

ADDENDUM A
Calculations of User Fees

FOUNTAIN GREEN CITY
SERVICE USER CHARGE SYSTEM

The monthly fees shall be fixed by the Governing Body on an annual review provided for in Article V, Section 1 of this Ordinance and where adjustments are required or indicated, annual notices given as provided in Article IV, Section 15, the Governing Body shall fix such charges in a manner that will establish an equitable distribution of costs among users as affected by burdens on the System; the first of such reviews to begin July 1, 1995, the beginning of the City's fiscal year and not less frequently than annually thereafter; however, the Governing Body shall afford a reasonable hearing to any person who may request the same, said hearing to be conducted by a member of the Governing Body and two members chosen at large will be held before the end of the quarter year next following a grievance. Hearings may be held at the same time but not corroborated unless the facts are identical or similar.

ADDENDUM A
Calculations of User Fees

FOUNTAIN GREEN CITY
SEWER USE CHARGE SYSTEM

The sewer use charge system (UCS) is the mechanism used to assess fees to the users of the system for its use. The UCS is based on a base flow with overage associated with water use and the quality (B.O.D. or S.S.) for sewage equivalent to "normal" household sewage.

A. NUMBER OF CONNECTIONS

Residential Users, RU	260
Commercial Users, CU	10
Industrial Users, IU	0

B. BASE GALLONS

Number of gallons for base use.	6,000
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C. PROPORTIONAL SHARE OF O&M

The first column is an inventory of each type of connection on the system.
The second column gives the percent of the total that each type of connection accounts for.

	CONNS (Conn)	PERCENT (%)
Residences*	260	96.30
Churches	1	0.37
Post Office	1	0.37
Garages	1	0.37
General Store	2	0.74
City Hall	1	0.37
Fish Hatchery	1	0.37
Elementary School	1	0.37
Fire Department	1	0.37
Other	<u>1</u>	<u>0.37</u>
	270	100.00

D. ITEMIZATION OF O&M COSTS

This section is the budget for the operation and maintenance of the wastewater system.

Labor	\$8,000
Material	1,000
Utilities	2,100
Outside Services	1,000
Parts and Equipment	2,500
Other	4,400
TOTAL, Annual	\$19,000
TOTAL, Monthly, Bm	\$1,583

E. ITEMIZATION OF LOAN SERVICE

This section gives the amount that must be applied to loan service.

Utah Wastewater Loan (\$710,000)	(30 yrs 0% Intrest)	\$25,527
FmHA Loan (\$398,300)	(39 yrs 5.125% Intrest)	\$24,200
Utah Wastewater Loan Reserves		\$6,382
FmHA Loan Reserves		\$2,420
TOTAL, Annual		\$58,529
TOTAL, Monthly, Lm		\$4,877

F. TOTAL COST OF WASTEWATER SYSTEM

per year	\$77,529
per month	\$6,461

G. RATE SCHEDULE

This is the contribution that each user pays. This is based on winter water useage and generates \$6461.00 in revenue per month from 270 connections.

Base Rate	Base Gallons	Overage Rate Per 1,000 Gallons
\$15.00	6,000	\$1.65

All connections will pay the base rate of \$15.00 active or inactive. Overage will begin on all water useage over 6,000 gallons per connection.

SURCHARGE RATES

The surcharge rates should be used for any user whose B.O.D. exceeds 200 mg/l per month, or whose suspended solids (S.S.) exceeds 250 mg/l. The B.O.D. and the S.S. are determined by sampling the discharge of the user to the collection system.

A. COST PROPORTION FOR MAIN CONSTITUENTS, P

This section give the percentage of the total cost of treatment attributable to each of the three catagories, e.g. 60% of the total cost of the wastewater system is used to convey the flow.

	Percent
Flow, (Q)	60
B.O.D.	20
Suspended Solids, (S.S.)	20

B. CHARACTERISTICS OF RESIDENTIAL EQUIVALENT

This section gives the "average" characteristics of a residential equivalent.

	Flow (gal/mo)	Conc (mg/l)	Load (lbs/mo)
Flow, (Q)	12,000		
B.O.D.		200	20.02
Suspended Solids, (S.S.)		250	25.02

$$\text{Load} = \text{Conc} \times Q \times 8.34$$

$$20 = 200 \times 12000 \times 8.34$$

C. COST OF EACH CONSTITUENT PER UNIT, Gu

This section gives the total cost of handling a unit quantity, i.e. one pound of B.O.D. and one pound of S.S.

