



Orem City

Sewer Base Rate Evaluation Project

Final Report

Revised September 2, 2015

Tyler Bain

## **Project Goals**

The purpose of this project was to evaluate the existing Orem City Utilities Billing Database(UBD) and modify it to reflect the actual residential units present at each address. UBD entries found to have multiple units will be charged a new sewer base rate based on the number of units present. Each entry in the UDB is associated with a single water meter which is identified by a GIS ID #. Over the course of this project, every address in the UDB was also associated with a parcel from Utah County's cadastral data layer in order to make the UDB spatially aware. Commercial properties as well as mixed-use parcels were identified. This project was completed between December 2014 and September 2015.

## **Process Overview**

The following is a step by step account of the process used to identify the number of residential units present at each address listed in the Utilities Billing Database (UBD):

- Step 1: The UBD was copied to my computer and ordered by meter reading route (Book). Each zone (Book) was examined in order from 1 to 99. I also utilized a map of parcels from the county, a map layer indicating current 'multiple-unit' parcels, a map of water meters maintained by the city, and an aerial photo of Orem taken in the spring of 2014.
- Step 2: For each entry in the UDB I identified the address and found the corresponding parcel on Utah County's map layer. Any errors or discrepancies were noted and rectified later.
- Step 3: The corresponding water meter for each parcel was found and its GISID was verified. Any meters that were missing or had errors in their GISID were collected and eventually forwarded to Layne Batty.
- Step 4: The current 'Residential/Commercial' status of each entry in the UBD was verified. Errors or discrepancies in this categorization were collected and eventually sent to Thomas Phelps for rectification. If a property was correctly classified as 'Commercial', no further evaluation was performed.
- Step 5: A visual evaluation of residential properties was performed based on the aerial photo. Characteristics indicating that a property needed further evaluation included the presence of multiple driveways, walkways, garages, sectioned yards, secondary structures, etc. All parcels that were currently marked as 'multiple unit', as well as any property surrounded by 'multiple unit' parcels were also evaluated further.
- Step 6: Any property that was not obviously a single unit was checked using Google Street View. Google's dataset includes street level photos taken in both 2007 and 2012. Each questionable property was checked for multiple mailboxes, address numbers, garbage cans and doors. Basement entryways could be seen as well. Any questionable parcels were added to the list of addresses to be verified in person. Other websites such as Bing Maps and Zillow.com were used

to check certain properties. Zillow.com in particular was useful as it sometimes contained realty listings and photos which clarified the status of many properties that were listed as 'multiple unit'.

Step 7: Questionable properties were also verified using resources provided by Orem City. The Planning and Zoning's official Accessory Apartment List was used as well as the notes and comments present in the Utility Billing Database. The Utah County property database was also consulted.

Step 8: Each questionable address not reasonably verified using in-office resources was checked in person. I checked for extra house numbers, multiple doors, the presence of extra garbage cans and mailboxes, and visible basement entryways.

Step 9: Checked empty and vacant parcels against a new version of the UBD for new accounts opened since the project began.

Step 10: Analyzed retirement homes and rehabilitation centers to determine if they were long-term or short-term care centers. Long-term centers were registered as residential and unit counts were determined. Short-term care centers were classified as commercial properties. Unit counts for mobile home parks were also verified.

Step 11: UBD addresses were modified to match address naming conventions in the county parcel layer. The UDB list was then linked to the parcels to create a map of residential property units.

**Results**

21,847 UBD entries were checked in office and in person.

Of these, 20,141 were classified as residential and 1,706 as commercial.

The 20,141 residential accounts contained 27,472 units, broken down as such:

**Residential**

Residential Units per Property	Count	Total Residential Units (Units per Property X Count)
0	1,725*	0
1	18,323	18323
2	997	1994
3	37	111
4	478	1912
5	19	95
6	43	258
7	2	14

\*(19 Vacant & 1,706 Commercial Properties)

8	8	64
9	2	18
10	1	10
12	82	984
13	2	26
14	2	28
15	4	60
16	31	496
17	1	17
18	17	306
20	7	140
21	1	21
22	1	22
24	32	768
25	3	75
26	1	26
27	4	108
28	2	56
32	1	32
34	1	34
35	3	105
40	3	120
41	2	82
43	1	43
48	2	96
52	1	52
68	1	68
77	1	77
83	1	83
88	1	88
142	1	142
144	1	144
178	1	178
196	1	196
	Total Properties	Total Residential Units
	21,847	27,472

**Residential anomalies**

Northridge HOA: There are 82 individual houses registered on only 2 water meters. These were equally split so that each meter represents 41 residential units.

