



STAFF REPORT

DATE: November 28, 2023
TO: Stormwater/Wastewater Project Advisory Committee (PAC)
FROM: Leland Koester, Wastewater Services Manager/Project Manager
SUBJECT: **Stormwater Utility Analysis, Meeting No. 2**

Report in Brief:

This staff report follows information presented to the PAC at your October 16, 2023, meeting. The report presents the methodology used to gather and analyze GIS data, projected stormwater utility revenue requirements, reviews the methodology used to calculate rates, and presents a recommended billing structure. A discussion of rate modifiers, e.g., credits and discounts, is scheduled for the Committee's February 2024 meeting.

Overview:

The City's stormwater system does not have sufficient and sustainable funding to maintain and replace our network of open channel and piped stormwater infrastructure or to protect waterways from pollution and erosion. There are long standing, substantial funding shortfalls for preventive maintenance, replacement of aging infrastructure, and increasingly restrictive unfunded regulatory mandates.

One of the community's goals is to *"...be responsible caretakers of our shared public assets and resources"*. Absent a reliable and sustainable funding source, this goal cannot be met. The limited funding available through Wastewater and Street funds places an inequitable burden on these rate payers and limits how these funds can meet the infrastructure needs they are targeted for.

The lack of equity and inadequate funding of stormwater system maintenance, improvements and regulatory demands has led communities to adopt stormwater utilities to equitably share the cost of stormwater programs. The concept has become well established nationally. Corvallis initiated the state's first stormwater utility in 1978, some 45 years ago. Since then, the utility approach for stormwater services has been increasingly accepted with more than 53 stormwater utilities statewide, ranging from Portland (641,000) to Sheridan (4,658).

Staff reviewed a summary of stormwater characteristics and examples of stormwater repair and replacement projects with the Committee at the October 16, 2023, meeting. Facilities that have failed and that are near failure cannot be repaired or replaced due to insufficient funding. Staff presented the City's current approach of providing nominal funding from Wastewater and Street Funds and the drawbacks of using these funds for services they are not intended to provide. Current and near-term regulatory requirements were discussed as well as the lack of resources to meet these unfunded mandates.

At the conclusion of the October PAC meeting, staff identified topics for the December meeting. These included a review of the methodology used to determine impervious areas for residential and non-residential properties, projection of revenue requirements to operate, maintain and improve the stormwater system and rate structure options. These agenda items will be presented at the December 5, 2023, meeting and are summarized in this report.

Methodology to determine impervious areas:

Raftelis, our GIS consultant for the stormwater utility analysis, developed representative impervious areas for single family residential properties, average impervious areas for single family attached properties and actual impervious area measurements for multifamily, commercial, industrial, and institutional properties. Data for these measurements was compiled using 2022 aerial imagery and 2023 Yamhill County parcel data. The methodology used for each customer class is described below.

Single Family Residential

There are over 10,000 single family residential (SFR) parcels in McMinnville. Raftelis suggested, and staff concurred, it would be more cost effective, and still result in statistically accurate data, to use a random sample of SFR parcels than measure impervious areas for each parcel. Raftelis used a random sample of 400 SFR properties to determine their average and median impervious areas. Statistically, this sample size provides data with 95 percent confidence that the median impervious areas from the sample are representative of all single-family parcels.

The median impervious area for a single-family residential parcel is 3,512 square feet. For simplicity and ease of use, 3,500 square feet has been used for development of rate options. The impervious area for a single-family parcel is used as the base unit for utility billing purposes and is typically referred to as one equivalent residential unit or ERU. **Figure 1** below shows the impervious area measurements for the 400 parcels measured.

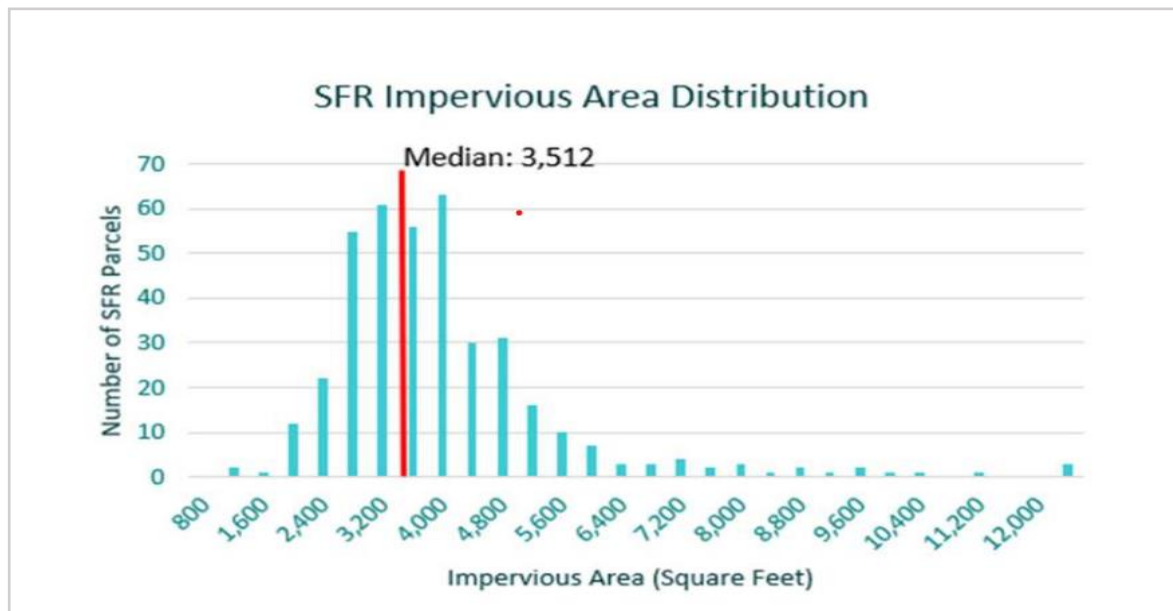


Figure 1, Impervious areas for sampled single family residential properties.

McMinnville’s average residential impervious area is approximately ten-percent larger than impervious areas used by Oregon stormwater utilities surveyed for this analysis. **Figure 2** below contrasts McMinnville’s median residential impervious areas with these utilities.

