end of the Study Period that is at least equal to the next 120 days of operating expenditures, as encouraged by the City's financial advisor.

6. There will be no significant changes in water sales from the projections shown herein.

7. There will be no material changes in federal and state laws or regulations that would adversely affect the City's ability to secure tax-exempt financing for its Water Division, place more stringent limitations on water quality, materially increase the cost of constructing or operating the water system, or otherwise adversely affect operating of the water system.

8. Local and regional economic conditions will remain relatively stable.

2.0 Revenue Adequacy Under Existing Rates

Table 1 presents a comparison summary of revenues under existing rates and revenue requirements. This summary table demonstrates the extent to which the City expects to complies with the rate covenants of the Master Indenture for FY 2018 through 2023 under current rates. Rate increases of 11.0 and 12.0 percent in FY 2010 and FY 2011 respectively, in addition to the repayment of outstanding debt refunded through the Series 2011 Water Revenue Refunding Bonds, have improved the ability of the Water Division to meet rate covenant requirements for debt service coverage during the Study Period.

Under the current rate structure, the City projects to have sufficient adjusted net revenues in FY 2017-2020 to meet the more restrictive additional bonds coverage test for FY 2018-2021. However, projected net revenues in FY 2022 through 2023 will not be sufficient to meet this requirement. The City must satisfy the additional bonds coverage test requirement in order to issue revenue bonds in FY 2021 required to finance proposed capital improvement projects in FY 2021-2023. The additional bonds test requires net revenues for the prior fiscal year, as adjusted for any rate increase adopted prior to the sale of additional bonds, provide at least 125 percent of the maximum annual debt service requirement, including debt service on any proposed bonds.

As indicated by Table 1, annual debt service coverage is well above the 125 percent limit in FY 2017 through 2021, falling to its lowest point of 161 percent in FY 2021, but does not meet this requirement in the years thereafter without adopted rate increases. To maintain its position to meet these coverage requirements over the long term, and to retain and/or improve the water utility's current bond rating, Black & Veatch recommends that the City establish a policy to maintain a ***minimum*** annual debt service coverage target of 150 percent.

While projected revenues should meet rate covenant debt service requirements, without rate increases in or before FY 2021, the Water Division's net annual operating fund balance will be negative beginning in FY 2019, and the operating fund balance drops below the minimum of120 days of operation and maintenance expense by FY 2021.

While operating fund balances are available to absorb short term annual revenue shortfalls, Black & Veatch recommends 9.0 percent rate increases in fiscal years 2019, 2020, and 2021. These increases should help the Water Division to maintain a positive annual operating fund balance in most years of the study period, allowing the current operating fund balance to remain above 120 days of operation and maintenance expenses, while allowing sufficient funding for the capital projects included in the CIP as well as any unforeseen capital funding needs that may arise during the study period. This is critical not only for the financial stability of the Water Division, but also to demonstrate to the bond market and rating agencies the City's commitment to maintaining the financial health of the Water Division. Presented in the following pages of this Report is a detailed discussion of the methodology used both for Table 1 and a similar table (Table 3) showing the effect of proposed revenue increases.

