

12719 WENONGA LANE LEAWOOD, KS 66225 TEL: (913) 345-1410 THE FOSTER GROUP, LLC
BART FOSTER, PRESIDENT
CELL: (913) 530-6240
BFOSTER@FOSTERGROUPLLC.COM

MEMORANDUM

FY 2022 SHARE Calculations

November 16, 2020

To: Sue McCormick

From: Bart Foster

This memorandum is intended to introduce the specific calculations of the proposed Sewer SHAREs for the upcoming proposed FY 2022 Wholesale Sewer Charges. The proposed SHAREs have been prepared by the "Think Tank" that collaborated as part of the Outreach process. The Think Tank's recommended methodology was set forth in a collaboratively authored memorandum dated October 20, 2020, which contained calculation results of implementing the methodology. The intent of this memorandum is to provide a more detailed understanding of the specific calculations.

The Think Tank's memorandum was carefully prepared to set forth the process followed and the specific methodology recommendations, and we'll note attempt to further elaborate on that discussion¹. Rather, we aim to set forth the detailed calculations with the assistance of the attached tables, which we briefly introduce herein.

- 1. Presents historical results of the annual flow balances for the Master Metered Member Partners for FYs 2013 through 2019, which represents the seven-year data period the Think Tank recommends for purposes of the FY 2022 SHAREs. The flow volume data is reflected in millions of gallons per day (mgd) as provided by the annual flow balance reports. Specific adjustments have been made to certain historical data to reflect prior SHARE modifications, most notably OMID's diversion of flow to the Pontiac treatment facility². Table 1 presents total contributed volume as well as Sanitary and Non-Sanitary contributions.
- 2. Presents similar historical data for the Member Partners in the D+ Customer Class, although limited to Sanitary contributions only. The flow balance protocol utilized for the SHARE calculations does not contain sufficient verifiable data to isolate Non-Sanitary flow volumes for individual D+ communities, nor was any analysis available

¹ The Think Tank memorandum addresses key assumptions regarding "Regional" and "Local" contributions of non-sanitary flow volumes within the D+ area. Regional volumes are effectively ignored for SHARE calculations.

² Other minor modifications were made to historical data for Dearborn and Rouge Valley.

to identify which D+ communities should receive reductions related to the Regional flow assumptions. A few notes:

- Grosse Pointe is being considered a member of the D+ Customer Class for purposes of the FY 2022 SHAREs. The flow balance data contains only one year (FY 2019) of metered data for Grosse Pointe and it was deemed appropriate to keep that Member Partner in the class for which the most data existed.
- Highland Park's sanitary flow estimate for purposes of SHARE calculations
 was based solely on the three most recent years (instead of seven) in order to
 honor new verified data.
- Sanitary flow volumes reported as Water Treatment Backwash in flow balance reports are treated as Regional flow for purposes of SHAREs
- 3. Provides a summary of total contributed volume by flow type, deducts volumes contributed from Master Metered Member Partners, and displays the balance as being assignable to either D+ or Regional.
- 4. Separates the "non-master metered" flow volumes into D+ (Local) and Regional components for purposes of SHARE calculations. As noted in the Think Tank memorandum, the proposed methodology assumes that 50% of such non-sanitary volumes should be assigned as Regional, and the other 50% as the Local responsibility of the D+ Customer Class. The table also assigns Dearborn's portion of the D+ flow (from the unmetered northeast district) to the majority of Dearborn (which is metered) in order to facilitate SHARE calculations.
- 5. Serves as a summary of units of service for Master Metered Member Partners and the D+ Customer Class at large, in a format that aligns with the Core Methodology established by the Think Tank recommendations. Flow volumes are summarized from Tables 1 and 4 and converted to thousands of cubic feet (Mcf). The table also presents the historical CSO "83/17" cost allocation units of service, which are set forth in legal agreements. The bottom portion of the table shows the individual *Shares* of each unit of service.
- 6. Illustrates application of the Core Methodology regarding cost pools and units of service "allocators". The FY 2021 Cost of Service Study results are used to populate the Core Methodology assumptions, and to assign the total revenue requirement to cost pools and units of service allocators. For purposes of SHARE calculations the allocation factors are simplified by rounding the nearest 0.5% and Line 9 presents the total revenue requirement to assign via each of the three allocators.
- 7. Allocates revenue requirement responsibility to individual Member Partners and computes the "All in" SHARE for FY 2022. Applies the units of service *Shares* from the bottom of Table 5 to the revenue requirements from Table 6.

