

**CITY OF PALM COAST  
STORMWATER UTILITY REVISIONS  
FINAL REPORT**

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## 1.0 OVERVIEW

Jones Edmunds worked with the City of Palm Coast to revise the City's stormwater utility ordinance. As part of this effort Jones Edmunds analyzed the available data to help address concerns with the current stormwater utility rate structure. Jones Edmunds' analysis was broken down into six primary tasks:

- Collecting and reviewing available data.
- Delineating the stormwater service area.
- Determining the relative impact on the stormwater system of vacant land compared to land with impervious area.
- Developing a possible appeals policy for mitigation credit based on impacts to the City's stormwater infrastructure.
- Quantifying the possible impacts of these changes on the stormwater utility fee.
- Revising the City of Palm Coast stormwater utility ordinance.

## 2.0 DATA COLLECTION

### 2.1 SPATIAL DATA

Jones Edmunds received the following GIS data that are pertinent to the stormwater utility ordinance revision:

- Digital Terrain Model (DTM) – The City provided Jones Edmunds with a DTM derived from auto-filtered Light Detection and Ranging (LiDAR) data and associated breaklines. The LiDAR data were collected by Merrick in 2004 and reprocessed and breaklined by PBS&J, Dewberry and Sanborn in 2008. The DTM covers approximately 94 square miles.
- Palm Coast Stormwater Asset Database – The City provided Jones Edmunds with the April 14, 2009, version of the City's Stormwater Asset database. The database included the following pertinent feature classes:
  - dOpenChannel – Polyline feature class showing the location of approximately 129 miles of City-maintained ditches and channels.
  - dPipes – Polyline feature class showing the location of 66 culvert or collector pipes maintained by the City of Palm Coast.
  - dWeir – Point feature class showing the location of 21 weirs maintained by the City of Palm Coast.

Based on review of the data and a discussion with staff, the stormwater asset database did not fully cover all of the stormwater assets maintained by the City. Jones Edmunds worked with the City to identify City-maintained stormwater assets that were not

included in the Stormwater Asset Database and that would affect the determination of the stormwater utility service area.

- Flagler County Parcel Information – The City provided Jones Edmunds with the Flagler County parcel shapefile received by the City April 2, 2009. The Flagler County parcels contained the following pertinent information for each parcel:
  - Property area
  - Building area
  - Other imperviousness
  - Property use description
  
- Stormwater Planimetrics Geodatabase – The City provided Jones Edmunds with a Stormwater Planimetrics Geodatabases that contained three feature datasets: *BaseMapInfo*, *Impervious*, and *Misc*.
  - The *BaseMapInfo* feature dataset included the Palm Coast City Limits (89.3 square miles), a feature class of dry lakes, and a feature class showing waterbodies within the City limits. The Palm Coast City Limits provided in this feature dataset were used for the stormwater utility analysis.
  - The *Impervious* feature dataset contained a polygon feature class of 1170 building footprints and a feature class of 619 impervious surfaces.
  - The *MiscCityData* feature dataset contained feature classes of street centerlines, future landuse, Palm Coast zoning, and wetland and vegetation inventory. The wetland and vegetation inventory were not used in the analysis as it was marked “for general reference only.”

## 2.2 FINANCIAL DATA

The City provided Jones Edmunds with a database and Crystal Report summary of the City’s stormwater utility billing data. The database contained a key field that related the stormwater utility billing data to the Flagler County parcel information. The billing summary was divided into two categories—those billed monthly and those billed annually. The total for the monthly billing category was \$328,997, which equates to \$3,947,968 annually. The total for the annual billing category was \$2,146,316. Therefore, the current total annual revenue potential (based on the April 2009 version of the revenue database) for the City of Palm Coast stormwater utility was \$6,094,284.

### 3.0 STORMWATER UTILITY OVERVIEW

#### 3.1 LEGAL FRAMEWORK

The City of Palm Coast stormwater utility is an enterprise fund established by the City to ensure stable funding for the stormwater operations and capital projects that are critical for addressing flooding issues and meeting the required level of service for the City. The stormwater utility provides the majority of the stormwater funding, thereby offsetting the need for other funding sources. In addition to the statutory authority to establish a utility, the finding from *City of Gainesville v. State of Florida Dep't of Transp.*, 778 So. 2d 519 (Fla. 1<sup>st</sup> DCA 2001) was that cities are authorized by statute to create stormwater utilities. The appellate court also found that the City of Gainesville stormwater utility charges could be considered fees—not a special assessment—because there was a reasonable relationship between the amount of the fee and the cost or burden of the service. Based on this finding, all users of the City of Palm Coast stormwater utility (including the State) could be considered compelled to pay the user fee.

As noted in *Establishing A Stormwater Utility In Florida* (FSA, 2003), in order to charge a user fee for a stormwater utility the amount of the fee must be commensurate with the burden that the user of the stormwater system places on the stormwater system. The City of Palm Coast maintains an extensive stormwater system—more than 129 miles of canals and ditches, 21 weirs, and many culverts. This stormwater system drains runoff from the City of Palm Coast and significantly reduces the likelihood and extent of flooding within the City. If the City's stormwater system did not function as designed, many of the properties within the City would be in a higher-risk flood zone and/or would have smaller percentages of the parcel that could adequately serve its designated land use. All the properties that drain into this stormwater system place a burden on the system since the City is required to maintain the system to adequately convey the runoff from all these properties. The burden or impact that each property has on the City's system is typically related to factors such as the following:

- The peak rate of runoff from the property.
- The volume of runoff from the property.
- The length and type of city-maintained stormwater system that the runoff from the property flows through.

It is not feasible for the City of Palm Coast to quantify the exact burden that each property places on the stormwater system. However, we do recommend that the City differentiate fees between various categories and sizes of properties—along with mitigating factors such as stormwater facilities—based on an estimate of the burden that these properties place on the city-maintained stormwater system. Our recommendation for how these fees could be developed is provided in Section 4 of this report.

