

April 21, 2023

Mr. Franky Howard  
Chief Executive Officer  
Onslow Water and Sewer Authority  
228 Georgetown Road  
Jacksonville, NC 28540

**Subject: System Development Fee Study Update**

Dear Mr. Howard:

Raftelis Financial Consultants, Inc. (“Raftelis”) has completed an evaluation to develop cost-justified water and sewer system development fees for fiscal year (“FY”) 2024 for consideration by the Onslow Water and Sewer Authority (“Authority” or “ONWASA”). This report documents the results of the analysis, which was based on an approach for establishing system development fees set forth in North Carolina General Statute 162A Article 8 – “System Development Fees.” The purpose of this report is to summarize Raftelis’ conclusion related to cost justified water and sewer system development fees. It is not intended to address anything else associated with the system development fees, such as the administration of these fees, etc.

The preparation of this report was developed by Raftelis for ONWASA based on a specific scope of work agreed to by both parties. The scope of Raftelis’ work consisted of completing a calculation of cost justified water and sewer system development fees using common industry practices and industry standards. We provide no opinion on the legality of the system development fees implemented by the Authority. It is the responsibility of the Authority to ensure compliance of the system development fees with North Carolina General Statute 162A Article 8 – “System Development Fees.”. The scope of work does did not include any additional work other than the calculation associated with the system development fees, such as opinions or recommendations on the administration of these fees, the timing and use application of revenues from the collection of these fees, etc., as that is the responsibility of the Authority.

In developing the conclusions contained within this report, Raftelis has relied on certain assumptions and information provided by ONWASA, who is most knowledgeable of the water and sewer system, its finances, etc. Raftelis has not independently verified the accuracy of the information provided by the Authority. We believe such sources are reliable and the information obtained to be reasonable and appropriate for the analysis undertaken and the conclusions reached. The conclusions contained in this report are as of the stated date, for a specific use and purpose, and made under specific assumptions and limiting conditions. The reader is cautioned and reminded that the conclusions presented in this report apply only as to the effective date indicated. Raftelis makes no warranty, expressed or implied, with respect to the opinions and conclusions contained in this report. Any statement in this report involving estimates or matters of opinion, whether or not specifically designated, are intended as such, and not as representation of fact.

## Background

System development fees are one-time charges assessed to new water and/or sewer customers for their use of system capacity and serve as an equitable method by which to recover up-front system capacity costs from those using the capacity. North Carolina General Statute 162A Article 8 (“Article 8”) provides for the uniform authority to implement system development fees for public water and sewer systems in North Carolina and was passed by the North Carolina General Assembly and signed into law on July 20, 2017 and was modified by Session Law 2021-76 and House Bill 344, which was approved on July 2, 2021. According to the statute, system development fees are required to be adopted in accordance with the conditions and limitations of Article 8, and the fees are required to conform to the requirements set forth in the Article no later than July 1, 2018.<sup>1</sup> 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 methods 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 five years, nor more than 20 years.
- Use the gallons per day per service unit that the local government unit applies to its water or sewer system engineering for planning purposes for water or sewer, as appropriate, in calculating the system development fee.

This letter report documents the results of the calculation of water and sewer system development fees for FY 2024 in accordance with these requirements. In general, system development fees are calculated based on (1) a cost analysis of the existing or planned infrastructure that is in place, or will be constructed, to serve new capacity demands, and (2) the existing or additional capacity associated with these assets. Article 8 is relatively explicit in the identification of infrastructure assets that may be included as part of the system development fee calculation, as the Article defines allowable assets to include the following types, as provided in Section 201:

*“A water supply, treatment, storage, or distribution facility, or a wastewater collection, treatment, or disposal facility providing a general benefit to the area that facility serves and is owned or operated, or to be owned or*

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*operated, by a local governmental unit. This shall include facilities for the reuse or reclamation of water and any land associated with the facility.”*

Therefore, the method used to calculate system development fees for ONWASA included system facility assets that satisfied this definition.