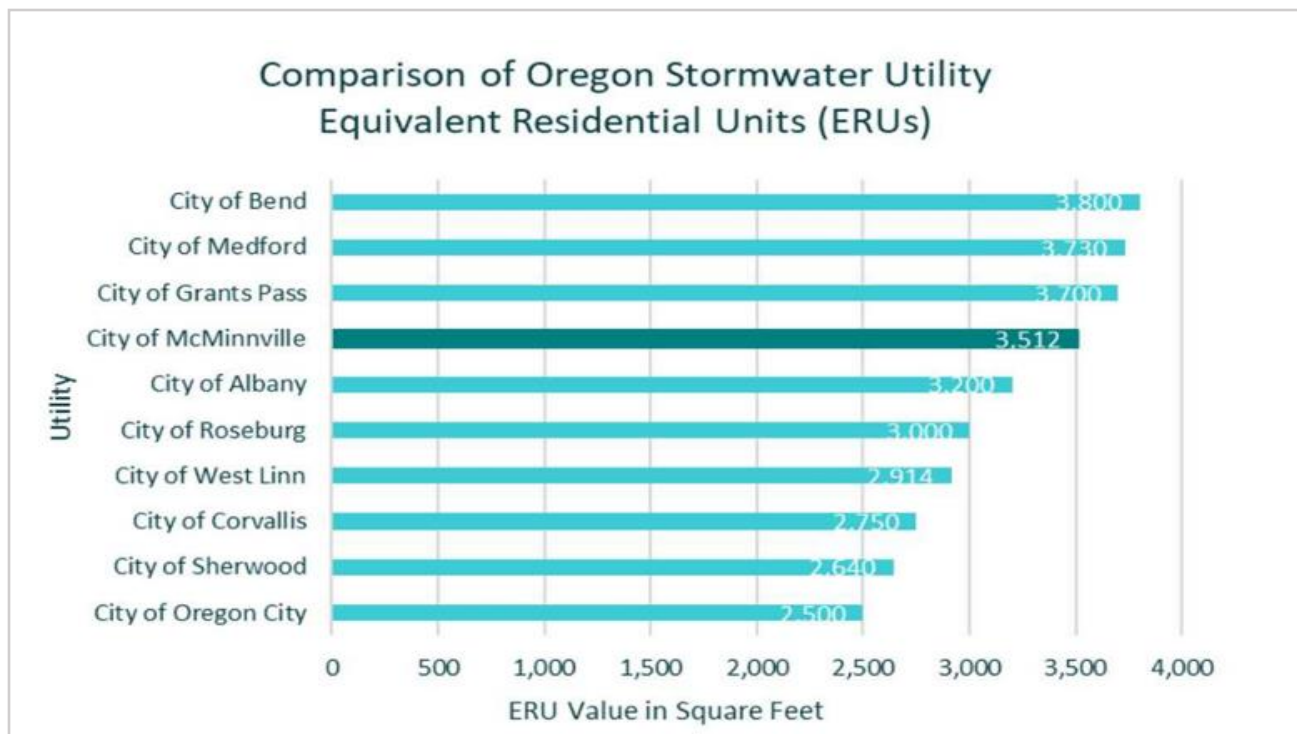


Figure 2, Comparison of McMinnville’s ERU areas with other Oregon stormwater utilities

ERUs are used as a measure of how non-residential customer classes will share in costs for operations, maintenance, repair, and replacement of the community’s stormwater system.

Single Family Attached

Single family attached (SFA) parcels are unique in that they are more densely developed than single family residential properties and share impervious areas for private streets and shared driveways. There are eleven single family attached (share a common wall) developments in McMinnville.



Figure 3 shows an example of one of these developments.

Figure 3, Example SFA development

Measurements of impervious areas for these developments found each parcel and its proportionate share of privately held impervious areas is approximately 2,450 square feet or 0.7 ERUs.

Multifamily, Commercial, Industrial, and Institutional

Impervious areas for all non-residential parcels vary significantly and have been individually measured. These areas, expressed as ERUs, range from .3 to 860 ERU's. **Figure 4** below shows the impervious area measured for a non-residential property.



Figure 4, Example non-residential impervious area measurement

Summary of GIS data

The total number of ERUs are summarized by customer class in **Table 1** below. A follow-on step in development of rates will involve credits, exemptions, and offsets for detention, private drainage systems, small parcels with nominal impervious areas and credit policies that will reduce the total number of ERUs. Galardi Rothstein Group have recommended a five percent reduction in ERUs to account for these credits. The ERUs used for preliminary rate developments have been reduced by five percent to estimate the total billable number of ERUs. If credits exceed this five percent allowance, rates shown in this report will be increased given the smaller amount of billable ERUs.

Table 1, Summary of ERUs

Customer Classification	ERUs	Basis
Single family residential	9,985	Median of random sample
Single family attached	188	Average in classification
Non-residential	17,886	Measured impervious area
TOTAL ERUs	28,059	
BILLABLE ERUs (95% of total)	26,656	

Projected Revenue Requirements

Projected revenue requirements to meet immediate needs for programed operation, maintenance of the stormwater system, engineering services, capital improvements and administrative costs that support utility funds are shown in **Table 2** below.

Table 2, Projected Revenue Requirements, Stormwater Utility

Operating costs	Current	Fully Funded Cost	Fully Funded FTE
Stormwater collections			
Estimated current stormwater collection system maintenance	\$ 62,315	\$ -	No FTE, 10 % of conveyance personel budget
2 new FTEs (\$127K/FTE including benefits)	\$ -	\$ 254,000	2.0
+ Cleaning/hydro excavation truck	\$ -	\$ 60,000	No FTE, equipment
Supervision (\$173K including benefits)	\$ -	\$ 173,000	1.0
+ Utility truck	\$ -	\$ 8,000	No FTE, equipment
+ Allowance for annual equipment maintenance	\$ -	\$ 20,000	No FTE, equipment
Sub-total, Stormwater Collections	\$ 62,315	\$ 515,000	3.0
PW-Operations			
Leaf program (\$70K/FTE +OEB@ 50%)	\$ 50,000	\$ 75,000	0.7
Reactive repairs and maintenance costs	\$ 5,000	\$ 50,000	No FTE, contractual
Roadside swale maintenance	\$ 70,000	\$ 120,000	1.1
Detention pond maintenance	\$ 5,000	\$ 30,000	0.3
Storm/High Water Response	\$ 10,000	\$ 20,000	0.2
Annual street cleaning contractual service	\$ 300,000	\$ 400,000	No FTE, contractual
Sub-total, Operations	\$ 440,000	\$ 695,000	2.3
Engineering			
Current personal services, 0.5 FTE (\$90K/FTE +OEB @ 50% OEB)	\$ 68,000	\$ 70,000	0.5
+1.5 FTE (\$90K/FTE +OEB @ 50%)	\$ -	\$ 200,000	1.5
Repayment to Sewer Fund for seed money	\$ -	\$ 50,000	No FTE, loan repayment
+ PSA (25% of Capital)	\$ 50,000	\$ 375,000	No FTE, contractual
Sub-total, Engineering	\$ 118,000	\$ 695,000	2.0
Administrative			
MWL billing cost		\$ 150,000	No FTE, contracted
Internal transer for support services (to General Fund, based on 7.3 FTE)		\$ 170,000	No FTE, interfund transfer
Franchise fee @ 6% (based on annual revenue)		\$ 240,000	No FTE, interfund transfer
Sub-total, Administrative	\$ -	\$ 560,000	-
Total Operating	\$ 620,315	\$ 2,465,000	7.3
Capital costs			
Estimated capital	\$ -	\$ 1,500,000	
Total Capital	\$ -	\$ 1,500,000	
TOTAL ESTIMATED ANNUAL EXPENSES	\$ 620,315	\$ 3,965,000	
ROUNDED, TOTAL ESTIMATED ANNUAL EXPENSES	\$ 600,000	\$ 4,000,000	

