FCS GROUP
Solutions-Oriented Consulting

Project Memorandum

To: Patrick Sorensen, General Manager
Lake Whatcom Water & Sewer District

Date: May 31, 2017

From: Gordon Wilson, Project Manager
Tage Aaker, Project Manager

RE: 2017 Update of Water & Sewer General Facilities Charges (GFCs)

A. INTRODUCTION TO STUDY

In September 2016, Lake Whatcom Water and Sewer District contracted with FCS GROUP to perform a water and sewer rate study update. The tasks related to that study were completed in early 2017, concluding with a project memorandum dated January 24, 2017. While we were engaged in the rate update, the District expressed interest in reviewing and updating the General Facilities Charges (GFC) for both water and sewer utilities. These charges have not increased since January 1, 2009 (Resolution 757).

This memo documents the assumptions and results of the GFC update. The District's existing GFCs are as follows, accompanied by the calculated update charge for 2017, plus an inflationary adjustment for 2018:

Exhibit A-1: Current GFCs by Utility, for Smallest Meter Size

District GFCs	Water	Sewer
5/8 x 3/4 Meter		
Existing 2017	$4,110	$5,201
Study Results:		
Calculated 2017	$5,602	$7,538
Inflated 2018 (2.5%)	$5,742	$7,726

B. BACKGROUND ON GENERAL FACILITIES CHARGES

GFCs are imposed on newly connecting customers, but they should not be confused with water meter installation charges or other fees that reimburse the District for the cost of making the physical connection for a new customer. Instead, a GFC is a method of recovering from new customers a proportionate share of the utility's investment in capital capacity—both the historical cost of existing capital assets and the planned cost of future capital improvements. GFCs serve two main purposes: to provide equity between existing and new customers, and to provide a source of utility capital funding. In addition, GFCs help ensure that growth pays for the cost of growth. The charge is imposed on both new development and redevelopment that increases demand for system capacity.

In part, the GFC functions as a "buy-in charge." To avoid dilution of the investment of existing customers, new customers are required to buy in to the system commensurate with the cost of the assets needed to serve them.

C. LEGAL BASIS FOR GFC

There are a variety of approaches that are used in the industry to establish a defensible GFC. The development of such charges always occurs in the context of state law. The District is authorized to assess fees and charges in general under Section 57.08.005 of the Revised Code of Washington (RCW) sets forth the powers of water-sewer districts in general. Paragraph 11 of that section states that among those powers is the authority to charge property owners a "reasonable connection charge." This is what the District and many other districts refer to as a General Facilities Charge. This paragraph also describes some conditions that must be met in calculating this charge:

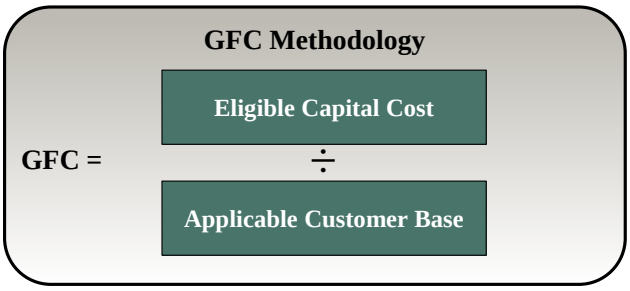
> *Section 57.08.005 (11) "Subject to subsection (7) of this section, to fix rates and charges for water, sewer, reclaimed water, and drain service supplied and to charge property owners seeking to connect to the district's systems, as a condition to granting the right to so connect, in addition to the cost of the connection, such reasonable connection charge as the board of commissioners shall determine to be proper in order that those property owners shall bear their equitable share of the cost of the system. For the purposes of calculating a connection charge, the board of commissioners shall determine the pro rata share of the cost of existing facilities and facilities planned for construction within the next ten years and contained in an adopted comprehensive plan and other costs borne by the district which are directly attributable to the improvements required by property owners seeking to connect to the system. The cost of existing facilities shall not include those portions of the system which have been donated or which have been paid for by grants. The connection charge may include interest charges applied from the date of construction of the system until the connection, or for a period not to exceed ten years, whichever is shorter, at a rate commensurate with the rate of interest applicable to the district at the time of construction or major rehabilitation of the system, or at the time of installation of the lines to which the property owner is seeking to connect. . .*

While the District has some flexibility to define an equitable share of system costs, it is important that the District follows a rational approach to consistently implement cost-based GFCs. FCS GROUP uses this language as guidance for calculating GFCs as it is likely to be used as a reference if GFCs are challenged. Since the calculated charges represent the maximum allowable charge, the District may choose to charge less but may not charge more than the calculated charge.

