

Appendix A to User Charge System

This appendix presents the methodology to be used in calculating user charge rates and surcharges, illustrates the calculations followed in arriving at the first year's user charges and surcharges. The unit costs established in this appendix are based on estimates of expenses, including those associated with transporting and treating inflow and infiltration, and loadings. The actual expenses and loadings that occur may differ from these estimates and certainly they will change as time passes. Therefore, the unit cost must be reestablished whenever necessary to reflect actual expenses and loadings. Once the system is in use, the expenses and loadings can be determined from operating records and the unit costs can be adjusted based on these figures.

The total annual expenses associated with the treatment works, as defined in Article II, Section 8, are estimated as follows:

<u>Item</u>	<u>Annual Expense</u>
Billing and Collection	\$ 3,100.00
Administration	\$ 43,195.00
Utilities	\$ 86,960.00
Labor (including fringe benefits)	\$ 101,324.54
LAGERS	\$ -
Replacement Costs (see Appendix B)	\$ 30,365.00
Total Annual Debt Service	\$ 200,000.00
Supplies	\$ 11,500.00
System Improvement/Extension Expense	\$ -
Professional Service(Eng, Legal, Lab)	\$ 13,400.00
Fuel & Mileage	\$ 6,500.00
Audit	\$ 4,000.00
Permits	\$ 500.00
Other - Misc.	\$ 12,094.00
Equipment Repair/Purchase	\$ 32,420.00

Total Expenses: \$ 545,358.54

Revenues Received from Other

<u>Sources</u>	
Penalties	\$ 9,000.00
Test Fees	\$ 900.00
Tap Fees	\$ 12,000.00
Other Revenue (interest)	\$ 600.00
Other Revenue (specify)	\$ -

Total Revenues from Other Sources: \$ 22,500.00

Total Expenses to be Derived From User Charges: \$ 522,858.54



Model Wastewater User Charge Methodology

2. Allocation of Expenses: The total operation and maintenance, including replacement expenses, is allocated to the appropriate pollutants in the following manner:

Annual Dollars to Treat Annual Flow = XX% annual cost allocated to flow x (total annual O&M budget minus billing, collection, administration, and debt less dedicated debt revenue)

$$= \boxed{60\%} \times \$ 522,858.54 - \$ 272,160.00$$

$$= \$ 150,419.12$$

Annual Dollars to Treat Annual BOD = XX% annual cost allocated to BOD x (total annual O&M budget minus billing, collection, administration, and debt less dedicated debt revenue)

$$= \boxed{20\%} \times \$ 522,858.54 - \$ 272,160.00$$

$$= \$ 50,139.71$$

Annual Dollars to Treat Annual SS = XX% annual cost allocated to SS x (total annual O&M budget minus billing, collection, administration, and debt less dedicated debt revenue)

$$= \boxed{20\%} \times \$ 522,858.54 - \$ 272,160.00$$

$$= \$ 50,139.71$$

Annual Dollars to Treat Annual Other = XX% annual cost allocated to Other Pollutant x (total annual O&M budget minus billing, collection, administration, and debt less dedicated debt revenue)

$$= \boxed{0\%} \times \$ 522,858.54 - \$ 272,160.00$$

$$= \$$$

100%

(Note: In this example, the billing, collection, administration, and debt expenses are deducted from the total O&M budget at this point because each user will pay the same for these expenses per billing period. See paragraph 5 for Minimum Charge calculation. In some situations other appropriate expenses may be handled in the same manner. Costs associated with debt can be collected as part of the unit/volume charge or as a combination of the Minimum Charge and Unit Charge. The ordinance writer should adjust the allocation of percentages to Flow, BOD, and SS to fit their specific type of treatment works.)

3. Loading:

- The number of system users is: Customers
- The initial hydraulic loading (less I/I) is estimated to be: Gallons/year
- The initial BOD loading is estimated to be: Pounds/year
- The initial SS loading is estimated to be: Pounds/year
- The initial *Other Pollutant (specify)* loading is estimated to be: Pounds/year

(Note: If the loading estimates for BOD, SS, and Other Pollutant(s), are based on historical data from the Treatment Works and the concentration is different from the definition of Normal Domestic Wastewater, please see note in paragraph 6 before completing the Residential Unit Charge Calculation.)

