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February 25, 2022

Mr. Victor Czar
Director of Public Works
225 E Weatherspoon St
PO BOX 3729
Sanford, NC 27331

Dear Mr. Czar:

Raftelis has completed an evaluation to develop cost-justified water and wastewater system development fees (SDF) for consideration by the City of Sanford ("City"). 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.

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. According to the statute, system development fees must be adopted in accordance with the conditions and limitations of the 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. The law was subsequently revised by HB 826 and HB 873. 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.

- Document and demonstrate the reliable application of the methodologies to the facts and data, including all reasoning, analysis, and interim calculations underlying each identifiable component of the system development fee and the aggregate thereof.
- Identify all assumptions and limiting conditions affecting the analysis and demonstrate that they do not materially undermine the reliability of conclusions reached.
- 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.
- Consider a planning horizon of not less than 5 years, nor more than 20 years.

This letter report documents the results of the calculation of water and wastewater system development fees for the City 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:

System Buy-In Approach

The System Buy-In Methodology is most appropriate in cases where the existing 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 system development 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

For the system development fee calculation, it was determined that adequate capacity exists in both the water and wastewater treatment plant facilities and in major trunk water transmission and wastewater collection lines to address expected demand from new customers over the short-term

(at least 5-year) planning horizon. As a result, the System Buy-In approach is the more appropriate methodology to use for both the water and wastewater calculation.

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

- Water and wastewater fixed asset data, as of June 30, 2021;
- Outstanding utility debt and associated debt service;
- Contributed capital;
- Quantity of lines / mains by size;
- Capacity in water and wastewater systems;
- Daily water production data;
- Inflow and infiltration data;
- System Peaking Factor for water;
- System water loss factor; and
- Inflow and infiltration factor for wastewater.

Using the System Buy-In approach, Raftelis calculated the estimated cost, or investment in, the current capacity available to provide water and wastewater 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, 2021, the end of the most recent fiscal year. Only assets directly related to providing capacity, including treatment plant infrastructure, lines, and tanks, were included in the System Buy-In analysis.

The depreciated value of the assets is first adjusted to reflect an estimated replacement cost to determine the "replacement cost new less depreciation" (RCNLD) value for the system. RCNLD was calculated by applying the Engineering News Record (ENR) Construction Cost Index to depreciated purchase costs. All assets contributed by or paid for by developers, or assets that were grant funded, are excluded from the calculation because costs not paid by the City should not be recovered through charges assessed to City customers. Also, the outstanding principal on funds borrowed to construct the core assets is deducted in order to ensure that new customers are not being double charged for these costs since the retail user rates and charges assessed to all present and future customers must be set to recover these debt service costs. These adjustments are also necessary to ensure compliance with the Rational Nexus test.

At the end of the analysis, the cost or investment in core system assets is reduced to a basic unit measure of cost per gallon per day (GPD) for water and wastewater capacity, as shown in Exhibit 1. Additional details on how this value was calculated are provided in the Schedules from the system development fee Model in the Appendix.

Exhibit 1 – Cost per GPD of Core Utility Assets

Cost Per Gallon per Day	Test Year Estimate
Water Assets	$ 3.34
Wastewater Assets	6.08
Total Cost per GPD	$ 9.42

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. Since the vast majority of customers are single-family residential customers, connected using the smallest meter size (5/8 or ¾ inch), this customer class becomes the starting point for calculating the system development fees. The next step is to define 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 built up based on a number of factors or assumptions, as shown in Exhibit 2.

Exhibit 2: Water and Wastewater Demand per ERU

Water Usage per ERU		**Wastewater Usage per ERU**	
GPD per ERU	250.00	GPD per ERU	250.00
System Peaking Factor	1.19	Inflow / Infiltration Factor	1.20
Water Loss Factor	1.15		
GPD per ERU	342.97	*GPD per ERU*	300.00

Note that demand for water service includes a peak demand factor, since water infrastructure must be sized to meet that level of demand, whereas the wastewater analysis is based on an average level of demand. Additional information in support of each of these factors or assumptions is provided below:

- **GPD per ERU** – For planning purposes and for calculating committed capacity at treatment plants, state guidelines specify expected average usage of 240 GPD for a 2-bedroom single family home and 360 GPD for a 3-bedroom home. For calculating the SDF for a typical residential customer or ERU, an average of 250 GPD was assumed for the City.
- **System Peaking Factor** – The system peaking factor is measured as the ratio between maximum day production and average day production at the water treatment plants. Over the last four years, the max day system peaking factor has averaged 1.19.
- **Water Loss Factor** – The water loss factor includes unaccounted for water losses (e.g., leaks, slow meters, theft, etc.), and water losses that are accounted for but not billed (e.g., line flushing, fire protection, etc.). Based on input by City staff, this factor was determined to be

15% of produced water. A water loss factor of 15% is generally considered to be acceptable, given that the typical target value is to achieve a 15% loss factor.