Abbreviations:

- FTW = Full Time Employee
- OEB = Other Employee Benefits
- PSA = Professional Services Agreement
- MWL = McMinnville Water and Light

Stormwater User Fee Rate Options

Two billing or rate structure alternatives are presented below. Option 1 charges customers solely based on impervious area or ERUs. Approximately 80-percent of stormwater utilities nationwide and in Oregon have adopted this approach. Rates for Option 1 are calculated as follows:

Option 1

Monthly cost/ERU = (Annual revenue requirement/12)/Total ERUs,

$$\text{Monthly cost/ERU} = (\$4,000,000/12)/26,656 \text{ ERUs} = \$12.51, \text{ Round to } \$12.50$$

Another rate structure adopted by approximately 20-percent of stormwater utilities uses a combination of a base rate and an impervious area charge. The base rate is calculated using administrative costs to each billed parcel and an impervious area charge for each ERU.

Option 2

Monthly cost/ERU = (Annual base charge/12)/Billable parcels) + (Annual variable cost)/12)/ Total ERUs

The base charge reflects costs that meet overall revenue requirements that are largely independent of the amount of runoff or demand from impervious areas. For Option 2 we have used billing costs with a prorated franchise fee as the revenue requirement for the base charge. These costs are shown below in **Table 3**.

Table 3, Billing and pro-rated franchise costs used for calculating Option 2 base fee

Billing/Prorated franchise fee

	MWL billing cost	\$	150,000
	Franchise fee @ 6% (based on annual revenue)	\$	10,000
	Sub-total	\$	160,000

There are an estimated 11,486 sewer billable parcels that would share equally in the utility's administrative costs. The base charge would be calculated as follows:

Base fee = (Annual administrative cost/12)/Total billable parcels, or

$$\text{Base fee} = (\$160,000/12)/11,486 = \$1.16, \text{ round to } \$1.20$$

The variable portion of the monthly charge for billing Option 2 is calculated by dividing the remaining annual revenue requirement by the total number of ERUs, as follows:

Remaining annual revenue requirement

Total annual revenue requirement =	\$4,000,000
<u>Less billing/prorated franchise fee -</u>	<u>\$ 160,000</u>
ERU share of annual revenue requirement	\$3,840,000

ERU fee = ((ERU share of annual revenue requirement)/12)/Total ERUs, or

$$\text{ERU fee} = (\$3,840,000/12)/26,656 = \$12.01, \text{ round to } \$12.00$$

Option 2 monthly user fee = base charge + variable charge, or

Option 2 monthly user fee per SFR = \$1.20 + \$12.00 = \$13.20

A comparison of Option 1 and Option 2 monthly user fees for example customers in each billing class is shown in **Table 4** below.

Table 4 – Example monthly user fees by customer class

Customer class	Impervious area (SF)	EDUs	Option 1, EDU only (monthly fee)	Option 2, Base charge + EDU (monthly fee)
Single Family Residential	3,500	1.0	\$12.50	\$13.20
Single Family Attached	2,450	0.7	\$8.75	\$9.60
Multifamily (Apartment Complex)	94,500	27.0	\$337.50	\$325.20
Commercial (small)	28,000	8.0	\$100.00	\$97.20
Commercial (large)	395,500	113.0	\$1,412.50	\$1,357.20
Industrial (small)	45,000	12.9	\$161.25	\$156.00
Industrial (large)	961,812	274.8	\$3,435.00	\$3,298.80
Institutional	255,500	73.0	\$912.50	\$877.20

Billing Option 2 allocates a greater share of costs to residential properties because the base fee is determined by billable parcels rather than ERUs.

Rate Comparison:

Our staff report for your October 16, 2023, meeting included a comparison of 15 residential stormwater utility fees for Oregon communities. Galardi Consulting updated this comparison to current rates. The comparison is shown below as **Figure 5**.

