

STORMWATER MANAGEMENT FEE STUDY

Prepared For

**MOON TOWNSHIP
1000 Beaver Grade Road
Moon Township, Pennsylvania 15108**

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**MOON TOWNSHIP
STORMWATER MANAGEMENT FEE STUDY**

SECTION 1

INTRODUCTION

Section 1.1 – Background

Moon Township 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 Township'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 Township. To this effect, the Township's MS4 should be considered a public utility serving each property owner, or user of the MS4, throughout the Township. 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 Township's General Fund comprised of revenue generated through sanitary sewer and potable water service fees. 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.

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 Township'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 Township'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 3,800 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 under natural conditions, pre-existent to development, or which cause water to run off the surface in greater quantities, or at an increased rate of flow than under natural conditions, pre-existent 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.

MULTI-FAMILY RESIDENTIAL PROPERTY – A property containing a single two, three, or four family attached structure containing only two, three, or four dwelling units, with each unit having independent access to the outside.

NON-SINGLE-FAMILY RESIDENTIAL PROPERTY – Individual Properties not used as a Single Family Detached Property, Single Family Attached Property or Multi-Family Property. These may include manufactured homes and mobile home parks, commercial and office buildings, public buildings and structures, industrial and manufacturing buildings, multi-family dwelling containing five or more dwelling units, lots with more than one detached single family house, places of worship, places of assembly, condominium association plans , 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 800 or more square feet of impervious surface. Lots or parcels containing less than 800 square feet of impervious surface shall be considered vacant land.

SINGLE FAMILY ATTACHED RESIDENTIAL PROPERTY – An individual property containing one dwelling unit that is designed for occupancy by one family located on one parcel of land that is attached to another dwelling unit. This does not include individual units in a multifamily dwelling containing 2, 3, or 4 units in which the individual dwelling units are located on a single parcel. This definition does not include individual units in a condominium association plan in which the subject lot includes only the extent of the individual condominium unit, with adjacent driveways, access roads, and open areas located on common ground.

SINGLE FAMILY DETACHED RESIDENTIAL PROPERTY – A 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 that is not attached to another dwelling unit. This does not include individual units in a condominium association plan 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 Township MS4 and provision of the stormwater utility service to its users requires effort of many Township departments and staff members, including the Township Manager, Superintendent and administrative/billing/clerical staff.

Section 2.2 – Operation and Maintenance of Storm Sewer Infrastructure

Continued operation of Township 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 Township 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 Township, 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 Township. 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

Township 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 Township's storm sewer infrastructure, including, inlets, conveyance piping, culverts, bridges and roadway curbs distributed over a 40 year period.

Section 2.4 – NPDES MS4 Permit Compliance

The Township'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 Township's NPDES MS4 Permit, number PAG136274, 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 March 2018, the Township will have to comply with Pollutant Reductions Plan requirement for the surface waters within the Township that are impaired for sediment or nutrients. Between 2018 and 2023, the Township 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 Township MS4, based, to the extent practicable, on the user's anticipated contribution of runoff to the Township 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 Detached Residential Property
2. Single Family Attached Residential Property
3. Multi-Family Residential Property
4. Non Single Family Residential Property
5. Vacant Land

Appendix A: Parcel Designations provides mapping showing the categorization of each parcel within the Township. 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 Detached Properties. Because of the apparent relative uniformity of use and magnitude of the number of single family residential parcels located in the Township, 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 Township properties.

To determine a reasonable and equitable impervious cover value for an ERU and evaluate the representativeness of the ERU if applied to all Township Single Family Residential Properties, a random sample of one-hundred (100) parcels was selected for evaluation. Using GIS software, and aerial photography dated October 2018 were traced and calculated for 100 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 Township recommended to consist of 3,800 square feet of impervious area. Assessment of user fees will be based on this value, with each Single Family Detached Residential Property determined to be one ERU.

Table B2 of Appendix B provides a summary of average impervious area for the single family attached properties. Based on this analysis, the rate of 0.5 ERU is recommended as the average impervious area for the single family attached properties is approximately half the recommended 3,800 square feet of impervious area used for single family detached properties.