Normal Domestic BOD based on above loadings: 89 mg/l
 Normal Domestic SS based on above loadings: 107 mg/l
 Normal Domestic Other Pollutant based on above loadings: - mg/l

Model Wastewater User Charge Methodology

4. Unit Costs

Initial unit cost for flow in \$/gallon	=	<u>Annual \$ to treat annual flow</u> Estimated annual hydraulic loading - inflow & Infiltration
	=	\$ 150,419.12 66,384,539
	=	\$ 0.002266 per gallon
Initial unit cost for BOD in \$/pound	=	<u>Annual \$ to treat annual BOD</u> Estimated annual BOD loading
	=	\$ 50,139.71 49,337
	=	\$ 1.016270 per pound
Initial unit cost for SS in \$/pound	=	<u>Annual \$ to treat annual SS</u> Estimated annual SS loading
	=	\$ 50,139.71 59,205
	=	\$ 0.846883 per pound
Initial unit cost for <i>Other Pollutant(s)</i> in \$	=	<u>Annual \$ to treat annual <i>Other Pollutant(s)</i></u> Estimated annual <i>Other Pollutant(s)</i> loading
	=	\$
	=	\$ per pound

(Note: The unit costs for BOD, SS, and Other Pollutants are to be inserted in Article IV, Section 4 of the ordinance.)

5. Minimum Charge

Number of users: 950
 Billing Period: 12

Billing and Collection	=	\$ 3,100.00
Administration, Audit, Prof. fees, LAGERS	=	\$ 60,595.00
Annual Debt Service plus replacement acct.	=	\$ 208,465.00
Total Annual Minimum Cost	=	\$ 272,160.00
Minimum Charge	=	Total Annual Minimum Cost/Billing Period/Number of Users
	=	\$ 23.87

(Note: The Annual Debt Service collected through the minimum charge is the Total Annual Debt Service less any other revenues dedicated to debt retirement as indicated in the budget.)

(Note: The minimum charge, per user, per billing period is to be inserted in Article IV, Section 3 of the ordinance.)

Model Wastewater User Charge Methodology

Residential User Unit Charge

The residential user unit charge is calculated as follows using the Normal Domestic pollutant concentrations as defined in Article II, Section 2 of this ordinance. **Note: If the estimated loadings in paragraph 3 result in pollutant concentrations that are different than those defined in Article II, Section 2 of this ordinance, then the definition must be revised or the contributors of extra strength wastewater must be identified (see paragraph 7).**

$$\text{Residential Unit Charge} = \text{unit flow charge} + [(\text{unit BOD charge}) \times (\text{BOD}_{\text{ND}}) \times (.00834)] + [(\text{unit SS charge}) \times (\text{SS}_{\text{ND}}) \times (.00834)]$$

Where: Residential unit charge is in \$/1,000 gallons;
 Unit BOD charge is in \$/pound of BOD from paragraph 4;
 Unit SS charge is in \$/pound of SS from paragraph 4;
 BOD_{ND} is the Normal Domestic BOD strength in milligrams per liter (mg/l) as defined in Article II, Section 2, of the ordinance;
 SS_{ND} is the Normal Domestic SS strength in milligrams per liter (mg/l) as defined in Article II, Section 2, of the ordinance; and,
 .00834 is a unit conversion factor.

$$= \$0.0023 \times 1000 + [(\$1.0163 \times (089 \text{ mg/l}) \times (0.00834))] + [(\$0.8469 \times (107 \text{ mg/l}) \times (0.00834))]$$

$$= \$ 3.78 \text{ per 1,000 gallons}$$

(Note: The total residential unit charge is to be inserted in Article IV, Section 3, of the ordinance.)