**Projected Revenue Increase from Revised Residential Unit Count**

METER SIZE	NEW UNIT TOTALS	CURRENTLY BILLING	ADDITIONAL UNITS	BASE RATE	TOTAL ADDITIONAL REVENUE
0.75	17700	16827	873	9.32	8,136.36
1	4711	2919	1792	9.32	16,701.44
1.5	1446	154	1292	9.32	12,041.44
2	2403	146	2257	9.32	21,035.24
4	135	2	133	9.32	1,239.56
6	749	8	741	9.32	6,906.12
10	266	2	264	9.32	2,460.48
				Monthly:	68,520.64
				Annual:	<b><u>822,247.68</u></b>

**Mixed Use Properties**

With the assistance of Tamara Beardall in Development Services I was able to examine the building plans to determine the number of plumbing fixtures present in the commercial portions of these mixed use developments. These numbers were used to determine the equivalent meter size necessary to service the commercial portions of these properties. At the time of this report there was no information available for the North tower of the Midtown development. This will be continually monitored and updated in the utility billing database.

ENTITY	Address	Residential Units	Commercial Facilities	Equivalent Meter Size	GISID
Wolverine Crossing Llc	1381 W 1100 South	258	10 toilets, 25 sinks	1.5	5647
Murray, Scott	202 E 800 South	6	2 toilets, 4 sinks	.75	20781
Midtown360 (South Tower only)	320 S State Street	No current residential units	8 toilets, 23 sinks	1.5	3192

### Commercial Properties by Meter Size

Includes equivalent meters from mixed use properties (1 x .75", 2 x 1.5")

Meter Size(inches)	Count
.75	809
1	405
1.5	203
2	242
3	16
4	28
6	2
8	4
	=1709

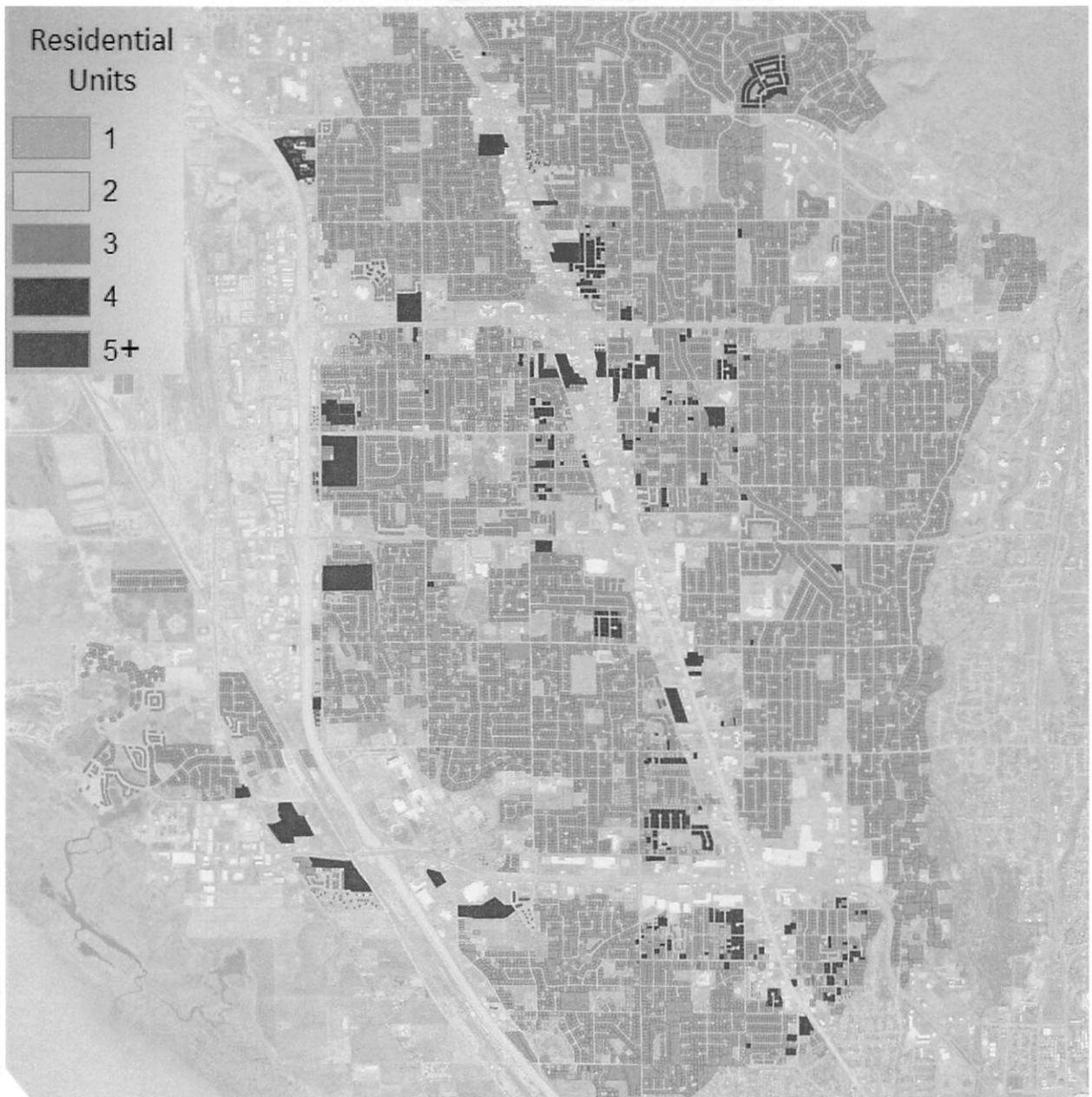
### Projected Revenue Increase From Revised Commercial Base Rate Multiplier