#### 3.2 EXEMPTIONS AND APPEALS

Since the City of Palm Coast stormwater utility charges are intended to be a fee and not a special assessment, Jones Edmunds recommends that the City provide exemptions for properties that are not users of the stormwater services provided by the City. We recommend that properties within the City that fall outside the delineated stormwater service area be exempt from paying the stormwater utility user fee as they do not ~~receive a direct benefit~~burden from the stormwater utility.

In keeping with the intent of the current stormwater utility ordinance, we ~~also~~ recommend that those properties that are used entirely as part of the City's stormwater management facilities or systems and that fall within a City easement be exempted from stormwater utility user fees.

We also recommend that property owners that can demonstrate that the broad, city-wide estimate of a property's burden or impact on the stormwater system is not accurate be allowed to appeal the fee charged by the City. In Section 5 of this report we have proposed a number of appeal categories that should help standardize the appeals process and provide a framework within which the appeals can be made.

#### 4.0 ANALYSIS FOR STORMWATER UTILITY

##### 4.1 DELINEATING THE STORMWATER SERVICE AREA

In this report the *stormwater service area* is defined as the area within the City of Palm Coast City limits that directly or indirectly contributes stormwater to a stormwater facility maintained by the City. All properties in the stormwater service area are considered to have a hydrologic connection and could be considered a 'user' of the City's stormwater management services.

Jones Edmunds used a combination of GIS-catchment-delineation techniques and a LiDAR-based digital elevation model to delineate a preliminary stormwater service area for various stormwater facilities maintained by the City of Palm Coast. We then compared the preliminary stormwater service area to features identified in the City's stormwater asset geodatabase and to features identified in maps showing the extent of some of the City's stormwater maintenance projects. City staff also reviewed the stormwater service area for accuracy.

The stormwater service area we delineated totals 53.95 square miles and includes 49,800 properties.

We also established that approximately 36.84 square miles (2,600 properties) of the City do not appear to be within the delineated stormwater service area. We do not consider these 2,600 properties that appear to fall outside the stormwater service area to be users of the City's stormwater services.

Appendix A includes a map of the stormwater utility service area that was delineated as a part of this project. A more detailed map showing the most up-to-date version of the City of Palm Coast

stormwater utility service area can be downloaded from the City's website (<http://www.ci.palm-coast.fl.us/Government/Departments/IT/PdfMaps.aspx>)

#### 4.2 EQUIVALENT RESIDENTIAL UNIT (ERU)

The ERU is the basic unit for computing stormwater service charges/rates and represents the average impervious and pervious area for all single-family residential properties with one dwelling unit in the City. The current stormwater utility ordinance uses an ERU value of 3,432 square feet of imperviousness on a quarter-acre parcel. The City of Palm Coast asked Jones Edmunds to re-evaluate the ERU value based on the most current property data. We calculated the average impervious area (e.g., house footprints, driveways, walkways, patios, etc.) of all single-family residential properties with one dwelling unit in the 2009 Flagler County Property Appraiser database that fall within the City of Palm Coast limits. We found that the average impervious area is now 3,682 square feet. We also found that the average single-family residential property size with one dwelling unit is 11,364 square feet, which is only 4% larger than a quarter acre (10,890 square feet). For reasons discussed later in this report (Section 4.3 and Section 4.5), we suggest that the updated ERU value be based on 3,682 square feet of imperviousness and 7,208 square feet of pervious area, which is based on the continued use of the quarter-acre (10,890 square feet) parcel assumption. Note that this definition of a quarter-acre is different from the working definition within the City of Palm Coast of a quarter-acre being 10,000 square feet. Jones Edmunds also recommends that the ERU be reviewed approximately every 5 years to confirm that the values are an adequate representation of a single-family residential property in the City of Palm Coast. For determining a stormwater utility fee, we recommend using the definition of *impervious area* in the City's current stormwater utility ordinance (Ordinance No. 2004-15), which does not include waterbodies or wetlands as an impervious surface.

#### 4.3 IMPACT OF PROPERTIES WITH IMPERVIOUS AREA VERSUS VACANT PROPERTIES

The following definitions are used in this project:

- *Vacant* means any land that is in a naturally vegetated state or land that has been cleared of such vegetation with no impervious area, excluding ~~vacant bulk lands~~ and *vacant single-family residential property*.
- *Single-Family Residential Properties* mean and includes all properties zoned or used for single-family detached housing units including, but not limited to, a mobile home on a separate lot or parcel of real property.

The City of Palm Coast asked Jones Edmunds to compare the effective contribution to the City's stormwater facilities of vacant land and land that includes impervious area. To make this comparison, Jones Edmunds determined the predominant hydrological conditions within the City and evaluated the relative impact of land with impervious area on the runoff volume and runoff rate, which impact the City's stormwater infrastructure.



Jones Edmunds found that the predominant NRCS hydrologic soil group in the City was hydrologic soils group B/D (56%), followed by hydrologic soil group D (20%). Hydrologic soils group B/D and D are classified by the NRCS as being poorly drained soils under wet conditions. Soils that are classified by the NRCS as being poorly drained typically have a lower infiltration capacity than well-drained soils (NRCS group A and group B). This reduced infiltration capacity means that these poorly drained soils are unable to infiltrate significant volumes of rainfall. Therefore, these poorly drained soils have the potential to generate a significant volume of runoff during storm events—even under natural conditions.

We also reviewed the NRCS-estimated average seasonal high water table depths and found that on average the soils within the City of Palm Coast do not have significant capacity to store rainfall—regardless of infiltration rate—and, therefore, have the potential to generate significant volumes of runoff. These two hydrologic factors suggest that, on average, vacant land in the City of Palm Coast generate significant runoff that the City’s stormwater infrastructure needs to accommodate. The impact on the City’s stormwater infrastructure can be mitigated by retention or detention. Mitigation is covered separately under mitigation credits (Section 5).

The City of Palm Coast stormwater system is typically maintained to provide a 100-year level of service. To provide adequate service, the stormwater system needs to convey the peak rate of runoff from the stormwater service area as well as the total volume of runoff from the stormwater service area. Jones Edmunds assumed that these two criteria (peak rate and total volume) are equally weighted when reviewing impacts on the City-maintained stormwater infrastructure.

