



**Memorandum**  
November 2013

# City of Portsmouth Capacity Use Surcharge Analysis



**Prepared by**



**Municipal & Financial Services Group**

This document was prepared to summarize the work performed by the Municipal & Financial Services Group (MFSG) for the City of Portsmouth (the City) to analyze the City's water and sewer capacity use surcharges.

## 1.0 Background

The City currently charges capacity use surcharges to new customers joining the City's water and sewer system. The City requires payment of the surcharges at the time of building permit issuance. Capacity use surcharges are imposed to recover the capital costs of providing water and sewer system capacity constructed to serve new customers. The charges recover investments made by the City in the backbone facilities such as treatment plants, storage facilities, pump stations and distribution and collection systems. Unlike water and sewer user rates capacity use surcharges are one-time charges that are based on the value of the City's capacity and the amount of capacity needed by the new customer. Capacity use surcharges are not intended to recover the cost of local facilities such as the actual connection to the water and sewer system (items such as the meter, lateral, meter vault, etc.).

MFSG reviewed the current capacity use surcharges imposed by the City to determine if they represent the true cost incurred by the City, while providing water and sewer service to new customers. MFSG also reviewed the methodology used the by City to impose these charges. Table 1 presents a sample of the current surcharges for water and sewer service.

*Table 1: Current Capacity Use Surcharges*

Type of Use	GPD (Gallons per Day)	EDU's (Equivalent Dwelling Unit)	Water	Sewer
Single Family Dwelling Unit	250	1	\$652	\$744
Commercial Building	3,300	13.2	\$8,606	\$9,821
Restaurant (60 seats)	1,200	4.8	\$3,130	\$3,571
Hotel (120 rooms)	8,000	32	\$20,864	\$23,808
<b>Cost per Gallon of Capacity</b>			<b>\$2.61</b>	<b>\$2.98</b>

As demonstrated in Table 1, the City currently imposes capacity use surcharges based on type of customer and the specific attributes for each customer (number of seats, number of rooms or other factor) which is then associated with an estimate daily use. The types of use listed in the Table 1 only represent a sample of the categories of type of use used by the City to calculate fees for each connection. While this approach is used by some utilities around the United States it is not the most common approach. It is far more common to base capacity use surcharges on the size of the water meters associated with the connection. This approach is discussed in more detail later in this memorandum.

## 2.0 Capacity Use Surcharge Calculations

There are three primary industry standard methods used to calculate capacity use surcharges for water and sewer systems. Within each method the goal is to determine the cost of

providing a unit of capacity in the water and sewer system for a new customer. The three methods include the following:

- *Equity Buy-In Method* - This approach is based on the historical cost of constructing the assets within the water and sewer systems. The approach is used when a utility has available capacity within its existing water and sewer system to sell to new customers. The specific calculation is shown below.

**Buy-In Method Capacity Cost per EDU**

$$\frac{\text{Replacement Costs less Net Depreciation (RCLND) less Present Value of Outstanding Principal on Existing Debt}}{\text{Existing Capacity (gallon per day)}} = \text{Cost per Gallon of Capacity}$$

- *Incremental (Marginal) Method* - This approach is based on the cost of constructing the next increment of water and sewer system capacity. This approach is used to calculate capacity use surcharges within a utility that has little or no capacity available for new customers. The specific calculation is shown below.

**Incremental Method Capacity Cost per EDU**

$$\frac{[\text{Total Cost of Planned Improvements less Present Value of Outstanding Principal on Projected Debt}] \times \% \text{ to Growth}}{\text{Capacity Added for Growth (gallon per day)}} = \text{Cost per Gallon of Capacity}$$

- *Hybrid (Combined) Method* – This approach is based on the use of a weighted average cost of historical investments in the water and sewer systems and the next increment of capacity. This approach is used within a utility that has existing capacity to sell but is also in the process of or so to be constructing new capacity. The specific calculation is shown below.