- **Inflow/Infiltration Factor** – This factor represents the portion of flows being returned to the water reclamation plants that is attributable to inflow and infiltration (I&I) that occurs in the wastewater collection system. Plant assets and wastewater collection lines must be sized to meet the level of actual flows delivered to the plants. Based on discussions with City staff, this factor has been estimated to be 20%.

Assessment Methodology

The analysis provides a calculation of the maximum cost justified level of the fees that could be charged for each meter size and/or customer type. For single-family 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 3. For multi-family residential customers (e.g. apartment buildings or condos), the system development fee can be based on meter size (as discussed below), or by using an adjustment factor to account for the difference in the level of average usage between single-family homes and apartments or condos.

Exhibit 3 – Calculated Maximum Residential SDF's

Water Fee per ERU		**Wastewater Fee per ERU**	
Cost per GPD	$ 3.34	Cost per GPD	$ 6.08
GPD per ERU	343	GPD per ERU	300
Total: Water Fee per ERU	$ 1,146.77	*Total: Wastewater Fee per ERU*	$ 1,823.14
		Total Water and Wastewater Fee per ERU	**$ 2,969.90**

For customers with larger meters, the fees for the smallest residential meter are scaled up by the ratio of meter capacities. This provides an approach for assessing fees to customers with larger meters that is easy to administer and provides reasonable equity for most new customers. However, the level of flows assigned to a 5/8" or 3/4" meter, based on the ERU concept, is well below the actual capacity of that meter size. As a result, since larger meters are scaled up from this starting point, there is a potential to understate the flows for customers with larger meters. The City may consider a policy that provides greater flexibility in how customers with larger meters are assessed a system development fee. Specifically, for customers requesting a meter three inches in diameter or greater, the City could retain the option of requesting an engineering analysis of expected water usage. This engineering analysis would provide an estimate of expected peak day and average day water usage. Peak day demand (GPD) would be adjusted by the lost water factor to determine total demand and then multiplied by the cost of water capacity ($3.34 per GPD) to determine the water system development fee, and average water usage would be adjusted for the I&I factor and multiplied by the cost of wastewater capacity ($6.08 per GPD) to determine the

wastewater system development fee. As an alternative, if a customer expects to use a significant portion of its purchased water such that it is not returned to the wastewater system for treatment, then they could prepare a separate engineering analysis of wastewater expected to be discharged to the City collection system.

However, as shown in Exhibit 4, the system development fee would be scaled by meter size for meters ranging from 5/8 inches to 10 inches (although currently the smallest meter size being installed is ¾ inch), which includes most of the new customers connecting to the system. For these calculations, the system development fees have been rounded to the nearest five dollars. See the schedules in the Appendix for additional information.

Exhibit 4 – Calculated Maximum System Development Fees by Meter Size

Meter Size (1)	Capacity Ratio	Water	Sewer	Combined
3/4" Displacement	1.00	$ 1,146.77	$ 1,823.14	$ 2,969.90
1" Displacement	1.67	$ 1,911.28	$ 3,038.56	$ 4,949.84
1.5" Displacement	3.33	$ 3,822.55	$ 6,077.12	$ 9,899.67
2" Displacement	5.33	$ 6,116.08	$ 9,723.39	$ 15,839.47
3" Singlejet	10.67	$ 12,232.17	$ 19,446.78	$ 31,678.95
3" Compound, Class I	10.67	$ 12,232.17	$ 19,446.78	$ 31,678.95
3" Turbine, Class I	11.67	$ 13,378.93	$ 21,269.92	$ 34,648.85
4" Singlejet	16.67	$ 19,112.76	$ 30,385.59	$ 49,498.35
4" Compound, Class I	16.67	$ 19,112.76	$ 30,385.59	$ 49,498.35
4" Turbine Class I	21.00	$ 24,082.08	$ 38,285.85	$ 62,367.93
6" Singlejet	33.33	$ 38,225.52	$ 60,771.19	$ 98,996.71
6" Compound, Class I	33.33	$ 38,225.52	$ 60,771.19	$ 98,996.71
6" Turbine Class I	43.33	$ 49,693.18	$ 79,002.54	$ 128,695.72
8" Compound, Class I	53.33	$ 61,160.83	$ 97,233.90	$ 158,394.73
8" Turbine Class II	93.33	$ 107,031.45	$ 170,159.33	$ 277,190.78
10" Turbine Class II	140.00	$ 160,547.18	$ 255,238.99	$ 415,786.17
12" Turbine Class II	176.67	$ 202,595.25	$ 322,087.30	$ 524,682.55