Table 1 Operating Flow of Funds under Existing Rates

Line No.		Year	Proposed Retail Rate Increase	Months Effective	2017	2018	2019	2020	2021	2022	2023
					$	$	$	$	$	$	$
	Water Sales Revenue at Existing Rates										
1	Retail (a)				46,966,000	46,745,000	46,526,000	46,309,000	46,094,000	45,882,000	45,672,000
2	Wholesale (b)				3,974,000	4,014,000	4,054,000	4,095,000	4,136,000	4,177,000	4,219,000
	Additional Retail Water Sales Revenue:										
3		2017	0.0%	0	0	0	0	0	0	0	0
4		2018	0.0%	3		0	0	0	0	0	0
5		2019	0.0%	12			0	0	0	0	0
6		2020	0.0%	12				0	0	0	0
7		2021	0.0%	12					0	0	0
8		2022	0.0%	12						0	0
9		2023	0.0%	12							0
10	Total Additional Water Sales Revenue				0	0	0	0	0	0	0
11	Total Water Sales Revenue				50,940,000	50,759,000	50,580,000	50,404,000	50,230,000	50,059,000	49,891,000
	Other Revenue										
12	Other Operating Revenue				2,618,000	2,644,000	2,670,000	2,697,000	2,724,000	2,751,000	2,779,000
13	Interest Income (c)				139,000	141,600	131,100	98,300	52,800	17,000	17,000
14	Net Other Nonoperating Revenues (d)				952,000	952,000	952,000	952,000	952,000	952,000	952,000
15	Total Revenue				54,649,000	54,496,600	54,333,100	54,151,300	53,958,800	53,779,000	53,639,000
16	**Operation and Maintenance Expense (e)**				41,069,000	42,095,000	43,145,000	44,221,000	45,323,000	46,451,000	47,608,000
17	**Gross Receipts Tax (f)**				3,271,000	3,261,000	3,252,000	3,243,000	3,234,000	3,226,000	3,217,000
18	Net Revenue				10,309,000	9,140,600	7,936,100	6,687,300	5,401,800	4,102,000	2,814,000
	Debt Service Deposits (g)										
19	Existing				576,100	594,300	593,500	594,500	594,300	593,900	594,300
20	Proposed				0	23,900	287,100	287,100	3,429,000	6,571,000	6,571,000
21	Total Debt Service Deposits				576,100	618,200	880,600	881,600	4,023,300	7,164,900	7,165,300
22	**Routine Annual Improvements**				3,983,000	3,983,000	3,983,000	3,983,000	3,983,000	3,983,000	3,983,000
23	**Transfer from Ordinance Funds**				0	0	0	0	0	0	0
24	**Transfer to Construction Funds**				5,314,293	4,000,000	8,000,000	10,000,000	10,000,000	7,000,000	5,000,000
25	Net Annual Balance				435,607	539,400	(4,927,500)	(8,177,300)	(12,604,500)	(14,045,900)	(13,334,300)
26	Balance Available at Beginning of Year				26,889,000	27,324,607	27,864,007	22,936,507	14,759,207	2,154,707	(11,891,193)
27	Balance Available at End of Year				27,324,607	27,864,007	22,936,507	14,759,207	2,154,707	(11,891,193)	(25,225,493)
28	Debt Service Payments (h)				576,100	618,200	880,600	881,600	4,023,300	7,164,900	7,165,300
29	Debt Service Coverage (i)				1789%	1479%	901%	759%	134%	57%	39%

(a) *Includes net revenue from metered and flat rate customers. Revenue is projected to decrease at an average annual rate of -1.0 percent per year for metered customers and 0.0 percent for flat rate customers.*

(b) *Revenue increases for the wholesale customers is proportional to expected growth and increases in O&M expense.*

(c) *Interest income is based on the average balance of funds available for investment and an average annual interest rate of 0.5 percent. Also includes interest earned on the Bond and Interest Account.*

(d) *Includes net miscellaneous nonoperating revenue and interest expense on consumer deposits.*

(e) *Excludes depreciation expense.*

(f) *Equal to 6.0 percent of gross operating revenue.*

(g) *Deposits to the Bond and Interest Account.*

(h) *Actual payments to the bondholders.*

(i) *Net revenue (Line 18) divided by debt service payments made to bondholders (Line 28).*

3.0 Revenue and Revenue Requirements

3.1 REVENUE

Revenue for the Water Division comes principally from charges for treated water service, which includes flat rate water sales, metered water sales, and wholesale water service. Metered water sales historically were the largest source of water revenue for the City, but beginning in 2009, flat rate water sales have exceeded metered water sales. This is likely due in part to declining water usage for metered water customers; a trend affecting utilities across the country.

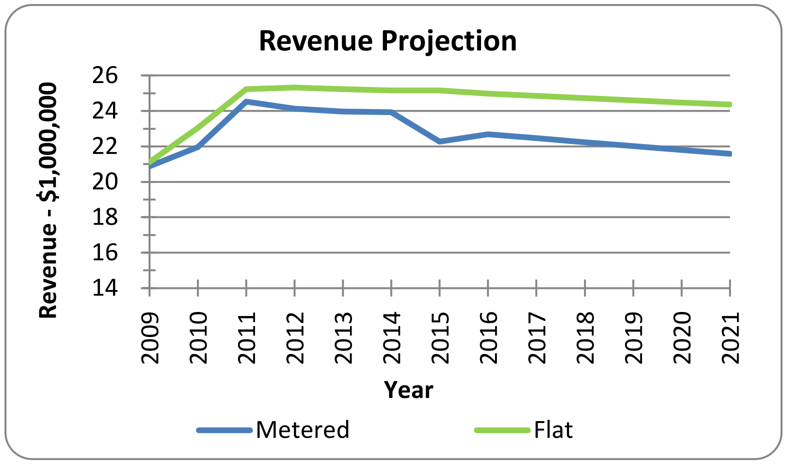

Figure 1 Projected Flat Rate and Metered Water Sales (Existing Rates)

The revenue projection graph in Figure 1 above shows the change in revenue due to usage changes and various rate increases in FY 2010, and 2011 and the projection under the current rates as of July 2016 for the period of FY 2017 through 2023.