Meter Size	New Unit Total	Current Base Rate	Current Revenue	New Base Rate Multiplier	New Revenue	Total Additional Revenue
0.75	809	9.32	7,539.88	1	7,5359.88	0.00
1	405	9.32	3,774.60	1.67	6,303.58	2,528.98
1.5	203	9.32	1,891.96	3.33	6,300.23	4,408.27
2	242	9.32	2,255.44	5.33	12,021.50	9,766.06
3	16	9.32	149.12	10	1,491.20	1,342.08
4	28	9.32	260.96	20	5,219.20	4,958.24
6	2	9.32	18.64	41.67	776.73	758.09
8	4	9.32	37.28	53.33	1,988.14	1,950.86
						Monthly: 25,712.58
						Annual: <b><u>308,550.90</u></b>

### Total Revenue Increase:

Residential Monthly:	68,520.64
Commercial Monthly:	<u>25,712.58</u>
Total Monthly Increase:	94,233.22
Total Annual Increase:	<b><u>1,130,798.64</u></b>

## Map of Residential Units in Orem City



## Orem Sewer Base Rate

### Background

**Sewer Base Rate.** Orem City presently charges users of the city sewer system a monthly “sewer base rate” for service. This charge is uniform for both residential, commercial, and industrial users.

**Sewer Production Rate.** The users are also charged a “production rate” based on the flows they contribute to the system. The production rate is based on the *average monthly water consumption* from November through March. This average monthly winter water consumption is the estimated amount of wastewater that would end up in and be treated at the Orem Water Reclamation Facility.



## City of Orem - Service Bill

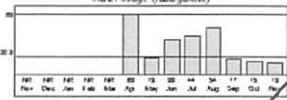
56 North State, Orem, Utah 84057 (801) 229-7275  
Office Hours: Mon - Thu 7:30 - 5:30, Fri 8:00 - 5:00  
billpay.orem.org or Pay by phone: (801) 229-7222

**SERVICE INFORMATION**

Service Period: 10/30/2014 to 11/30/2014

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

Previous Read	Current Read	Consumption
9675	9688	13



Water Usage (000 gallons)

This is the Sewer Base Rate. This value is fixed each month. For this bill, this charge represents one (1) sewer base rate or \$9.32.

This is the Production Rate. This value is derived from the average monthly winter water consumed from November through March and varies from year to year. For this bill, this charge represents 9,000 gallons/month and is calculated as follows:  
\$1.42/1,000 gal x 9,000 gallons = \$12.78.