To evaluate the difference in runoff impacts from vacant land and land with impervious area, but with no stormwater treatment system, Jones Edmunds developed a hydrologic and hydraulic model for a property and downstream channel reach. We used the NRCS Curve Number methodology to model the hydrologic response of both type of land and assumed that soils fell within the NRCS hydrological soil group B/D and D. We ran the model for the 100-year/24-hour storm event. The model results for this design event showed that the peak rate of discharge in the channel from the vacant land was approximately 53% of the peak rate of discharge in the channel from the land with impervious area. The model results for this design event also showed that the total runoff volume from the vacant land was approximately 89% of the total runoff volume from the land with impervious area, with the relatively high percentage being accounted for by the high groundwater tables and minimal soil storage.

Equally weighting the reduction in peak flow rate and the reduction in the total volume would result in vacant land having approximately 71% of the impact on the stormwater channel as that of land with impervious area. It appears that at least 10% of the stormwater utility’s expenses are in overhead costs that are not affected by discharges to the stormwater system. We recommend that these expenses be equally shared by all users of the system. Therefore, Jones Edmunds concludes that vacant land could reasonably be charged 74% of the fee charged to land with impervious area. The City has previously charged vacant land 50% (Resolution 2004-33), 75%

(Resolution 2005-38), and 68.8% (Resolution 2008-170) of the ERU rate charged to land with impervious area. The fee for a vacant property could be calculated as 2.96 ERUs per acre of vacant land based on the calculations presented previously in this report.

We recommend that vacant single-family residential properties, which would be eligible for a single ERU when they include impervious area, be charged a stormwater utility fee of 74% of an ERU until they include impervious area if they are 1 acre or less. ~~Further, we recommend that vacant single-family residential properties greater than 1 acre and less than or equal to 5 acres be assumed to receive reduced service and be charged at the rate of 0.89 ERUs per acre (see Sections 4.4 and 5.6). We recommend that other vacant property be charged a fee of 2.96 ERUs per acre.~~

#### ~~4.4 ESTIMATING ERUS FOR VACANT BULK LANDS~~

~~The City of Palm Coast stormwater service area includes large, vacant properties that typically discharge directly into the City maintained canal system. The City has to maintain significantly less infrastructure in the immediate vicinity of these properties—relative to the contribution to the stormwater system—than for other properties in more impervious parts of the service area. The City of Palm Coast’s analysis of the City’s stormwater utility’s operating budget found that approximately 70% of the City’s cost is associated with maintaining and operating local stormwater features, while 30% of the cost is associated with maintaining and operating the larger canal system.~~

~~Jones Edmunds recommends that the City consider this disproportion in levels of service when calculating the ERU for these vacant bulk lands. Based on the City’s analysis of its operating budget and Jones Edmunds’ analysis of the impact of vacant land versus land with impervious area, we recommend that that these vacant bulk lands be charged a fee of 0.89 ERUs per acre. This value represents a 70% reduction of the standard ERU rate for vacant land, with the exception of the 10% for overhead that was already accounted for in Section 4.3.~~

~~For administrative purposes we recommend that *vacant bulk lands* be defined as any lot or parcel of land greater than 25 acres that are in a natural vegetated state or land that has been cleared of such vegetation but not as an adjunct of construction. Jones Edmunds has identified approximately 100 properties, representing 7,200 ERUs, that may fit into this category.~~

~~In Appeal F we propose an option for property owners whose properties are greater than 5 acres and which have not been classified as being vacant bulk land to appeal for an equivalent stormwater utility fee reduction. We recommend that the property owners would need to demonstrate that their property meets the criteria proposed in Appeal F to receive this reduction in their stormwater utility fee. It should be noted that properties where the ERU was calculated based on the methodology used for vacant bulk lands (Section 4.4) are not eligible for a reduced-service fee appeal as reduced service was already considered in the ERU calculation.~~

#### 4.54.4 ESTIMATING ERUS FOR NONRESIDENTIAL/COMMERCIAL PROPERTIES

An ERU represents an average improved single-family residential property in the City of Palm Coast—3,682 square feet of imperviousness on a quarter-acre (10,890 square feet) parcel, which translates to 7,208 square feet of pervious area. As the existing ERU calculation (based on imperviousness only for some categories) for a large property with a small impervious area will significantly underestimate the impact to the City’s stormwater system, we recommend that the stormwater utility fee for a nonresidential/commercial property be assessed relative to both the impervious area and the pervious area found on the equivalent residential unit.

Using similar hydrologic parameters as discussed in Section 4.3 and the calculations shown in Appendix B, we found that the impact to the stormwater system from approximately 6,981 square feet of **impervious** area would be equivalent to the impact from a single ERU. We also found that the impact from approximately 15,338 square feet of **pervious** area would be equivalent to the impact from a single ERU. Accounting for at least 10% of the stormwater utility costs being overhead costs, which are not impacted by discharges to the system, would result in each acre of impervious area being equivalent to 6.02 ERUs and each acre of pervious area being equivalent to 2.96 ERUs.

Therefore, we recommend that the equivalent number of ERUs associated with a nonresidential/commercial property be calculated by finding the sum of the following:

- a. The impervious area (acres) multiplied by 6.02 ERUs.
- b. The pervious area in (acres) multiplied by 2.96 ERUs.

#### 4.64.5 ACCOUNTING FOR MULTI-FAMILY RESIDENTIAL

The City of Palm Coast bills duplexes, triplexes, and quadraplexes based on a rate of 0.75 ERUs per unit. We recommend that the City continue to use a rate of 0.75 ERUs per unit of a duplex, triplex, or quadraplex when calculating the stormwater utility fee for these units. For multi-family residential properties with five or more dwelling units per parcel, we recommend that the stormwater utility fee be calculated using the same methodology that we recommend for Nonresidential/Commercial properties (Section 4.5).

#### 4.74.6 UNPLATTED PROPERTIES

The City does not currently charge unplatted properties a stormwater utility fee. However, platting a property does not impact the runoff generated from that property and, therefore, does not impact the service being provided by the City. Because of this, Jones Edmunds recommends that unplatted properties be charged the same fee as a vacant property. The proposed fees for vacant properties are specified in Section 4.3 and Section 4.4.

