

March 12, 2018

Mr. Don Chamblee  
Public Works Director  
Lincoln County  
115 W Main St  
Lincolnton, NC 28092

**Subject: Lincoln County Capacity Development Fees**

Dear Mr. Chamblee:

Raftelis has completed an evaluation to develop cost-justified water and wastewater system development fees for consideration by Lincoln County (County). This letter documents the results of the analysis, which is based on an approach for establishing system development fees set forth in North Carolina General Statute 162A Article 8 – “System Development Fees.” As one of the largest and most respected utility financial, rate, management, and operational consulting firms in the U.S., and having prepared system development fee calculations for utilities in North Carolina and across the U.S. since 1993, Raftelis is qualified to perform system development fee calculations for water and wastewater utilities in North Carolina.

**Background**

System development fees are one-time charges assessed to new water and/or wastewater customers, or developers or builders, to recover a proportional share of capital costs incurred to provide service availability and capacity for new customers. North Carolina General Statute 162A Article 8 (Article 8) provides for the uniform authority to implement system development fees for public water and wastewater systems in North Carolina, and was recently passed by the North Carolina General Assembly and signed into law on July 20, 2017. According to the statute, system development fees must be adopted in accordance with the conditions and limitations of Article 8, and those fees in effect as of October 1, 2017 must conform to the requirements set forth in the Article no later than July 1, 2018. In addition, the system development fees must also be prepared by a financial professional or licensed professional engineer, qualified by experience and training or education, who, according to the Article, shall:

- )] Document in reasonable detail the facts and data used in the analysis and their sufficiency and reliability.
- )] Employ generally accepted accounting, engineering, and planning methodologies, including the buy-in, incremental cost or marginal cost, and combined cost approaches for each service, setting forth appropriate analysis to the consideration and selection of an approach

appropriate to the circumstances and adapted as necessary to satisfy all requirements of the Article.

- J Document and demonstrate the reliable application of the methodologies to the facts and data, including all reasoning, analysis, and calculations underlying each identifiable component of the system development fee and the aggregate thereof.
- J Identify all assumptions and limiting conditions affecting the analysis and demonstrate that they do not materially undermine the reliability of conclusions reached.
- J Calculate a final system development fee per service unit of new development and include an equivalency or conversion table for use in determining the fees applicable for various categories of demand.
- J Consider a planning horizon of not less than 10 years, nor more than 20 years.

This letter report documents the results of the calculation of water and wastewater system development fees for the County in accordance with these requirements.

Article 8 references three methodologies that can be used to calculate system development fees. These include the buy-in method, the incremental cost method, and the combined cost method. A description of each of these methods follows:

#### Capacity Buy-In Approach

The Capacity Buy-In Methodology is most appropriate in cases where the existing system assets provide adequate capacity to provide service to new customers. This approach calculates a fee based upon the proportional cost of each user's share of existing plant capacity. The cost of the facilities is based on fixed assets records and usually includes escalation of the depreciated value of those assets to current dollars.

#### Incremental Cost Approach

The second method used to calculate water and wastewater capital facilities fees is the Incremental Cost (or Marginal Cost) Methodology. This method 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.

#### Combined Approach

A combined approach, which is a combination of the Buy-In and Incremental Cost approaches, can 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.

## **Summary of Results**

To perform the system development fee calculation, Raftelis requested and was provided with the following data from County staff:

- ) Water and wastewater fixed asset data;
- ) Outstanding utility debt and associated debt service;
- ) Capital improvement plan;
- ) Contributed capital;
- ) Capacity in water and wastewater systems; and
- ) History of system development fees collected.

The Combined approach was chosen as the method to calculate the system development fees. While the County has limited existing capacity through a water purchase agreement with the City of Lincolnton, the County plans to construct a four million gallon per day (MGD) water treatment plant expansion. Included in this expansion is several transmission mains and an elevated storage tank that will help to provide additional capacity to the water system. The County is also planning to add capacity to their existing wastewater plant, by upgrading the plant to provide an additional 3.33 MGD of capacity. It should be noted that the County has chosen to refer to these system development fees as capacity development fees, and as such, the remainder of this letter will use this terminology.