**ACCOUNT INFORMATION**

Previous Balance: 75.07  
Payments Received: -75.07  
Credits: \_\_\_\_\_  
Balance Due Now: \$0.00  
Current Charges Due: 12/29/2014 73.84

**Total Amount Due:**  
Due Date:

CURRENT CHARGES	
Water Usage \$0.58/1,000 gal	13.94
<b>Sewer Base Rate</b>	<b>9.32</b>
<b>Sewer charge \$1.42/1,000 gal</b>	<b>12.78</b>
City Franchise Tax	2.91
Garbage charge (1)	10.50
Recycling (1)	3.05
Green Waste Fee (1)	5.55
Storm Sewer	5.00
Street Lighting	3.25
<b>CURRENT TOTAL</b>	<b>73.84</b>

## Problem

1. Presently, *Orem City charges the same base rate to each account holder.* It does not charge multi-family housing such as apartments and condominiums or commercial properties with multiple units an individual base rate for each unit. The present sewer base rate is \$9.32 per month *per account holder.*
2. Following cost-of-service principles, the current Orem sewer base rate includes fixed costs associated with operating the system (i.e. costs that do not vary with wastewater production). While a few of these fixed costs can be equitably distributed on a per customer basis (e.g. billing costs), the majority of these *fixed costs are associated with maintaining the infrastructure* and manpower necessary to provide capacity in the system for potential flows.

## Problem (cont.)

3. As such, distribution of these costs should be based on the *potential* for wastewater flow from each account holder and larger customers should pay a larger share of the base rate than smaller customers. As it is currently structured, the Orem base rate structure results in individual homeowners subsidizing larger customers such as commercial properties and multi-unit developments.

## Solution

- Each residential living unit found in a single-family dwelling, multi-family, dwelling, apartment complex, condominium complex, etc. will be charged a sewer base rate. In other words, a 12-plex would now be billed for 12 sewer base rates and not 1 sewer base rate.
- Commercial and industrial units will be charged a sewer base rate based using their water meter size and the industry standard American Water Works Association (AWWA) equivalent meter information.
- Mixed-use developments will be charged accordingly by combining these two methods and on a case-by-case basis.

## Benefit

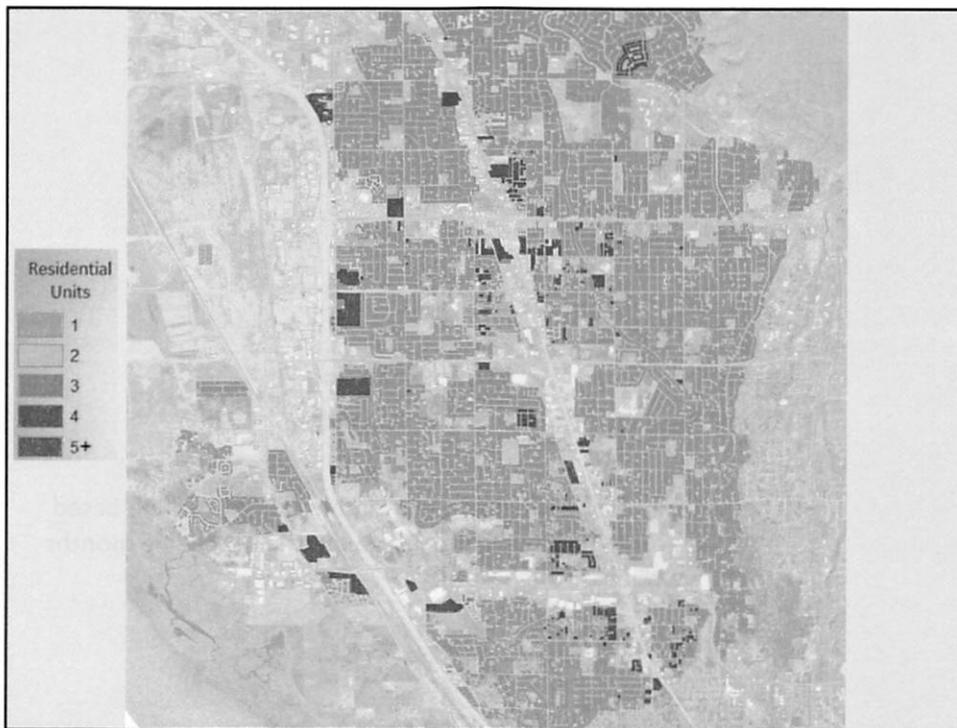
As the City begins the process of developing a capital improvement program for the City's sewer system and the required funding for that program, this change will help develop additional funding. This was conservatively estimated to be \$500,000 annually but this has since been *calculated to be* \$1,100,000. This will help offset needed rate increases and address the issue of fairness.