Black & Veatch projects revenue from wholesale customers to increase approximately 1.0 percent per year over 2017[1] revenue. Wholesale customer usage increased sharply in FY 2012 largely because of a significant drought in the region which caused wholesale customers to turn to the City for a larger portion of their source of supply than they traditionally had obtained. The result was a 41.0 percent increase in wholesale revenue for 2012. Wholesale revenues decreased sharply in FY 2013 and remained steady in FY 2014 and FY 2015. In FY 2016, wholesale revenues increased substantially due to increased sales to Public Water Supply District #2 of St. Charles Co. Overall, wholesale water sales volume in FY 2017 were 23 percent lower than in FY 2016.

Historical Rate Increases

Fiscal Year	Increase	Cumulative Increase
2010	11.0%	11.0%
2011	12.0%	24.3%
2012	0.0%	24.3%
2013	0.0%	24.3%
2014	0.0%	24.3%
2015	0.0%	24.3%
2016	0.0%	24.3%
2017	0.0%	24.3%
Annual Avg.	*2.9%*	

Figure 2 Historic Water Rate Increases

Projected metered and flat rate retail water sales revenues are based on revenues actually received under existing rates during FY 2016 and FY 2017, along with recognition of observed trends in billed water sales volumes and customer accounts from historical customer billing information. Based upon these analyses, projected water revenue from metered customers decreases approximately 1.0 percent per year and projected water revenue from flat rate customers remains steady at current levels.

[1] Wholesale revenue for FY 2016 was higher than normally experienced due to additional water sales to Public Water Supply District #2 of St. Charles Co. Therefore, projected wholesale water sales reflect a return to more usual sales volume.

The last water rate increase of 12.0 percent occurred in FY 2011. Figure 2 shows a history of the retail water rate increases enacted by the City since 2010. As indicated in Figure 2, the City has not adjusted water rates on a routine annual basis, with no revenue adjustment for the past six years.

3.2 REVENUE REQUIREMENTS

The revenue required to adequately provide for the continued operation of the Water Division must be sufficient to meet the cash requirements for system operation. Revenue requirements include: (1) operating and maintenance expense; (2) gross receipts taxes paid to the City; (3) debt service (consisting of principal and interest payments) on existing and proposed bonds and the projected state of Missouri Department of Natural Resources low interest loan program; and (4) expenditures for routine and major capital improvements met from annual revenues. Projections of the cash requirements to meet these system expenditures for the Study Period are developed in this section.

3.2.1 Operating and Maintenance Expense

The elements of operating and maintenance expense for the Water Division include the annual expense associated with supply and purification, transmission and distribution, power and pumping, administrative and general, and customer accounting. Each of these cost categories includes salaries and wages, materials and supplies, support services, and other services. Some of the categories include additional costs for chemicals, purchased power, and the cost of service line maintenance. Actual audited costs recorded for FY 2016 were used in this analysis. Unaudited actual costs were used for FY 2017. Projections for FY 2018 through 2023 are based on actual FY 2016 and FY 2017 costs with assumed inflation allowances ranging between 2. 2 and 3.2 percent per year based on the expenditure category. The result of these projections is an average increase in total operating and maintenance expenses of approximately 2.5 percent per year over the Study Period.

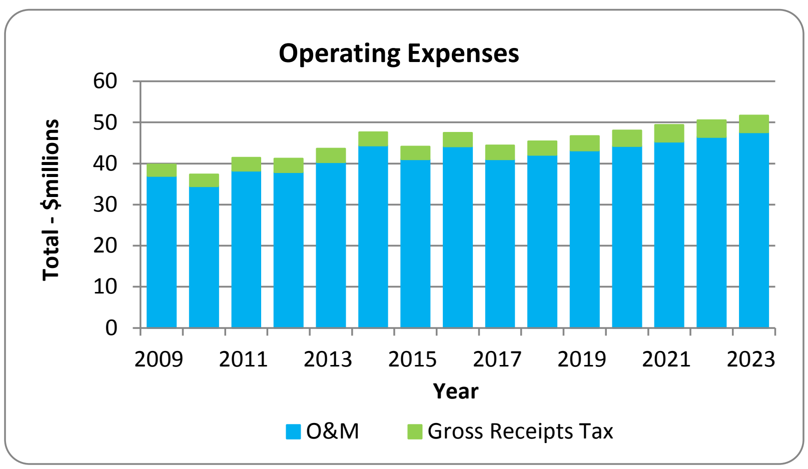

Figure 3 Historical Operating Expenses

Operating and maintenance expense also includes costs for other City department services, the additional year end adjustment for expenses incurred due to the Collector of Revenue and the cost of community services. Total operating and maintenance expense is projected to increase from $41.1 million in FY 2017 to approximately $47.6 million in FY 2023, as shown in Figure 3.