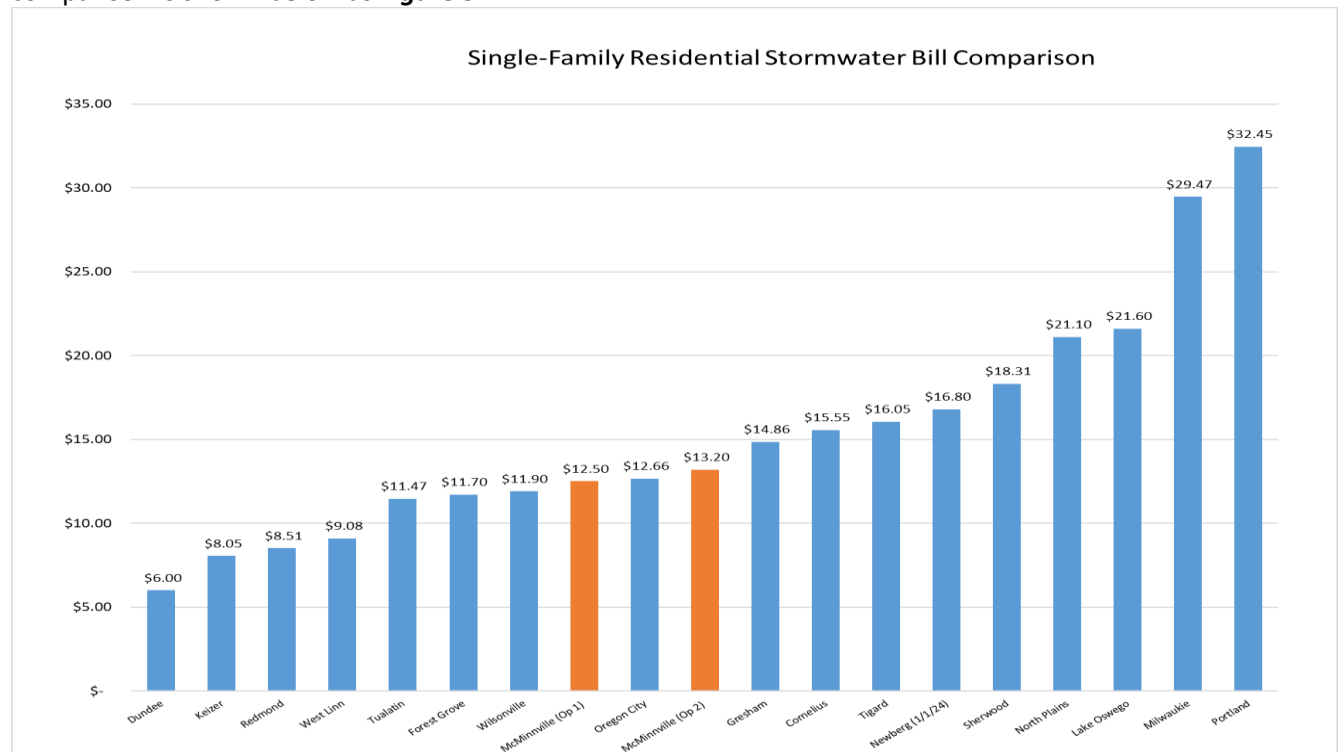


Figure 5, Comparison of Oregon Stormwater Utility Rates (all but Redmond use Billing Option 1)

Recommendation:

Either of the two billing options provide an equitable allocation of stormwater management costs. The choice between the two billing approaches is a policy recommendation for the Committee, and ultimately a City Council policy decision.

Option 1 is consistent with the approach taken by most local and national communities. It is attractive from the standpoint of simplicity.

Option 2 allocates some of the administrative costs on a per parcel basis. Because there are fewer billable parcels (11,486) than ERUs (26,656), the net result of Option 2 is to shift a greater share of administrative costs to residential properties and provides some relief for nonresidential properties.

Staff recommends billing Option 1 for its consistency with the approach taken by most stormwater utilities and slightly greater ease in billing and accounting.

Next Steps:

The next step in consideration of a stormwater utility is to identify rate modifiers. Specifically, this refers to credits that may be allowed for private improvements such as detention basins that reduce peak flows, discounts for areas served entirely by private drainage systems and discounts for nominal impervious areas. Staff will be developing options for rate modifiers for discussion and recommendations at the February 2024 PAC meeting.

Attachments

- 1 Galardi Rothstein Group, Stormwater Utility Analysis (*provided previously*)
- 2 Raftelis SFR memo (*provided previously*)
- 3 Raftelis NSFR memo



Attachment No. 1

PREPARED FOR: Anne Pagano, Public Works Director
PREPARED BY: Deb Galardi, Galardi Rothstein Group
SUBJECT: Stormwater Utility Study
DATE: July 13, 2023

Introduction

The City of McMinnville (City) is considering implementation of a stormwater utility and dedicated user fee to fund stormwater management. Galardi Rothstein Group was engaged by the City to assist in the development of a stormwater system funding plan and evaluation of rate structures and other program elements.

Stormwater utilities have been implemented by dozens of cities in Oregon to provide equitable and dedicated funding to meet regulatory requirements, and system operation, maintenance, and replacement needs. The chart attached illustrates a range of stormwater monthly rates charged in Oregon (based on 2021 data).

This memorandum summarizes key elements to be addressed as part of the stormwater utility development.

Stormwater Utility Development

Annual Revenue Requirements

As with the wastewater utility, annual stormwater funding requirements include capital and operation and maintenance costs, as well as policy-based set-asides for contingencies and reserves. Specific cost elements to be considered for stormwater include:

- Inspection and maintenance activities
- Regulatory compliance activities
- Public education
- Technical services

- Customer service
- Administration
- Capital improvements.

In estimating annual revenue needs, the project team is considering costs of existing activities (e.g., street sweeping, limited cleaning and inspection of stormwater lines and other assets) that are currently funded from wastewater rates or street funds, as well as additional costs needed to meet regulatory, environmental, safety, and system reliability needs. Different funding “packages” will be identified for the City Council’s consideration to allow balancing of desired levels of service against customer rate impacts.

Stormwater Rate Structure

Site impervious area is the most common basis for recovering stormwater utility costs from customers, as it provides an indirect measure of stormwater discharge that has implications for stormwater management. Stormwater utility rate structures may also include per-account or dwelling unit charges for recovering costs that relate to customer services, billing, and in some cases, water quality and quantity costs associated with impervious area in the public right-of-way.

The determination of the portion of annual costs to be recovered from impervious area or other account or unit charges has direct implications on the distribution of costs to customer types (e.g., residential vs. commercial) and different sizes of customers. The project team is currently developing customer impervious area measurements for purposes of developing stormwater rate structure options. Once that process is complete, specific rate options will be developed and presented to the City Council for consideration.

Rate Modifiers

It is common practice for stormwater utilities to include credit or discount programs for private activities or investments that reduce a customer’s impact on the stormwater system. Credit programs may include incentives for runoff volume or flow control, or water quality. Development of the credit program must balance customer incentives against the additional administrative costs associated with program implementation and monitoring.