**Hybrid (Combined) Method Capacity Cost per EDU**

$$\frac{\text{Buy-In + Incremental Cost of Capacity}}{\text{Existing + Capacity Added for Growth (gallon per day)}} = \text{Cost per Gallon of Capacity}$$

The goal of each approach is to price the capacity in the water and sewer systems based on the actual costs of constructing the capacity. Each of these approaches were reviewed in light of the specific circumstances within the City’s water and sewer system and the calculations for the recommended method for each system are presented in the following section.

## 2.1 Water Capacity Use Surcharges

The City does not currently have capital improvement projects that will provide additional capacity within the water system. Therefore there are no incremental costs associated with the water system that could be used to use the incremental or hybrid approach and the City currently has capacity in the water system to sell to new customers. As a result the buy-in approach was used to evaluate the water system capacity use surcharge.

To determine historical costs, MFSG used the book value of the water system less depreciation and trended this value up to current dollar values using a compounding 3% inflation rate from the acquisition year to the current year. This methodology provides an estimate of the cost per unit of capacity in current dollars but accounts for the fact that the water system has depreciated over time. It also accounts for existing principal on debt service to ensure that customers are not charged twice (in the capacity use surcharge and user rates). Table 2 demonstrates the calculation of capacity use surcharge for the water system.

*Table 2: Calculation of Water Capacity Use Surcharge*

System Buy-In Method	Treatment	Storage	Distribution	Total
Net Costs <sup>(1)</sup>	\$10,902,844	\$1,415,000	\$32,586,009	\$44,903,853
Capacity by Asset Type (MGD)	8.35	11.00	8.35	
Unit Cost (GPD; in \$)	\$1.31	\$0.13	\$3.90	\$5.34
Capacity Use Surcharge per EDU	\$326.43	\$32.16	\$975.63	\$1,300 <sup>(2)</sup>

(1) Replacement Costs less Net Depreciation (RCLND) less Present Value of Outstanding Principal on Existing Debt

(2) Rounded (\$1,334.22)

The calculated cost per gallon of capacity, which serves as the basis for the capacity use surcharge, is significantly higher than the current water capacity use surcharge imposed by the City and demonstrates that the City is not recovering all costs associated with providing water system capacity to new customers. The calculated fees and the current fees are shown in Table 3 for comparison purposes.

*Table 3: Water Capacity Use Surcharge - Current vs. Calculated*

Type of Use	Current	Calculated
Single Family Dwelling Unit	\$652	\$1,200
Commercial Building	\$8,606	\$17,160
Restaurant (60 seats)	\$3,130	\$6,240
Hotel (120 rooms)	\$20,864	\$41,600
<b>Cost per Gallon of Capacity</b>	<b>\$2.61</b>	<b>\$5.34</b>

## 2.2 Sewer Capacity Use Surcharges

Although the sewer system has a significant expansion project at the Pierce Island WWTP and the incremental approach would be a defensible method to calculating the sewer capacity use surcharge, the buy-in method was selected to conservatively calculate capital costs for the sewer system. Table 4 demonstrates the calculation of capacity use surcharge for the sewer system.

*Table 4: Calculation of Sewer Capacity Use Surcharge*

System Buy-In Method	Treatment	Pumping	Collection	Total
Net Costs <sup>(1)</sup>	\$20,616,056	\$9,802,484	\$17,251,686	\$47,670,225
Capacity by Asset Type (MGD)	6.00	26.50	6.00	
Unit Cost (GPD; in \$)	\$3.44	\$0.37	\$2.88	\$6.68
Capacity Use Surcharge per EDU	\$859.00	\$231.19 <sup>(2)</sup>	\$718.82	\$1,800 <sup>(3)</sup>

(1) Replacement Costs less Net Depreciation (RCLND) less Present Value of Outstanding Principal on Existing Debt

(2) Assumes system peaking factor of 2.5

(3) Rounded (\$1,809.01)

The calculated cost per gallon of capacity, which serves as the basis for the capacity use surcharge, is significantly higher than the current water capacity use surcharge imposed by the City and demonstrates that the City is not recovering all costs associated with providing sewer system capacity to new customers. The calculated fees and the current fees are shown in Table 5 for comparison purposes.