3.2.2 Gross Receipts Tax

Gross receipts tax payable by the Water Division is equal to 6 percent of gross water revenue. An additional 4 percent gross receipts tax, which is shown as a separate line item on each water bill, is paid directly to the City's General Fund and does not affect the rate design process of the Water Division. Gross water revenue is equal to total retail water sales revenue, wholesale water sales revenue, interest income, and all other operating and nonoperating revenue. Based on projected revenues, gross receipts tax payments will decrease from $3.309 million in FY 2017 to $3.255

million in FY 2023 as shown in Table 1 if rate increases are not implemented during the Study Period. Figure 3 shows the projection of total operating expenses, which consist of total operating and maintenance expense and gross receipts tax payments based on projected revenues with proposed rate increases as depicted in Table 3.

3.2.3 Routine Annual Improvements

Expenditures for routine annual capital improvements include those costs that tend to be routinely incurred each year for on-going improvements or repairs as well as normal replacements such as vehicles and office equipment. Since the costs of these improvements are a continuing expense to be met each year, the Water Division appropriately finances these expenditures from current water revenues. These expenditures are originally recorded as operating and maintenance expenses but are capitalized during each year and deducted from the Water Division's annual operating and maintenance expense. Routine annual improvements are projected to remain at $3.983 million throughout the forecast period.

3.2.4 Major Capital Improvements

Figure 4 summarizes the proposed major capital improvements from FY 2017 through 2023, as prepared by Water Division. The total cost of improvements included in the proposed financing plan is currently estimated to be $134 million. Major projects include: distribution and transmission main replacement and improvements ($69.7 million), Chain of Rocks Wash Water Pump Station ($30 million), miscellaneous plant improvements ($22.6 million), and Stacy Reservoir emergency by-pass valving and improvements ($3 million). Water Division staff has determined that these capital projects are needed to improve operations, provide system redundancy and replace aging infrastructure.

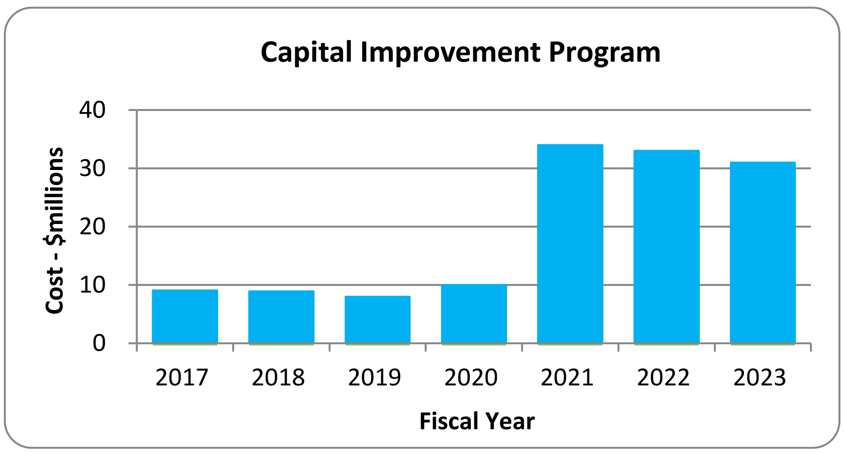

Figure 4 Capital Improvement Program Expense

3.2.5 Major Capital Improvement Financing

Table 2 presents the proposed CIP financing plan proposed by the City and summarizes the projected source and application of funds over the Study Period. This plan anticipates that proposed capital improvements will be financed from a combination of available funds on hand, annual operating revenues resulting from additional rate increases, revenue bonds, funds available from two loans from the state of Missouri Department of Natural Resources (DNR), and interest income.

The beginning of year balances for FY 2017, as shown in Table 2, is based on audited financial statements. The unencumbered balance available at the beginning of FY 2017 was $12.1 million. This includes monies held in the Water Ordinances, Water Bond Ordinance, and Unappropriated Construction Funds accounts. Total cash financing of major capital improvements from annual revenues is anticipated to total $54.3 million for the Study Period. Interest income is projected to provide approximately $620,000 during this period and is determined based on average beginning and ending fund balances shown on Lines 1 and 13 of Table 2 and an average annual interest rate of 1.0 percent per year. A revenue bond issue in the amount of $77 million in FY 2021 is shown on Line 5 of Table 2. These bonds are expected to finance approximately 55 percent of the total CIP costs. The amount of the proposed issue was developed considering capital program needs, current policies, other sources of capital improvement program financing, and debt service coverage requirements related to the issuance of revenue bonds.