The Combined approach requires both a Buy-In calculation and an Incremental Cost calculation, as described in the following sections.

### **Buy-In Calculation**

Using the 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, transmission and distribution facilities and land, but excludes non-core assets such as administrative buildings, small equipment, and vehicles. The RCNLD value of the wastewater assets includes wastewater treatment, collection system facilities, disposal facilities and land, and like water, excludes non-core assets. Results of the asset escalation by asset category are shown in Exhibits 1 and 2.

**Exhibit 1 – Replacement Cost New, Less Depreciation: Water Assets**

<b>Asset Category</b>	<b>RCNLD Value</b>
Buildings <sup>1</sup>	\$11,642,980
Donated Water Lines	\$12,242,060
Land Improvements	\$640,231
Land	\$6,600
Water Lines	\$35,509,693
Water Plant	\$3,974,434
<b>Total</b>	<b>\$64,015,997</b>

**Exhibit 2 – Replacement Cost New, Less Depreciation: Wastewater Assets**

<b>Asset Category</b>	<b>RCNLD Value</b>
Buildings <sup>1</sup>	\$3,456,598
Donated Wastewater Lines	\$10,338,523
Land Improvements	\$70,445
Land	\$821,827
Wastewater Lines	\$9,420,679
Wastewater Plant	\$23,881,310
<b>Total</b>	<b>\$47,989,382</b>

Several adjustments were then made to the estimated water and wastewater RCNLD values in accordance with Article 8, which included adjustments for contributed assets, and outstanding debt service as described below.

Contributed Assets

The listing of fixed assets provided was reviewed to identify assets that were contributed or paid for by developers, and these assets were subtracted from the RCNLD value, as these assets do not represent an investment in system capacity by the County.

Outstanding Debt Service Deduction

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

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<sup>1</sup> The “Buildings” asset category includes plant components, pump stations, and buildings that are essential to water or wastewater production or processing. It excludes administrative buildings and assets that are not core functional components of the water and wastewater systems.

double charged for these assets, once through the capacity development fee and again through retail rates and charges, the outstanding debt that is paid for through retail rates and charges should be deducted from the calculation.

The RCNLD values for water and wastewater assets with the adjustments as described above are shown in Exhibit 3.

**Exhibit 3 – Deductions from RCNLD for Water and Wastewater System Values**

	<b>Water</b>	<b>Wastewater</b>
RCNLD	\$64,015,997	\$47,989,382
Contributed Capital Deduction	\$(12,242,060)	\$(10,338,523)
Debt Service Deduction	\$(6,224,827)	\$(12,250,000)
<b>Net System Value (RCNLD)</b>	<b>\$45,549,110</b>	<b>\$25,400,859</b>

The adjusted RCNLD values for water and wastewater were then converted to a unit cost of capacity by dividing the RCNLD value by the respective capacity in gallons per day (GPD) for the water and wastewater systems (Exhibit 4).

**Exhibit 4 – Cost per GPD of Core Utility Assets (Buy-In Approach)**

	<b>Water</b>	<b>Wastewater</b>
A. Net System Value	\$45,549,110	\$25,400,859
B. Existing Capacity (GPD)	3,990,000	3,350,000
<b>Cost Per GPD (A/B)</b>	<b>\$11.42</b>	<b>\$7.58</b>

**Incremental Calculation**

Using the Incremental Cost approach, Raftelis calculated the value of future expansions relative to the increased capacity that they would provide. The starting point for the Incremental approach is the total value of all expansion-related capital projects included in the County's capital improvement plan. The total cost of planned expansion projects for water and wastewater is \$31,178,000 and \$26,304,160, respectively (Exhibits 5 & 6).