An example calculation of a monthly residential charge is as follows:

$$\begin{aligned} \text{Assumed flow} &= 5,000 \text{ gallons} \\ \$23.87 + [(5,000/1,000) \times \$3.78] &= \$42.77 \text{ per month} \end{aligned}$$

Extra Strength User

For users who contribute wastewater that has a greater strength than Normal Domestic wastewater, the user charge will be calculated as follows:

$$\text{Total Monthly Charge for Extra Strength User} = \text{Minimum Charge} + \text{Residential Unit Charge} + \text{surcharge for BOD (if applicable)} + \text{surcharge for SS (if applicable)} + \text{surcharge for other pollutant(s) if applicable.}$$

$$\text{Total Monthly Charge for Extra Strength User} = \text{Minimum Charge} + v(\text{Residential Unit Charge}) + v(\text{unit BOD charge})(\text{BOD}_{\text{ES}} - \text{BOD}_{\text{ND}})(.00834) + v(\text{unit SS charge})(\text{SS}_{\text{ES}} - \text{SS}_{\text{ND}})(.00834) + \text{and so on for any other pollutant(s) if applicable.}$$

Where: Total monthly charge to extra strength user is in dollars;
 Minimum charge is in dollars as calculated in paragraph 5;
 v is the volume of wastewater in 1000 gallons discharged by the extra strength user during the month;
 Residential unit charge is in \$/1000 gallons as calculated in paragraph 6
 Unit BOD charge is in \$/pound BOD from paragraph 4;
 Unit SS charge is in \$/pound SS from paragraph 4;
 BOD_{ES} is the average BOD concentration in milligrams per liter (mg/l) contributed by the extra strength user during the month;



Model Wastewater User Charge Methodology

SS_{ES} is the average SS concentration in milligrams per liter (mg/l) contributed by the extra strength user during the month;
 BOD_{ND} is the Normal Domestic BOD strength in mg/l as defined in Article II, Section 2, of the ordinance;
 SS_{ND} is the Normal Domestic SS strength in mg/l as defined in Article II, Section 2, of the ordinance; and,
 .00834 is a unit conversion factor.

An example user charge calculation for an extra strength user follows:

Assumed flow	=	30,000 gallons
Assumed BOD _{ES}	=	540 mg/l
Assumed SS _{ES}	=	400 mg/l
Monthly Charge	=	\$23.87 + [(30,000/1000)(\$3.78)] + [(30,000/1000)(\$1.02)(540 - 089)(0.00834)] + [(30,000/1000)(\$0.85)(400 - 107)(0.00834)]
Monthly Charge	=	\$23.87 + \$113.40 + \$114.68 + \$62.08
Monthly Charge	=	314.04

Are rates sufficient?

Annual revenues generated from Minimum Charge	=	Minimum Charge per billing period x Number of Billing Periods x Number of Customers
Annual revenues generated from Minimum Charge	=	\$23.87 x 12 x 950
Annual revenues generated from Minimum Charge	=	\$ 272,160.00
Annual revenues generated from Residential Unit Charge	=	Residential Unit Charge x Total Annual Flow in 1000 gallons
Annual revenues generated from Residential Unit Charge	=	\$3.78 x Gallons/year/1000
Annual revenues generated from Residential Unit Charge	=	\$ 250,933.56
Total Annual Revenues	=	Annual revenues generated from Minimum Charge + Annual revenues generated from Residential Unit Charge
Total Annual Revenues	=	\$272,160.00 + \$250,933.56
Total Annual Revenues	=	\$ 523,093.56
Budget Surplus/(Deficit)	=	Total Annual Revenues - Total Expenses to be Derived From User Charges
Budget Surplus/(Deficit)	=	\$523,093.56 - \$522,858.54
Budget Surplus/(Deficit)	=	\$235.02