## Implementation Plan - updated

- December 2014 – Presented concept to City Council.
- February 2015 – Hired a GIS graduate to identify all non-residential and residential units within the City.
- August 2015 – Completed study.
- September 2015 – Presented study findings to PWAC.
- October 2015 – Present study findings to City Council.
- November 10, 2015 – Formally adopt new billing policy.
- January 1, 2016 – Implement new billing policy.

## Study Results

- 21,847 Utility Billing Database entries checked in office and in field.
- 20,141 Residential
- 1,706 Non-Residential
- 27,472 Total Residential Units, which means that 7,331 Residential Units are not billed for a sewer base rate.



## Study Results

- Projected residential annual increase: **\$800,000**
- Projected non-residential annual increase: **\$300,000**
- Projected total annual increase: **\$1,100,000**
- The base rate is established to distribute costs associated with maintaining the infrastructure necessary for potential flows. The production rate or commodity charge is established to normalize actual usage.

## Existing Fees and Charges

### Sewer Rates

Monthly, All Uses:

Base Rate <sup>1</sup>	\$9.32/connection
Volume Charge	\$1.42 /1,000 gallons

<sup>1</sup>Effective July 1 of each year, the monthly charge shall be based on the average winter water usage for the preceding months of November through April.

## Proposed Fees and Charges

### Monthly Sewer Rates

Residential Base Rate <sup>1</sup>	\$9.32/Living Unit
Non-Residential Base Rate <sup>2</sup>	\$9.32 × AWWA Multiplier
Mixed-Use Base Rate <sup>3</sup>	\$9.32/Living Unit + Non-Residential Component
Volume Charge <sup>4</sup>	\$1.42/1,000 Gallons

<sup>1</sup> Each residential utility account will be assessed a sewer base rate according to the number of living units associated with the account. For example, a single-family dwelling will be billed for 1 sewer base rate, a duplex (including single-family dwellings with an accessory apartment) will be billed for 2 sewer base rates, a 4-plex will be billed for 4 sewer base rates, a 12-plex will be billed for 12 sewer base rates, etc.

<sup>2</sup> All non-residential utility account holders will be billed using a water meter size multiplier in accordance with American Water Works Association (AWWA) guidelines as shown in the following table.

Meter Size	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"
AWWA Multiplier	1.00	1.67	3.33	5.33	10.00	20.00	41.67	53.33	96.67

<sup>3</sup> Mixed-use utility accounts will be assessed using a combination of the residential and non-residential base rates.

<sup>4</sup> Effective July 1 of each year, the monthly charge shall be based on the average winter water usage for the preceding winter months.

## How will this affect future Sewer Master Plan rates?

Staff recommends to eliminate the \$0.21/1,000 gallon increase in Year 1. This would result in a \$1.68/month reduction of the monthly bill for an average home in Orem.

## Utility Bill Sample Language

### “Attention Utility Account Holders

On January 1, 2016, the City of Orem will assess all residential utility accounts a sewer base rate according to the number of living units associated with the account. For example, a duplex will be billed for 2 sewer base rates, a 4-plex will be billed for 4 sewer base rates, a 12-plex will be billed for 12 sewer base rates, etc. Single family dwellings will continue to be billed one (1) sewer base rate. All non-residential utility account holders will be billed using a water meter size multiplier in accordance with American Water Works Association (AWWA) guidelines. Please visit [www.orem.org](http://www.orem.org) for more specific information, examples, and frequently asked questions and answers.”

## Frequently Asked Questions

**Q: What is the proposed sewer base rate policy change beginning January 1, 2016?**

A: Presently, utility account holders pay one sewer base rate regardless of the number of actual living units connected to the public sewer system. In effect, an account holder of a single-family dwelling may be paying the same amount as an account holder of multiple living units. Beginning January 1, 2016, all residential utility account holders will be charged a sewer base for each living unit.