Article 8 references three methodologies that could 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 is included in the following paragraphs:

### Capacity Buy-In Method:

Under the Capacity Buy-In Method, a system development fee is calculated based on the proportional cost of each user's share of existing system capacity. This approach is typically used when existing facilities can provide adequate capacity to accommodate future growth. The cost of capacity is derived by dividing the estimated value of existing facilities by the current capacity provided by existing facilities. Adjustments to the value of existing facilities are made for developer contributed assets, grant funds, and outstanding debt.

### Incremental Cost Method:

Under the Incremental Cost (or Marginal Cost) Method, a system development fee is calculated based on a new customer's proportional share of the incremental future cost of system capacity. This approach is typically used when existing facilities have limited or no capacity to accommodate future growth. The cost of capacity is calculated by dividing the total cost of growth-related capital investments by the additional capacity provided as a result of the investments.

### Combined Method:

Under the Combined Method, a system development fee is calculated based on the blended value of both the existing and expanded system capacity. As such, it is a combination of the Capacity Buy-In and Incremental Cost methods. This method is typically used when existing facilities provide adequate capacity to accommodate a portion of the capacity needs of new customers, but where significant investment in new facilities to address a portion of the capacity needs of future growth is also anticipated, or where some capacity is available in parts of the existing system, but incremental capacity will be needed for other parts of the system to serve new customers at some point in the future.

The Combined method was used to calculate the water and sewer system development fees for ONWASA, since in general, the Authority's existing water and sewer treatment facilities have some capacity to accommodate anticipated future growth over the near term, and the capital improvements projects are adding additional capacity to serve new customers. The following steps were completed to calculate the fees under the Combined Method:

1. The replacement value of existing system facilities was calculated, and adjustments were made to derive a net replacement value estimate in accordance with Article 8. Adjustments to the calculated replacement value included deducting accumulated depreciation, developer contributions, and a portion of outstanding debt. The growth-related capital improvement projects were incorporated into the total system value, making adjustments to the calculated value to account for future debt to fund the projects. A combined net system value was calculated by adding together the net system asset replacement value (net of contributions) and the growth-related capital spending (net of grants), and subtracting the current outstanding principal and the future borrowing net present value.

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2. The unit cost of system capacity was estimated by dividing the calculated system value from step 3 by the total capacity of the system. This includes the current capacity of the system (minus any capacity reserved for others by contract) plus any capacity added by the capital projects.
3. The amount of capacity assumed to be demanded by one service unit of new development was identified. One equivalent residential unit (“ERU”) was defined as the smallest service unit of new development.
4. The system development fee for one service unit of development was calculated by multiplying the cost per unit of system capacity by the capacity associated with one ERU, as defined below.
5. The calculated system development fee for one ERU was scaled for different categories of demand. Meter capacity ratios were used to scale system development fees from a base meter size, or the smallest unit of new development (one ERU), to different categories of demand, as defined by the different customer meter sizes.

## Calculation of System Development Fees

### *Step 1 – Estimate the System Value and Apply Adjustments*

A listing of fixed assets provided by ONWASA, as of June 30, 2022, was reviewed and each individual asset was categorized into one of the categories shown in Table 1. General assets, such as those related to administrative buildings, certain rolling stock, and certain equipment items were not directly attributable to a specific category. As a result, these assets were categorized as “Other Non-Core Assets.” These assets were excluded from the calculation of system value as these assets were not specifically identified as allowable under Article 8. Excluded assets included those relating to administrative and miscellaneous type buildings, rolling stock, and various types of equipment.

**Table 1. Fixed Asset Categories by System**

<b>Water System</b>	<b>Sewer System</b>
Treatment	Treatment
Land	Land
Distribution	Collection
Meters	
Vehicles	Vehicles
Easements	Easements
Other Non-Core Assets	Other Non-Core Assets

Next, the replacement value of existing assets in allowable categories was estimated. Each asset’s original cost, as contained in the fixed asset listing provided by the Authority, was escalated to 2023 dollars based on the year the asset was purchased and the corresponding escalation factor for that year. Escalation factors for each year were developed using the Handy-Whitman Index (“HWI”) for the South Atlantic Region, which provides an annual index value representing the relative change in costs for each year from 1908 to 2023. Using the HWI to estimate an asset’s current replacement cost is an industry accepted method by which to value system facilities.