Appendix B

2010 Repair & Replacement Schedule-Sewer

Item	Amount	Total each year
2010 NW & CCWWTF-replace valves/plumbing	10,000.00	
NW & CCWWTF-replace elect panels, starters, contactors	10,000.00	
1/2 of portable generator	23,380.00	
1/2 portable generator adapters	2,500.00	
MM lagoon closure-in stages	5,000.00	
Engineering for Tropicana lagoon upgrade/elimination	10,000.00	
Unexpected equipment repair & replacement	167,777.00	
Large lift station repair (7)	7,000.00	235,657.00
2011 NWWWTF-replace UV light disinfection	7,100.00	
MM lagoon closure-in stages	5,000.00	
Large lift station repair (7)	3,500.00	
1/2-replace computer/printer/monitor-City Hall	1,250.00	
1/2-replace computer/printer/monitor-Maint.	1,250.00	18,100.00
2012 CCWWTF-replace 15 hp grinder pump	5,000.00	
NWWWTF-replace motor	5,000.00	
NWWWTF-replace aeration blowers	2,800.00	
MM lagoon closure-in stages	5,000.00	
Large lift station repair (7)	3,500.00	21,300.00
2013 CCWWTF-replace UV light disinfection	7,100.00	
NW & CCWWTF-replace valves/plumbing	10,000.00	
Replace utility truck	40,000.00	
MM lagoon closure-in stages	5,000.00	
Large lift station repair (7)	3,500.00	65,600.00
2014 MM lagoon closure-in stages	5,000.00	
Large lift station repair (7)	3,500.00	
NW & CCWWTF-replace elect panels, starters, contactors	10,000.00	
1/2-replace computer/printer/monitor-City Hall	1,250.00	
1/2-replace computer/printer/monitor-Maint.	1,250.00	21,000.00
2015 CCWWTF-replace 15 hp grinder pump	5,000.00	
CCWWTF-replace rake motor	2,000.00	
CCWWTF-Lab or in house testing	12,000.00	
MM lagoon closure-in stages	5,000.00	
Large lift station repair (7)	3,500.00	27,500.00
2016 MM lagoon closure-in stages	5,000.00	
Large lift station repair (7)	3,500.00	
1/3-replace vactron	13,500.00	22,000.00
2017 MM lagoon closure-in stages	5,000.00	
Large lift station repair (7)	3,500.00	
CCWWTF-generator repairs	15,000.00	
1/2-replace computer/printer/monitor-City Hall	1,250.00	
1/2-replace computer/printer/monitor-Maint.	1,250.00	26,000.00
2018 CCWWTF-replace aeration blower	6,000.00	
CCWWTF-replace 15 hp grinder pump	5,000.00	
Himmel lift station-generator repairs	15,000.00	
Large lift station repair (7)	3,500.00	29,500.00

2019	CCWWTF-replace 30 hp motor	6,000.00	
	NWWWWTF-replace motor	5,000.00	
	NWWWWTF-replace aeration blowers	2,800.00	
	Large lift station repair (7)	3,500.00	17,300.00
2020	1/2-repairs of portable generator	7,500.00	
	CCWWTF-rebuild auger monster	10,000.00	
	Large lift station repair (7)	3,500.00	
	Replace utility truck	40,000.00	
	1/2-replace computer/printer/monitor-City Hall	1,250.00	
	1/2-replace computer/printer/monitor-Maint.	1,250.00	63,500.00
2021	CCWWTF-replace 15 hp grinder pump	5,000.00	
	CCWWTF-replace rake motor	2,000.00	
	Large lift station repair (7)	3,500.00	
	1/3-replace back hoe	27,000.00	37,500.00
2022	NWWWWTF-paint building	4,500.00	
	City Hall lift station-generator repairs	30,000.00	
	Large lift station repair (7)	3,500.00	38,000.00
2023	Large lift station repair (7)	3,500.00	
	1/2-replace computer/printer/monitor-City Hall	1,250.00	
	1/2-replace computer/printer/monitor-Maint.	1,250.00	6,000.00
2024	CCWWTF-replace 15 hp grinder pump	5,000.00	
	NWWWWTF-sludge removal	50,000.00	
	Large lift station repair (7)	3,500.00	58,500.00
2025	CCWWTF-generator repairs	15,000.00	
	Himmel lift station-generator repairs	15,000.00	
	1/2-repairs of portable generator	7,500.00	
	CCWWTF-paint building	4,500.00	
	CCWWTF-replace furnace/AC	2,250.00	
	Large lift station repair (7)	3,500.00	
	1/3-replace bobcat	12,500.00	60,250.00
2026	NWWWWTF-replace motor	5,000.00	
	NWWWWTF-replace aeration blowers	2,800.00	
	Large lift station repair (7)	3,500.00	
	1/2-replace computer/printer/monitor-City Hall	1,250.00	
	1/2-replace computer/printer/monitor-Maint.	1,250.00	13,800.00
2027	CCWWTF-replace 15 hp grinder pump	5,000.00	
	CCWWTF-replace rake motor	2,000.00	
	Large lift station repair (7)	3,500.00	10,500.00
2028	CCWWTF-replace aeration blower	6,000.00	
	Large lift station repair (7)	3,500.00	9,500.00
2029	CCWWTF-replace 30 hp motor	6,000.00	
	CCWWTF-sludge removal	50,000.00	
	Large lift station repair (7)	3,500.00	
	1/2-replace computer/printer/monitor-City Hall	1,250.00	
	1/2-replace computer/printer/monitor-Maint.	1,250.00	62,000.00
	Total	843,507.00	843,507.00