8. Compares the existing and proposed SHAREs and the allocation of FY 2021 revenue requirements under both sets of SHAREs in order to illustrate potential impact of the proposed SHAREs. The bottom portion of this table is what populated the Impact Summary contained in the Think Tank memorandum. The SHAREs shown in Column 2 reflect the proposed SHAREs to be implemented with the FY 2022 Wholesale Sewer Charges and remain in place for two additional years.

We trust that this information provides additional detail that may be helpful in Member Partner review in advance of the Charges Rollout Meeting scheduled for this Thursday, November 19 and we encourage distribution of this material in advance. We are prepared to incorporate this material into the formal presentation at that meeting.

A few closing comments on this topic:

- We'd like to accentuate the message following the Impact Summary in the Think Tank memorandum. The most important metric impacting the (relatively minor) shifts in proposed SHAREs are relative changes in flow volumes for individual Member Partners. The new proposed SHAREs add flow volume data for three years (FYs 2017 through 2019) to the units of service. Those Member Partners that experienced relatively higher flow contributions in those years (compared to the average of all Member Partners) would naturally experience a SHARE increase under ANY methodology that relies on flow volume. We are prepared to illustrate this notion at Thursday's meeting.
- As noted in the Think Tank memorandum, the originally proposed SHAREs treated the D+ Member Partners as a class at large, and did not individually assign SHAREs to those communities. We have provided recommendations regarding individual D+ SHAREs under separate cover, and we are prepared to present that information on Thursday as well.

We are prepared to discuss this matter at your convenience.

Table 1
Flow Volume Data from Annual Flow Balances: FY 2013 - 2019 (mgd)

