

# **STORMWATER MANAGEMENT FEE STUDY**

Prepared For

**FOX CHAPEL SANITARY AUTHORITY  
401 Fox Chapel Road  
Pittsburgh, Pennsylvania 15238**

FEBRUARY 2019



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**Lennon, Smith, Souleret  
Engineering, Inc.**

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Civil Engineers and Surveyors

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# **FOX CHAPEL SANITARY AUTHORITY STORMWATER MANAGEMENT FEE STUDY**

## **SECTION 1**

### **INTRODUCTION**

#### **Section 1.1 – Background**

Fox Chapel Borough owns and operates a Municipal Separate Storm Sewer System (MS4) consisting primarily of a system of collection and conveyance infrastructure, with some facilities providing detention and treatment used to manage stormwater runoff. Infrastructure associated with the Borough's MS4 includes, but is not limited to inlets, catch basins, storm drains, conveyance pipes, channels, swales, roadway curbs, culverts, detention basins, infiltration practices, and other post-construction stormwater management (PCSM) Best Management Practices (BMPs). This infrastructure has been installed in accordance with state and federal law and must be maintained to manage impact of stormwater runoff and minimize the potential negative effect of runoff to public and private property for the public good throughout the Borough. To this effect, the Borough's MS4 should be considered a public utility serving each property owner, or user of the MS4, throughout the Borough. A property's impact and therefore the user's contribution of stormwater to the MS4 can be best evaluated based on the amount of impervious cover present on the property. As development occurs and pre-existing natural land cover is replaced with impervious cover, rates and volumes of runoff increase and as such must be managed by the MS4. Funding for operation, maintenance and improvement of the MS4 has historically been budgeted as part of the Borough's General Fund comprised of revenue generated through tax revenue. However, as development progresses, flooding and stormwater quality concerns intensify and federal and state regulations increase, a dedicated funding source similar to that which has been previously established for the noted sanitary sewer and potable water services, should be established for the required sustainability of the MS4. The Article of Incorporation of the Fox Chapel Sanitary Authority were amended by of the Fox Chapel Borough Council to

extend the existence of the Authority and to grant it the additional power to perform stormwater planning, management and implementation and to collect in support thereof fees.

### Section 1.2 – Purpose

The purpose of this study is to develop an equitable and fair MS4 user fee system that promotes that users and beneficiaries of the Borough's MS4 pay a proportionate share of the costs of administration, operation, maintenance, repair, replacement and improvement of the MS4. A reasonable basis by which to establish the user fee system would be on the user's anticipated contribution of stormwater runoff to the MS4 system. It is also reasonable to establish criteria for credits or reduction in fees for those users who opt to implement Best Management Practices that serve their properties to lessen the impact of same on the Borough's MS4.

### Section 1.3 – Definitions

**DWELLING UNIT** – A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

**EQUIVALENT RESIDENTIAL UNIT (ERU)** - The measure of impervious ground cover for a typical single-family residential Property used in assessing the fees for each parcel of Property, and which has been determined to be 8,400 square feet. Refer to Section 3.3 for additional information of the ERU calculation.

**IMPERVIOUS SURFACE** - Those hard surface areas that either prevent or impede the entry of water into the soil, or which cause water to run off the surface in greater quantities, or at an increased rate of flow than under natural conditions, prior to development, including, without limitation, surfaces such as roof tops, asphalt, concrete,

or any other material that has been compacted, engineered and intended for vehicular traffic or parking, including, but not limited to, driveways and parking lots, private streets, or other surfaces which similarly affect the natural infiltration or runoff of natural drainage patterns existing prior to development including, but not limited to, walkways, patio areas and storage areas. Compacted gravel or crushed stone surfaces are considered impervious surfaces for this analysis. In addition, any surface designed to be constructed of permeable, pervious or porous concrete, asphalt, or pavers are also considered to be an impervious surface for this analysis.