Appendix C to User Charge System

REPLACEMENT FUND ANNUAL ANNUITY

(A separate sheet showing what items are to be replaced, what year, and estimated replacement cost, should also be attached.)

Inflation **3.00%**
Interest **0.50%**
Initial Balance **\$473,557.22**

<u>Year</u>	<u>Estimated Replacement Costs</u>	<u>3.00% Compound Amount Factor (F/P)</u>	<u>=</u>	<u>Future Worth</u>	<u>X</u>	<u>0.50% Present Worth Factor (P/F)</u>	<u>=</u>	<u>Adjusted Present Worth</u>	<u>Interest on Fund Balance</u>	<u>Net Fund Balance</u>
	Initial Balance									\$473,557.22
1	\$235,657.00	1.030000		\$242,726.71		0.995025		\$241,519.11	2,367.79	\$263,563.30
2	\$18,100.00	1.060900		19,202.29		0.990075		\$19,011.70	1,317.82	\$276,043.83
3	\$21,300.00	1.092727		23,275.09		0.985149		\$22,929.42	1,380.22	\$284,513.96
4	\$65,600.00	1.125509		73,833.38		0.980248		\$72,374.99	1,422.57	\$242,468.15
5	\$21,000.00	1.159274		24,344.76		0.975371		\$23,745.16	1,212.34	\$249,700.73
6	\$27,500.00	1.194052		32,836.44		0.970518		\$31,868.36	1,248.50	\$248,477.79
7	\$22,000.00	1.229874		27,057.23		0.965690		\$26,128.88	1,242.39	\$253,027.95
8	\$26,000.00	1.266770		32,936.02		0.960885		\$31,647.74	1,265.14	\$251,722.07
9	\$29,500.00	1.304773		38,490.81		0.956105		\$36,801.24	1,258.61	\$244,854.87
10	\$17,300.00	1.343916		23,249.75		0.951348		\$22,118.60	1,224.27	\$253,194.39
11	\$63,500.00	1.384234		87,898.85		0.946615		\$83,206.36	1,265.97	\$196,926.51
12	\$37,500.00	1.425761		53,466.03		0.941905		\$50,359.94	984.63	\$174,810.11
13	\$38,000.00	1.468534		55,804.28		0.937219		\$52,300.85	874.05	\$150,244.88
14	\$6,000.00	1.512590		9,075.54		0.932556		\$8,463.45	751.22	\$172,285.56
15	\$58,500.00	1.557967		91,141.09		0.927917		\$84,571.36	861.43	\$112,370.90
16	\$60,250.00	1.604706		96,683.56		0.923300		\$89,267.97	561.85	\$46,614.19
17	\$13,800.00	1.652848		22,809.30		0.918707		\$20,955.06	233.07	\$54,402.96
18	\$10,500.00	1.702433		17,875.55		0.914136		\$16,340.68	272.01	\$67,164.42
19	\$9,500.00	1.753506		16,658.31		0.909588		\$15,152.20	335.82	\$81,206.93
20	<u>62,000.00</u>	1.806111		111,978.90		0.905063		\$101,347.95	406.03	(\$0.94)
	\$843,507.00							\$ 1,050,111.00		
				Less Initial Deposit				(\$473,557.22)		
								\$ 576,553.78		
				Capital Recovery Factor	X	0.052666				
				Annual Annuity				\$30,365.00		