Table 2 Capital Flow of Funds

Line No.		2017	2018	2019	2020	2021	2022	2023	Total 2017 - 2023
		$	$	$	$	$	$	$	
	Source of Funds								
1	Beginning of Year Balance	12,077,000	12,137,500	12,060,400	12,120,900	12,181,700	64,414,200	38,671,900	
2	Cash Financing of Improvements	5,314,293	4,000,000	8,000,000	10,000,000	10,000,000	7,000,000	5,000,000	49,314,293
3	DNR Loan	3,779,308	4,900,000	0	0	0	0	0	8,679,308
4	Interest Income	60,500	60,800	60,500	60,800	191,000	257,700	128,700	820,000
5	Proposed Revenue Bonds	0	0	0	0	77,000,000	0	0	77,000,000
6	Total	21,231,101	21,098,300	20,120,900	22,181,700	99,372,700	71,671,900	43,800,600	135,813,601
	Application of Funds								
7	Major Capital Improvements	9,093,601	8,900,000	8,000,000	10,000,000	34,000,000	33,000,000	31,000,000	133,993,601
8	Revenue Bond Issuance Cost	0	0	0	0	770,000	0	0	770,000
9	DNR Loan Issuance Cost	0	137,900	0	0	0	0	0	137,900
10	Purchase of Surety Bond	0	0	0	0	188,500	0	0	188,500
11	Transfers Out	0	0	0	0	0			0
12	Total	9,093,601	9,037,900	8,000,000	10,000,000	34,958,500	33,000,000	31,000,000	135,090,001
13	**End of Year Balance**	12,137,500	12,060,400	12,120,900	12,181,700	64,414,200	38,671,900	12,800,600	

The application of funds shows that $134 million total CIP expenditures are expected for FY 2017 through 2023. Lines 8, 9, and 10 of Table 2 allows for costs that are typically associated with the issuance of revenue bonds. The costs to issue the proposed revenue bonds in FY 2021 are estimated to total $958,500 during the Study Period. This estimate assumes issuance costs are equal to 1.0 percent of the principal amounts borrowed. In addition, this assumes that the City would purchase a surety bond, which the City estimated to cost 3.0 percent of the expected maximum debt service payment for the FY 2021 revenue bond issue. Although surety bonds are assumed for this analysis, it is not intended to preclude the option of satisfying a debt reserve requirement by establishing a debt service reserve fund should the City find this to be a more preferable option. The City should consult with its financial advisor to determine the most preferable option.

3.2.6 Debt Service Requirements

The Water Division currently has one outstanding loan, Series 2013 loan from the Missouri Department of Natural Resources (DNR) with an initial principal amount of $9.5 million. The Water Division expects to close on one additional DNR loan of $4.9 million in FY 2018. One new revenue bond is projected to be issued within the Study Period, with Series 2021 revenue bonds assumed to be issued on January 1, 2021. Projected annual debt service requirements on the proposed revenue bonds assume equal annual principal and interest payments with 20 year maturities and an average annual interest rate of 5.2 percent. Annual debt service on DNR loan and projected future revenue bond issuance is expected to increase annual debt service requirements from $576,100 in FY 2017 to $7,165,300 in FY 2023.

3.2.7 Operating Reserve

The operating reserve is a cash balance maintained in the Operating Fund to accommodate fluctuations in annual revenues and expenditures. Black & Veatch recommends that the Water Division establish a policy to require a minimum operating reserve is set equal to 120 days or approximately 33.0 percent of annual operating and maintenance expense. This level of operating reserve is encouraged by the City's financial advisor and is consistent with the median operating reserve level recommended by rating agencies.

3.3 SUMMARY OF REVENUE AND REVENUE REQUIREMENTS

A pro forma cash flow statement showing projected revenues and revenue requirements for the Water Division during FY 2017 through 2023 is presented in Table 3. Water revenues must be at least sufficient to finance the costs of operating and maintenance, gross receipts taxes, routine annual capital improvements, and debt service costs on existing and future revenue bonds, while maintaining adequate operating reserves and complying with all applicable revenue bond coverage requirements. Annual revenue can also be used to provide partial cash financing of major capital improvements.

Lines 1 and 2 of Table 3 show actual and projected revenue under existing rates attributable to the respective retail and wholesale customers. Lines 3 through 9 show projected increases in retail water sales revenues assumed to be in effect for the number of months indicated for each fiscal year. Rate increases are projected for FY 2019 through 2021 to meet projected revenue requirements, maintain the operating reserve, and provide the required annual debt service coverage (DSC) of 125 percent (and recommended DSC of 150 percent) to enable the utility to issue additional revenue bonds for the planned capital improvement projects. These annual revenue increases are necessary to continue to comply with the requirements set forth in Sections 210(b) and 810C(b) of the City's Water Revenue Bond Indenture of Trust and are also designed to maintain a minimum balance in the Operating Fund at least equal to a 120 day operating reserve. The indicated revenue increases are calculated to be the minimum increases required by the Water Division to meet the Indenture of Trust requirements and to maintain a 120 day operating reserve.