D. METHODOLOGY

D1. GENERAL OVERVIEW

The basic approach to a GFC calculation can be shown in general terms:



The capital costs used in the GFC calculation can be separated into two major categories:

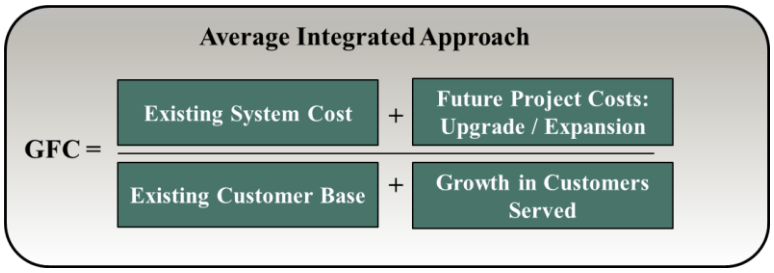
- Existing system: These costs represent the net investment in assets that currently provide service to customers (and that presumably have some amount of capacity to serve growth).

- Future capital projects: These costs refer to capital improvement projects that the utility plans to undertake within a period of time specified in the system planning documents, but not more than ten years. These projects typically fall into one of three categories, depending on the reason for the capital expenditure. District staff helped allocate projects to these categories for this analysis.
    - Repair & Replacement (R&R) Projects: These projects are to replace existing infrastructure due to wear and tear over time. These projects do not increase system capacity and are not upgrades to functionality or regulatory compliance. These costs are excluded from the GFC calculation as they are assumed to be repairing or replacing fixed assets that are already accounted for within the existing system cost.
    - Upgrade Projects: These projects broadly benefit both existing and future customers without increasing system capacity. Examples might include construction of an operations facility, improving system security, or projects driven by new regulations.
    - Expansion Projects. These projects primarily increase system capacity to serve additional customers. They may include main extensions, investments in conservation programs, treatment plant expansions, or pipe upsizing projects.

The applicable customer base is measured in Meter Capacity Equivalents (MCEs) at system buildout.

D2. RECOMMENDED APPROACH

The average integrated approach is as follows:



Under this methodology, all relevant capital costs (existing assets, upgrades and expansion projects) are divided by buildout capacity. The main policy emphasis here is on intergenerational equity—there is no cost advantage for either existing or new customers. This calculation is like a simple buy-in charge (which consists of existing costs divided by existing customers), except that it is projected into a future year, after the planned capital projects are completed. The resulting GFC is generally stable over time, and we recommend this methodology for the District.

D3. DEFINING EXISTING SYSTEM COSTS

The existing cost basis is intended to recognize the current ratepayers' net investment in the original cost of system assets. The main provisions of the calculation include:

- Utility Plant-In-Service: The existing cost basis is typically comprised of the original cost of plant-in-service, as documented in the fixed asset schedules of a utility. The District's asset records consist of replacement cost estimates as of 2013. These estimates were converted into original cost estimates, by using the Engineering News Record's Construction Cost Index.
    - While relatively low-value items such as tools, vehicles, furniture, etc. can be included in the original cost basis, they were not included in this replacement cost data. Therefore they were not incorporated into this analysis. This results in a slightly conservative estimate of the existing utility plant-in-service cost basis.

  - Major assets constructed from 2013 to 2016 were noted and included to fill in the missing years of asset data. A review of assets was performed to ensure that no asset was double counted in the existing basis and in the 2016 capital plan.