**Exhibit 5 – Capital Projects for the Water System**

<b>Water System Expansion Projects</b>	<b>Projected Cost</b>
Water Treatment Plant Expansion to 8 MGD	\$14,362,000
NC 73 Water Line Loop Improvements	\$3,016,000
Interconnection with City of Lincolnton – Reepsville Rd	\$3,400,000
Water Treatment Plant Transmission Line	\$6,100,000
Replace NC 16 Waterline – Future Phases	\$1,800,000
Elevated Water Tank	\$2,500,000
<b>Total Expansion Costs</b>	<b>\$31,178,000</b>

**Exhibit 6 – Capital Projects for the Wastewater System**

<b>Wastewater System Expansion Projects</b>	<b>Projected Cost</b>
Wastewater Treatment Plant Upgrade to 6.6 MGD	\$26,304,160
<b>Total Expansion Costs</b>	<b>\$26,304,160</b>

The aggregate project costs must be reduced by a revenue credit according to the North Carolina General Statute 126A-207 "Minimum requirements" of Article 8. The credit shall reflect a deduction of either the outstanding principal debt or the present value of projected revenues received by the local governmental unit for the capital improvements. The credit must be no less than 25% of the aggregate cost of these capital improvements. The revenue credit is applied to ensure that new customers are not paying twice for the capacity (once through the system development fee and then again through rates which are used to pay debt service issued for the projects that provided capacity).

The County anticipates borrowing approximately \$19,978,000 and \$25,437,160 to fund the water and wastewater expansions, respectively.<sup>2</sup> The County's average annual principal debt associated with funding expansions is approximately \$811,107 for water, and \$1,032,749 for wastewater.

It is the County's plan to apply revenues from the capacity development fees to pay for the annual debt service associated with the expansions. The history of the County's annual capacity development fee revenue is shown below in Exhibit 7.

**Exhibit 7 – Annual Capacity Fee Revenue Collected**

<b>Fiscal Year</b>	<b>Water</b>	<b>Wastewater</b>
2013	\$287,250	\$208,368
2014	\$453,200	\$370,028
2015	\$653,396	\$539,494
2016	\$1,275,789	\$1,046,990
2017	\$1,877,732	\$1,572,678
2018 <sup>3</sup>	\$993,377	\$1,405,119

For the water system, the five-year average capacity fee revenue collected from fiscal year 2013 to 2017 is \$909,473, and exceeds the water system's average annual debt principal (\$811,107). For the wastewater system, the five-year average capacity fee revenue collected from fiscal year 2013 to 2017 is \$747,512, which is less than wastewater average annual principal (\$1,032,749). The 5-year average calculation is conservative, given that the County's fee revenues and development projections show a growth trajectory; even the County's year-to-date 2018 revenues<sup>3</sup> for water and wastewater exceed average annual water and wastewater debt principal, respectively.

The revenue credit is equal to the net present value of the principal debt that will not be funded through the system development fees (\$0 for water, \$4.02 million for wastewater). Since this net present value calculation is lower than the minimum credit of 25% of the total project costs, the water and wastewater aggregate project costs were both reduced by 25%, yielding adjusted expansion costs of \$23,383,500 for water and \$19,728,120 for wastewater (Exhibit 8). The calculated cost per GPD resulting from the Incremental approach calculation is shown in Exhibit 9.

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<sup>2</sup> Water expansion projects are funded through two revenue bond issues: Series 2018 Revenue Bonds totaling \$14,112,000 (25-year term, 4.5% interest rate) and Series 2019 Revenue Bonds totaling \$37,169,160 (25-year term, 4.5% interest rate). Wastewater expansion projects are funded with proceeds remaining from the Series 2019 Revenue Bonds.

<sup>3</sup> Data from fiscal year 2018 are year-to-date actuals as of January 9<sup>th</sup>, 2018.