## 5.0 APPEALS POLICY

Jones Edmunds recommends that an appeals policy be established to allow property owners to apply for a reduction in the stormwater utility fee based on the mitigation possibilities described below.

### 5.1 APPEAL A - MITIGATION CREDITS FOR NON-CITY STORMWATER FACILITIES

Mitigation credits for non-City stormwater facilities are intended to reflect the fact that sites with impervious area that have on-site stormwater treatment facilities that are not owned or maintained by the City have a reduced impact on the City's stormwater infrastructure and should, therefore, pay a reduced stormwater fee. Stormwater treatment facilities can result in a reduced peak discharge, a reduced discharge volume, and a reduction in water quality impacts. Since the City of Palm Coast stormwater utility does not budget a significant amount of money for projects that specifically target water quality improvement, Jones Edmunds recommends that the City consider only reductions in peak discharge and reductions in discharge volume as part of the mitigation provided by non-City owned or non-City maintained stormwater treatment facilities.

Stormwater treatment can be divided into two broad categories—retention or detention. Stormwater retention is the practice of retaining a designated volume of water on a site so that the designated volume does not leave the site in the form of surface runoff. Stormwater detention is the practice of detaining water on a site so that the peak discharge from the site does not exceed a designated rate but does discharge via a surface connection. Both practices result in a reduced peak discharge from a site in comparison to the untreated, post-development condition; however, stormwater retention results in a decrease in runoff volume from a site in comparison to the untreated, post-development condition. The SJRWMD typically requires that stormwater treatment systems are designed so that the post-development peak rate of discharge for the 25-year/24-hour storm event does not exceed the predevelopment peak rate of discharge for the same event. However, the City of Palm Coast also requires that certain developments demonstrate that the stormwater treatment system attenuates the peak discharge from the 100-year/24-hour event to a rate that does not exceed the predevelopment peak rate of discharge for the 100-year/24-hour event.

Starting with the same model discussed previously, we ran the model for the 100-year/24-hour storm event for five scenarios:

1. Land with impervious area with no stormwater treatment system.
2. Land with impervious area with a detention system designed to reduce the peak discharge to meet the pre-development peak discharge for the 100-year/24-hour storm.

3. Land with impervious area with a retention system sized to retain the water quality designated by the SJRWMD and meet or be below the peak discharge requirement for the 100-year/24-hour storm.
4. Land with impervious area with a detention system designed to reduce the peak discharge to meet the predevelopment peak discharge for the 25-year/24-hour storm.
5. Land with impervious area with a retention system sized to retain the water quality designated by the SJRWMD and meet or be below the peak discharge requirement for the 25-year/24-hour storm.

The model results for the 100-year/24-hour design event showed the following:

- The peak rate of discharge in the channel from the land with impervious area with a detention system sized for the 100-year/24-hour event and for a detention system sized for the 25-year/24 hour event were both approximately 52% of the 100-year/24-hour peak rate of discharge in the channel from the land with impervious area with no stormwater treatment system.
- There was no difference in the volume discharged from the land with impervious area with no treatment system and the land with impervious area with the detention system.
- The peak rate of discharge in the channel from land with impervious area with a retention system designed for the 100-year/24-hour event and land with impervious area with a retention system designed for the 25-year/24-hour event was approximately 53% of the peak rate of discharge in the channel from the land with impervious area with no stormwater treatment system.
- The total volume of discharge to the channel from the land with impervious area with a retention system sized for the 100-year/24-hour event was approximately 91% of the total volume of discharge in the channel from the land with impervious area with no stormwater treatment system.
- The land with impervious area with a retention system sized for the 25-year/24-hour event was approximately 93% of the total volume of discharge in the channel from the land with impervious area with no stormwater treatment system.

Equally weighting the reduction in peak flow rate and the reduction in the total volume results in the following:

- Land with impervious area with a detention system (sized for either the 100-year/24-hour or the 25-year/24-hour event) has approximately 76% of the impact

on the stormwater channel as that of land with impervious area with no stormwater treatment system.

- Land with impervious area with a retention system sized for the 100-year/24-hour event has approximately 72% of the impact, while a retention system sized for the 25-year/24-hour event has approximately 73% of the impact on the stormwater channel as that of land with impervious area with no stormwater treatment system.

To reduce the administrative burden of tracking which properties receive retention credits and which receive detention credits, we suggest simply assuming that all properties with impervious area with permitted stormwater treatment systems (retention or detention systems sized for either the 100-year/ 24-hour or the 25-year/24-hour storm) have 74% of the impact of properties with impervious area without stormwater treatment facilities. Therefore, Jones Edmunds concludes that a property with impervious area with a stormwater treatment system could reasonably be charged 74% of the fee charged a property with impervious area without a stormwater treatment system. This equates to a 26% mitigation credit for property with impervious area with a permitted stormwater treatment system.

Based on the City's budget estimates for the stormwater utility, it appears that at least 10% of the stormwater utility's expenses are in overhead costs that are not impacted by discharges to the stormwater system. We recommend that these expenses be equally shared by all users of the system. The mitigation credit given to a property with impervious area would then be 23%. The 2009 Florida Stormwater Association Stormwater Utility Survey found that in Florida the average mitigation credit provided to a property with a stormwater treatment system is 22.94%, placing the City's mitigation credit essentially equal to the survey average.

Jones Edmunds also reviewed the Environmental Resources Permit spatial data available from the St. Johns River Water Management District to determine the approximate number and location of the permitted stormwater treatment systems in the City's stormwater service area. This determination was made at a scale of approximately 1:12,000. Approximately 3,300 properties were estimated as being served by a permitted non-City stormwater treatment system. This estimate was made only to approximate the impacts of the mitigation credits on the stormwater utility revenue. We recommend that actual mitigation credits only be applied to a property once the property owner has adequately demonstrated that the property is served by a permitted stormwater treatment system by providing a copy of the appropriate SJRWMD or FDEP permit.