- Plus: Construction Work In Progress***:*** The cost of construction work in progress is added to the existing cost basis to recognize investments that a utility has made in capital projects that are currently underway, despite the fact that these projects have not yet been placed into service. The District did not currently have any construction in progress as of the end of 2016.
- Less: Contributed Capital: Assets funded by developers or grants are excluded from the cost basis on the premise that the GFC should only recover costs actually incurred by the District.
- Plus: Interest on Utility-Funded Assets: The RCW and subsequent legal interpretations provide a guideline for GFCs which suggests that such charges can include interest on an asset at the rate applicable during the time of construction. Using the historical Bond Buyer Index for 20-year term bonds, interest can accumulate for a maximum of ten years from the date of construction for any particular asset. Conceptually, this interest provision attempts to account for opportunity costs that the District's customers incurred by supporting investments in infrastructure rather than having it available for other needs.
- Less: Net Debt Principal Outstanding: Another adjustment to the existing system cost basis is to deduct the net liability of outstanding utility debt, recognizing that new customers will bear a proportionate share of annual debt service through ongoing utility service rates. Outstanding debt represents assets that have been placed in service but that today's ratepayers have not yet paid for. However, cash reserves represent money that today's ratepayers *have* paid for, and that cash could be substituted for indebtedness if needed. So in calculating the amount that should be subtracted from the GFC cost basis, we first deduct cash reserves from the outstanding debt (which is why it is referred to as "*net* debt principal outstanding"—that is, net of cash reserves). If the amount of cash reserves is greater than the amount of outstanding debt, the deduction for net debt principal outstanding is zero—it cannot be negative. (The term "cash reserves" includes both cash and investments.)

D4. DEFINING FUTURE SYSTEM COSTS

A utility capital improvement program (CIP) includes projects that address many needs, including system expansion, upgrades and the repair and replacement of infrastructure. In some cases, a single CIP project can serve more than one of these purposes. A maximum of 10-years of capital projects may be included in GFC calculations for special purpose districts, according to RCW 57.08.005, and those projects must be included in an adopted comprehensive plan. As previously noted, repair and replacement projects are excluded from the future cost basis. All costs included in the calculations are in estimated 2016 dollars. The District currently has a six-year adopted CIP, spanning 2016-2021, and this is used in the charge calculations.

D5. DEFINING THE CUSTOMER BASE

A key objective in defining the customer base is to determine the number of "customer units" the system can support. In other words, "How many customer equivalents can the system serve, once the capital plan has been fully executed?" Based on discussions with District staff and the District's consulting engineer, once the six-year capital plan is executed, the system could serve projected buildout in each utility—with the single exception of the North Shore area of the sewer utility service area. This area's assets can only serve the 20-year projection rather than full-buildout.

E. WATER UTILITY RESULTS

E1. OVERVIEW OF RESULTS

The following exhibit shows the existing charge and updated calculation.

Exhibit E-1: Results of the Water GFC Calculation

District GFCs	Existing 2017	Calculated 2017
Water		
5/8 x 3/4 Meter	$4,110	$5,602
Increase ($)		$1,492
Increase (%)		36%

E2. DEFINING THE CUSTOMER BASE

The District currently administers the water GFC based on the meter size of the new development, using meter capacity equivalents (MCEs) as defined by the American Water Works Association (AWWA). The MCE ratios shown below represent the maximum safe operating flow capacity in gallons per minute, relative to the smallest meter size (which is a 5/8" x 3/4" meter).

However, capacity and buildout figures in the District's system plans are represented in ERUs rather than MCEs. A reasonable effort was made to correlate those ERUs to MCEs. This helps maintain consistency with how the charge was calculated (MCEs) and how the charge is administered (MCEs).

The most recent detailed customer data download we had from the District was from a previous study which used 2012 customer data. This 2012 data was used in this GFC update to calculate MCEs, which was compared to the estimated number of ERUs in 2012, based on projections from the 2010 Water Comprehensive Plan. It was found that 1 ERU was approximately equal to 0.93 MCEs, which is shown in the following exhibit. For the purposes of this analysis, we are assuming that this relationship remains intact through present day and through buildout.