A subsequent review was conducted of the remaining residential property type category, Multi-Family Residential Dwellings. Upon review of impervious area on typical lots of each type, with respect to a typical Single Family Detached Residential, the fee assessment basis for each property type is recommended as follows:

- Multi-Family Residential: 0.5 ERU per dwelling unit
 - Two Family: 1 ERU
 - Three Family: 1.5 ERUs
 - Four Family: 2 ERUs

Section 3.4 – Analysis of Non-Single Family Residential Properties

Determination of a single ERU value for Single Family Detached Residential, Single Family Attached Residential, and Multi-Family Residential Properties 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 Township, 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 half number. For example a Non-Single Family Residential Property containing 18,000 square feet of impervious area would be assessed in the amount of 5 ERUs ($18,000 \text{ sf} \div 3,800 \text{ sf/ERU} = 4.74 \text{ ERUs}$, rounded to 5 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 800 square feet of impervious area were considered to not be significant contributors to the Township 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 Township as described in Section 3 yielded the following summation of ERUs existing as of the date of this study:

- Non-Single Family Residential (545 Properties) – 17,448.5 ERUs*
- Single Family Detached Residential (7,003 Properties) – 7,003 ERUs
- Single Family Attached Residential (469 Properties) – 234.5 ERUs
- Multi-Family Residential (125 Properties) – 183.5 ERUs
- Totals – 24,869.5 ERUs

*Includes 6,974 ERUs from the Pittsburgh International Airport

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 Township's 2017 expenses and supplementing additional costs for long term replacement and improvement of MS4 infrastructure. An approximation was included to account for the Township'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 Township staff members

throughout each permit year. While labor and other associated costs for these Township 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	\$39,093
Annual O&M	\$352,947
Capital Improvements	\$390,445
MS4 Permit Compliance	\$535,000
Total Annual Expense	\$1,317,484

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 Township, to receive up to a 50% reduction of the property's base 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 improvements installed based on the Township's Small Project Development Stormwater Management Plan Application, properties shall be eligible for credit as follows. Projects proposing on-lot BMPs to associated with the construction of a new single-family home shall be eligible for credit up to a up to 40% reduction of the property's base fee. Projects related to construction of improvements to an existing single-family home (i.e. construction of an addition, detached garage, barn, accessory structure etc.), shall be eligible for credit of up to a 20% reduction of the property's base fee.

Public Education and Involvement Credit may also be considered for users that have the capability to conduct, organize and implement public education or public involvement activities related to stormwater management or stormwater quality. This credit is based upon public participation and involvement requirements of Minimum Control Measures (MCM) No. 1 and No. 2 as part of the Township's MS4 Permit. Groups and/or organizations that assist the Township in completing its goals for MCM 1 and MCM 2 will be eligible for credit up to 10% of the annual fee, at the discretion of the Township, based upon the proposed education or involvement. Eligibility for credit requires a minimum annual documented participation of 20 participant manhours associated with educational or involvement activities sponsored by the applicant. All activities must be approved for credit eligibility in advance. For receipt of credit, the applicant must provide written copies of educational curriculum or materials and/or written agendas and descriptions for involvement activities. Subsequent to completion of the educational activity the applicant must furnish to the Township documentation of completed activities, to include, at a minimum, a written summary of the planning, implementation and results of the activity or event, a sign in sheet or roster identifying the participants and photographic documentation of the activity. This credit must be applied for, reviewed, and approved annually.

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 Township. This includes the presence of existing PCSM BMPs throughout the Township, 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 24,869.5 total ERUs. With anticipated credits, there is a total of 19,587.75 total ERUs

Distribution of anticipated annual expenses noted in Section 4.2 among 19,587.75 ERUs results in a monthly per ERU fee of \$5.61. For implementation, a \$5.50/month/ERU fee is recommended. This equates to \$66.00 annual fee per ERU and an annual gross revenue of \$1,292,791.50 collected for the Township Stormwater Fund when accounting for anticipated credits.

