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March 29, 2018

Mr. John Overton, CPA
Finance Director
City of Lexington
28 West Center Street
Lexington, NC 27292

Dear Mr. Overton:

Raftelis has completed its assignment to develop cost-justified water and wastewater system development fees for consideration by the City of Lexington ("City"). This letter documents the results of the analysis which is based on a cost justified approach for establishing system development fees as set forth in North Carolina general statute 162A Article 8 "System Development Fees".

Raftelis is a financial professional firm that has provided rate and financial consulting to public water and wastewater utilities since 1993, has edited or contributed content for the Seventh Edition of the American Water Works Association "Principles of Water Rates, Fees and Charges M-1 Manual" (AWWA M-1 Manual), and has calculated system development fees for utilities in North Carolina and across the country since 1993 using generally accepted methodologies as provided in the AWWA M-1 Manual and other water/sewer industry publications. Raftelis is qualified to perform system development fee calculations for water and wastewater utilities in North Carolina.

Background

System development fees are defined as one-time charges assessed to new water and wastewater customers, or developers and builders, to recover a proportional share of capital costs incurred to provide service availability and capacity for new utility customers. Typically, the cost basis for setting system development fees is based on the major system components, or core system assets, that are necessary to serve, and that provide benefit to, all customers. These components typically include reservoirs, water treatment plants, storage tanks, major water transmission lines, wastewater treatment plants, pumping stations, and major wastewater interceptors.

Raftelis recommends that system development fees should be consistent with the common legal standard in setting system development fees in the water and wastewater industry – the Rational Nexus Test. The Rational Nexus test requires that: 1) the need for capacity is a result of new development; 2) the costs are identified to accommodate new development; and 3) the appropriate

apportionment of that cost to new development is in relation to the benefit the new development reasonably receives[1].

There are three approaches, as described below, for calculating water and wastewater system development fees that are recognized in the industry as cost-justified[2] (that meet the requirement of the Rational Nexus standard), and as set forth in North Carolina general statute 162A Article 8 "System Development Fees".

Buy-In Approach

The Capacity Buy-In Approach calculates a system development fee based upon the proportional cost of each user's share of existing system capacity, and is most appropriate in cases where the existing system assets provide adequate capacity to provide service to new customers. The cost of the facilities is based on fixed assets records and can include escalation of the depreciated value of those assets to current dollars, or "replacement costs" as identified in the general statute. The general statute also identifies adjustments to be made to the replacement cost such as "debt credits, grants, and other generally accepted valuation adjustments."

Incremental Cost Approach

The Incremental Cost (or Marginal Cost) Approach calculates a system development fee based upon a new customer's proportional share of the incremental future cost of system capacity. This approach focuses on the cost of adding additional facilities to serve new customers. It is most appropriate when existing facilities do not have adequate capacity to provide service to new customers, and the cost for new capacity can be tied to an approved capital improvement plan (CIP) that covers at least a 10-year planning period. Per the general statute, a revenue credit must be applied "against the projected aggregate cost of water or sewer capital improvements."

Combined Approach

The Combined Approach is a combination of the Buy-In and Incremental Cost approaches, and is appropriate to be used when the existing assets provide some capacity to accommodate new customers, but where the capital improvement plan also identifies significant capital investment to add additional infrastructure to address future growth and capacity needs.

Calculation of System Development Fees

Raftelis requested and was provided with the following data from City staff to complete the system development fee calculation:

[1] See the AWWA M-1 7th Edition Manual –System Development Charges, Chapter VII2; pp.324.
[2] See the AWWA M-1 Manual –System Development Charges, Chapter VII.2; pp.329-330.

- Water and wastewater fixed asset data;
- Outstanding utility debt and associated debt service;
- Construction work in progress ("CWIP")
- Contributed capital;
- Capacity in water and sewer systems;
- Daily water production data;
- Inflow and infiltration data; and
- History of system development fees collected.

The Capacity Buy-In Approach was chosen as the method to calculate the system development fees because the City has adequate water and sewer treatment capacity for the near future.

Using the Capacity Buy-In approach, Raftelis calculated the estimated cost, or investment in, the current capacity available to provide utility services to existing and new customers. This analysis was based on a review of fixed asset records and other information as of June 30, 2017. The depreciated value of the assets was first adjusted to reflect an estimated replacement cost to determine the "replacement cost new less depreciation" (RCNLD) value for the assets. The asset values were escalated using the Handy Whitman Index of Public Utility Construction Costs (for the South Atlantic Region). The RCNLD value of the water assets includes water supply, treatment, storage and distribution facilities but excludes small equipment and vehicles. The RCNLD value of the sewer assets includes wastewater collection, treatment, and distribution facilities, but excludes small equipment and vehicles.