Exhibit E-2: Relating 2012 Water System ERUs to MCEs

Meter Capacity Equivalents in 2012 (Actual Customer Data)			
Meter Size (inches)	Accounts in 2012	MCE Ratio	MCEs in 2012
0.625	3,426	1	3,426
1	29	2	58
1.5	19	5	93
2	5	8	43
3	1	22	22
	3,480		**3,642**

Equivalent Residential Units in 2012 (2010 Comprehensive Plan)	
Area	Estimated ERUs
Sudden Valley	2,674
Geneva	1,130
North Shore / Eagleridge	69
North Shore / Wells	44
Total	**3,917**

In 2012, MCEs ÷ ERUs	**93%**

This 93% factor was then applied to the estimated number of ERUs at system buildout. These buildout numbers were provided by the District's consulting engineer, Wilson Engineering. They estimated 4,660 ERUs at buildout, which we equated to 4,330 MCEs.

Exhibit E-3: Relating Buildout ERUs to MCEs

Equivalent Residential Units at Buildout (2017 Wilson Engineering Figures)	
Area	Estimated ERUs
Sudden Valley	3,287
Geneva	1,250
North Shore / Eagleridge	71
North Shore / Wells	52
Total	**4,660**
Apply 93% Factor to estimate MCEs	**4,333**

E3. GFC CALCULATION

The following exhibit shows the summary calculation for the Water GFC. The total existing cost basis is $22.59 million plus $1.69 million in eligible capital projects, for a total cost basis of $24.3 million. This is then divided by an estimated system capacity, once the capital plan is executed, of 4,333 MCEs. This results in a charge of $5,602 per MCE, as of 2017.

Exhibit E-4: Summary-level 2017 Water GFC Calculation per MCE

Water Utility: GFC Calculation	
Capital Cost Basis ($)	
Existing Assets	$22,587,608
Future Assets (Upgrade/Expansion of System)	1,686,906
Total Cost Basis	$24,274,514
Buildout Capacity (Estimated in MCEs)	4,333
General Facilities Charge per MCE	**$5,602**

F. SEWER UTILITY RESULTS

F1. OVERVIEW OF RESULTS

The following exhibit shows the existing charge and updated calculation.

Exhibit F-1: Results of the Sewer GFC Calculation

District GFCs	Existing 2017	Calculated 2017
Sewer		
5/8 x 3/4 Meter	$5,201	$7,538
Increase ($)		$2,337
Increase (%)		45%

F2. DEFINING THE CUSTOMER BASE

The District also administers the sewer GFC based on meter size and the equivalent meter capacity ratio. The sewer utility customer data from 2012 did not have the number of accounts by meter size—rather the data consisted of just the number of accounts since the service charges are not based on meter size like they are for the water utility. However, because the Sewer GFC is administered based on meter size, the number of MCEs needs to be estimated.

To estimate the number of sewer MCEs, we took the proportion of sewer accounts to water accounts, and applied that factor to the number of water MCEs. At the time of the 2012 rate study, there were 3,832 sewer accounts compared to 3,480 water accounts—or 10% more sewer accounts than water accounts. This 10% factor was applied to the estimated number of water MCEs in 2012 to arrive at an estimated number of 2012 sewer MCEs: 4,010 MCEs. This methodology assumes the same meter size composition for the portion of the sewer service area that does not overlap with the water utility.

Exhibit F-2: Relating 2012 Sewer System ERUs to MCEs

Meter Capacity Equivalents in 2012 (Actual Customer Data)			
Meter Size (inches)	Accounts in 2012	MCE Ratio	MCEs in 2012
0.625	3,426	1	3,426
1	29	2	58
1.5	19	5	93
2	5	8	43
3	1	22	22
	3,480		**3,642**
Apply 10% Factor: more Sewer than Water Accounts			**4,010**

Equivalent Residential Units in 2012 (2014 Comprehensive Plan)	
Area	Estimated ERUs
Sudden Valley / Geneva	3,842
North Shore	366
Total	**4,208**

In 2012, MCEs ÷ ERUs	**95%**

With this assumption, 1 ERU was approximately equal to 0.95 MCEs.