Master Metered Member Partners

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Average
	Total Contributed Volume	·							
1	OMID	60.519	60.829	60.781	60.899	63.053	64.909	63.483	62.068
2	Rouge Valley	53.198	61.323	57.774	54.795	62.032	56.939	65.223	58.755
3	Oakland GWK	49.439	52.317	54.128	50.963	58.605	54.885	61.558	54.556
4	Evergreen Farmington	33.619	35.325	37.054	34.791	37.673	37.230	39.474	36.452
5	SE Macomb San Dist	26.231	28.909	27.672	28.877	30.144	29.642	32.750	29.175
6	Dearborn	19.532	22.349	20.883	20.456	26.248	23.789	24.396	22.522
7	Grosse Pointe Farms	3.012	3.048	2.891	2.983	3.296	3.320	3.452	3.143
8	Grosse Pointe Park	1.848	2.010	2.185	2.237	2.395	2.625	2.822	2.303
9	Melvindale	1.474	1.717	1.553	1.521	1.622	1.682	1.869	1.634
10	Farmington	1.122	1.233	1.343	1.195	1.304	1.407	1.548	1.308
11	Center Line	1.042	1.057	0.976	0.983	1.141	1.047	1.128	1.053
12	Allen Park	0.727	0.895	0.939	0.932	0.888	1.000	0.895	0.897
13	Total	251.764	271.013	268.179	260.631	288.402	278.477	298.598	273.866
	Sanitary Volume								
1	OMID	44.885	45.985	44.591	43.363	42.658	42.959	42.627	43.867
2	Rouge Valley	29.265	31.883	29.317	28.341	28.199	29.043	28.535	29.226
3	Oakland GWK	20.833	21.523	21.173	19.373	20.093	20.525	20.317	20.548
4	Evergreen Farmington	20.530	21.224	20.891	19.127	19.851	20.296	20.103	20.289
5	SE Macomb San Dist	11.348	12.228	12.183	11.096	10.519	11.149	10.956	11.354
6	Dearborn	7.904	8.001	8.312	8.124	7.795	7.937	7.362	7.919
7	Grosse Pointe Farms	1.163	1.366	0.950	0.871	0.783	0.839	0.893	0.981
8	Grosse Pointe Park	0.805	0.911	0.906	0.785	0.863	0.868	0.651	0.827
9	Melvindale	0.861	0.840	0.940	0.790	0.857	0.828	0.779	0.842
10	Farmington	0.636	0.646	0.577	0.616	0.587	0.587	0.572	0.603
11	Center Line	0.582	0.627	0.576	0.557	0.539	0.556	0.553	0.570
12	Allen Park	0.459	0.518	0.497	0.443	0.388	0.406	0.436	0.449
13	Total	139.273	145.753	140.912	133.488	133.132	135.992	133.784	137.476
	Non-Sanitary Volume								
1	OMID	15.634	14.845	16.190	17.536	20.395	21.951	20.856	18.201
2	Rouge Valley	23.933	29.440	28.457	26.454	33.833	27.896	36.688	29.529
3	Oakland GWK	28.606	30.794	32.955	31.590	38.512	34.360	41.241	34.008
4	Evergreen Farmington	13.088	14.102	16.163	15.664	17.822	16.934	19.372	16.164
5	SE Macomb San Dist	14.883	16.681	15.489	17.780	19.625	18.493	21.794	17.821
6	Dearborn	11.628	14.348	12.571	12.332	18.452	15.852	17.034	14.602
7	Grosse Pointe Farms	1.849	1.682	1.941	2.112	2.513	2.481	2.559	2.163
8	Grosse Pointe Park	1.043	1.099	1.279	1.452	1.531	1.758	2.171	1.476
9	Melvindale	0.613	0.877	0.614	0.731	0.765	0.854	1.090	0.792
10	Farmington	0.486	0.587	0.766	0.579	0.717	0.820	0.976	0.705
11	Center Line	0.460	0.430	0.400	0.425	0.603	0.492	0.575	0.483
12	Allen Park	0.268	0.377	0.442	0.490	0.501	0.594	0.459	0.447
13	Total	112.491	125.260	127.267	127.144	155.270	142.484	164.814	136.390

Table 2
Flow Volume Data from Annual Flow Balances: FY 2013 - 2019 (mgd)

Sanitary Volume from D+ Member Partners

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Average
	Sanitary Volume								
1	Dearborn N.E.	0.474	0.469	0.471	0.454	0.361	0.362	0.349	0.420
2	Grosse Pointe *	0.256	0.459	0.411	0.564	0.421	0.420	0.430	0.423
3	Hamtramck	1.050	1.170	1.113	1.056	1.037	1.120	1.135	1.097
4	Harper Woods	0.104	0.116	0.111	0.104	0.105	0.105	0.084	0.104
5	Highland Park (a)	NA	NA	NA	NA	0.622	0.571	0.591	0.594
6	Redford Township	0.031	0.031	0.091	0.091	0.091	0.091	0.091	0.074
7	Wayne County #3	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
8	Detroit	56.373	55.148	52.554	49.666	48.543	55.806	54.829	53.274
9	Total	58.294	57.398	54.757	51.941	51.185	58.482	57.515	55.993
10	Water Trtmt Plant Backwash (b)	8.014	8.846	8.155	7.473	7.580	8.089	8.708	8.124
11	Total	66.308	66.245	62.912	59.414	58.765	66.571	66.223	64.116
12	Adjustment (c)	0.783	0.701	0.625	0.633	0.000	0.000	0.000	0.052
13	Total	67.091	66.945	63.538	60.047	58.765	66.571	66.223	64.169

^{*} Grosse Pointe is considered part of the D+ class for FY 20220 SHAREs. Only one year of metered data exists.