As indicated on Line 3 through 9 of Table 3, 9 percent increases are projected to be effective the beginning of each fiscal years 2019 through 2021, effective July 1 of each fiscal year. Such rate increases ares proposed to produce the additional revenue required to pay additional debt service on the new bonds, provide adequate debt service coverage, cash finance a portion of the capital improvement program while maintaining the available fund balances to their desired levels, and lessen the effect on future revenue increases. These increases are projected to put the City in position to meet minimum required debt service coverage if operating and maintenance expense unexpectedly increases, water sales revenue decreases below the projected levels, or by the occurrence of any other changes that affect net revenues other than currently projected in this Report. Such rate increases will also allow for a reserve fund balance that could be used for any unanticipated capital project or emergency that could arise during the study period.

Other operating revenue available for the Water Division is projected to increase slightly from $2.6 million in FY 2017 to $2.8 million in FY 2023. Interest income earned on available funds is shown on Line 13 of Table 3. The interest income shown in Table 2 is not included in Line 13 of Table 3 because such construction related interest earnings are not available for debt service coverage. Projected interest income amounts are based on a 1.0 percent annual interest rate applied to average beginning and end of year fund balances. Funds available for this interest calculation include the Waterworks Revenue Fund, Waterworks Operation and Maintenance Account, Water Replacement and Improvement Account, and the Water Contingent Account, which comprise the amounts shown in Lines 26 and 27 of Table 3. Interest income also includes amounts earned on monies deposited and retained by the Bond and Interest Account during each year and any residual interest earned on the Water Bond Reserve Fund. Other nonoperating revenue is shown on Line 14 and consists of miscellaneous nonoperating revenue and the interest expense on customer deposits in excess of nonoperating expenditures. Total Water Division revenue is shown on Line 15 of Table 3.

Operating and maintenance expense and gross receipts tax payments are shown on Lines 16 and 17 of Table 3. The projected gross receipts tax payments are greater than those shown in Table 1 because of the proposed retail revenue increases. Line 18 shows the net revenue remaining after deducting operating and maintenance expense and gross receipts tax from total revenue. This net revenue is available for debt service coverage and other purposes.

Debt service requirements on existing revenue bonds reflect the monthly deposits made to the Bond and Interest Account and are shown on Line 19 of Table 3. Additional revenue bonds are expected to be issued in FY 2021 to help finance the CIP. As indicated on Lines 21 of Table 3, the debt service requirement on this future debt issuance is projected to increase from $0 in FY 2017 to approximately $6.6 million by FY 2023.

The costs for routine annual improvements, transfer from Ordinance Funds, and the funds available to cash finance part of the CIP are shown on Lines 22, 23 and 24, respectively, of Table 3. The net annual balance shown on Line 25 of Table 3 is equal to net revenue (Line 18) less total debt service (Line 21), less routine annual improvements (Line 22), plus transfers from Ordinance Funds (Line 23), and less cash financing of major capital improvements (Line 24). Balances indicated for the combined fund balances included in Table 3 are shown on Lines 26 and 27. The beginning of year balance for FY 2017 matches the balance reported by the Water Division for the combined funds for FY 2016.

Debt service coverage is reported on Line 29 of Table 3. Debt service coverage is equal to net revenue (Line 18) divided by total revenue bond principal and interest payments made to the bondholders (Line 28). The Indenture of Trust requires that the City maintain an annual debt service coverage ratio of at least 110 percent. Under the proposed revenue adjustments, this targeted level is exceeded in each year of the Study Period, as shown on Line 31. To allow for possible fluctuations in revenue and operating expenses, such as may occur periodically due to unexpected decreased water sales and possible unexpected increases in costs of system operating, and to maintain the ability to meet the more restrictive 125 percent additional bonds coverage test, it is suggested that a future coverage level of at least 150 percent should be recognized for rate design purposes. This will provide a greater margin above the minimum coverage requirements.