This 95% factor was then applied to the estimated number of ERUs at system buildout. These buildout numbers came from the District's 2014 Comprehensive Sewer Plan, with one adjustment suggested by Wilson Engineering.

Wilson Engineering explained that the build-out numbers shown in the 2014 Comprehensive Sewer Plan for the North Shore area include the area at the end of Northshore Road, with 100 houses on septic systems. There is no sewer service yet for those houses, and a major sewer extension project would be required in order to serve them. That major sewer extension is not included in the 2014 Comprehensive Sewer Plan. In order to exclude those homes, Wilson Engineering suggested that we use the 20-year projection for the North Shore area rather than the buildout figure. So Exhibit F-3 assumes buildout for South Shore (Sudden Valley and Geneva) and 20-year growth projections for the North Shore service area.

Given those assumptions, the total number of ERUs that could be served by the sewer system after the capital plan is executed, is 5,234 ERUs, which is equivalent to 4,988 MCEs.

Exhibit F-3: Relating Buildout ERUs to MCEs

Equivalent Residential Units Capacity (2017 Wilson Engineering Figures)	
Area	Estimated ERUs
Sudden Valley / Geneva (Buildout)	4,810
North Shore (20-Year Growth)	424
Total	**5,234**

Apply 95% Factor to estimate MCEs	**4,988**

F3. GFC CALCULATION

The following exhibit shows the summary calculation for the Sewer GFC. The total existing cost basis is $37.6 million. District staff determined that all projects in the capital plan were related to the repair and replacement of existing assets. Therefore, we excluded all future capital costs.

The $37.6 million is divided by 4,988 MCEs, resulting in a charge of $7,538 per MCE.

Exhibit F-4: Summary-level 2017 Sewer GFC Calculation per MCE

Sewer Utility: GFC Calculation	
Capital Cost Basis ($)	
Existing Assets	$ 37,597,880
Future Assets (Upgrade/Expansion of System)	-
Total Cost Basis	$ 37,597,880
Buildout Capacity (Estimated in MCEs)	4,988
General Facilities Charge per MCE	**$7,538**

G. SUMMARY

The following exhibit shows the existing GFCs by utility, the updated GFC calculation in 2017, and the forecasted charges through 2021, assuming an annual Construction Cost Index (CCI) inflation factor of 2.5% per year. The District is allowed to increase the calculated 2017 charge by the annual increase in the Engineering News Record's CCI.

If the District wants to adopt a multi-year schedule, as they currently do for customer service rates, we believe the 2.5% per year used in Exhibit G-1 is conservative and defensible (the five-year annual historical average is 2.7% and the ten-year average is 2.9%).

Exhibit G-1: Summary of GFC Calculation plus Projected Charges

District Existing GFCs				Update	Forecasted GFCs with Estimated CCI Inflation (2.5% / yr.)			
Meter Size (inch)	Continuous Flow (gpm)	Meter Capacity Ratio	Existing 2017	Calculated 2017	2018	2019	2020	2021
Water								
5/8 x 3/4	15	1	$4,110	$5,602	$5,742	$5,885	$6,033	$6,183
1	30	2	$8,220	$11,204	$11,484	$11,771	$12,065	$12,367
1.5	75	5	$20,550	$28,009	$28,710	$29,427	$30,163	$30,917
2	120	8	$32,880	$44,815	$45,935	$47,084	$48,261	$49,467
3	330	22	$90,420	$123,241	$126,322	$129,480	$132,717	$136,035
4	440	29.33	$120,546	$164,303	$168,411	$172,621	$176,936	$181,360
Sewer								
5/8 x 3/4		1	$5,201	$7,538	$7,726	$7,919	$8,117	$8,320
1		2	$10,402	$15,075	$15,452	$15,839	$16,235	$16,640
1.5		5	$26,005	$37,688	$38,631	$39,596	$40,586	$41,601
2		8	$41,608	$60,302	$61,809	$63,354	$64,938	$66,562
3		22	$114,422	$165,829	$169,975	$174,224	$178,580	$183,044
4		29.33	$152,545	$221,080	$226,607	$232,273	$238,079	$244,031

A two-year, phase-in strategy was initially presented to the District's Board of Commissioners, but the general feedback was that they would lean towards adopting the full increase at once. The full charge is reflected in **Exhibit G-1**, and no phase-in strategy is shown in this documentation.