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The replacement costs of the assets were adjusted by their indexed accumulated depreciation to derive the replacement cost new less accumulated depreciation (“RCNLD”) amounts. The estimated RCNLD values for water and sewer system assets allowable under Article 8 are summarized in Table 2.

As shown in Table 2, the RCNLD value of the water system was estimated to be approximately \$135 million, and the RCNLD value of the sewer system was estimated to be approximately \$190 million. Several additional adjustments were made to the estimated water and sewer system RCNLD values in accordance with Article 8, which included adjustments for meters, vehicles, other non-core assets, developer contributed assets, and a portion of outstanding debt, as described below.

### Non-Core and Developer Contributed Assets:

Assets such as meters, vehicles and easements are not allowable under Article 8, and as such are excluded from the total system value used in the fee calculation. Additionally, the listing of fixed assets was reviewed to identify assets that were contributed, or paid for, by developers. ONWASA tracks assets that were contributed by developers and identifies them in the fixed asset register as such. These assets were subtracted from the RCNLD value, as these assets do not represent an investment in system capacity by the Authority. The total RCNLD value of the non-core and contributed water and sewer system assets was estimated to be approximately \$42 million and \$64 million, respectively.

### Growth Related Capital Spending

The other component of the system value when utilizing the Combined Method is the growth-related capital spending. ONWASA staff provided us with the capital improvements plan for the next 10 years, as well as which projects are growth related, capacity added, and funding sources for each project. The growth-related portion of the spending is incorporated into the system value, with revenue credit given for future borrowing, as discussed below. For the Authority, \$177 million of growth-related water capital spending, and approximately \$47 million of growth-related sewer capital spending were added to the system value. The total system value used in the fee calculation including capital spending is shown in Table 2 below.

**Table 2. Water and Sewer System Value**

<b>Description</b>	<b>Water</b>	<b>Sewer</b>
Assets (RCNLD)	\$135,030,983	\$189,874,597
Less: Non-Core Assets/ Contributed Capital	-\$41,981,580	-\$64,212,467
Total Net Assets RCNLD	\$93,049,403	\$125,662,130
Plus: Growth Related CIP	\$177,263,425	\$46,610,810
Total System Value Before Credits	\$270,312,828	\$172,272,940

### Debt Credit

Article 8 specifies that the buy-in calculation should be determined using generally accepted methods, including the consideration of debt credits and other generally accepted valuation adjustments. Article 8 also states that in applying the incremental cost or the combined cost methods to calculate a system development fee, the analysis must include a credit against the projected aggregate cost of capital improvements and that in no case shall the credit be less than 25 percent of the aggregate cost of capital

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improvements. In calculating the system development fees for ONWASA, a debt credit was included in the calculation as described below.

The debt credit is applied to reflect that a portion of the outstanding debt associated with the system facilities will be repaid with water and sewer user charges and a portion will be repaid with system development fee revenues. An adjustment was made to prevent recovering the cost of the assets twice, once when assessing system development fees to new customers, and then again when these customers pay user charges.

The amount of the credit was calculated by first identifying the amount of existing outstanding debt attributable to both the water and sewer systems that funded qualifying assets. Then, the debt identified as funding growth-related projects was estimated over 30 years with an interest of 4.5%. The net present value (NPV) was then calculated on the projected principal of each issue, using the current weighted average cost of debt of 4.1%. A summary of the debt credits is provided in Table 3.

**Table 3. Debt Credit**

<b>Description</b>	<b>Water</b>	<b>Sewer</b>
Outstanding Principal	-\$17,482,362	-\$39,687,417
NPV Of Future Debt	-\$79,421,991	-\$18,731,548
Total Credit	-\$96,904,352	-\$58,418,964

The resulting adjustments to the water and sewer system values are shown in Table 4.