**NON-SINGLE-FAMILY RESIDENTIAL PROPERTY** - Individual Properties not used as a Single Family Residential Property. These may include manufactured homes and mobile home parks, commercial and office buildings, public buildings and structures, industrial and manufacturing buildings, multi-family dwellings containing three or more dwelling units, places of worship, places of assembly, condominium units where individual units are not townhouses, parking lots or garages, schools and other educational facilities, storage buildings and storage areas covered with impervious surfaces, research stations, hospitals, convalescent centers, airports, agricultural, water reservoirs, water and wastewater treatment plants, and parcels with two or more single family detached dwellings.

**OPERATION, MAINTENANCE AND CAPITAL COSTS** - The associated costs for facilities, energy, manpower, materials, property acquisition, transportation and other services and equipment required to collect, convey, detain, pump and transport stormwater.

**PROPERTY or PROPERTIES** - Each lot, parcel, or portion thereof containing 1,000 or more square feet of impervious surface. Lots or parcels containing less than 1,000 square feet of impervious surface shall be considered vacant land.

**SINGLE FAMILY RESIDENTIAL PROPERTY** - An individual property containing one dwelling unit that is designed for occupancy by one family located on one or more individual lots or parcels of land. The inclusion of townhomes as single family dwellings takes into account the common areas. This does not include individual units in a condominium association or mobile home community in which the subject lot includes only the extent of the individual condominium unit or mobile home, with adjacent driveways, access roads, and open areas located on common ground.

**TOWNHOUSE** – A building which contains at least three (3) but no more than eight (8) single family dwelling units, each of which are separated from the adjoining unit or units by a continuous, common wall extending from the basement to the roof, each unit having independent access directly to the outside and having no units above or below. For the purpose of this definition each dwelling unit is located on an independent tax parcel containing no other dwelling units.



## SECTION 2

### ASSESSMENT OF STORMWATER UTILITY EXPENDITURES

#### Section 2.1 – Administrative Costs

Administration of the Borough MS4 and provision of the stormwater utility service to its users requires effort of many Borough departments and staff members, including the Borough Manager, Code Enforcement Office, Public Works staff and administrative/billing/clerical staff.

#### Section 2.2 – Operation and Maintenance of Storm Sewer Infrastructure

Continued operation of Borough MS4 infrastructure requires routine annual maintenance and repairs. Expenditures associated with operation and maintenance activities primarily consist of labor, material and equipment costs of the Borough staff. Annual operation and maintenance activities typically involve cleaning and repair of collection and conveyance facilities, including, but not limited to, removal of debris from inlets, flushing of storm sewer lines, street sweeping, rebuilding deteriorating inlets, repair of roadway curbs and maintenance of collection channels and swales. Significant annual maintenance is also required to ensure proper operation of post-construction stormwater management BMPs owned by the Borough, including mowing, debris and sediment removal, maintenance of plantings and vegetation, repair or replacement of the facility's infrastructure and repair of erosion areas.

#### Section 2.3 – Capital Improvement Projects for Storm Sewer Infrastructure

A long term capital improvement program consisting of replacement and improvement of storm sewer infrastructure is needed for effective provision of the stormwater utility by the Borough. Storm sewer infrastructure deteriorates with age increasing potential for failure of the facilities and occurrence of flooding or other stormwater runoff issues.

Similarly, instances of undersized infrastructure lacking capacity throughout the Borough contribute to flooding and stormwater runoff issues. Expenditures for long term capital improvement programs are based upon the estimated replacement or improvement cost of the Borough's storm sewer infrastructure, including, inlets and conveyance piping, distributed over a 50 year period.

#### Section 2.4 – NPDES MS4 Permit Compliance

The Borough's MS4 is regulated by the Pennsylvania Department of Environmental Protection (PADEP) under the National Pollutant Discharge Elimination System (NPDES) established as part of the federal Clean Water Act administered by the Environmental Protection Agency (EPA). Compliance with the Borough's NPDES MS4 Permit, number PAI136102, requires implementation of a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4 and protect water quality. Implementation of the SWMP requires compliance with six Minimum Control Measures, as follows:

1. Public Education and Outreach on Stormwater Impacts
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination (IDD&E)
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management (PCSM)
6. Pollution Prevention/Good Housekeeping

In addition, beginning with issuance of the MS4 NPDES permit in December 2018, the Borough will have to comply with Pollutant Reductions Plan requirement for the surface waters within the Borough that are impaired for sediment or nutrients. Between 2018 and 2023, the Borough must implement and perpetually maintain new BMPs to achieve minimum pollutant reductions established by PADEP.