**Exhibit 8 – Revenue Credit Applied to Water & Wastewater Expansion Values**

	Water	Wastewater
A. Total Expansion Costs	\$31,178,000	\$26,304,160
B. Revenue Credit (25% of projects' cost)	\$7,794,500	\$6,576,040
<b>Net Capital Projects after Revenue Credit (A-B)</b>	<b>\$23,383,500</b>	<b>\$19,728,120</b>

**Exhibit 9 – Cost per GPD for Future Expansion Projects (Incremental Approach)**

	Water	Wastewater
A. Adjusted Expansion Cost	\$23,383,500	\$19,728,120
B. New Capacity from Expansion (GPD)	4,010,000	3,330,000
<b>Cost Per GPD (A/B)</b>	<b>\$5.83</b>	<b>\$5.92</b>

**Combined Cost Calculation**

The Combined Cost method requires a weighted average of the respective cost per GPD numbers calculated under the Buy-In and Incremental approaches. The cost per GPD calculated using the Buy-In approach is multiplied by the percent of total system capacity provided by existing assets. The cost per GPD calculated using the Incremental approach is multiplied by the percent of total system capacity to be provided by capital expansion projects. The sum of these weighted cost per GPD numbers yields the cost per GPD used in the Combined approach, as illustrated in Exhibit 10.

**Exhibit 10 – Weighted Cost/gallon/day for Combined Approach**

	Water			Wastewater		
	% Capacity	Cost/ GPD	Weighted Cost/ GPD	% Capacity	Cost/ GPD	Weighted Cost/ GPD
Buy-In	49.9%	\$11.42	\$5.69	50.1%	\$7.58	\$3.80
Incremental	50.1%	\$5.83	\$2.92	49.9%	\$5.92	\$2.95
<b>Total</b>			<b>\$8.62</b>			<b>\$6.76</b>

The weighted average cost per GPD becomes the basic building block or starting point for determining the *maximum cost-justified level* of the water and wastewater capacity 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.



### **Equivalent Residential Unit (ERU) Calculation**

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. For water, the County assumes 360 gallons per day per ERU based on the demand associated with a three-bedroom dwelling. This number is consistent with 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. For wastewater, the County assumes a reduced demand of 240 gallons per day per ERU (two bedrooms). This reduced demand is based on the County's delegated permitting authority as authorized by the North Carolina Department of Water Resources.

### **Assessment Methodology**

The analysis provides a maximum cost-justified level of capacity development fees that can be assessed by the County. For residential customers, the calculation of the capacity 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 in Exhibit 11.

### **Exhibit 11 – Capacity Development Fee Calculation for Water and Wastewater Systems**

	<b>Water</b>	<b>Wastewater</b>
A. Weighted Average Cost/gallon/day	\$8.62	\$6.76
B. Per ERU Consumption	360	240
<b>Capacity Fee Per ERU (A*B)</b>	<b>\$3,101.97</b>	<b>\$1,621.40</b>

For non-residential customers (or customers with larger meters), 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.<sup>4</sup> This method provides a straightforward approach that is simple to administer and reasonably equitable for most new customers. Exhibit 12 shows the resulting maximum cost-justified capacity development fees by meter size for meters ranging from 3/4 inches to 12 inches. For these calculations, the capacity development fees have been rounded to the nearest dollar.

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<sup>4</sup> See the AWWA M-1 Manual – Appendix B- Equivalent Meter Ratios; pp.326

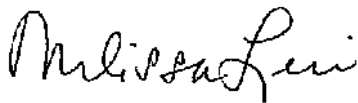
**Exhibit 12 – Maximum Justified Capacity Development Fees for Water and Wastewater Customers**

Meter Size	Water	Wastewater
¾"	\$3,102	\$1,621
1"	\$5,170	\$2,702
2"	\$16,544	\$8,647
3"	\$33,088	\$17,295
4"	\$51,699	\$27,023
6"	\$103,399	\$54,047
8"	\$165,438	\$86,475
10"	\$434,275	\$226,996
12"	\$548,014	\$286,447

Lincoln County may elect to charge a cost per gallon that is less than the maximum cost-justified charge documented in this report. If the County 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 Lincoln County with this important engagement. Should you have questions, please do not hesitate to contact me at (704) 373-1199.

Sincerely,  
**RAFTELIS FINANCIAL CONSULTANTS, INC.**



**Melissa Levin**  
*Senior Manager*