Table 3 Operating Flow of Funds under Proposed Rates

Line No.				2017	2018	2019	2020	2021	2022	2023
				$	$	$	$	$	$	$
	Water Sales Revenue at Existing Rates									
1	Retail (a)			46,966,000	46,745,000	46,526,000	46,309,000	46,094,000	45,882,000	45,672,000
2	Wholesale (b)			3,974,000	4,014,000	4,054,000	4,095,000	4,136,000	4,177,000	4,219,000
	Additional Retail Water Sales Revenue:									
	Year	Proposed Retail Rate Increase	Months Effective							
3	2017	0.0%	0	0	0	0	0	0	0	0
4	2018	0.0%	3		0	0	0	0	0	0
5	2019	9.0%	12			3,843,200	4,167,800	4,148,500	4,129,400	4,110,500
6	2020	9.0%	12				4,169,500	4,521,800	4,501,000	4,480,400
7	2021	9.0%	12					4,523,700	4,502,900	4,482,300
8	2022	0.0%	12						0	0
9	2023	0.0%	12							0
10	Total Additional Water Sales Revenue			0	0	3,843,200	8,337,300	13,194,000	13,133,300	13,073,200
11	Total Water Sales Revenue			50,940,000	50,759,000	54,423,200	58,741,300	63,424,000	63,192,300	62,964,200
	Other Revenue									
12	Other Operating Revenue			2,618,000	2,644,000	2,670,000	2,697,000	2,724,000	2,751,000	2,779,000
13	Interest Income (c)			139,000	141,600	140,100	136,100	141,500	143,700	137,500
14	Net Other Nonoperating Revenues (d)			952,000	952,000	952,000	952,000	952,000	952,000	952,000
15	Total Revenue			54,649,000	54,496,600	58,185,300	62,526,400	67,241,500	67,039,000	66,832,700
16	**Operation and Maintenance Expense (e)**			41,069,000	42,095,000	43,145,000	44,221,000	45,323,000	46,451,000	47,608,000
17	**Gross Receipts Tax (f)**			3,271,000	3,261,000	3,483,000	3,743,000	4,026,000	4,014,000	4,002,000
18	Net Revenue			10,309,000	9,140,600	11,557,300	14,562,400	17,892,500	16,574,000	15,222,700
	Debt Service Deposits (g)									
19	Existing			576,100	594,300	593,500	594,500	594,300	593,900	594,300
20	Proposed			0	23,900	287,100	287,100	3,429,000	6,571,000	6,571,000
21	Total Debt Service Deposits			576,100	618,200	880,600	881,600	4,023,300	7,164,900	7,165,300
22	**Routine Annual Improvements**			3,983,000	3,983,000	3,983,000	3,983,000	3,983,000	3,983,000	3,983,000
23	**Transfer from Ordinance Funds**			0	0	0	0	0	0	0
24	**Transfer to Construction Funds**			5,314,293	4,000,000	8,000,000	10,000,000	10,000,000	7,000,000	5,000,000
25	Net Annual Balance			435,607	539,400	(1,306,300)	(302,200)	(113,800)	(1,573,900)	(925,600)
26	Balance Available at Beginning of Year			26,889,000	27,324,607	27,864,007	26,557,707	26,255,507	26,141,707	24,567,807
27	Balance Available at End of Year			27,324,607	27,864,007	26,557,707	26,255,507	26,141,707	24,567,807	23,642,207
28	Debt Service Payments (h)			576,100	618,200	880,600	881,600	4,023,300	7,164,900	7,165,300
29	Debt Service Coverage (i)			1789%	1479%	1312%	1652%	445%	231%	212%

(a) *Includes net revenue from metered and flat rate customers. Revenue is projected to decrease at an average annual rate of -1.0 percent per year for metered customers and 0.0 percent for flat rate customers.*
(b) *Revenue increases for the wholesale customers is proportional to expected growth and increases in O&M expense.*
(c) *Interest income is based on the average balance of funds available for investment and an average annual interest rate of 0.5 percent. Also includes interest earned on the Bond and Interest Account.*
(d) *Includes net miscellaneous nonoperating revenue and interest expense on consumer deposits.*
(e) *Excludes depreciation expense.*
(f) *Equal to 6.0 percent of gross operating revenue.*
(g) *Deposits to the Bond and Interest Account.*
(h) *Actual payments to the bondholders.*
(i) *Net revenue (Line 18) divided by debt service payments made to bondholders (Line 28).*

4.0 Comparison with Other Utilities

Figure 5 provides a comparison of a typical quarterly bill for a flat rate customer with comparable bills for neighboring utilities. For the purpose of the comparison, an estimate of equivalent volume, as shown in Figure 6, was utilized in order to calculate estimated bills of others. While St. Louis Water Division bills customers with no meters a flat rate each month of the year, other utilities bill based on actual metered water usage. Due to the difficulty in estimating a comparable volume for outdoor watering, an estimated volume representing the volume assumed by the Frontage component of the Water Division bill was not included. Therefore, these rate comparisons can be considered "winter usage" comparisons. A comparison of bills under summer usage would most likely show an increase in the average bill for other utilities compared to the bills shown in this Report.