Several adjustments were then made to the RCNLD value, which were as follows:

- *Subtraction of contributed assets* - Assets contributed by or paid for by developers were deducted from the calculation since these costs were not "paid" by the existing customers. The City also received a grant that funded 87.5% of the cost of the wastewater treatment plant that was built in 1990. The grant funded portion was removed from the assets since these assets were also not "paid" by the existing customers.

- *Debt Service Credit* - Utilities often borrow funds to construct assets, and revenues from retail rates and charges can be used to make the payments on these borrowed funds. To ensure that new customers are not being double charged for these assets, once through the system development fee and again through retail rates and charges, the proportion of the outstanding debt principal amount that is anticipated to be paid for through retail rates and charges was deducted from the system development fee calculation.

- Other adjustments – The asset associated with the City's package plant at the golf course was removed, but the capacity of this plant was also removed from the analysis. This

asset does not provide capacity to retail customers and therefore it was removed from the analysis.

The adjusted RCNLD value was then converted to a unit cost of capacity by dividing the RCNLD value by the capacity in each system to derive a basic unit measure of cost per gallon per day (GPD) for water and wastewater capacity, as shown in Exhibit 1. It should be noted that the capacity of the water system represents the functional capacity of the system (as opposed to the rated capacity) and the capacity of the wastewater system excludes the capacity of the package plant at the golf course since the capacity from this plant is not available to retail customers.

Exhibit 1 – Cost per GPD of Core Utility Assets

	Water	Wastewater
Adjusted RCNLD	**$8,252,769**	**$40,134,991**
Total Capacity (gallons per day)	**7,200,000**	**6,500,000**
Cost Per Gallon per Day	**$1.1462**	**$6.1746**

This measure becomes the basic building block or starting point for determining the *maximum cost-justified level* of the water and wastewater system development fees. Fees for different types of customers are based on this cost of capacity multiplied by the amount of capacity needed to serve each type or class of customer.

The next step is to define the level of demand associated with a typical, or average, residential customer, often referred to as an Equivalent Residential Unit, or ERU. The level of demand associated with a typical residential customer is often estimated using wastewater design flow rates as specified by the North Carolina Administrative Code Title 15A (Department of Environment and Natural Resources) Subchapter 2T, which states that the sewage from dwelling units is 120 gallons per day per bedroom. The average gallons per day of a two and three-bedroom home was assumed (based on census data that indicates the average number of persons per household in the City is 2.56), which results in a typical resident customer ERU of 300 gallons per day. This daily ERU was used for both water and wastewater.

Assessment Methodology

The analysis provides a maximum cost-justified level of system development fees that can be assessed by the City. For residential customers, the calculation of the system development fee is

based on the cost per gallon per day multiplied times the number of gallons per day required to serve each ERU, as shown below in Exhibit 2.

Exhibit 2 – Calculated Maximum Residential System Development Fee

Residential	Water	Wastewater
Cost per GPD	**$1.1462**	**$6.1746**
GPD per ERU	**300**	**300**
Total Calculated System Development Fee per ERU[3]	**$344**	**$1,852**
Existing Capital Recovery Fee per ERU	**$157**	**$922**

For non-residential customers, the fees for the smallest residential meter can be used and then scaled up by the flow ratios for each meter size, as specified in the AWWA M-1 Manual[4], the results of with are shown in Exhibit 3. This method provides a straightforward approach that is simple to administer and reasonably equitable for most new customers. Exhibit 3 shows the resulting maximum cost-justified system development fees by meter size for meters ranging from 5/8 or 3/4 inches to 10 inches. For these calculations, the system development fees have been rounded to the nearest dollar. It should be noted that for calculating system development fees for non-residential customers, the City could also choose to use the wastewater design flow rates for non-residential customers as specified by the North Carolina Administrative Code Title 15A (Department of Environment and Natural Resources) Subchapter 2T. The estimated flow per gallon per day for the non-residential customer would then be divided by the residential ERU of 300 gallons per day to determine the number of ERUs for the non-residential customer. The number of ERUs would then be multiplied by the system development fee for the residential customer ($344 for water or $1,852 for sewer) to derive the system development fee for the non-residential customer.

[3] Rounded to the nearest dollar.
[4] See the AWWA M-1 Manual – Appendix B- Equivalent Meter Ratios; pp.326

Exhibit 3– Calculated Maximum System Development Fees for Non-Residential Customers

	Existing		Maximum Cost Justified	
Meter Size	**Water**	**Wastewater**	**Water**	**Wastewater**
¾" or 5/8"	**$157**	**$922**	**$344**	**$1,852**
1"			**$860**	**$4,630**
1 ½"			**$1,720**	**$9,260**
2"			**$2,752**	**$14,816**
3"			**$5,160**	**$27,780**
4"			**$8,600**	**$46,300**
6"			**$17,200**	**$92,600**
8"			**$27,520**	**$148,160**
10"			**$39,560**	**$212,980**

The City may elect to charge a cost per gallon that is less than the maximum cost justified amount documented in this report. If the City elects to charge a fee that is less, all customers must be treated equally, meaning the same reduced cost per gallon per day must be used for all customers.