APPENDIX A

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

APPENDIX B

RESIDENTIAL SAMPLE PARCEL SUMMARY

MOON TOWNSHIP
STORMWATER MANAGEMENT FEE STUDY

TABLE B1
RESIDENTIAL SAMPLE PARCEL SUMMARY
SINGLE FAMILY DETACHED HOMES

Sample Parcel	Parcel ID	Property Address	Impervious Area (sf)	Sample Parcel	Parcel ID	Property Address	Impervious Area (sf)
1	925-A-133	319 SHADY GLEN DR, CORAOPOLIS, PA, 15108	2156.04	51	597-G-47	166 GREENLEA DR, CORAOPOLIS, PA, 15108	3172.97
2	926-F-501	303 RANCHERO DR, CORAOPOLIS, PA, 15108	2751.05	52	597-S-24	112 CURRY CT, CORAOPOLIS, PA, 15108	2824.84
3	1051-H-47	1576 SPRING RUN RD EXT, CORAOPOLIS, PA, 15108	6310.39	53	596-C-237	1013 SANDHURST DR, CORAOPOLIS, PA, 15108	3786.31
4	272-J-240	2516 STATE AVE, CORAOPOLIS, PA, 15108	2855.91	54	597-M-253	133 TORY RD, CORAOPOLIS, PA, 15108	2498.88
5	341-S-208	1635 GLENBROOK AVE, CORAOPOLIS, PA, 15108	3455.63	55	599-C-87	222 WESTMINSTER DR, CORAOPOLIS, PA, 15108	2826.59
6	341-R-353	1896 BEECHFORD AVE, CORAOPOLIS, PA, 15108	3188.27	56	599-L-352	111 WESTBURY DR, CORAOPOLIS, PA, 15108	3577.1
7	414-D-80	103 GATEHOUSE DR, CORAOPOLIS, PA, 15108	6881.77	57	701-M-25	12 AIRLANE DR, CORAOPOLIS, PA, 15108	2873.47
8	337-B-8	5050 STAGS LEAP LN, CORAOPOLIS, PA, 15108	3081.16	58	700-M-1	1806 MADISON DR, CORAOPOLIS, PA, 15108	3839.6
9	338-K-14	4136 DUCKHORN DR, CORAOPOLIS, PA, 15108	5647.79	59	699-H-371	103 BLACK FRIAR DR, CORAOPOLIS, PA, 15108	2571.83
10	340-R-218	2134 JOHNS RIDGE RD, CORAOPOLIS, PA, 15108	5211.18	60	599-P-96	219 LYTTON RD, CORAOPOLIS, PA, 15108	2689.4
11	340-J-3	2007 MARJORIE LN, CORAOPOLIS, PA, 15108	6722.03	61	697-E-232	207 BENDIX DR, CORAOPOLIS, PA, 15108	2091.07
12	340-B-98	2043 MONTOUR ST EXT, CORAOPOLIS, PA, 15108	4110.71	62	698-P-91	195 ROSEMONT DR, CORAOPOLIS, PA, 15108	2383.35
13	415-K-15	118 OLDE MANOR LN, CORAOPOLIS, PA, 15108	4321.37	63	806-D-265	360 MOON CLINTON RD, CORAOPOLIS, PA, 15108	3828.91
14	415-G-42	117 BERTLEY RIDGE DR, CORAOPOLIS, PA, 15108	3395.12	64	697-H-319	225 SPRINGER DR, CORAOPOLIS, PA, 15108	4303.64
15	414-G-26	101 CHERRINGTON CT, CORAOPOLIS, PA, 15108	9694.4	65	697-M-68	110 S PATTON DR, CORAOPOLIS, PA, 15108	3291.39