⁽a) Highland Park's sanitary contributions based on a three-year average.

⁽b) Water Treatment Plant Backwash is considered a Regional flow volume.

⁽c) Necessary to reflect prior Highland Park sanitary estimates and other minor adjustments from FY 2018 SHARE analysis.

 $\label{eq:Table 3} Table \ 3$ Flow Volume Data from Annual Flow Balances: FY 2013 - 2019 (mgd)

Total System

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Average
	Total Contributed Volume								
1	Total Reported @ WRRF	603.353	639.334	611.987	580.371	658.043	620.835	670.076	626.286
2	Total Reported Overflow	21.149	36.292	37.377	17.617	27.668	35.777	26.577	28.922
3	Total Contributed Volume	624.502	675.626	649.364	597.988	685.711	656.612	696.654	655.208
4	Sanitary Volume	206.364	212.699	204.449	193.535	191.897	202.564	200.007	201.645
5	Non-Sanitary Volume (3) - (4)	418.138	462.927	444.915	404.453	493.814	454.049	496.647	453.563
	Master Metered Member Partners								
6	Sanitary Volume (Table 1)	139.273	145.753	140.912	133.488	133.132	135.992	133.784	137.476
7	Non-Sanitary Volume (Table 1)	112.491	125.260	127.267	127.144	155.270	142.484	164.814	136.390
8	Total Contributed Volume	251.764	271.013	268.179	260.631	288.402	278.477	298.598	273.866
	Balance from D+ and Regional								
9	Sanitary Volume (4) - (6)	67.091	66.945	63.538	60.047	58.765	66.571	66.223	64.169
10	Non-Sanitary Volume (5) - (7)	305.647	337.667	317.648	277.309	338.545	311.564	331.833	317.173
11	Total Contributed Volume	372.738	404.613	381.186	337.356	397.309	378.136	398.056	381.342

Table 4
Determination and Allocation of D+ Flow Volumes (mgd)

Total System

		(1)	(2)	(3)	(4)	(5)	(6)
		7-Year	Regional Flow		Flow for	Dearborn	Remaining
		Average	Assumption	Amount	D+ Class	Volume	D+ Class
					(1) - (3)	<i>(b)</i>	(1) - (3)
	Total D+ and Regional Flow						
1	Sanitary Volume	64.169	(a)	8.176	55.993	0.420	55.573
2	Non-Sanitary Volume	317.173	50%	158.587	158.587	1.145	157.442
3	Total Contributed Volume	381.342		166.762	214.580	1.565	213.014

⁽a) Water Treatment Plant Backwash.

⁽b) Flows for the portion of Dearborn in D+ are assigned to the main Dearborn master metered account.

