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Cocomar Water Control District Stormwater Equivalent Residential Unit Derivation

1. Introduction

The City has been operating a stormwater management utility for the purpose of maintaining and enhancing stormwater infrastructure within its service area. In 1993, when the utility was first developed, the area associated with the Cocomar Water Control District (WCD) was excluded. The City has requested Hazen to provide engineering services related to extension of the City's stormwater service area to include selected parcels that are located within the Cocomar WCD.

This study is based on completion of the following work:

- Evaluate a statistically relevant random sample of Single-Family Residences (SFRs) within Cocomar. Derive an Equivalent Residential Unit (ERU) through measurement of the impervious area of selected parcels. Determine a City-wide weighted ERU value based on the total number of SFRs in Cocomar versus the rest of Margate, using the historical ERU value (applied to the rest of the City) and the Cocomar ERU value (applied to Cocomar).
- Measure the impervious area of the non-residential parcels within Cocomar. Determine the unique number of billing units for these nonresidential parcels using the new ERU value.

To this end, the following data was obtained from the City:

- Broward County Property Appraiser GIS parcel polygon layer including all parcels within the City's existing and proposed extended service area.
- Broward County Tax Roll file in Microsoft Excel .xlsx format including all parcels within the City's existing and proposed extended service area.
- Broward County high resolution aerial orthophotography for an area including both the existing and proposed extended stormwater service area.

2. Cocomar WCD Stormwater ERU Derivation

Stormwater charges typically depend on the characteristics of parcels including the dimensions of impervious area. Impervious area is the portion of a parcel which has been altered by development and which prevents the percolation of rainwater into the ground, thereby providing an indicator of the amount of runoff that a property passes into the City’s stormwater management system.

Electronic files containing property appraiser parcel data were brought into GIS, mapped over aerial photograph imagery to create an underlay to the parcel polygons, and joined with the tax roll file which included detailed property use descriptions. Subsequent work enabled development of the following findings:

- A total of 1,390 SFR parcels are contained by the Cocomar WCD within the City of Margate. A statistically significant sample size of 126 parcels was identified for GIS evaluation and measurement, based on a 90 percent confidence level and a 7 percent margin of error.
- The Cocomar WCD ERU is 2,078 square feet, based on the mean impervious area of the measured sample parcels.
- A total of 11,550 SFR parcels are contained within the City of Margate but fall outside the Cocomar WCD. The historical City of Margate ERU is 2,382 square feet.
- The City-wide weighted ERU (reference Table 1 below) value, for the total number of SFR parcels in Cocomar versus the rest of Margate, is 2,349 square feet.

Table 1: City-wide weighted ERU

Area	SFR Parcels	Weight	ERU	City-Wide Weighted ERU
Cocomar WCD	1,390	11 %	2,078	2,349
City of Margate	11,550	89 %	2,382	

3. Non-Residential Impervious Area Measurement

Margate’s Code of Ordinances, Section 34, addresses the Stormwater Management Utility and defines the fee for nonresidential property as follows:

“The fee for nonresidential property is the rate for one (1) ERU multiplied by the numerical factor. The numerical factor is obtained by dividing the total impervious area in square feet of the nonresidential property by the square footage for one (1) ERU, as set forth in section 34-2. The resulting calculation is Fee = ERU rate X (parcel impervious area expressed in square feet divided by the square footage for one (1) ERU).”

Based on the above definition, impervious area was measured individually for each non-residential parcel in the Cocomar WCD. A Microsoft Excel electronic file, containing a proposed stormwater billing roll

supplement indicating (by folio) each parcel's assigned ERU, is being separately delivered for the City's use.

Table 2 summarizes the findings presented above for the Cocomar WCD, including the estimated total ERUs for residential fixed-fee and nonresidential variable-fee billing classes, and represents a starting point for understanding ERU-based revenue potential.

Table 2: Summary of Cocomar WCD ERU

Billing Class	Billing Structure	Estimated Impervious Area (Acres)	ERU Calculation	Number of ERUs
Residential, Single Family	Flat fee based on average residential billing class impervious area	Not applicable	One per dwelling unit	1,391 ¹
Residential, Multi-Family	Flat fee based on average residential billing class impervious area	Not applicable	One per dwelling unit	2,710
Non-Residential	Calculated fee based on actual parcel impervious area divided by average residential impervious area	335	Impervious area divided by 2,078	7,049

Notes:

¹ For single-family residential the tax roll indicated 1,354 dwelling units at the time of this evaluation; however, there are 1,390 parcels. One of the 1,390 parcels contained two dwelling units, and aerial photos indicated that those parcels without dwelling units on the tax roll appeared to be in various stages of development. Accordingly, 1,391 ERUs are assumed so as to reflect these conditions.

² Multi-family dwelling units were determined using the tax roll.