16	416-N-263	219 EWINGS MILL RD, CORAOPOLIS, PA, 15108	5543.52	66	596-F-52	313 MCCAFFREY DR, CORAOPOLIS, PA, 15108	4415.9
17	416-M-323	316 EWINGS MILL RD, CORAOPOLIS, PA, 15108	3434.74	67	699-G-127	119 SHAFER RD, CORAOPOLIS, PA, 15108	3917
18	416-R-207	304 BEAGLE CT, CORAOPOLIS, PA, 15108	5372.7	68	700-K-8	1867 MADISON DR, CORAOPOLIS, PA, 15108	9254.83
19	417-R-270	104 QUEENSGATE DR, CORAOPOLIS, PA, 15108	2737.39	69	699-H-107	137 DOVER DR, CORAOPOLIS, PA, 15108	2087.13
20	417-C-316	104 LANSDOWNE DR, CORAOPOLIS, PA, 15108	4103.93	70	810-M-294	1004 ESTATE DR, CORAOPOLIS, PA, 15108	7104.38
21	417-G-158	126 PHILOMENA DR, CORAOPOLIS, PA, 15108	2995.65	71	700-B-13	2031 BROAD HILL FARMS RD, CORAOPOLIS, PA, 15108	6323.06
22	341-E-51	1321 PARK DR, CORAOPOLIS, PA, 15108	3136.75	72	701-E-44	1707 WHEATLAND CT, CORAOPOLIS, PA, 15108	2953.52
23	418-M-182	1510 CHARLTON HEIGHTS RD, CORAOPOLIS, PA, 15108	3282.84	73	808-N-118	204 SANTA ANNA DR, CORAOPOLIS, PA, 15108	2327.07
24	418-L-78	1149 MAPLE ST EXT, CORAOPOLIS, PA, 15108	5090.66	74	808-P-108	115 WEST WIND DR, CORAOPOLIS, PA, 15108	2999.71
25	418-N-73	209 OAKHAVEN DR, CORAOPOLIS, PA, 15108	5813.43	75	807-B-21	526 BLUE RIDGE DR, CORAOPOLIS, PA, 15108	2821.8
26	417-F-242	108 STILLWOOD DR, CORAOPOLIS, PA, 15108	5929.39	76	807-E-22	429 BLUE RIDGE DR, CORAOPOLIS, PA, 15108	3098.08
27	502-D-304	104 FITZRANDOLPH DR, CORAOPOLIS, PA, 15108	4505.02	77	808-S-65	409 ELGIN CIR, CORAOPOLIS, PA, 15108	2562.62
28	504-G-39	221 THORNWOOD CT, CORAOPOLIS, PA, 15108	3786.51	78	807-H-286	190 FOXWOOD RD, CORAOPOLIS, PA, 15108	4556.96
29	419-P-21	378 INDIAN RIDGE DR, CORAOPOLIS, PA, 15108	3471.93	79	699-P-248	113 BEACON HILL DR, CORAOPOLIS, PA, 15108	4845.48
30	419-N-11	505 DOGWOOD CT, CORAOPOLIS, PA, 15108	4480.63	80	810-K-213	1226 SPRING RUN RD EXT, CORAOPOLIS, PA, 15108	3741.61
31	420-P-165	411 WEST END AVE, CORAOPOLIS, PA, 15108	1790.41	81	809-G-20	617 MEADE DR, CORAOPOLIS, PA, 15108	3189.6
32	504-D-25	128 TIFFANY RIDGE DR, CORAOPOLIS, PA, 15108	3023.43	82	809-C-94	505 BOGGS SCHOOL RD, CORAOPOLIS, PA, 15108	6646.86