*Table 5: Sewer Capacity Use Surcharge - Current vs. Calculated*

Type of Use	Current	Calculated
Single Family Dwelling Unit	\$744	\$1,800
Commercial Building	\$9,821	\$23,760
Restaurant (60 seats)	\$3,571	\$8,640
Hotel (120 rooms)	\$23,808	\$57,600
<b>Cost per Gallon of Capacity</b>	<b>\$2.98</b>	<b>\$6.68</b>

## 3.0 Capacity Use Surcharge Assessment Method

As mentioned previously, the methodology used by the City to assess the capacity use surcharges is not very common. The current approach of assessing the capacity use surcharge based on the type of use can be a significant administrative burden on the City as each new connection or change in use at a location (a restaurant adding outdoor seating) requires an individual calculation.

The industry standard approach for assessing capacity use surcharges is to assess the fee based on the size of the water meter association with the connection to the water system. The use of meter size simplifies the administration of the charge, conforms with industry standards and

assess the charge based on the amount of capacity that is required with the connection. In general the size of the water meter dictates the amount of water that can be drawn on the system and amount of sewerage that would be returned to the sewer system. Table 6 presents the capacity use surcharges based on the calculated cost of capacity and tied to meter size.

*Table 6: Meter Size Based Capacity Use Surcharges*

Meter Size	Maximum Safe Operating Capacity (gpm) <sup>(1)</sup>	Capacity Ratio	Recommended Capacity Use Surcharges	
			Water	Sewer
1"	50	1.0	\$1,300	\$1,800
1 1/2"	100	2.0	\$2,600	\$3,600
2"	160	3.2	\$4,160	\$5,760
3"	320	6.4	\$8,320	\$11,520
4"	500	10.0	\$13,000	\$18,000
6"	1,000	20.0	\$26,000	\$36,000
8"	1,600	32.0	\$41,600	\$57,600
10"	2,400	48.0	\$62,400	\$86,400

*(1) American Water Works Association - Manual M1 - Principles of Water Rates, Fees and Charge*

It should be noted that the minimum meter size within the City is a 1" meter, therefore the capacity use ratios were calculated using the 1" meter size as the base unit. Additionally, it should be noted that using a meter size based methodology for assessing capacity use surcharges would not impact the City's average water and sewer customer. However for non-residential connections the methodology will result in differences. For example if a commercial connection such as a restaurant expands its seating, unless the expansion requires an increase in the size of the meter, the customer would not pay any additional capacity use surcharges.

#### 4.0 Recommendations

Based on our review and analysis of the water and sewer capacity use surcharges for the City of Portsmouth we recommend that the City:

- Increase the water and sewer capacity use surcharges to reflect the actual cost of providing capacity in the water and sewer system.
- Assess the capacity use surcharges based on the size of the meter serving the new customer.

The adoption of these recommendations will ensure that new customers are paying the appropriate amount for the capacity constructed to serve them, will simplify the administration of the charge and will conform to industry standard. The recommended capacity use surcharges are presented in Table 6. It should be noted that it is uncommon for a utility to reserve the right to calculate the capacity use surcharges for larger metered customers on a case-by-case basis. While we recommend that the City adopt a meter size based approach to assessing capacity use surcharges, the City may want to consider only publishing the charges for

meter sizes up to 4" and that new customers requiring meters larger than 4" be handled on a case by case basis with the meter size being a starting point for determining the fee. New customers requiring meters larger than 4" could be required submit maximum monthly water usage estimates to determine if the particular customer will exceed the water usage defined by the required meter size.