## SECTION 3

### EVALUATION OF USERS/CONTRIBUTORS OF STORMWATER RUNOFF AND QUANTIFICATION OF FEE BASIS CRITERIA

#### Section 3.1 – Introduction

As described as part of Section 1.2 – Purpose, the intent of this study is to establish an equitable fee for each user of the Borough MS4, based, to the extent practicable, on the user's anticipated contribution of runoff to the Borough MS4. In determining the anticipated contribution of runoff to the MS4, the variable most reasonably associated with quantifying the relative contribution of runoff to the MS4 was determined to be impervious area. While land in a natural wooded or meadow state does contribute runoff to the MS4, the magnitude of runoff rate, runoff volume and the introduction of pollutants is greatly increased with the development of impervious surfaces. The basis of the user fee was determined to be based on the present use of the parcel. For analysis, parcels were generally categorized into five groups as follows, and as defined in Section 1.3:

1. Single Family Residential Property
2. Non Single Family Residential Property
3. Vacant Land

Appendix A: Parcel Designations provides mapping showing the categorization of each parcel within the Borough. Parcel lines provided are based on Allegheny County tax parcel data, last updated January 2019. An overview drawing is provided in Appendix A as well as detailed map books overlain on available orthometrics.

### Section 3.2 – Analysis of Single Family Residential Properties

Analysis of land cover conditions was completed using GIS software. The amount of impervious coverage and associated contribution of runoff to the MS4 is not expected to vary significantly between individual Single Family Properties. Because of the apparent relative uniformity of use and magnitude of the number of single family residential parcels located in the Borough, establishment of the user fee based on the precise impervious cover on each parcel is not practical or necessary.

The intent of analysis of Single Family Detached Residential Properties was to establish a reasonable, representative value of all such properties for use as the Equivalent Residential Unit (ERU). This ERU is to be used as the fee basis for all Borough properties.

To determine a reasonable and equitable impervious cover value for an ERU and evaluate the representativeness of the ERU if applied to all Borough Single Family Residential Properties, a random sample of fifty (50) parcels was selected for evaluation. Using GIS software, and aerial photography dated October 2018 were traced and calculated for 50 single family residential parcels. Refer to Appendix A for identification of the randomly selected sample parcels.

### Section 3.3 – Establishment of the ERU

Table B1 of Appendix B provides a summary of average impervious for the single family detached residential property. Based on this analysis one ERU for the Borough recommended to consist of 8,400 square feet of impervious area. Assessment of user fees will be based on this value, with each Single Family Residential Property determined to be one ERU.

### Section 3.4 – Analysis of Non-Single Family Residential Properties

Determination of a single ERU value for Single Family Residential Property was based upon the conclusion of sample size analysis that impervious cover and therefore contribution of stormwater runoff to the MS4 does not vary greatly between properties of each type and as such a single uniform fee for each is reasonable. When evaluating the characteristics of Non-Single Family Residential Properties within the Borough, the same conclusion cannot be made. Land use and impervious cover for Non-Single Family Residential Properties varies significantly for the variety of property uses that fit within this category. Runoff contributions to the MS4 and use of this utility varies significantly and establishment of a uniform fee basis for Non-Single Family Residential Properties would not be equitable. Accordingly, to determine the contribution of stormwater runoff to the MS4 and establish a fee basis for these properties, the actual approximate existing impervious coverage of each lot was calculated. Impervious coverages were calculated using the same methodology as noted for the sample Single Family Residential Properties. Coverage for each parcel was determined using GIS tools and aerial photography dated October 2018. To determine the contribution of stormwater to the MS4 from each property and subsequently the basis of the assessment of the user fee the actual measured impervious area was converted to its corresponding number of ERU's. Fractional ERUs were rounded to the next highest whole number. For example a Non-Single Family Residential Property containing 24,000 square feet of impervious area would be assessed in the amount of 3 ERUs ( $24,000 \text{ sf} \div 8,400 \text{ sf/ERU} = 2.86 \text{ ERUs}$ , rounded to 3 ERUs).