33	419-B-179	712 THORN ST, CORAOPOLIS, PA, 15108	1059.37	83	808-H-311	715 CULLODEN CT, CORAOPOLIS, PA, 15108	3307.81
34	500-F-315	280 HOOKSTOWN GRADE RD, CORAOPOLIS, PA, 15108	3191.27	84	809-R-15	406 LYTHAM CT, CORAOPOLIS, PA, 15108	2424.28
35	500-G-221	105 TREEVIEW DR, CORAOPOLIS, PA, 15108	2188.49	85	809-J-180	432 SCOTTSDALE DR, CORAOPOLIS, PA, 15108	2031.11
36	500-R-269	620 HOOKSTOWN GRADE RD, CORAOPOLIS, PA, 15108	6069.86	86	811-P-70	1728 BRODHEAD RD, CORAOPOLIS, PA, 15108	4986.59
37	501-B-347	1819 BEAVER GRADE RD, CORAOPOLIS, PA, 15108	5183.6	87	810-B-112	105 BAUN DR, CORAOPOLIS, PA, 15108	2732.09
38	502-L-179	412 MARNEY DR, CORAOPOLIS, PA, 15108	7411.24	88	928-M-18	121 BOGGS AVE, CORAOPOLIS, PA, 15108	6686.51
39	502-E-160	133 NYETIMBER PKWY, CORAOPOLIS, PA, 15108	5024.1	89	924-L-170	108 MERCURY DR, CORAOPOLIS, PA, 15108	3042.86
40	504-E-132	209 LARUE DR, CORAOPOLIS, PA, 15108	3643.07	90	924-K-128	594 MOON CLINTON RD, CORAOPOLIS, PA, 15108	2657.75
41	505-N-354	206 LAURA LEE DR, CORAOPOLIS, PA, 15108	4046.78	91	806-A-153	509 MOON CLINTON RD, CORAOPOLIS, PA, 15108	3069.22
42	504-B-357	205 FERNVUE DR, CORAOPOLIS, PA, 15108	2460.03	92	925-D-44	505 OVERHEAD DR, CORAOPOLIS, PA, 15108	2079.36
43	506-N-13	133 JAROD DR, CORAOPOLIS, PA, 15108	3321.77	93	925-C-38	611 FIELDSTONE DR, CORAOPOLIS, PA, 15108	2390.55
44	505-E-295	114 W CRESTRIDGE DR, CORAOPOLIS, PA, 15108	2598.9	94	808-K-5	1025 AUTUMN WOODS DR, CORAOPOLIS, PA, 15108	4304.94
45	505-F-182	110 RIVERCREST DR, CORAOPOLIS, PA, 15108	3483.59	95	925-G-5	4016 TURNWOOD LN, CORAOPOLIS, PA, 15108	3082.47
46	596-M-105	203 SNYDER DR, CORAOPOLIS, PA, 15108	2079.35	96	925-J-15	7017 WEEPING WILLOW DR, CORAOPOLIS, PA, 15108	2355.91
47	596-G-241	901 TOTTENHAM DR, CORAOPOLIS, PA, 15108	2725.89	97	925-F-205	5010 SPRUCE DR, CORAOPOLIS, PA, 15108	2840.8
48	595-D-236	220 GENTRY RD, CORAOPOLIS, PA, 15108	7086.74	98	926-G-11	127 DARNLEY DR, CORAOPOLIS, PA, 15108	2074.36
49	597-P-17	103 SNELL DR, CORAOPOLIS, PA, 15108	3198.63	99	927-R-111	128 GLENGARRY DR, CORAOPOLIS, PA, 15108	3675.89
50	597-E-163	105 GREENLEA DR, CORAOPOLIS, PA, 15108	1702.9	100	927-K-176	1235 N FLAUGHERTY RUN RD, CORAOPOLIS, PA, 15108	3494.65