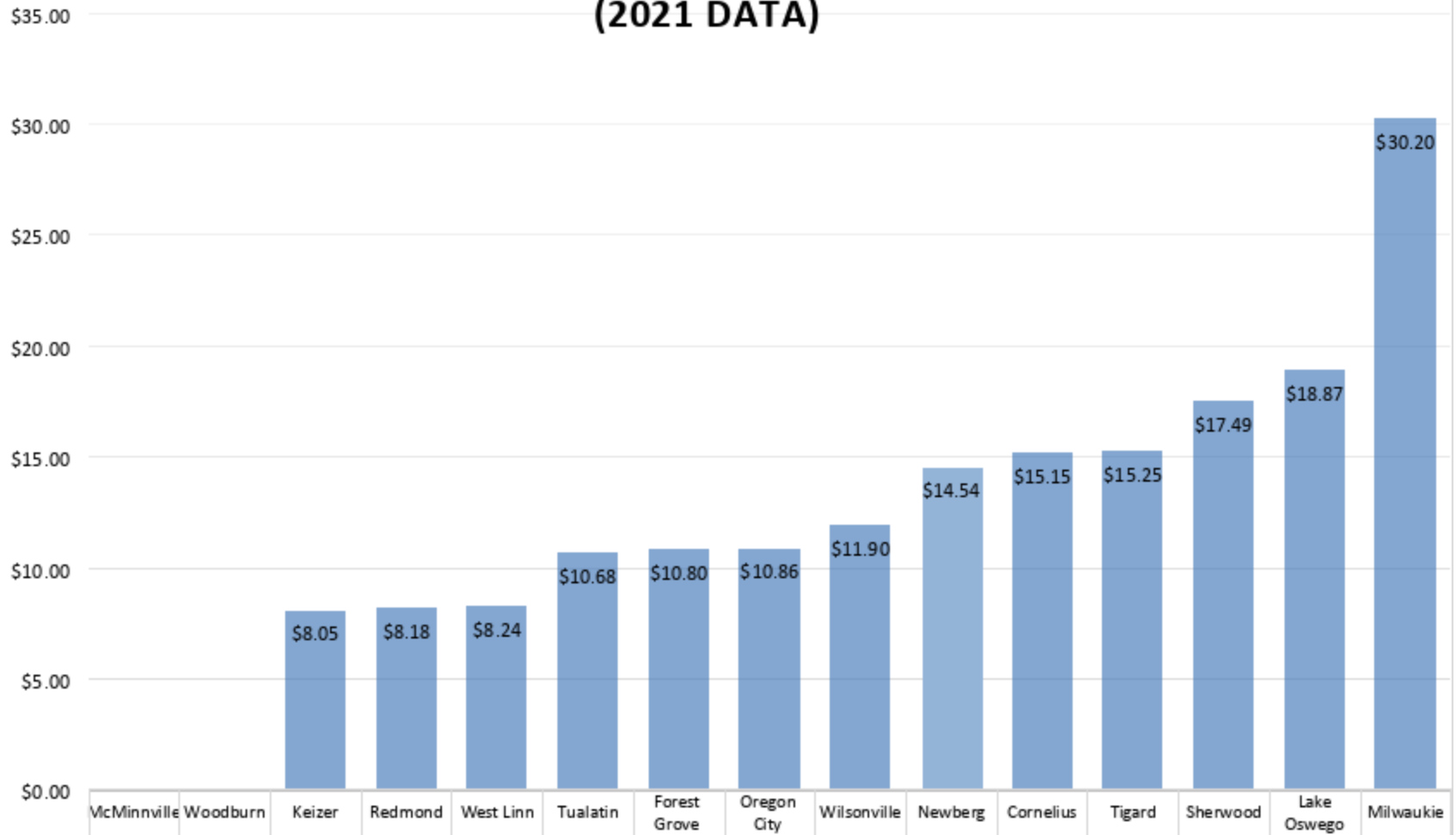
Like the City’s other rates, the stormwater rate structure may include policy-based discounts for customers experiencing financial hardships or other circumstances, and stormwater-specific exemptions (e.g., undeveloped parcels). Credit program options and other rate policies will be considered in the context of the rate structure and funding plan development.

Implementation Plan

Concurrent with development of the funding plan and rate structure will be the development of the implementation plan which will require coordination across multiple City departments and with McMinnville Water and Light to develop the legal, financial, and customer billing

framework to implement the utility and the associated charges. More details on implementation steps will be provided to the City Council at future meetings.

SAMPLE RESIDENTIAL STORMWATER MONTHLY BILLS (2021 DATA)



City of McMinnville, Oregon Stormwater ERU Analysis June 8, 2023

The following analysis and results are presented by Raftelis to the City of McMinnville (City) in support of Task 1 of the Stormwater Utility Implementation Data Development project. This task includes the determination of an Equivalent Residential Unit (ERU) for the City, which is a billing unit often used by stormwater utilities with impervious area-based rate structures. An ERU reflects the typical amount of impervious area on a single family residential (SFR) parcel and allows for simplified billing of the largest customer group - single family properties. Impervious surface area is the most common rate structure among those communities with stormwater fees because it is a good measure of a ratepayer's demand on the stormwater system. The more impervious area on a property, the more stormwater the property generates and the greater the demand for the utility's stormwater management services. Raftelis' determination of the City's ERU is based upon the impervious area digitization analysis described below. The information provided in this memo describes Raftelis' methodology for completing this Task and the results of our analysis.

Data

Raftelis' analysis was based on 2022 aerial imagery and Yamhill County geographic tax parcels provided by the City in January and April 2023.

Methodology

A Raftelis GIS analyst began by generating a random sample of 400 parcels falling into one of the following Yamhill County Tax property class code (PCA) categories that represent the SFR class:

PCA Category	Parcel Count in Sample
101	322
109	11
111	18
121	2
191	2
207	31
401	6
409	3
451	1
551	3

PCA 101 also includes duplex and single-family attached (SFA) property types. Often, duplex properties have impervious area measurements and overall development patterns substantially similar to single family properties and are therefore good candidates for including in the SFR customer class. Therefore, Raftelis included them in this analysis. SFA properties were not

included in this sample and their impervious area will be measured and evaluated separately under Task 2 of our Scope of Services. The results of that analysis will be provided under separate cover. PCA 207 includes mobile home and manufactured home types, some of which have one dwelling per parcel and some of which have multiple dwellings per parcel. Only those with one dwelling per parcel were included in the population for this sample. Those with multiple dwellings per parcel are considered multi-family properties and their impervious area will be measured under Task 3 of our Scope of Services.

The sample size was selected to provide 95% confidence that the ERU value is within 5% of true value (margin of error) and is representative of the population of the City's SFR properties. We also performed a visual and tabular review of the resultant sample properties to verify that they encompassed a representative range of geography, structure age, and housing type. In some cases, an original randomly selected sample property was obscured by vegetation and could not be accurately measured. In these cases, the analyst removed the obscured parcel from the review and replaced it with an additional randomly selected parcel. The final sample list is attached as Appendix A, and a map of the final, measured sample parcels throughout the City is shown below in Figure 1. The final, measured sample of SFR property types are highlighted in red, while other parcels are in blue. Please note that some parcel identification numbers (PIN) are duplicated, as parcels within the PCA 207 group have identical PIN numbers if they are within the same development and are distinguished in the tax parcel data by lot codes. Lot codes for those parcels are also provided in Appendix A.