Table 5
Consolidated Units of Service Summary

Based on 7-Year Average Flow Contributions from FY 2013 through FY 2019

		(1)	(2)	(3)	(4)	(5)
		Contributed V	olume - mgd	Contributed V	olume - Mcf	
		Total	Sanitary	Total	Sanitary	CSO
			<u> </u>		<u> </u>	(a)
	Member Partner Units					
1	OMID	62.068	43.867	3,028,500	2,140,400	2.651%
2	Rouge Valley	58.755	29.226	2,866,900	1,426,000	2.956%
3	Oakland GWK	54.556	20.548	2,662,000	1,002,600	2.256%
4	Evergreen Farmington	36.452	20.289	1,778,600	990,000	1.485%
5	SE Macomb San Dist	29.175	11.354	1,423,500	554,000	1.174%
6	Dearborn * (w/ D+ allo)	24.087	8.339	1,175,300	406,900	1.631%
7	Grosse Pointe Farms	3.143	0.981	153,400	47,800	0.504%
8	Grosse Pointe Park	2.303	0.827	112,400	40,400	0.062%
9	Melvindale	1.634	0.842	79,700	41,100	0.074%
10	Farmington	1.308	0.603	63,800	29,400	0.052%
11	Center Line	1.053	0.570	51,400	27,800	0.056%
12	Allen Park	0.897	0.449	43,700	21,900	0.031%
13	M Customer Subtotal	275.431	137.896	13,439,200	6,728,300	12.931%
14	D+ Customers * (w/o Dbn allo)	213.014	55.573	10,393,700	2,711,500	87.069%
15	Total	488.446	193.469	23,832,900	9,439,800	100.000%
	Member Partner Shares					
1	OMID			12.707%	22.674%	2.651%
2	Rouge Valley			12.029%	15.106%	2.956%
3	Oakland GWK			11.169%	10.621%	2.256%
4	Evergreen Farmington			7.463%	10.488%	1.485%
5	SE Macomb San Dist			5.973%	5.869%	1.174%
6	Dearborn * $(w/D + allo)$			4.931%	4.310%	1.631%
7	Grosse Pointe Farms			0.644%	0.506%	0.504%
8	Grosse Pointe Park			0.472%	0.428%	0.062%
9	Melvindale			0.334%	0.435%	0.074%
10	Farmington			0.268%	0.311%	0.052%
11	Center Line			0.216%	0.294%	0.056%
12	Allen Park			0.210%	0.232%	0.030%
13	M Customer Subtotal			56.389%	71.276%	12.931%
14	D+ Customers * (w/o Dbn allo)			43.611%	28.724%	87.069%
	,			100.000%	100.000%	
15	Total			100.000%	100.000%	100.000%

⁽a) Existing 83/17 allocation factors from legal agreements.

Table 6
Revenue Requirement Allocation to Cost Pools
Application of Core Methodology Assumptions

		(1)	(2)	(3)	(4)
			Allocators		
		Total Contr	Sanitary		
	<u>Cost Pool</u>	<u>Volume</u>	<u>Volume</u>	<u>CSO</u>	
1	WRRF Cost Pool	50%	50%		
2	Conveyance Cost Pool	100%			
3	CSO Cost Pool			100%	
		-			
		FY 2021	All	on	
		Revenue	Total Contr	Sanitary	
		Requirement	<u>Volume</u>	Volume	<u>CSO</u>
4	WRRF Cost Pool	302,705,900	151,353,000	151,353,000	0
5	Conveyance Cost Pool	95,992,900	95,992,900	0	0
6	CSO Cost Pool	61,507,400	0	0	61,507,400
7	Total	460,206,200	247 345 900	151,353,000	61,507,400
8	Simplified Allocation Factors (a)	400,200,200	54.0%	32.5%	13.5%
o	Simplified Anocation Factors (a)		34.0/0	34.3/0	13.3/0
9	Revenue Requirement Allocation		248,511,300	149,567,100	62,127,800
	0.50/				

⁽a) Rounded to nearest 0.5%

Table 7
Allocated Revenue Requirements / Determination of SHAREs
Three Year SHARE Period Beginning with FY 2022

		(1)	(2)	(3)	(4)	(5)
		Contributed	Sanitary			FY 2022
		Avg Volume	<u>Volume</u>	<u>CSO</u>	<u>Total</u>	SHARE
						~ (4)
	FY 2021 Cost Pool Allocation (a)	248,511,300	149,567,100	62,127,800	460,206,200	
	Relative Cost Pool %	54.0%	32.5%	13.5%	100.0%	
	Allocated Revenue Requirements (b)					
1	OMID	31,578,900	33,913,200	1,647,100	67,139,200	14.589%
2	Rouge Valley	29,893,800	22,594,000	1,836,300	54,324,100	11.804%
3	Oakland GWK	27,757,300	15,885,500	1,401,600	45,044,400	9.788%
4	Evergreen Farmington	18,545,900	15,685,900	922,600	35,154,400	7.639%
5	SE Macomb San Dist	14,843,200	8,777,700	729,400	24,350,300	5.291%
6	Dearborn * (w/ D+ allo)	12,255,100	6,447,000	1,013,300	19,715,400	4.284%
7	Grosse Pointe Farms	1,599,500	757,400	313,100	2,670,000	0.580%
8	Grosse Pointe Park	1,172,000	640,100	38,400	1,850,500	0.402%
9	Melvindale	831,100	651,200	45,900	1,528,200	0.332%
10	Farmington	665,300	465,800	32,600	1,163,700	0.253%
11	Center Line	536,000	440,500	34,500	1,011,000	0.220%
12	Allen Park	455,700	347,000	19,200	821,900	0.179%
13	M Customer Subtotal	140,133,800	106,605,300	8,034,000	254,773,100	55.361%
14	D+ Customers * (w/o Dbn allo)	108,377,500	42,961,800	54,093,800	205,433,100	44.639%
15	Total	248,511,300	149,567,100	62,127,800	460,206,200	100.000%