### Section 3.5 – Vacant Land

For purposes of calculating user fees and assessing an equitable distribution among utility users, parcels containing no dwelling units and consisting of less than 1,000 square feet of impervious area were considered to not be significant contributors to the Borough MS4. Those parcels have been categorized as vacant land exempt from the user fee.

## SECTION 4

### ESTABLISHMENT OF RATE PER ERU

#### Section 4.1 – Determination of Total ERUs

Analysis of all properties within the Borough as described in Section 3 yielded the following summation of ERUs existing as of the date of this study:

- Non-Single Family Residential (26 Properties) – 350 ERUs
- Single Family Residential (1,940 Properties) – 1,940 ERUs
- Totals – 2,290 ERUs

Totals presented are indicative of conditions as of the date of this report and the land cover conditions as noted above. ERU totals are subject to change with development currently in construction, development pending construction and future land use changes.

#### Section 4.2 – Determination of Stormwater Expenditures

Anticipated annual expenditures were calculated using information from the Borough's 2018 expenses and supplementing additional costs for long term replacement and improvement of MS4 infrastructure. An approximation was included to account for the Borough's required compliance with the Pollutant Reductions Plan requirements of the 2018 NPDES MS4 Permit. Expenditures were categorized as generally described in Section 2, however, it should be noted that overlap inherently exists among expenditure categories, though tabulation of expenses avoided double-counting of these overlaps. For example, MS4 Permit Compliance requires the effort of many Borough staff members throughout each permit year. While labor and other associated costs for these Borough employees are not specifically included in the MS4 Permit Compliance value, they are included in the Administration and Annual O&M values, as appropriate, and the

tabulation assumes that implicit sharing of expenditures among noted categories avoids unreasonable inflation of total anticipated annual expenditure.

The following table provides a summary of annual anticipated stormwater expenditures. Refer to Tables C located in Appendix C for a complete breakdown of anticipated expenditures for each category.

### **Cost Summary**

Administration	\$12,096
Annual O&M	\$474,660
Capital Improvements	\$188,613
MS4 Permit Compliance	\$257,500
<b>Total Annual Expense</b>	<b>\$932,869</b>

### **Section 4.3 – Establishment of Fee Reduction Credits**

In assigning a user fee and developing an equitable distribution of stormwater utility costs, individual property owners, or users, should be given the opportunity to implement on-site post construction stormwater management best management practices (PCSM BMPs) to reduce the rate of runoff generated by the impervious area on their property. To receive credit, all PCSM BMPs must be designed, operated and maintained to control the peak rate of runoff, up to the 100-year design storm, from the developed property. PCSM BMPs that have not been maintained in accordance with their original design and operation and maintenance plan or the PADEP BMP manual will not be considered to be eligible for credit. Properties with such PCSM BMPs shall be eligible, upon review of the Borough, to receive up to a 50% reduction of the property's fee. For example, a property calculated to contain 100 ERUs, as determined using the methodology noted in Section 3.4, shall be assessed a fee at the rate of 50 ERUs, if the PCSM was designed to serve the entire property. If the PCSM BMP was designed to serve only a portion of the property and its impervious area, the credit shall be prorated for that portion of the billed

ERUs only. For eligibility of a fee reduction credit, the user must file a completed Fee Reduction Credit application with the Borough.

#### Section 4.4 – Determination of Fee per ERU

Anticipated expenditures calculated as part of Section 4.2 are based on present and projected future stormwater expenditures based on current conditions throughout the Borough. This includes the presence of existing PCSM BMPs throughout the Borough, and as such, anticipated fee credits must be incorporated in establishment of the base fee rate. If PCSM BMPs have been properly maintained, the property's impact on stormwater utility expenses are lesser than that of other uncontrolled, developed properties and accordingly these property owners or users will be immediately eligible for the fee reduction credit. Conversely, developed sites without PCSM BMPs, or with PCSM BMPs that have not been maintained to ensure proper operation have a greater contribution to the utility costs and should be expected to receive a higher distribution of the user fee costs. Base calculations as noted in Section 4.1 note 2,298 total ERUs.