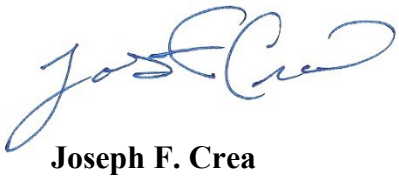
1. Meter types and capacity ratios are calculated from the standards in the AWWA M1 Manual, 7th Edition, to illustrate how the SDF fee should be scaled up by meter size. Because the 3/4" meter is the smallest meter size that the City uses, the ¾" meter should receive the smallest SDFs, as shown above.

It is important to point out that the results shown above in Exhibit 4 reflect the maximum cost justified amount for the City's System Development Fees, as presented in this report. There is no requirement that this maximum amount has to be charged, and the calculation only sets an upper limit on the amount that can be justified. However, if the City decides to charge a lesser amount, it is important that all customers be assessed a comparable fee to avoid criticism that the fees may be arbitrary or discriminatory.

We appreciate the opportunity to have provided assistance to the City of Sanford with this important engagement. Please contact me at your convenience if you have any questions regarding this report. I can be reached at (513) 818-4145.

Very truly yours,

RAFTELIS FINANCIAL CONSULTANTS, INC.



Joseph F. Crea
Vice President

Appendix

Supporting Schedules
From the
System Development Fee Model

City of Sanford, NC
Utility System Development Fee Analysis
Water System Development Fee Calculation
Schedule 1

	Test Year
Water Capacity Fee Calculation	System Buy-In
Water System Assets (1)	
Tank Improvements	$ 690,144
Tanks	2,564,365
Water Lines	20,796,026
Water Plant	13,950,060
Water Plant Improvements	2,769,505
Total: Water System Investment	$ 40,770,100
Less:	
Debt Principal Credits (2)	$ (646,792)
Total: Costs Eligible for Impact Fee Recovery	**$ 40,123,308**
Plant Capacity (mgd) (3)	12.00
System Unit Cost ($/gal/day)	**$ 3.344**

1) Based on the RCNLD of capacity related water system fixed assets as of June 30, 2021. The asset values exclude developer contributed capital.

2) The cost per GPD for the water system is reduced by a debt credit for existing debt service. The debt credit is included to prevent new customers from paying twice for debt financed assets: once through a capacity fee and again as a part of costs recovered through user rates and charges.

3) Total system capacity available to the City.

City of Sanford, NC
Utility System Development Fee Analysis
Water System Development Fee Calculation
Schedule 1 (Continued)

Water Capacity Fee Calculation (Continued)		**Test Year** System Buy-In
Average Residential Daily Usage (gal/day) (4)		250.00
System Peaking Factor Adjustment (5)		1.19
System Water Loss Adjustment (6)		1.15
Adjusted Average Residential Usage		342.97
Calculated Capacity Fee per REU		**$ 1,146.77**
Fees by Meter Size	Ratio (7)	
3/4" Displacement	1.00	1,146.77
1" Displacement	1.67	1,911.28
1.5" Displacement	3.33	3,822.55
2" Displacement	5.33	6,116.08
3" Singlejet	10.67	12,232.17
3" Compound, Class I	10.67	12,232.17
3" Turbine, Class I	11.67	13,378.93
4" Singlejet	16.67	19,112.76
4" Compound, Class I	16.67	19,112.76
4" Turbine Class I	21.00	24,082.08
6" Singlejet	33.33	38,225.52
6" Compound, Class I	33.33	38,225.52
6" Turbine Class I	43.33	49,693.18
8" Compound, Class I	53.33	61,160.83
8" Turbine Class II	93.33	107,031.45
10" Turbine Class II	140.00	160,547.18
12" Turbine Class II	176.67	202,595.25

4) For planning purposes and for calculating committed capacity at treatment plants, state guidelines specify expected average usage of 240 GPD for a 2-bedroom single family home and 360 GPD for a 3-bedroom home. For calculating the system development fee for a typical residential customer or ERU, an average of 250 GPD was assumed for the City.