Summary	
Average Area (sf)	3,814
Proposed ERU (sf)	3,800

**MOON TOWNSHIP
STORMWATER MANAGEMENT FEE STUDY**

**TABLE B2
RESIDENTIAL SAMPLE PARCEL SUMMARY
TOWNHOUSES**

Sample Parcel	Parcel ID	Property Address	Impervious Area (sf)
1	341-S-358	1883 OAKBINE AVE, CORAOPOLIS, PA, 15108	2243.8
2	414-E-18	916 MONTCLAIR DR, CORAOPOLIS, PA, 15108	1881.1
3	414-E-22	920 MONTCLAIR DR, CORAOPOLIS, PA, 15108	2138.18
4	500-L-228	213 NOBLE WOODS DR, CORAOPOLIS, PA, 15108	1446.3
5	500-L-232	209 NOBLE WOODS DR, CORAOPOLIS, PA, 15108	1521.98
6	503-A-22	533 PARKRIDGE LN, CORAOPOLIS, PA, 15108	1225.1
7	503-A-26	535 PARKRIDGE LN, CORAOPOLIS, PA, 15108	1081.04
8	504-K-3	104 CANTERBURY DR, CORAOPOLIS, PA, 15108	1334.75
9	504-K-5	108 CANTERBURY DR, CORAOPOLIS, PA, 15108	1473.1
10	504-L-101-D	1002 GREYSTONE DR, CORAOPOLIS, PA, 15108	2517.14
11	504-L-45	704 CANTERBURY DR, CORAOPOLIS, PA, 15108	1301.6
12	504-L-47	700 CANTERBURY DR, CORAOPOLIS, PA, 15108	1907.07
13	504-R-32-D	3206 WARWICK CT, CORAOPOLIS, PA, 15108	2669.45
14	504-R-40-D	3907 WARWICK CT, CORAOPOLIS, PA, 15108	2613.91
15	504-R-8-C	2101 GREYSTONE DR, CORAOPOLIS, PA, 15108	2302.69
16	506-A-21	1571 STAUNTON DR, CORAOPOLIS, PA, 15108	3523.34
17	506-A-24	1567 STAUNTON DR, CORAOPOLIS, PA, 15108	3968.79
18	596-D-3	103 PARKRIDGE LN, CORAOPOLIS, PA, 15108	1105.66
19	596-D-5	105 PARKRIDGE LN, CORAOPOLIS, PA, 15108	933.92
20	600-M-2-230A	1400 ELIZABETH CT, CORAOPOLIS, PA, 15108	2998.98
21	600-S-153-229A	1404 ELIZABETH CT, CORAOPOLIS, PA, 15108	2805.69
22	697-A-15	144 LOCKHEED DR, CORAOPOLIS, PA, 15108	1484.09
23	697-A-22	140 LOCKHEED DR, CORAOPOLIS, PA, 15108	1449.96
24	698-N-24	114 LOCKHEED DR, CORAOPOLIS, PA, 15108	1675.12
25	698-N-26	110 LOCKHEED DR, CORAOPOLIS, PA, 15108	1739.51

Summary	
Average Area (sf)	1,974

APPENDIX C

BREAKDOWN OF ANTICIPATED EXPENDITURES

**MOON TOWNSHIP
STORMWATER MANAGEMENT FEE STUDY**

**TABLE C
ANTICIPATED ANNUAL EXPENDITURES**

ITEM NO.	POTENTIAL BUDGET ACCOUNT	QUANTITY	UNIT	UNIT COST	ITEM COST
Adminstration					
1	Executive/Admin	2019 Township Budget - Typical Year Expenditure (2% Employee Expense)			\$13,886
2	Community Development	2019 Township Budget - Typical Year Expenditure (5% Employee Expense)			\$25,207
Administration Total					\$39,093
Annual Operations and Maintenance					
1	Public Works Staff	2019 Township Budget - Typical Year Expenditure (15% Employee Expense)			\$332,947
2	Storm Sewer Materials	2019 Township Budget - Typical Year Expenditure			\$20,000
Operation and Maintenance Total					\$352,947
Capital Improvements					
1	Storm Sewer Piping	273,865	LF	\$50.00	\$13,693,250
2	Inlets	1,943	EA	\$3,000.00	\$5,829,000
Maintenance Subtotal					\$19,522,250
Annual Cost over 50 year cycle					\$390,445.00
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			\$10,000
3	PRP Plan Implementation	Anticipated Annual Costs for 2018 Permit			\$515,000
MS4 Permit Compliance Total					\$535,000

Anticipated Annual Authority Stormwater Expenditures	\$1,317,484.53
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APPENDIX D

CONDO ASSOCIATIONS