Distribution of anticipated annual expenses noted in Section 4.2 among 2,298 ERUs results in a monthly per ERU fee of \$33.83. As the intent of the fee is supplement of existing tax revenue to meet increased regulatory requirement, a \$12.50/month/ERU fee is recommended for initial implementation to address approximately one-third of the anticipated annual stormwater expense budget. This equates to a \$150.00 annual fee per ERU and an annual gross revenue of \$343,500 collected for the Authority Stormwater Fund prior to potential reductions for credit applications for reimbursement.



# **APPENDIX A**

**PARCEL MAP OVERVIEW  
AND MAP BOOK STORMWATER FEE**

# **APPENDIX B**

## **RESIDENTIAL SAMPLE PARCEL SUMMARY**

**FOX CHAPEL SANITARY AUTHORITY  
STORMWATER MANAGEMENT FEE STUDY**

**TABLE B1  
RESIDENTIAL SAMPLE PARCEL SUMMARY**

Sample Parcel	Parcel ID	Property Address	Impervious Area (sf)	Sample Parcel	Parcel ID	Property Address	Impervious Area (sf)
1	170-A-99	628 W WALDHEIM RD, PITTSBURGH, PA 15215	1,700	26	360-J-65	3 INDIAN HILL RD, PITTSBURGH, PA 15238	19,795
2	170-C-99	6 EDGEWOOD RD, PITTSBURGH, PA 15215	7,904	27	361-A-68	104 SILENT RUN RD, PITTSBURGH, PA 15238	6,258
3	170-F-158	907 DELAFIELD RD, PITTSBURGH, PA 15215	8,847	28	361-C-128	119 SHADOW RIDGE DR, PITTSBURGH, PA 15238	4,787
4	170-J-75	210 RUTLEDGE DR, PITTSBURGH, PA 15215	3,427	29	437-C-15	909 SETTLERS RIDGE RD, PITTSBURGH, PA 15238	6,349
5	170-K-30	233 E WALDHEIM RD, PITTSBURGH, PA 15215	2,124	30	437-M-6	165 MILLVIEW DR, PITTSBURGH, PA 15238	9,247
6	170-P-95	209 E WALDHEIM RD, PITTSBURGH, PA 15215	2,721	31	437-N-90	564 DORSEYVILLE RD, PITTSBURGH, PA 15238	7,340
7	170-R-30	310 PASADENA DR S, PITTSBURGH, PA 15215	2,773	32	438-F-10	213 WILMAR DR, PITTSBURGH, PA 15238	6,660
8	224-G-29	612 BERKSHIRE DR, PITTSBURGH, PA 15215	3,821	33	439-G-215	1120 FOX CHAPEL RD, PITTSBURGH, PA 15238	14,191
9	224-L-50	621 TWIN PINE RD, PITTSBURGH, PA 15215	4,409	34	439-H-10	15 OLD TIMBER TRL, PITTSBURGH, PA 15238	5,732
10	225-A-70	126 MARVELWOOD PL, PITTSBURGH, PA 15215	4,796	35	439-J-260	100 NANTUCKET DR, PITTSBURGH, PA 15238	17,923
11	225-D-20	2 WOODCLIFF RD, PITTSBURGH, PA 15238	22,317	36	439-M-105	2 FOXWOOD DR, PITTSBURGH, PA 15238	7,661
12	225-J-100	37 LONGFELLOW RD, PITTSBURGH, PA 15215	7,026	37	440-K-92	104 TREE FARM RD, PITTSBURGH, PA 15238	6,566
13	225-S-125	337 FOX CHAPEL RD, PITTSBURGH, PA 15238	7,560	38	440-L-64	115 TREE FARM RD, PITTSBURGH, PA 15238	6,112
14	226-K-60	224 HILLCREST RD, PITTSBURGH, PA 15238	4,741	39	440-N-54	4 WHITE FAWN LN, PITTSBURGH, PA 15238	6,636
15	227-A-150	118 ROCKWOOD DR, PITTSBURGH, PA 15238	5,707	40	525-B-48	332 OLDE CHAPEL TRL, PITTSBURGH, PA 15238	6,316
16	287-B-20	444 DORSEYVILLE RD, PITTSBURGH, PA 15215	15,787	41	525-C-54	300 OLDE CHAPEL TRL, PITTSBURGH, PA 15238	6,655
17	287-H-4	146 RIDING TRAIL LN, PITTSBURGH, PA 15215	9,184	42	525-H-3	2 TWIN STREAM DR, PITTSBURGH, PA 15238	8,527
18	287-P-112	104 WYNNWOOD DR, PITTSBURGH, PA 15215	11,238	43	525-N-204	100 SHANNON DR, PITTSBURGH, PA 15238	5,369
19	289-B-175	109 PHEASANT DR, PITTSBURGH, PA 15238	6,234	44	525-S-220	500 FAIRVIEW RD, PITTSBURGH, PA 15238	10,614
20	289-N-70	126 FIELD CLUB RD, PITTSBURGH, PA 15238	9,923	45	526-A-82	59 LONG MEADOW DR, PITTSBURGH, PA 15238	12,154
21	289-P-64	156 NORTH DR, PITTSBURGH, PA 15238	4,394	46	526-G-140	25 CHAPEL RIDGE RD, PITTSBURGH, PA 15238	6,100
22	358-G-120	103 HAVERFORD RD, PITTSBURGH, PA 15238	10,120	47	526-J-250	5 CHAPEL OAK RD, PITTSBURGH, PA 15238	4,590
23	359-C-215-O-1	572 SQUAW RUN RD E, PITTSBURGH, PA 15238	12,704	48	526-L-215	111 QUAIL HILL RD, PITTSBURGH, PA 15238	7,457
24	359-P-20	714 SQUAW RUN RD E, PITTSBURGH, PA 15238	14,178	49	621-N-85	6 SHIRL DR, PITTSBURGH, PA 15238	7,895
25	360-C-100	401 WINDMERE DR, PITTSBURGH, PA 15238	25,988	50	621-P-8	23 OLD INDIAN TRAIL CT, PITTSBURGH, PA 15238	9,231