**Q: How will this affect me if I own a single-family dwelling?**

A: An account holder for a single-family dwelling will not be affected by this policy change. The current sewer base rate of \$9.32 will continue to be charged to your account each month. In the event the sewer base rate changes, you will be billed for that rate.

**Q: Why is this change needed?**

A: The simple answer is fairness to all users. Paying for the privilege of or ability to discharge to the public sewer system should be charged among all account holders in a fair and equitable manner. This is a necessary step towards that end.

## Frequently Asked Questions

**Q: How is sewer charged each month?**

A: There are two sewer charges each month: a Sewer Base Rate and a Sewer Production Rate.

**Q: What is the Sewer Base Rate?**

A: The sewer base rate is the monthly charge for the availability of being connected to a public sewer system. The amount is fixed each month, whether the facilities are utilized or not. The privilege of having the ability to discharge to the public sewer system is the basis for a fixed monthly base rate. Revenues collected from the fee are generally used to maintain and replace the sewer collection system. Presently, the sewer base rate is \$9.32 per month.

**Q: What is the Sewer Production Rate?**

A: Sometimes referred to as the commodity charge, the sewer production rate is associated with conveying and treating discharges to the public sewer system. Each winter, the sewer production for each account holder is measured by using the winter water consumption associated with that account. The amount charged depends on the volume of discharge. Therefore, those who produce more will pay more. Revenues collected from this fee are generally used to operate, maintain, and replace the Orem Water Reclamation Facility. Presently, the rate is \$1.42/1,000 gallons.

## Frequently Asked Questions

**Q: How will this affect me if I own a 4-plex?**

A: An account holder for a 4-plex will be billed 4 times the base rate. The current sewer base rate of \$9.32 per living unit will result in a \$37.28 monthly charge. In the event the sewer base rate changes, you will be billed for 4 times that rate.

**Q: How will my mixed-use sewer base rate charge be affected by this?**

A: Accounts that are associated with mixed uses of residential and non-residential will be evaluated on a case-by-case basis. However, each residential living unit will be assessed one sewer base rate and the non-residential portion of the mixed-use development will be assessed according to the minimum required meter size for that development.

**Q: How will this affect me if I own a 12-plex?**

A: An account holder for a 12-plex will be billed 12 times the base rate. The current sewer base rate of \$9.32 per living unit will result in a \$111.84 monthly charge. In the event the sewer base rate changes, you will be billed for 12 times that rate.

## Frequently Asked Questions

**Q: How will this affect me if I have an account with 100 units?**

A: An account holder with 100 units will be billed 100 times the base rate. The current sewer base rate of \$9.32 per living unit will result in a \$932.00 monthly charge. In the event the sewer base rate changes, you will be billed for 100 times that rate.

**Q: How will my business sewer base rate charge be affected by this?**

A: Because non-residential account holders do not have living units, your business will be charged according to American Water Works Association (AWWA) guidelines. Accordingly, a multiplier associated with your meter size will be applied to the sewer base rate according to this schedule.

Meter Size	1/2"	1"	1 1/2"	2"	3"	4"	6"	8"	10"
AWWA Multiplier	1.00	1.67	3.33	5.33	10.00	20.00	41.67	53.33	96.67

## Frequently Asked Questions

**Q: How do other cities apply sewer base rates?**

A: Every city is different but Orem surveyed American Fork, Lindon, Ogden, Pleasant Grove, and Provo. Only Provo currently bills similar to Orem but is very interested in changing their billing structure to what Orem is proposing. (In FY 2016, Provo increased to its rate from \$5.88 to \$7.31).

**Budget Highlight from Provo City FY2016 Wastewater Fund**

- FY 2016 included a utility rate increase of 24.4% or an average of \$5.78 per month for a residential customer.