	\$/1000 gal	(\$/lb.)
Flow	\$1.65	
B.O.D.		0.239
Suspended Solids, (S.S.)		0.191

D. OVERAGE COST FOR EACH GALLON ABOVE 6,000 GALLONS

Overage Flow (gallons)			Cost (\$)
1	-	1000	1.650
1001	-	2000	3.300
2001	-	3000	4.950
3001	-	4000	6.600
4001	-	5000	8.250
5001	-	6000	9.900
6001	-	7000	11.550
7001	-	8000	13.200
8001	-	9000	14.850
9001	-	10000	16.500
10001	-	11000	18.150
11001	-	12000	19.800
12001	-	13000	21.450
13001	-	14000	23.100
14001	-	15000	24.750
15001	-	16000	26.400
16001	-	17000	28.050
17001	-	18000	29.700
18001	-	19000	31.350
19001	-	20000	33.000
20001	-	21000	34.650
21001	-	22000	36.300
22001	-	23000	37.950
23001	-	24000	39.600
24001	-	25000	41.250

E. COST OF B.O.D. PER EACH 1000 GALLONS

Concentration of B.O.D. (mg/l)			Cost (\$)
1	-	100	0.101
101	-	200	0.300
201	-	300	0.499
301	-	400	0.699
401	-	500	0.898
501	-	600	1.097
601	-	700	1.297
701	-	800	1.496
801	-	900	1.695
901	-	1000	1.895
1001	-	1100	2.094
1101	-	1200	2.293
1201	-	1300	2.493
1301	-	1400	2.692
1401	-	1500	2.891
1501	-	1600	3.091
1601	-	1700	3.290
1701	-	1800	3.489
1801	-	1900	3.689
1901	-	2000	3.888

General Equation: $Cost = .001 \times Q_{ave} \times C_u(B.O.D.) \times 8.34$

Q_{ave} is the average of the above flow increment, e.g. $(201+300)/2 = 250$

F. COST OF S.S. PER EACH 1000 GALLONS

Concentration of S.S. (mg/l)			Cost (\$)
1	-	100	0.080
101	-	200	0.240
201	-	300	0.399
301	-	400	0.558
401	-	500	0.718
501	-	600	0.877
601	-	700	1.036
701	-	800	1.196
801	-	900	1.355
901	-	1000	1.514
1001	-	1100	1.673
1101	-	1200	1.833
1201	-	1300	1.992
1301	-	1400	2.151
1401	-	1500	2.311
1501	-	1600	2.470
1601	-	1700	2.629
1701	-	1800	2.788
1801	-	1900	2.948
1901	-	2000	3.107

General Equation: $\text{Cost} = .001 \times Q_{\text{ave}} \times \text{Cu(B.O.D.)} \times 8.34$

Q_{ave} is the average of the above flow increment, e.g. $(201+300)/2 = 250$

Surcharges can be determined by using either Section C, COST OF EACH CONSTITUENT PER UNIT as shown in Section G or using the Tables in Sections D, E and F as shown in Section H.

G. EXAMPLE FOR DETERMINING SURCHARGE - Using cost of Each Constituent per Unit

Assume an industry discharges wastewater with the following characteristics:

Flow :	20000	gals/month
B.O.D.:	550	mg/l
S.S. :	750	mg/l

FLOW: To find the cost for flow, use the cost per thousand gallons in Section C.

$$\begin{array}{rcl}
 20000 \text{ gal/mon} - 6000 \text{ gal/mon} & \times & \$1.65/1000 \text{ gal} = \\
 \text{Flow minus base flow} & & \boxed{\$23.10} \\
 & & \text{Cost of flow}
 \end{array}$$

B.O.D.: To find the cost for B.O.D., multiply the pounds of B.O.D. by the cost of B.O.D. per pound in Section C.

$$\begin{array}{rcl}
 20000 \text{ (gal/mon)} / 1,000,000 \times 550 \text{ (mg/l)} \times 8.34 & \times & \$ 0.239 \text{ (/lb)} = \\
 \text{Pounds of B.O.D.} & & \boxed{\$21.93} \\
 & & \text{Cost of B.O.D.}
 \end{array}$$

S.S.: To find the cost for S.S., multiply the pounds of S.S. by the cost of S.S. per pound in Section C.

$$\begin{array}{rcl}
 20000 \text{ (gal/mon)} / 1,000,000 \times 750 \text{ (mg/l)} \times 8.34 & \times & \$ 0.191 \text{ (/lb)} = \\
 \text{Pounds of S.S.} & & \boxed{\$23.89} \\
 & & \text{Cost of S.S.}
 \end{array}$$

TOTAL BILLING:

BASE	\$15.00
FLOW	\$23.10
B.O.D.	\$21.93
S.S.	\$23.89
Total	<u>\$83.92</u>

H. EXAMPLE FOR DETERMINING SURCHARGE - Using Rate Tables for flow, B.O.D., and S.S.

Assume an industry discharges wastewater with the following characteristics:

Flow :	20000	gal/month
Overage:	14000	gal/month
B.O.D.:	550	mg/l
S.S. :	750	mg/l

FLOW: To find the cost for flow look up the flow in Table D

13001	-	14000	23.100
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\$23.10

B.O.D.: To find the cost of B.O.D. look up the B.O.D. in Table E

501	-	600	1.097
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Multiply the cost per 1000 gallons by the number of gallons divided by 1000.

$$\text{\$ } 1.097 \times (20000 / 1000) = \text{\$ } 21.95$$

S.S.: To find the cost of S.S. look up the S.S. in Table F

701	-	800	1.196
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Multiply the cost per 1000 gallons by the number of gallons divided by 1000.

$$\text{\$ } 1.196 \times (20000 / 1000) = \text{\$ } 23.91$$

TOTAL BILLING:

BASE	\$15.00
FLOW	\$23.10
B.O.D.	\$21.95
S.S.	\$23.91
Total	\$83.96