Table 1 Impact of Stormwater Treatment Systems on Runoff from the 100-Year/24-Hour Event			
Treatment System	Impact relative to peak discharge	Impact relative to volume discharged	Relative weighted impact
Detention System (Sized for 100-year/24-hour)	52%	100%	76%
Retention System (Sized for 100-year/24-hour)	53%	91%	72%
Detention System (Sized for 25-year/24-hour)	52%	100%	76%
Retention System (Sized for 25-year/24-hour)	53%	93%	73%

## 5.2 APPEAL B - MITIGATION CREDITS FOR PROPERTIES BIASECTED BY THE STORMWATER SERVICE AREA BOUNDARY

Jones Edmunds identified approximately 1,100 properties bisected by the service area boundary and that therefore are only partly served by the stormwater utility. ~~Due to the high administrative cost of estimating and tracking the portion of individual properties served by the stormwater utility, w~~We recommend that ~~only properties greater than 5 acres be eligible for~~ a partial-service reduction ~~be provided to these property owners~~ and that the reduction be equivalent to the percentage of the property that is outside of the City’s stormwater service area. As with mitigation credits we recommend that the actual partial-service credits only be applied to a property once the property owner has adequately demonstrated that the property is only partially within the City’s stormwater service area. ~~We recommend that a threshold of more than 5 acres be used because approximately 1% of the properties within the service area are greater than 5 acres. Reducing the cutoff to 2 acres would double the number of properties that would need to be individually reviewed by City staff, thereby increasing the overhead cost of tracking these properties.~~

## 5.3 APPEAL C - MITIGATION CREDITS FOR PROPERTIES CONVEYING OR STORING STORMWATER

In Section 3.2 we recommended that those properties that are used entirely as part of the City’s stormwater management facilities or systems and that fall within a City easement be exempted from stormwater utility user fees. We recommend that a property owner also be allowed to appeal for any portion of a property that is used to store or convey stormwater to be excluded from the ERU calculation. We recommend that the following three definitions be used to define the portion of a property that is exempt from a stormwater utility fee:

- The portion of the property that conveys or stores runoff and is within a City drainage easement. We recommend that the eligible extent of the easement not be greater than the 100-year floodplain. This would include non-City-maintained stormwater retention or detention systems that are within a City drainage easement.

- The portion of the property that is within the 100-year floodplain. We recommend that the 100-year floodplain either be the most up-to-date FEMA 100-year floodplain or a 100-year floodplain delineated by a Florida-registered and -licensed professional engineer. We also recommend that the extent of the 100-year floodplain be reviewed and accepted by City staff before credits are given.
- The portion of the property that is within a jurisdictional wetland that is approved by City staff.

~~Due to the high administrative cost of estimating and tracking the portion of individual properties that are functioning as a conveyance or storage feature we recommend that only properties greater than 5 acres be eligible for this credit.~~

Jones Edmunds identified approximately ~~3102,500~~ properties ~~that are greater than 5 acres and~~ where a portion of the property appears to include a feature that conveys or stores stormwater. We anticipate that approximately ~~16,300~~20,000 ERUs could be credited under this mitigation option.

#### 5.4 APPEAL D - MITIGATION CREDITS FOR PROPERTIES WITH SIGNIFICANT ONSITE RETENTION

Jones Edmunds recommends that properties that **retain** volumes of stormwater that are significantly greater than what is required for an ERP permit in either natural or man-made surface storage features be given the opportunity to receive additional partial-service credits for the reduced volume of stormwater and the reduced peak rate of stormwater discharged to the City's stormwater system, with a maximum possible credit of 100%. For simplicity, we recommend that the percentage reduction in runoff volume be calculated by demonstrating a storage depth (volume of storage on a site divided by site area). The ratio of the storage depth to the 100-year/24-hour runoff depth would provide an estimate of the percentage reduction of the runoff volume. We recommend that it be assumed that the peak rate of discharge would be reduced by the same proportion as the volume reduction. We also recommend that if soil storage is to be included in the retention volume, either City-approved site-specific soils data or NRCS soils survey data must be used to calculate available soil storage. We recommend that where soil storage is included in the retention volume credit the credit should be calculated based on the difference in the 100-year/24-hour runoff volume (using TR-55 methodology) between a site-specific, area-weighted CN value and a CN of 80.

For example, a 24-acre site with 8 acre-feet of onsite retention storage would provide a storage depth of 4 inches. The ratio of the storage depth (4 inches) to the 100-year/24-hour rainfall runoff volume (assumed for this example to be 10 inches) would demonstrate a 40% reduction in runoff volume. Assuming that the peak discharge from the site would also be reduced by approximately 40% would mean that the impact of this site on the City's stormwater



infrastructure would be approximately 40% less than originally estimated. Accounting for the estimated 10% overhead costs would result in this site's receiving a 36% mitigation credit in its stormwater utility fee.

We recommend that any area that is considered (under Appeal C) to convey or store stormwater not be considered for this onsite retention credit. We recommend that the retention volume used to calculate the partial-service credit exclude any storage above an elevation that would result in parking lots or roads being inundated or that would result in structural flooding of buildings. We also recommend that the applicant demonstrate that the retention volume used for credits be recovered within 14 days of the design event.

Jones Edmunds completed a preliminary review of possible areas that may be eligible for retention credits. This review only considered the digital elevation model and did not consider any subsurface drainage or recovery of the retention volume. We estimated that approximately 5,100 ERUs of retention credit may be available within the service area. Most of these retention credits would be for large, natural depressions.

## 5.5 APPEAL E - MITIGATION CREDITS FOR PROPERTIES WITH EXTRA ONSITE DETENTION

Stormwater detention systems attenuate the peak rate of discharge from a site but do not reduce the total volume of runoff from the site. Therefore, the maximum possible mitigation credit that could be given to a stormwater detention system is 50%, which is reduced to 45% if a 10% overhead is considered. However, it should be noted that this would require a peak discharge of 0 cubic feet per second, which is only attainable through retention.

We recommended (Section 5.1) that a property that contributes stormwater to a permitted stormwater treatment system (retention or detention) be eligible for a mitigation credit of 23%. This was based on the assumption that a permitted stormwater treatment system peak discharge rate equals the predevelopment peak discharge rate. We recommend that those properties with extra onsite detention (i.e., those that attenuate the peak discharge well below the predevelopment peak) be eligible for additional credit.