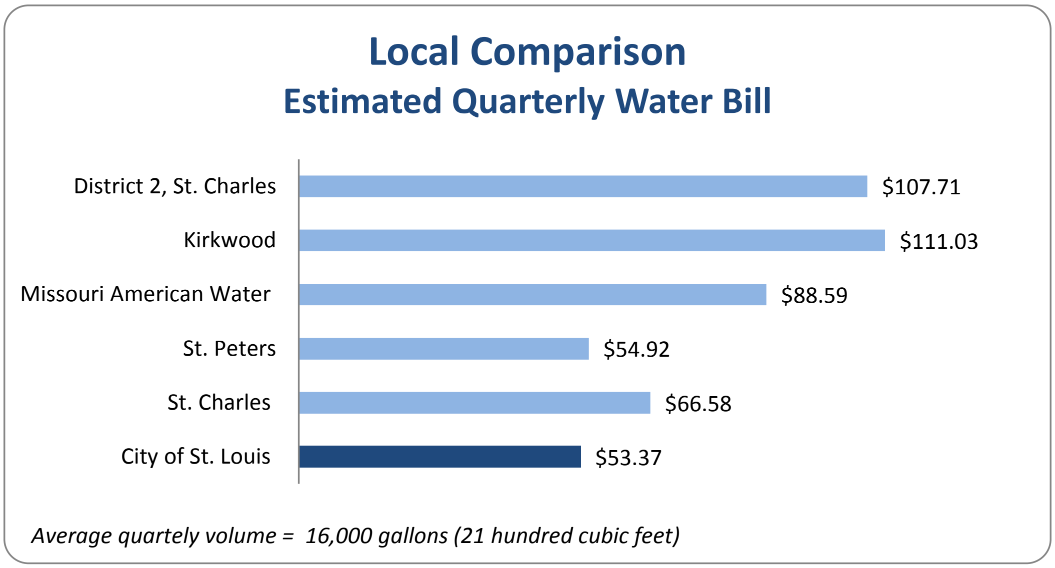

Figure 5 Comparison of a Typical Flat Rate Customer Quarterly Bill with Comparable Bills of Other Local Utilities

As shown in Figure 5, the typical quarterly bill for flat rate customers is less than that for surrounding communities. In some cases, the bill is half the typical bill for some communities.

	No. of Units	Est. Volume (gpd)
Rooms	5	14.5
Water Closet	1	54.2
Baths	1	45.2
Separate Showe	0	45.2
Frontage (feet)	30	0

* gpd = gallons per day

Figure 6 Estimated Volume per St. Louis Water Division Billing Unit

A similar comparison of typical bills with other regional utilities is presented in Figure 7. As shown, St. Louis Water Division rates are substantially lower than the midwest regional utilities shown in this chart.

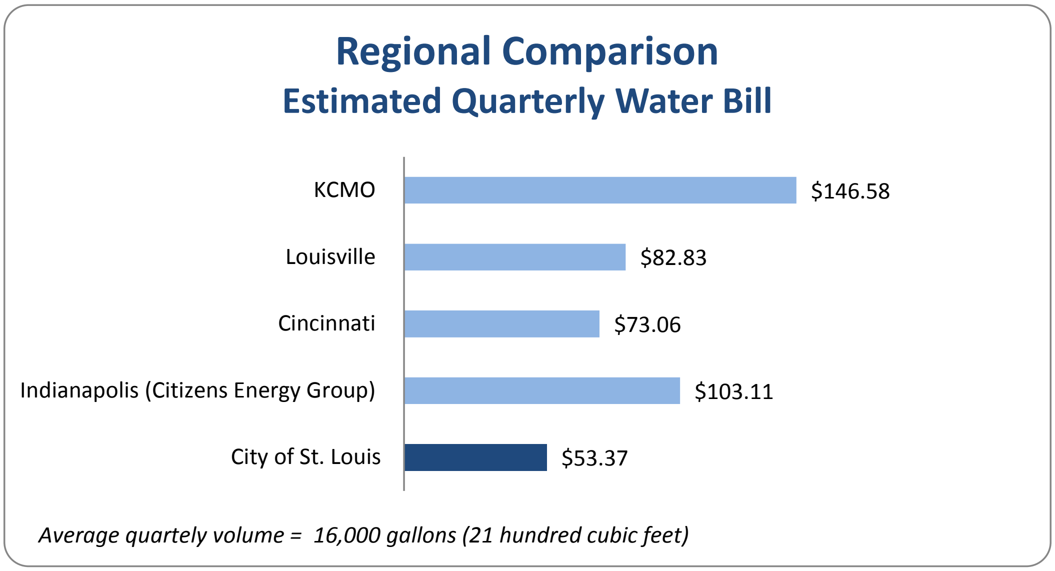

Figure 7 Comparison of a Typical Flat Rate Customer Quarterly Bill with Comparable Bills of Other Regional Utilities

5.0 Rate Sufficiency

The results of the financial analysis based on the current rates, as provided in Table 1, show that under the assumptions stated in the Report the current rates do not generate sufficient revenue to meet the requirements of the Indenture of Trust and other financial criteria, including maintaining a reserve equal to 120 days of O&M expenses, and these current revenues result in negative net annual balances.

Black & Veatch calculated increased rates designed to provide revenue that would meet the requirements of the Indenture of Trust and other financial criteria. As previously stated, the increases indicated in this Report are calculated to be the minimum required by the Water Division. Table 1 shows a significant depletion of fund balances available over the study period, indicating that rate increases are required over the study period. The proposed rate increases presented in Table 3 should allow the Water Division to maintain a strong financial condition over the study period.