⁽a) From Table 6.

⁽b) Application of specific Cost Pool Shares from Table 5.

Table 8
Existing and Proposed SHARE Comparison
SHAREs reflect "All in" SHAREs

		(1)	(2)	(3)	(4)
		Existing CTA SHARE (a) (a)	Proposed <u>SHARE</u> from Table 7	Variance	% Variance
	Member Partner Units	(4)	j, om racie,		
1	OMID	67,465,400	67,139,200	(326,200)	-0.5%
2	Rouge Valley	53,762,400	54,324,100	561,700	1.0%
3	Oakland GWK	44,800,700	45,044,400	243,700	0.5%
4	Evergreen Farmington	34,611,300	35,154,400	543,100	1.6%
5	SE Macomb San Dist	24,599,100	24,350,300	(248,800)	-1.0%
6	Dearborn * $(w/D + allo)$	19,300,500	19,715,400	414,900	2.1%
7	Grosse Pointe Farms	2,727,100	2,670,000	(57,100)	-2.1%
8	Grosse Pointe Park	1,793,600	1,850,500	56,900	3.2%
9	Melvindale	1,522,600	1,528,200	5,600	0.4%
10	Farmington	1,141,800	1,163,700	21,900	1.9%
11	Center Line	1,027,100	1,011,000	(16,100)	-1.6%
12	Allen Park	848,500	821,900	(26,600)	-3.1%
13	M Customer Subtotal	253,600,100	254,773,100	1,173,000	0.5%
14	D+ Customers * (w/o Dbn allo)	206,606,100	205,433,100	(1,173,000)	-0.6%
15	Total	460,206,200	460,206,200	0	0.0%
	Member Partner Shares				
1	OMID	14.660%	14.589%	-0.071%	-0.5%
2	Rouge Valley	11.682%	11.804%	0.122%	1.0%
3	Oakland GWK	9.735%	9.788%	0.053%	0.5%
4	Evergreen Farmington	7.521%	7.639%	0.118%	1.6%
5	SE Macomb San Dist	5.345%	5.291%	-0.054%	-1.0%
6	Dearborn * (w/ D+ allo)	4.194%	4.284%	0.090%	2.1%
7	Grosse Pointe Farms	0.593%	0.580%	-0.013%	-2.2%
8	Grosse Pointe Park	0.390%	0.402%	0.012%	3.1%
9	Melvindale	0.331%	0.332%	0.001%	0.3%
10	Farmington	0.248%	0.253%	0.005%	2.0%
11	Center Line	0.223%	0.220%	-0.003%	-1.3%
12	Allen Park	0.184%	0.179%	-0.005%	-2.7%
13	M Customer Subtotal	55.106%	55.361%	0.255%	0.5%
14	D+ Customers * (w/o Dbn allo)	44.894%	44.639%	-0.255%	-0.6%
15	Total	100.000%	100.000%	0.000%	0.0%

⁽a) Based on review of FY 2021 Charges, which were based on FY 2020 Cost of Service Study. Existing SHAREs reflect "All in" SHAREs after recognizing CSO & Suburban only Cost Pools.