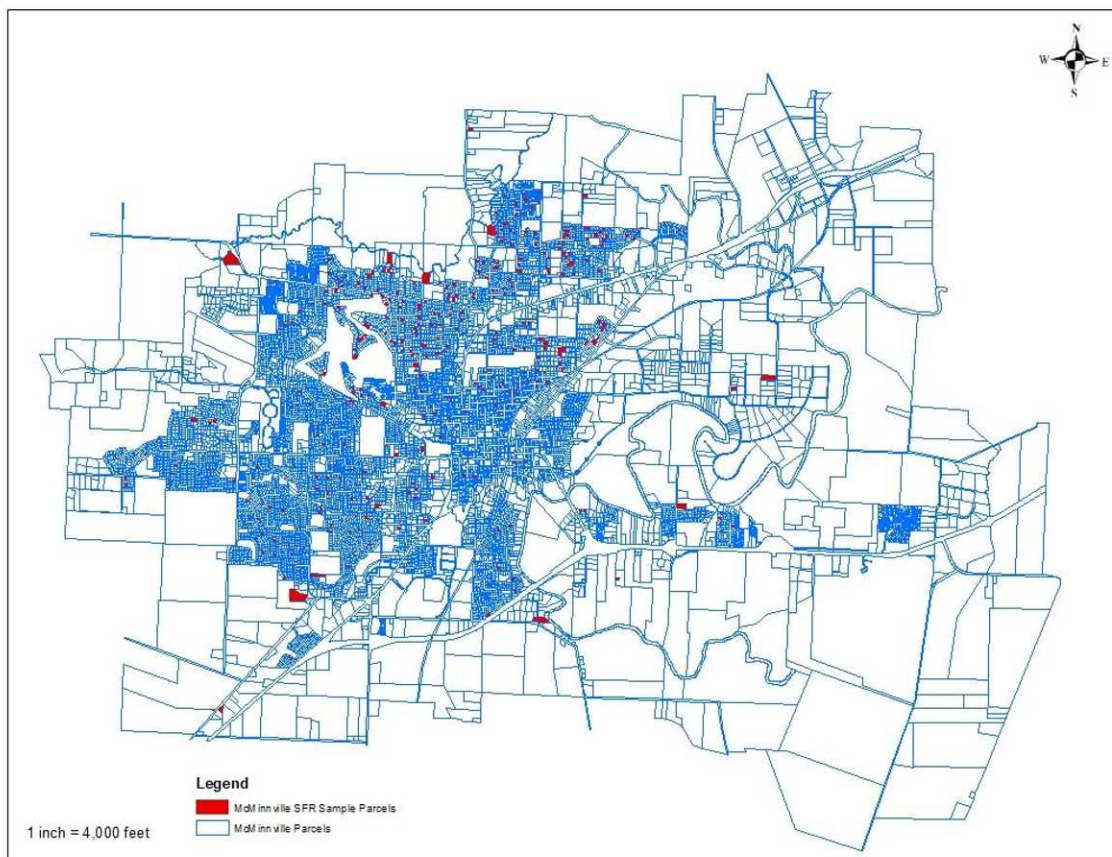


Figure 1. City of McMinnville Sample Distribution

Using ArcGIS, overlaying parcels on top of 2022 aerial imagery, the analyst created new spatial features to represent the impervious area on each property based on visual assessment of the property and met the definition of “impervious”. Impervious area was defined as “hard surfaces that don’t allow infiltration of stormwater into the ground.” Examples of impervious surface include rooftops, driveways, patios, private sidewalks, parking lots and compacted gravel. Swimming pool water, railroad ballast, open graded aggregate and landscaping gravel are not considered impervious surfaces. The impervious area polygons were created to match the footprint on the ground of these surfaces, rather than rooflines which may be obscured by the angle of the aerial photography.

Figure 2 provides a selection of digitized SFR property types. The sample property is outlined in bright green, the impervious area features created by Raftelis are translucent yellow. Per the impervious surface definition, swimming pools and landscaped areas are excluded, and outbuildings, if any, are included.



Figure 2. Example of SFR Properties' Impervious Area Digitization (photos not at the same scale)

ERU Results

Raftelis' 400 sampled parcels had a wide range of impervious area amounts, from a minimum of 658 square feet to a maximum of 15,970 square feet. Raftelis recommends using the median value of impervious area on SFR properties to calculate the ERU. Compared with the mean (average) impervious area, the median is more statistically robust, and less sensitive to outliers, the very small or very large impervious surface amounts in the sample, and therefore a more accurate representation of typical SFR impervious area within the City. Based on the median value, the ERU value for McMinnville is 3,512 square feet of impervious area. The distribution of sampled impervious area for the sample, with the median demarcated, is shown in Figure 3 below.

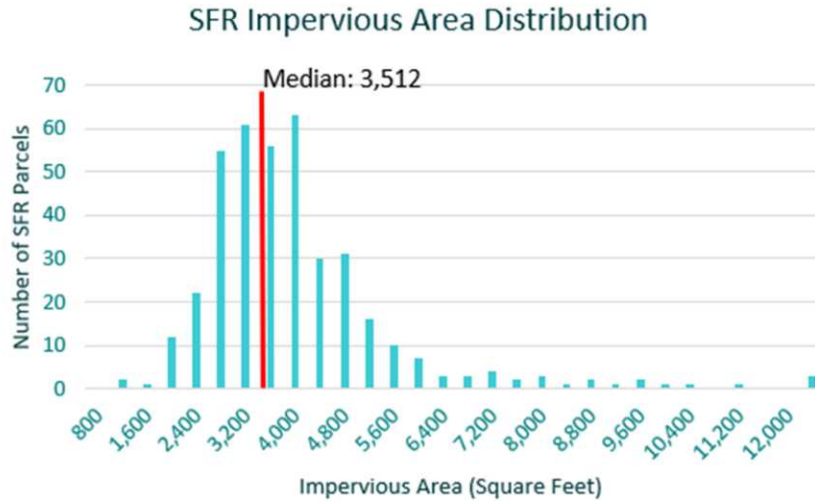


Figure 3. Impervious Area Distribution for SFR Properties in the McMinnville ERU Sample

Benchmarking

At the request of the City, Raftelis compared the McMinnville ERU to the ERU values for other similarly sized stormwater utilities in the State of Oregon. The 2021 populations of these cities range from approximately 20,000 to 60,000, except for the City of Medford (~86,000) and the City of Bend (~102,000). Those values in comparison to the City's ERU value are provided in Figure 4 below.