## Frequently Asked Questions

City	Sewer Base Rate	Assessment Method	Examples		
			Single Family Home	Multi-family Residential 4-plex	Business
Orem (Currently)	\$9.32	Per Account	\$9.32	\$9.32	\$9.32
Orem (Proposed)	\$9.32 (Pending Capital Facility Plan and Financial Plan)	Per Dwelling Unit or Non-residential meter size	\$9.32	\$37.28 (4 x \$9.32)	\$31.03 ( $\$9.32 \times \text{AWWA multiplier } 3.33$ for 1-1/2" water meter)
American Fork	\$35.55	Per "unit"	\$35.55	\$142.20 (4 x \$35.55)	\$35.55 each business.
Lindon	\$16.97	Per "unit" for residential AND non-residential	\$16.97	\$67.88 (4 x \$16.97)	\$16.97 each business.
Ogden	\$28.58	Meter Size (both residential and non-residential)	\$28.58	\$47.30 1" meter	\$66.02
Pleasant Grove	\$24.14	Per "unit" for residential AND non-residential	\$24.14	\$96.56 (4 x \$24.14)	\$24.14 each business.
Provo	\$7.31	Per Account	\$7.31	\$7.31	\$7.31

Questions?

# Frequently Asked Questions

## Q: How do other cities apply sewer base rates?

A: Every city is different but Orem surveyed American Fork, Lindon, Ogden, Pleasant Grove, and Provo. Only Provo currently bills similar to Orem but is very interested in changing their billing structure to what Orem is proposing. (Update: Provo increased to \$7.31 from \$5.88)

### Budget Highlight from Provo City FY21016 Wastewater Fund

- FY 2016 included a utility rate increase of 24.4% or an average of \$5.78 per month for a residential customer.

City	Sewer Base Rate	Assessment Method	Examples		
			Single Family Home	Multi-family Residential <b>4-plex</b>	Business
Orem	\$9.32	Per Account	A single family home pays <b>\$9.32</b> per month for a sewer base rate.	A 4-plex that has one account pays <b>\$9.32</b> per month for sewer base rate.	A business or business complex with a 1-1/2" meter pays <b>\$9.32</b> per month for a sewer base rate <b>TOTAL</b> , regardless of number of businesses or meter size.
Orem (Proposed)	\$9.12	Per Dwelling Unit or Non-Residential Meter Size	A single family home pays <b>\$9.32</b> per month for a sewer base rate.	A 4-plex that has one account pays <b>\$37.28</b> (4 x \$9.32) per month for sewer base rate.	A business or business complex with a 1-1/2" meter pays <b>\$31.08</b> (\$9.32 x Alaska multiplier 3.33) per month for a sewer base rate.
American Fork	\$35.55	Per "unit"	A single family home pays <b>\$35.55</b> per month for a sewer base rate.	A 4-plex that has one account pays <b>\$142.20</b> (4 x \$35.55) per month for sewer base rate.	A business or business complex with a 1-1/2" meter pays <b>\$35.55</b> per month for a sewer base rate for <b>each business</b> .
Lindon	\$16.97	Per "unit" for residential AND non-residential	A single family home pays <b>\$16.97</b> per month for a sewer base rate.	A 4-plex that has one account pays <b>\$67.88</b> (4 x \$16.97) per month for sewer base rate.	A business or business complex with a 1-1/2" meter pays <b>\$16.97</b> per month for a sewer base rate for <b>each business</b> .
Ogden	\$28.58	METER SIZE (both residential and non-residential)	A single family home pays <b>\$28.58</b> per month for a sewer base rate.	A 4-plex that has one account with a <b>1" meter</b> pays <b>\$47.30</b> (according to fee schedule) per month for sewer base rate.	A business or business complex with a 1-1/2" meter pays <b>\$46.02</b> (according to fee schedule) per month for a sewer base rate.
Pleasant Grove	\$24.14	Per "unit" for residential AND non-residential	A single family home pays <b>\$24.14</b> per month for a sewer base rate.	A 4-plex that has one account pays <b>\$96.56</b> (4 x \$24.14) per month for sewer base rate.	A business or business complex with a 1-1/2" meter pays <b>\$24.14</b> per month for a sewer base rate for <b>each business</b> .
Provo	\$5.88	Per Account	A single family home pays <b>\$5.88</b> per month for a sewer base rate.	A 4-plex that has one account pays <b>\$5.88</b> per month for sewer base rate.	A business or business complex with a 1-1/2" meter pays <b>\$5.88</b> per month for a sewer base rate <b>TOTAL</b> , regardless of number of businesses or meter size.