While the District may adjust the GFC at any time, we suggest allowing enough time for public outreach and communication before the new, higher charge goes into effect.

H. APPENDICES

H1. WATER GFC

Existing Cost Basis			Notes
PLANT-IN-SERVICE			
Utility Capital Assets		$ 18,172,481	Fixed Assets as of end of 2016, Estimated Original Cost from Replacement Cost
less: Contributed Capital		$ (3,550)	Donated Assets at Original Cost
plus: Interest on Non-Contributed Plant		7,593,851	Interest on assets up to a maximum 10-year period
plus: Construction-Work-in-Progress		-	
Year-end Estimated Cash Balances	$ 1,482,650		Projected Year Ending 2016
less: Debt Principal Outstanding	(4,657,825)		Projected Year Ending 2016
less: Net Debt Principal Outstanding		$ (3,175,174)	Debt principal outstanding, net of cash reserves
TOTAL EXISTING COST BASIS		**$ 22,587,608**	

Future Cost Basis		Notes
CAPITAL IMPROVEMENT PLAN (2016-2021)		CIP costs begin in 2016 and are in 2016 dollars.
Total Projects	$ 3,221,082	
less: R&R Projects	$ (1,534,176)	
Growth Related Projects	**$ 1,686,906**	
TOTAL FUTURE COST BASIS	**$ 1,686,906**	

Resulting Charge				Notes
Charge Components	**Cost Basis**	**MCEs**	**Charge**	
Component for Existing Assets	$ 22,587,608	4,333	**$5,213**	
Component for Future Assets	$ 1,686,906	4,333	**$389**	
	$ 24,274,514	4,333	**$5,602**	
TOTAL GFC PER MCE			**$5,602**	
Existing GFC per MCE			$4,110	
Increase (%) - Calculated Above Existing GFC			36%	
Increase ($) - Calculated Above Existing GFC			$1,492	

H2. SEWER GFC

Existing Cost Basis			Notes
PLANT-IN-SERVICE			
Utility Capital Assets		$ 28,180,217	Fixed Assets as of end of 2016, Estimated Original Cost from Replacement Cost
less: Contributed Capital		$ (860,560)	Donated Assets at Original Cost
plus: Interest on Non-Contributed Plant		13,256,845	Interest on assets up to a maximum 10-year period
plus: Construction-Work-in-Progress		-	
Year-end Estimated Cash Balances	$ 3,160,728		Projected Year Ending 2016
less: Debt Principal Outstanding	(6,139,350)		Projected Year Ending 2016
less: Net Debt Principal Outstanding		$ (2,978,622)	Debt principal outstanding, net of cash reserves
TOTAL EXISTING COST BASIS		**$ 37,597,880**	

Future Cost Basis		Notes
CAPITAL IMPROVEMENT PLAN (2016-2021)		CIP costs begin in 2016 and are in 2016 dollars.
Total Projects	$ 6,590,388	
less: R&R Projects	$ (6,590,388)	
Growth Related Projects	**$ -**	
TOTAL FUTURE COST BASIS	**$ -**	

Resulting Charge				Notes
Charge Components	**Cost Basis**	**MCEs**	**Charge**	
Component for Existing Assets	$ 37,597,880	4,988	**$7,538**	
Component for Future Assets	$ -	4,988	**$0**	
	$ 37,597,880	4,988	**$7,538**	
			2017	
TOTAL GFC PER MCE			**$7,538**	
Existing GFC per MCE			$5,201	
Increase (%) - Calculated Above Existing GFC			45%	
Increase ($) - Calculated Above Existing GFC			$2,337	