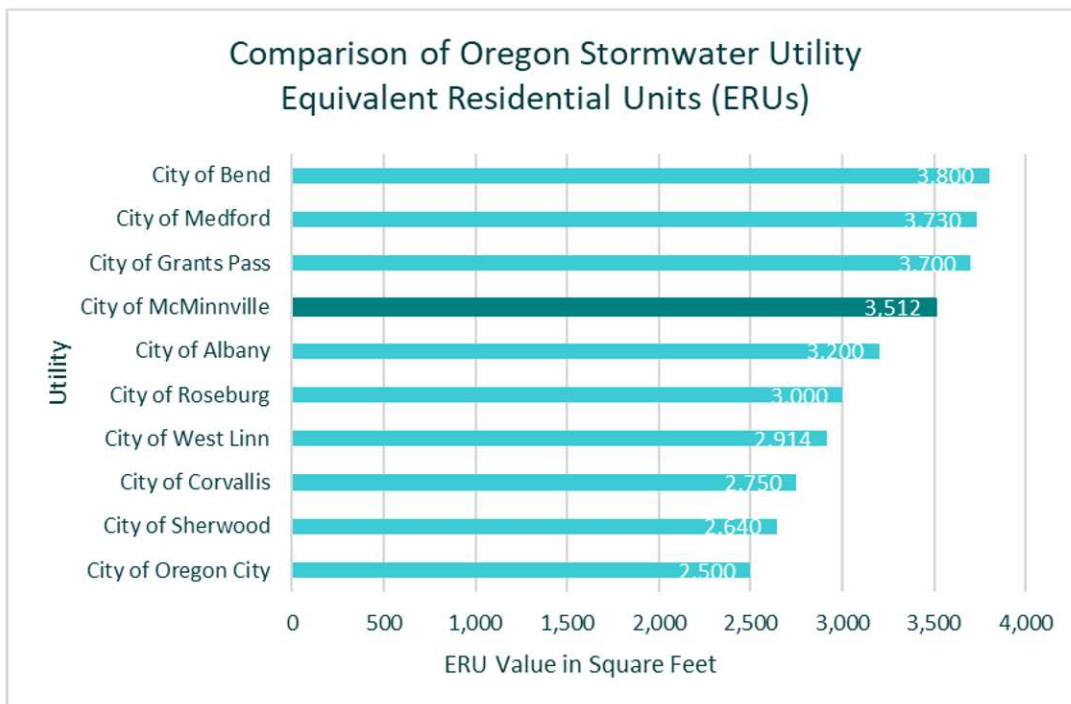


Figure 4. Comparison of ERU Values in Oregon Stormwater Utilities

Appendix A
Final SFR Sample Parcel ID Number and Lot Numbers

Parcel Identification Number	Lot Code
R4409 00700	
R4409 02000	Lot 92
R4409 02000	Lot 1
R4409 02000	Lot 39
R4409 02000	Lot 31
R4409 02000	Lot 85
R4409 02000	Lot 82
R4409 02000	Lot 77
R4409 02000	Lot 75
R4409 02000	Lot 26
R4409 02000	Lot 12
R4409 02004	
R4409CA04700	
R4409CA04800	
R4409CA05600	
R4409CA05700	
R4409CA10000	
R4409CA11500	
R4409CA12200	
R4409CA13000	
R4409CA14100	
R4409CA14800	
R4409CA15200	
R4409CA18300	
R4409CA19900	
R4409CA20500	
R4409CA21500	
R4409CB02500	
R4409CB04300	
R4409CD00204	
R4409CD00208	
R4409CD00212	
R4409CD00213	
R4409CD00713	
R4409CD00715	
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R4417BA02700	
R4417BA02900	
R4417BA03300	
R4417BA04500	
R4417BA05800	
R4417BA06800	
R4417BA08000	
R4417BA08100	
R4417BB02100	
R4417BB03600	
R4417BB03700	
R4417BB05100	
R4417BB05300	
R4417BB05500	
R4417BB06300	
R4417BB07001	
R4417BB08300	
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R4417BC02500	
R4417BC03000	
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R4417BD06300	
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R4417CC02000	
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R4417DA08700	
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R4418AA02800	

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R4420AA01300	
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R4420AA09501	
R4420AA12700	
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R4420AB06900	
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R4421CD07916	
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R4421DD00902	
R4421DD00904	
R4422 03500	
R4422DD01300	
R4422DD06700	
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R4424C 00200	Lot 228
R4424C 00200	Lot 14
R4427 01000	
R4428BA01900	
R4428BC00310	
R4428BC01110	
R4428BC02016	
R4428BD01500	
R4428BD01807	
R4428D 00200	
R4428D 00200	
R4429 02501	Lot 2
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R4429BA03901	
R4429BA08900	
R4429BA11100	
R4429BA14300	
R4429BB00500	
R4429BC04921	
R4429BC05000	
R4430 00102	Lot 56
R4430 00102	Lot 107
R4430 00102	Lot 44
R4430AA02921	
R4430AA03000	Lot 91
R4430AB00100	Lot 212
R4430AB00100	Lot 165
R4430AB00100	Lot 23
R4430AB00100	Lot 185

R4430AB00100	Lot 145
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R4430DC01800	
R4430DC02000	
R4430DD09200	
R4431 01400	
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R4524DA02100	
R4524DA02900	
R4524DB00100	
R4524DB01900	
R4524DB03800	
R4524DB04800	

City of McMinnville, Oregon
Stormwater Utility Implementation Data Development for
Single-Family Attached and Non-Single Family Residential Properties
September 5, 2023

The following analysis and results are presented by Raftelis to the City of McMinnville (City) in support of Tasks 2 and 3 of the Stormwater Utility Implementation Data Development project. Task 2 included measurement of impervious area for single-family attached (SFA) properties in the City and their associated common areas and evaluating options for billing those properties by the City's proposed stormwater utility. Task 3 included impervious area measurements of non-single family residential (NSFR) properties in the City. Raftelis then used the calculated impervious area data and the Equivalent Residential Unit (ERU) calculated in Task 1 (and documented in Stormwater ERU Analysis Memorandum dated June 8, 2023, provided under separate cover) to determine draft units of service for the stormwater utility with billing units provided for each parcel in the City. The information provided in this memo describes Raftelis' methodology for completing these Tasks and the results of our analysis.

Data

Raftelis' analysis was based on 2022 aerial imagery and Yamhill County geographic tax parcels provided by the City in January and April 2023, respectively.

Impervious Area Digitization Methodology

Raftelis identified parcels with Yamhill County Tax property class codes (PCA) that represent the SFA and NSFR classes. PCA 102 is the primary code for SFA properties, but some SFA properties were also identified in PCA 100 and 101 and PCA 003 represents some SFA common area parcels. (Note PCA 003 also includes some NSFR parcels that are not associated with SFA properties). Table 1 includes the number of SFA properties in each PCA code. A total of 282 SFA properties within 9 SFA communities were evaluated in Task 2.