Due to the complexity of estimating the appropriate additional mitigation credit for these facilities relative to an ERU, we recommend that the mitigation credit simply be calculated by providing an additional 0.22% credit for every 1% reduction in peak discharge below the predevelopment peak discharge rate. Therefore, the maximum credit attainable would be 45%. We suggest that this calculation be made for peak discharge from the site under the permitted build-out condition for either the 100-year/24-hour or 25-year/24-hour event, depending on the City's permit requirements.

For example, a developer required by the City to meet the predevelopment 100-year/24-hour peak discharge rate designs its stormwater system to reduce the peak discharge rate from the site

with impervious area to a level that is 30% less than the predevelopment peak. The mitigation credit for significant onsite detention could be calculated as follows:

1. 23% mitigation credit for obtaining a SJRWMD permit.
2. 6.6% mitigation credit for attenuating flow to a level that is 30% lower than the predevelopment peak.
3. Adding these credits provides a total mitigation credit of 29.6%.

## 5.6 APPEAL F - REDUCED-SERVICE APPEAL

The City of Palm Coast stormwater utility provides a service and benefit to all properties that drain into the City-maintained stormwater system. However, for some properties the City has to maintain significantly less infrastructure in the immediate vicinity of the property—relative to the contribution to the stormwater system—than for other properties. For example a typical quarter-acre single-family residential property with impervious area (1 ERU) may drain into 75 feet of swale that is maintained by the City, while a vacant 20-acre property (60 ERUs) may have a single drainage point into the City canal system. Although it is difficult to determine the exact cost of maintaining stormwater infrastructure in the immediate vicinity of these two properties, it is clear that the maintenance costs are not directly proportional to the ratio of their ERUs. Therefore, we recommend that a reduced-service appeal be developed for properties in which the property owner can demonstrate a significantly reduced service from the City compared to the typical ERU. ~~To reduce the expense and complexity of tracking and reviewing these appeals and since this reduced service typically only occurs in large, vacant areas, we~~ We recommend that ~~only large (greater than 5 acres) vacant properties and properties with impervious area that are larger than 5 acres and~~ where the City provides no maintenance of the drainage system or of the roadway within the property or subdivision be eligible for this credit. ~~We recommended that individual single-family residential parcels that are 1 acre of less not be eligible for this appeal. Additionally, we recommend that vacant single-family residential properties greater than 1 acre and less than or equal to 5 acres be assumed to receive reduced service.~~

Based on the City of Palm Coast's analysis of the City's stormwater utility's operating budget it seems that approximately 70% of the cost is associated with maintaining and operating local features, while 30% of the cost is associated with maintaining and operating the larger canal system. Jones Edmunds found that typical properties within the City have more than 25 linear feet (within a 50-foot property buffer) of maintained stormwater infrastructure per ERU. Therefore, we recommend that the owner of any ~~large, vacant~~ property ~~—excluding individual single-family residential properties that are 1 acre of less—~~ who can demonstrate that the City has less than 25 linear feet of maintained stormwater infrastructure per ERU (within a 50-foot buffer of the property) should be given a 70% reduction in his or her stormwater utility fee.

~~It should be noted that properties where the ERU was calculated based on the methodology used for vacant bulk lands (Section 4.4) are not eligible for a reduced service fee appeal as reduced service was considered in the ERU calculation.~~ We have identified approximately 80 vacant properties ~~that are greater than 5 acres and~~ that seem to meet the recommended criteria necessary to file for the reduced-service appeal. ~~This estimate excludes those properties identified as vacant bulk lands in Section 4.4.~~ We have ~~also~~ identified approximately 1,250 properties that fall within subdivisions where the subdivision is greater than 5 acres and the subdivision does not receive a direct roadway or drainage maintenance from the City. A 70% fee reduction applied to properties that we identified would result in a net reduction of approximately 2,000 ~~2,000~~ ERUs.

## 5.7 APPEAL G - ADDITIVE MITIGATION CREDITS

In cases where more than one mitigation credit may apply to a single property, the areas under Appeal B (Mitigation for Properties Bisected by Service Area) and Appeal C (Mitigation for Stormwater Conveyance or Storage) should be identified and credited first. Possible credits under Appeal A (Mitigation for non-City Stormwater Facility), Appeal D (Mitigation for Significant Onsite Retention), and Appeal E (Mitigation for Extra Onsite Detention) should then be identified. If Appeals A (Mitigation for a Non-City Stormwater Facility) and E (Mitigation for Extra Onsite Detention) apply, they should be added together. In the case that Appeal A (Mitigation for Non-City Stormwater Facility), Appeal D (Mitigation for Significant Onsite Retention), and Appeal E (Mitigation for Extra Onsite Detention) all apply, the sum of Appeals A (Mitigation for a Non-City Stormwater Facility) and E (Mitigation for Extra Onsite Detention) should be compared to Appeal D (Mitigation for Significant Onsite Retention); the greater of these will be applied to the remaining portions of the property, as applicable. It is theoretically possible for Appeals A (Mitigation for Non-City Stormwater Facilities) and D (Mitigation for Significant Onsite Retention) to be applicable to different portions of the property. If the property is proven to be in a reduced-service area, Appeal F (Reduced-Service Appeal) should be applied after the credits in Appeals A-E have already been applied.

## 6.0 OPINIONS OF ESTIMATED IMPACTS ON REVENUE

Jones Edmunds has developed opinions on the estimated impacts to revenue by the changes proposed in this report. The opinions are based on the following assumptions:

1. Only those properties within the delineated stormwater service area were included in all calculations.
2. The fee for vacant properties (platted and unplatted) was set at 2.96 ERUs per acre. Additional mitigation factors were considered where appropriate.
- ~~3. The fee for vacant bulk lands was set at 0.89 ERUs per acre.~~
- 4.3. The fee for vacant single-family residential properties was set at 0.74 ERUs.