**Table 4. Calculation of Net Water and Sewer System Value**

<b>Description</b>	<b>Water</b>	<b>Sewer</b>
System Facilities RCNLD	\$135,030,983	\$189,874,597
Less: Non-Core/Contributed Assets	-41,981,580	-64,212,467
Plus: Growth CIP	+177,263,425	+46,610,810
Less: Debt Credit/Revenue Credit	<u>-96,904,352</u>	<u>-58,418,964</u>
Net System Value	\$173,408,475	\$113,853,976

### *Step 2 – Calculate the Unit Cost of System Capacity*

The cost per unit of system capacity was calculated by dividing the adjusted system values (derived in Step 1) by the water and sewer system capacities. The treatment capacity of the water system is currently 11.44 million gallons per day (“MGD”). Additionally, the Authority will be adding 6 MGD of capacity with the capital expansion projects, for a total water system capacity of 17.44 MGD. Therefore, the cost per unit of system capacity for the water system was calculated to be \$9.94 per gallon per day ( $\$173,408,475 \div 17.44 \text{ MGD}$ ).

The treatment capacity of the sewer system is 3.754MGD, but the capital expansion projects are necessary to access the full treatment capacity of the existing system for future growth. Therefore, the cost per unit of system capacity for the sewer system was calculated to be \$30.33 per gallon per day ( $\$113,853,976 \div 3.754 \text{ MGD}$ ).

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### *Step 3 – Estimate the Amount of Capacity Per Service Unit of New Development*

Section 205 of Article 8 states that the system development fee calculation “...use the gallons per day per service unit that the local governmental unit applies to its water or sewer system engineering for planning purposes for water or sewer, as appropriate, in calculating the system development fee.” For the water and sewer system, one ERU of peak day capacity was defined to be 300 gallons per day (“GPD”) for single-family customers. This information was provided by staff and is based on data from the NCDHEC planning estimates which assigns 120 gallons per day per bedroom. The ERU of 300 gallons is derived assuming the average gallons per day per bedroom for a 2 and 3 bedroom house.

### *Step 4 – Calculate the System Development Fee for One ERU*

The system development fee for one ERU was calculated by multiplying the unit cost of capacity from Step 2 by the capacity demanded by one ERU from Step 3. The calculations are provided in Table 5.

**Table 5. Calculation of Water and Sewer System Development Fees for One ERU – Single-Family**

<b>Description</b>	<b>Water</b>	<b>Sewer</b>
Net System Value	\$173,408,475	\$113,853,976
System Capacity (MGD)	17.44	3.75
Unit Cost of Capacity (\$ / gallon per day)	\$9.94	\$30.33
Capacity Required for 1 ERU (gallons per day)	300	300
System Development Fee per ERU	\$2,983	\$9,099

### *Step 5 – Scale the System Development Fees for Various Categories of Demand*

The system development fees for various categories of demand (for non-residential customers) were scaled using water meter capacity ratios. The scaling factors were based on rated meter capacities for each meter size, as published by the American Water Works Association in Principles of Water Rates, Fees, and Charges.<sup>2</sup> The meter scaling factors are shown in

<sup>2</sup> Manual of Water Supply Practices (M1), Principles of Water Rates, Fees, and Charges, American Water Works Association, 7th Edition, Table VII.2-5 on p. 338.

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Table 6 and the resulting system development fees scaled by meter size are shown in Table 7.

**Table 6. Meter Capacities and Scaling Factors by Meter Size**

Meter Size	Scaling Factor
3/4"	1.0
1"	1.7
1.5"	3.3
2"	5.3
3"	10.7
4"	16.7
6"	33.3
8"	53.3
10"	80.0

**Table 7. Maximum Cost-Justified Water and Sewer System Development Fees by Meter Size for Single-Family Residential Customers and Non-Residential Customers**

Meter Size	Water Fee	Sewer Fee
3/4"	\$ 2,983	\$ 9,099
1"	\$ 4,971	\$ 15,165
1.5"	\$ 9,943	\$ 30,328
2"	\$ 15,907	\$ 48,525
3"	\$ 31,814	\$ 97,053
4"	\$ 49,710	\$ 151,644
6"	\$ 99,419	\$ 303,286
8"	\$ 159,071	\$ 485,259
10"	\$ 238,606	\$ 697,561

The water and sewer system development fees shown in Table 7 represent the maximum cost-justified level of system development fees that can be assessed by ONWASA per Article 8. If the Authority chooses to assess fees that are less than those shown in the tables, the adjustments need to be reflected consistently across all categories of demand.

We appreciate the opportunity to assist the Onslow Water and Sewer Authority 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**

*Executive Vice President*