Table 1. Number of SFA Parcels by PCA Code

PCA	Number of SFA Parcels
003	17
100	2
101	123
102	140

Parcels that were not classified as SFR (Task 1) or as SFA (Task 2) were classified as NSFR. They encompass a large number of PCA codes, with 35 parcels having no assigned PCA code. Table 2 includes the number of NSFR properties in each PCA code. A total of 1,613 NSFR properties were evaluated in Task 3.

Table 2. Number of NSFR Parcels by PCA Code

PCA	NSFR Parcel Count
No Assigned PCA	35
3	46
10	1
23	6
24	2
120	1
181	3
200	50
201	456
202	23
204	13
207	16
211	26
231	6
251	1
300	49
301	112
320	2
321	11
331	5
333	30
350	3
401	4
440	1
449	1
450	1
451	1
471	1
501	1
520	1
530	7
540	27
541	32
549	2
550	8
551	67
554	1
559	7
700	3
701	84
721	4
781	6
900	1
901	11
909	2
910	13
911	47
920	16
921	41
930	2
931	2
940	145
941	30
942	2
943	2
950	14
951	45
960	6
961	2
970	1
971	6
980	30
981	28
990	1
991	10

Using ArcGIS, overlaying parcels on top of 2022 aerial imagery, Raftelis created new spatial features to represent the impervious area on each property based on visual assessment of the property that met the definition of “impervious”. Impervious area was defined as “hard surfaces that don’t allow infiltration of stormwater into the ground.” Examples of impervious surface include rooftops, driveways, patios, private sidewalks, parking lots and compacted gravel. Swimming pool water, railroad ballast, open graded aggregate and landscaping gravel are not considered impervious surfaces. The impervious area polygons were created to match the footprint on the ground of these surfaces, rather than rooflines which may be obscured by the angle of the aerial photography.

Figure 1 provides an example of impervious area digitization on an SFA community with multiple residences and associated common area. Figure 2 provides an example of impervious area digitization on an NSFR property. Sample properties are outlined in bright green and the impervious area features created by Raftelis are translucent yellow.



Figure 1. Example of SFA community Impervious Area Digitization (figures not at the same scale)



Figure 2. Example of NSFR parcel Impervious Area Digitization (figures not at the same scale)

SFA Impervious Area Analysis

While SFA properties are like SFR properties, in that the dwelling units are on their own individual tax lots, SFA properties differ from SFR properties because they share a common area space that often has impervious area associated with private roadways, walkways, parking spaces, and recreational facilities. Therefore, to calculate the total impervious area associated with the SFA property, Raftelis measured impervious area associated with each SFA dwelling unit and the SFA development’s common area impervious area. The total impervious area, both dwelling units and common area combined, was divided by the number of dwelling units in the development to calculate the impervious area per dwelling unit. Raftelis then divided the impervious area per unit by the City’s ERU value (3,500 square feet) for a per unit ERU value (‘Unit ERUs’). As an example, for the SFA development with Parent Parcel ID R4416AB90003, Raftelis subtracted the total parcels (31) in the development by the number of common area parcels (1) in the development to equal the unit count (30). The total impervious area for the development was measured at 58,290.04 square feet, which was divided by 30 units for as impervious area per unit of 1,943 square feet. The IA per unit was divided by the ERU value of 3,500 to calculate the Unit ERUs of 0.6 for this community. Raftelis also computed the group’s average Unit ERUs, which is 0.7 ERUs. Table 3 below provides the impervious area measurements and ERU values for each community.

Table 3. SFA Impervious Area and ERU Values

Parent_Par	Total Parcel Count	Common Area Parcel Count	Unit Count	Impervious Area (sq. ft.)	IA per Unit	Unit ERUs
R4416AB90003	31	1	30	58,290.04	1,943.00	0.6
R4417CC90000	24	2	22	71,720.55	3,260.03	0.9
R4417CD90100	25	1	24	90,623.60	3,775.98	1.1
R4418DB12131	29	1	28	44,792.54	1,599.73	0.5
R4419AD00660	20	0	20	29,423.51	1,471.18	0.4
R4419DB03906	23	2	21	42,473.95	2,022.57	0.6
R4420BA00200	62	6	56	179,447.97	3,204.43	0.9
R4421CC90000	38	1	37	45,005.40	1,216.36	0.3
R4423 90000	30	3	27	91,911.06	3,404.11	1.0
					Average	0.7

SFA Options and Selected Option

The City considered options for the SFA properties’ rate structure that were both fair and would control administrative burden. Options included treating the communities as NSFR properties, developing a community specific per-unit flat charge, and developing a classwide per-unit charge. The first two options are almost identical, in effect, and present an increased administrative burden in comparison with a classwide per unit charge. Under the first two options, either the total ERUs or per ‘Unit ERUs’ would be billed that vary by community based upon their impervious area measurements. Under the third approach, all SFA properties would be charged the classwide per unit ERU value of 0.7.

Raftelis recommends that the City adopt the classwide SFA unit value of 0.7 ERUs and bills each SFA dwelling, for one unit charge. The SFA properties are fairly similar in impervious area characteristics and can be billed at a flat rate similarly to SFR properties (where the City is planning to bill them all 1 ERU). Common area parcels would not receive a stormwater bill, as under this methodology their impervious area has been allocated among their associated SFA units. It should be noted that the account and meter configurations for all of the SFA communities are not all known, but is believed that the number of units for each community is a billing operand in the McMinnville Water and Light billing system that City’s stormwater bills are likely to be

conveyed on, as it is used for wastewater charges. Thus, the per unit charge can be applied to the units associated with each account.

NSFR Impervious Area Analysis

The impervious area for each NSFR parcel was measured and divided by the ERU value (3,500 sq. ft) to calculate the total ERUs per parcel. Raftelis recommends that the total ERU value be rounded up to the whole integer for billing purposes. Raftelis recommends that NSFR parcels with less than 350 sq. ft. of impervious area be assigned zero ERUs and exempted from stormwater utility billing.

Draft Units of Service

Upon completion of the impervious area digitization, Raftelis assigned each parcel an ERU value by customer class, with SFR parcels being assigned an ERU of 1, SFA parcels being assigned an ERU of 0.7, and NSFR parcels being assigned a total ERU value as described in the NSFR Impervious Area Analysis section above. Raftelis summed the ERUs by customer class and for the entire proposed stormwater utility service area (Table 4). These units of service are draft and subject to change based upon finalization of billing policies discussed in this document (SFA ERUs, minimum impervious area and ERU rounding) and other billing policies which have yet to be finalized (customer exemptions, parcel aggregation, etc.).

Table 4. Draft Stormwater Units of Service by Parcel Class

Parcel Class	Number of ERUs
SFR	9,985
SFA	188.3
NSFR	17,886
TOTAL	28,059.3