- ~~5.4.~~ The fee for nonresidential/commercial properties was estimated as the sum of 2.96 ERUs per acre of pervious area and 6.02 ERUs per acre of impervious area.
- ~~6.5.~~ Properties that are ~~greater than 5 acres and that are~~ bisected by the service area boundary were split so that only that portion within the service area was included in the calculations.
- ~~7.6.~~ Properties that were identified as potentially being served by a non-City stormwater treatment system were given a credit of 23%.
- ~~8.7.~~ Retention credits were assigned to properties that appeared to have significant onsite retention.
- ~~9.8.~~ Mitigation credits for extra on-site detention were not assigned as we did not have any site-specific data to justify this mitigation credit.
- ~~10.9.~~ A 70% fee reduction was given to ~~large~~ vacant properties that have less than 25 linear feet of maintained stormwater infrastructure per ERU and ~~land with impervious area properties within subdivisions~~ where the City does not provide any road or drainage maintenance.
- ~~11.10.~~ To remain revenue neutral (meet the stormwater utility budget), the City of Palm Coast stormwater utility would need to generate \$5,440,000 in 2010.

Based on these assumptions Jones Edmunds estimated that the City would be able to bill between ~~5044~~,000 and ~~7165~~,000 ERUs. We provided a range in the number of billable ERUs because we had to make a number of assumptions when estimating the value of the mitigation credits that may be available to property owners, and there is some uncertainty about the number of credits for which property owners may apply. If we assume that the City has a 90% collection efficiency, the City would need to charge between \$~~7.8040~~ and \$~~110.5000~~ per ERU per month to remain revenue neutral. The 2009 Florida Stormwater Association Stormwater Utility Survey found that in Florida the stormwater utility rate varies from \$0.75 to \$11.82 per ERU per month.

Figure 1 and Figure 2 show the distribution of potential revenue based on the City's current and the proposed rate structure, respectively.

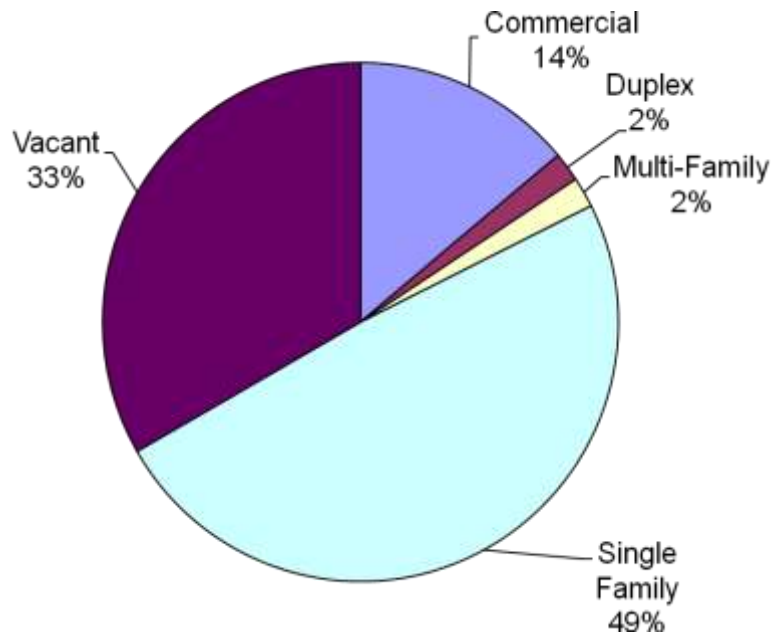


Figure 1 Revenue Distribution Based on Current Rate Structure

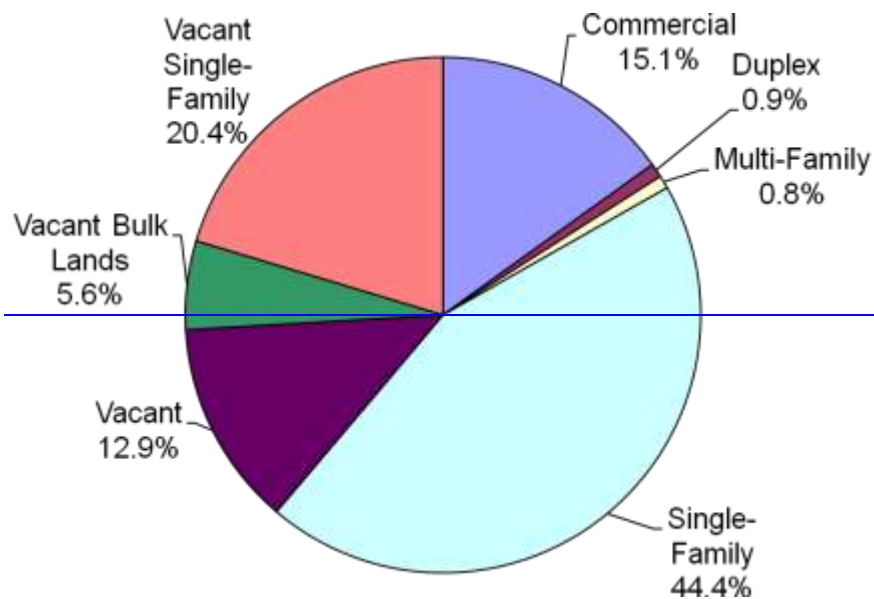
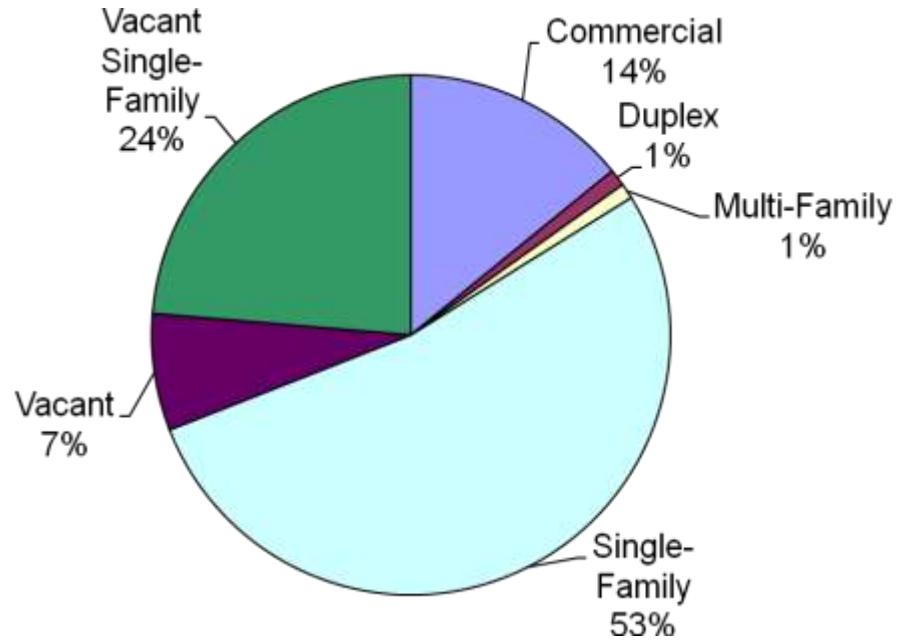