Summary	
Average Area (sf)	8,396
Proposed ERU (sf)	8,400



# **APPENDIX C**

## **BREAKDOWN OF ANTICIPATED EXPENDITURES**

**FOX CHAPEL SANITARY AUTHORITY  
STORMWATER MANAGEMENT FEE STUDY**

**TABLE C  
ANTICIPATED ANNUAL EXPENDITURES**

ITEM NO.	POTENTIAL BUDGET ACCOUNT	QUANTITY	UNIT	UNIT COST	ITEM COST
Adminstration					
1	Administration	2018 Borough Budget - Typical Year Expenditure (2% of Salary and Benefits)			\$8,076
2	Code Enforcement	2018 Borough Budget - Typical Year Expenditure (5% of Salary and Benefits)			\$4,020
Administration Total					\$12,096
Annual Operations and Maintenance					
1	Public Works Staff	2018 Borough Budget - Typical Year Expenditure (20% of Salary and Benefits)			\$149,660
2	Storm Sewer Materials	2018 Borough Budget - Typical Year Expenditure			\$325,000
Operation and Maintenance Total					\$474,660
Capital Improvements					
1	Storm Sewer Piping	127,533	LF	\$50.00	\$6,376,650
2	Inlets	1,018	EA	\$3,000.00	\$3,054,000
Maintenance Subtotal					\$9,430,650
Annual Cost over 50 year cycle					\$188,613.00
MS4 Permit Compliance					
1	Annual Tasks - Miscellaneous Expenditures - Training Seminars, Publications, Postage, Advertisements, Public Events, etc.	Anticipated Annual Costs for 2018 Permit			\$10,000
2	Annual Tasks - Engineering Support	Anticipated Annual Costs for 2018 Permit			\$17,100
3	PRP Plan Implementation	Anticipated Annual Costs for 2018 Permit			\$230,400
MS4 Permit Compliance Total					\$257,500

<b>Anticipated Annual Stormwater Expenditures</b>	<b>\$932,869.00</b>
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