We appreciate the opportunity to assist the City of Lexington with this important engagement. Should you have questions, please do not hesitate to contact me at (704) 373-1199.

Very truly yours,
RAFTELIS FINANCIAL CONSULTANTS, INC.

Elaine Conti, Senior Manager

Appendix

Supporting Schedules
From the
System Development Fee Model

City of Lexington, NC
Supporting Schedule 1 – Water System

Water System		Calculated RCNLD
Lines/Mains/Pipes	$	736,771
Equipment/Machinery	$	6,406
Plant	$	5,037,826
Land	$	431,471
Building	$	34,706
Tank	$	2,112,543
Valve	$	22,786
Total Eligible Assets (1)	**$**	**8,382,508**
Less: Contributed Capital (2)	$	(100,548)
Less: Vehicles, Non-core Equipment, Computer (3)	$	(29,192)
Subtotal: System Costs	$	8,252,769
Adjustments:		
Less: Outstanding Principal (4)	$	-
Net System Assets	$	8,252,769
Existing System Capacity (in MGD) (5)		7.2
Cost per Unit of Capacity (per gallon)	$	1.15
Daily ERU (in MGD) (6)		300
Calculated System Development Fee per ERU	$	344
Current System Development Fee per ERU	$	157

(1) Represents the replacement cost new less depreciation of all water assets.
(2) There is only 1 waterline that was contributed in 2005 and this asset is being removed from the calculation.
(3) Equipment, vehicles, and small computers are removed from fixed assets.
(4) The water system has no outstanding debt.
(5) Staff indicated the functional capacity of the water system is 7.2 MGD.
(6) For calculating the capacity fee for a typical residential customer or ERU, an average of 300 GPD was assumed. Per NCAC 02T.0114, flow rate is 120 gallons per day per bedroom. Per 2015 census data, the number of persons per household in the City of Lexington is 2.56.

Note: Calculation of ERU

Wastewater permitted capacity design flow rates
120 gallons per day per bedroom
240 gallons per day for 2 bedrooms
360 gallons per day for 3 bedrooms
Estimated gallons per day per household - average of 2 and 3 bedrooms

Supporting Schedule 2 – Wastewater System

Wastewater System		**Calculated RCNLD**
Lines/Mains/Pipes	$	20,924,281
Equipment/Machinery	$	160,196
Plant	$	42,036,323
Land	$	416,920
Tank	$	54,788
Pump	$	1,119,546
Total Eligible Assets (1)	**$**	**64,712,053**
Less: Contributed Capital (2)	$	(3,149,890)
Less: Vehicles, Non-core Equipment, Computer (3)	$	(160,196)
Less: Package Plant (4)	$	(1,774,701)
Less: Grant Funded Assets (5)	$	(18,479,569)
Subtotal: System Costs	$	41,147,696
Adjustments:		
Less: Outstanding Principal	$	(1,012,705)
Net System Assets	$	40,134,991
Existing System Capacity (in MGD) (6)		6.5
Cost per Unit of Capacity (per gallon)	$	6.17
Daily ERU (in MGD) (7)		300
Calculated System Development Fee per ERU	$	1,852
Current System Development Fee per ERU	$	922

(1) Represents the replacement cost new less depreciation of all wastewater assets.
(2)There are 3 wastewater lines that were contributed in 2005 and these asset are being removed from the calculation.
(3) Equipment, vehicles, and small computers are removed from fixed assets.
(4) The package plant at the golf course is removed since it does not provide capacity for retail customers.
(5) About 87.5% of the Wastewater Treatment Plant in 1990 was grant funded.
(6) The capacity excludes the capacity of the package plant at the gold course since the package plant asset is removed from the RCNLD.
(7) For calculating the capacity fee for a typical residential customer or ERU, an average of 300 GPD was assumed. Per NCAC 02T.0114, flow rate is 120 gallons per day per bedroom. Per 2015 census data, the number of persons per household in the City of Lexington is 2.56.

Supporting Schedule 3 – Removal of Wastewater Grant Funded Asset

Wastewater Class Description	I.D.	Category	Asset Description	Calculated RCNLD	
Distribution System	02365	Plant	WASTE TREATMENT PLANT	$	21,119,508
	Portion of Plant Paid by Utility (12.5%)			$	(2,639,938)
Portion of Asset Grant Funded and Excluded from Fee Calculation				**$**	**18,479,569**

Supporting Schedule 4 – Outstanding Principal – Wastewater System

Debt Service		Outstanding Principal
2011 Refunding Bonds	$	618,019
2015 First Tennessee - W&WW Refinancing	$	394,686
Total Outstanding Principal - Wastewater	**$**	**1,012,705**