Figure 2 Revenue Distribution Based on Proposed Rate Structure

Note: In Figure 1 the term *vacant* excludes vacant properties that were classified as *unplatted* and includes vacant single-family properties. In Figure 2 the terms *vacant* and *vacant bulk lands* includes properties that were previously classified as *unplatted*. In Figure 2 vacant single-family properties were shown as an explicit category.

7.0 SUMMARY OF PROPOSED RATE STRUCTURE

Table 2 Summary of Proposed Rate Structure			
	Rate Structure	Fee	Property Area Threshold
Exemptions	Properties outside the stormwater service area.	No Fee	No Threshold
	Properties entirely dedicated to stormwater conveyance and within a City easement.	No Fee	No Threshold
Fees <sup>1</sup>	Single-Family Residential Property	1 ERU	No Threshold
	Vacant Single-Family Residential Property	0.74 ERUs	Less than or equal to 1 acre
	Vacant <a href="#">Property (Including vacant single-family residential property greater than 1 acre)</a>	<del>2.96</del> <del>0.89</del> ERUs per acre	<del>Greater than 1 acre and less than or equal to 5 acres</del> No Threshold
	Nonresidential/Commercial/Multi-family with more than 4-units per parcel/Other impervious areas	Sum of: <ul style="list-style-type: none"> <li>6.02 ERUs per acre of impervious area.</li> <li>2.96 ERUs per acre of pervious area.</li> </ul>	No Threshold
	Duplexes, triplexes, quadraplexes	0.75 ERUs per unit.	No Threshold
Appeals <sup>2</sup>	<a href="#">A - Non-City Stormwater Facility</a>	Reduce fee by 23%.	No Threshold
	<a href="#">B - Properties bisected by service area.</a>	Reduce fee by percentage of property outside service area.	No Threshold <del>Greater than 5 acres</del>
	<a href="#">C - Properties that partly convey or store stormwater.</a>	Reduce fee by: <ul style="list-style-type: none"> <li>The percentage of the property that stores or conveys stormwater.</li> <li>The percentage of the property that is in the 100-year floodplain.</li> <li>The percentage of the property that is a wetland.</li> </ul>	No Threshold <del>Greater than 5 acres</del>
	<a href="#">D - Significant onsite retention</a>	Reduce fee by site-specific estimate.	No Threshold
	<a href="#">E - Extra onsite detention</a>	Reduce fee by 0.22% for every 1% reduction in peak discharge below predevelopment peak discharge.	No Threshold
	<a href="#">F - Reduced-service</a>	Reduce fee by 70%.	<del>Non single-family residential property greater than 1 acre</del> <del>Greater than 5-acres</del>
	<a href="#">G – Additive Mitigation Credits</a>	<a href="#">Combination of appeals A through E.</a>	No Threshold

<sup>1</sup>Note stated fees are maximum fees that could be reduced through appeal.

<sup>2</sup>Details on each appeal are provided in Section 5.

**APPENDIX A**

**FIGURE SHOWING THE CITY OF PALM COAST  
STORMWATER UTILITY SERVICE AREA**



## **APPENDIX B**

### **CALCULATIONS DEMONSTRATING RELATIVE IMPACT OF IMPERVIOUS AND PERVIOUS AREA**

APPENDIX B  
CALCULATIONS DEMONSTRATING RELATIVE IMPACT OF IMPERVIOUS AND  
PERVIOUS AREA

*We found that vacant land has 71% of the impact of land with impervious area on the stormwater system (Section 4.3).*

Let Y = impact from 1/4-acre of pervious area

Therefore:

$$(1) \quad Y = 0.71 \text{ ERU}$$

*We know that a 1/4-acre of land with impervious area (an ERU) is approximately 34% impervious and 66% pervious.*

Let X = impact from 1/4-acre of impervious area

Therefore:

$$(2) \quad 1 \text{ ERU} = 0.66 Y + 0.34 X$$

Solving Equations (1) and (2):

$$1 \text{ ERU} = 0.66 (0.71 \text{ ERU}) + 0.34 X$$

$$0.34 X = 0.53 \text{ ERU}$$

$$X = 1.56 \text{ ERU}$$

*Therefore for a pervious area:*

$$10,890 \text{ square feet (1/4-acre)} = 0.71 \text{ ERU}$$

$$\text{Or } 15,338 \text{ square feet} = 1 \text{ ERU}$$

$$\text{Or } 1 \text{ acre} = 2.84 \text{ ERUs}$$

Weighting for 10% minimum overhead assuming 1 acre of single-family residential properties is equal to 4 ERUs:

$$\text{Weighted ERU per acre} = (2.84 * (90/100)) + (4 * (10/100)) = 2.96 \text{ ERUs}$$

*Similarly for an impervious area:*

$$10,890 \text{ square feet (1/4-acre)} = 1.56 \text{ ERU}$$

$$\text{Or } 6,981 \text{ square feet} = 1 \text{ ERU}$$

$$\text{Or } 1 \text{ acre} = 6.24 \text{ ERUs}$$

Weighting for 10% minimum overhead assuming 1 acre of single-family residential properties is equal to 4 ERUs:

$$\text{Weighted ERU per acre} = (6.24 \text{ ERUs} * (90/100)) + (4 \text{ ERUs} * (10/100)) = 6.02 \text{ ERUs}$$