5) The system peaking factor is measured as the ratio between maximum day production and average day production at the water treatment plants. Over the last four years, system peaking factors have averaged 1.19.

6) The water loss factor includes unaccounted for water losses (e.g., leaks, slow meters, theft, etc.), and water losses that are accounted for but not billed (e.g., line flushing, fire protection, etc.). Based on input by City staff, this factor was determined to be 15% of produced water.

7) These capacity ratios are developed from meter flow capacity information provided in the AWWA M1 Manual, 7th Edition. The smallest meter installed for new customers by the City is a ¾" meter. New customers with larger meters, including commercial and industrial customers, will be assessed a higher fee based on the ratio of capacity for different meter sizes.

City of Sanford, NC
Utility System Development Fee Analysis
Wastewater System Development Fee Calculation
Schedule 2

	Test Year System Buy-In
Wastewater Capacity Fee Calculation	
Wastewater System Assets (1)	
Sewer Lift Stations	$ 5,325,725
Sewer Lines	42,448,670
Sewer Plant Improvements	69,801,100
Wastewater Treatment Plant	9,166,586
Total: Wastewater System Investment	$ 126,742,080
Less:	
Debt Principal Credits (2)	$ (53,816,654)
Total: Costs Eligible for Impact Fee Recovery	**$ 72,925,426**
Plant Capacity (mgd) (3)	12.00
System Unit Cost ($/gal/day)	**$ 6.077**

1) Based on the RCNLD of capacity related wastewater system fixed assets as of June 30, 2021. The asset values exclude developer contributed capital.

2) The cost per GPD for the water system is reduced by a debt credit for existing debt service. The debt credit is included to prevent new customers from paying twice for debt financed assets: once through a capacity fee and again as a part of costs recovered through user rates and charges.

3) Total wastewater system capacity available to the City.

City of Sanford, NC
Utility System Development Fee Analysis
Wastewater System Development Fee Calculation
Schedule 2 (Continued)

Wastewater Capacity Fee Calculation (Continued)		**Test Year** System Buy-In
Average Residential Daily Usage (gal/day) (4)		250.00
System I&I Adjustment (5)		1.2
Adjusted Average Residential Usage		300.00
Calculated Capacity Fee per REU		**$ 1,823.14**
Fees by Meter Size	Ratio (6)	
3/4" Displacement	1.00	1,823.14
1" Displacement	1.67	3,038.56
1.5" Displacement	3.33	6,077.12
2" Displacement	5.33	9,723.39
3" Singlejet	10.67	19,446.78
3" Compound, Class I	10.67	19,446.78
3" Turbine, Class I	11.67	21,269.92
4" Singlejet	16.67	30,385.59
4" Compound, Class I	16.67	30,385.59
4" Turbine Class I	21.00	38,285.85
6" Singlejet	33.33	60,771.19
6" Compound, Class I	33.33	60,771.19
6" Turbine Class I	43.33	79,002.54
8" Compound, Class I	53.33	97,233.90
8" Turbine Class II	93.33	170,159.33
10" Turbine Class II	140.00	255,238.99
12" Turbine Class II	176.67	322,087.30

4) For planning purposes and for calculating committed capacity at treatment plants, state guidelines specify expected average usage of 240 GPD for a 2-bedroom single family home and 360 GPD for a 3-bedroom home. For calculating the system development fee for a typical residential customer or ERU, an average of 250 GPD was assumed for the City.

5) This factor represents the proportion of flows being returned to the wastewater treatment plants that is attributable to I&I that occurs in the collection system. Plant assets and wastewater collection lines must be sized to meet the level of actual flows delivered to the plants. This factor has decreased since the prior analyses because of ongoing programs to locate and repair leaking collection lines.

6) These capacity ratios are developed from meter flow capacity information provided in the AWWA M1 Manual, 7th Edition. The smallest meter installed for new customers by the City is a ¾" meter. New customers with larger meters, including commercial and industrial customers, will be assessed a higher fee based on the ratio of capacity for different meter sizes.