

TOWN OF SEWALL'S POINT



PAMELA MAC'KIE WALKER
Town Manager

TO: Town of Sewall's Point Commission
FROM: Pamela Mac'Kie Walker, Town Manager
SUBJECT: Agenda Item 1
Martin County Septic System Elimination Report
Town Commission Workshop, December 12, 2016

On November 3, 2015, the Board of Martin County Commission received the attached Septic Tank Elimination Study in a presentation by Captec, the author of the study.

The Town of Sewall's Point is one of the communities reviewed in the Study. The study notes costs for 3 different options for elimination of Septic Tanks – Vacuum, Gravity and Grinder Systems. It then ranked the 24 communities within the Martin County Utility Service area for prioritization of septic elimination based on 10 different ranking factors. The Town of Sewall's Point was in the middle of the ranking at number 12.

The Town Engineer would like to present the study to the Commission and discuss potential next steps including assessments, scheduling, grant funding opportunities and additional sampling.

MARTIN COUNTY SEPTIC SYSTEM ELIMINATION FINAL REPORT

Prepared for:

MARTIN COUNTY UTILITIES



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TABLE OF CONTENTS

Section	Page
1.0 Introduction	3
2.0 Background	3
2.1. Design Evaluation	3
3.0 Method of Evaluation	4
3.1. Population Density	4
3.2. Potable Water System	4
3.3. Classification of Surface Water.....	4
3.4. Proximity of Surface Waters	5
3.5. FEMA Flood Plain	5
3.6. Ground Water Table	5
3.7. Soil Types.....	6
3.8. Surface Water Management System	6
3.9. Nitrogen/Nitrate Load Contribution to Groundwater.....	7
3.10. Verified Presence of Human Fecal Source Markers	7
3.11. Priority Rankings Summary	8
4.0 Preliminary Public Water System Cost Estimate	10
5.0 Preliminary Sanitary Sewer Cost Estimate	12
5.1. Peak Flow Determination	12
5.2. Conventional Gravity System Cost Estimate	14
5.2.1. Existing Dry Sanitary Sewer Lines	15
5.3. Air Vacuum Systems Cost Estimate Rankings Summary.....	17
5.4. Grinder Pump Sewer System Estimated Construction Cost	18
6.0 CONCLUSION	19
Appendix A	Public Water System Cost Estimates
Appendix B	Peak Flow Calculations
Appendix C	Gravity Sewer Cost Estimates
Appendix D	Air Vacuum System Cost Estimates
Appendix E	Grinder Pump System Cost Estimates
Appendix F	Supplementary Exhibits 1-10

1.0 INTRODUCTION

The purpose of the Septic Tank Elimination Study is to determine the priority and cost of removing the existing septic systems located along the St. Lucie Estuary and Indian River Lagoon within Martin County, Florida. A preliminary analysis was performed to estimate the cost of replacing the septic systems with three (3) alternative systems:

- 1) Gravity Sewer System
- 2) Air Vacuum System
- 3) Grinder Pump System

All costs include service lines, force mains, clean outs, lift stations or individual pump stations and their associated appurtenances.

The 24 Septic Tank Served Communities (Communities)

- | | | | |
|----|---|----|----------------------------------|
| 1 | Martin Downs / Sunset Gardens
(Old Palm City) Area | 12 | Rio/St. Lucie (West) |
| 2 | Salerno / Manatee Pocket Area | 13 | Rio/St Lucie (East) |
| 3 | Golden Gate Subdivision | 14 | River's End Subdivision |
| 4 | Hibiscus Park Area | 15 | Crane Creek Country Club |
| 5 | Rosewalk / Galleon Bay Subdivision | 16 | North Mapp Road Area |
| 6 | Vista Salerno / US 1 Area | 17 | Stuart Yacht & Country Club |
| 7 | Evergreen Golf &Country Club
(Hideaway Isles / Mid Rivers) | 18 | Port Salerno / New Monrovia Area |
| 8 | Tropical Farms Area | 19 | Lake Grove Subdivision |
| 9 | North River Shores - Phase 2 | 20 | Four River's Subdivision |
| 10 | Town of Sewalls Point | 21 | Captain's Creek Subdivision |
| 11 | Beau Rivage Subdivision | 22 | South Mapp Road Area |
| | | 23 | Gaines Ave Area |
| | | 24 | South Fork Area |

2.0 BACKGROUND

2.1 Design Evaluation

The 24 Communities within the Septic Elimination Study are located throughout Martin County and consist of properties to the north along the St Lucie Estuary, to the West along the Florida Turnpike, to the south in the vicinity of the Manatee Pocket, and to the East along the Indian River Lagoon and the Atlantic Ocean. Martin County sanitary collection systems consist primarily of gravity sanitary sewers but still contain service areas utilizing onsite septic treatment and disposal systems to treat sewage. The Martin County Utilities Department has contracted with CAPTEC Engineering Inc (CAPTEC) to analyze and prioritize the conversion of the remaining Communities to the Martin County Utilities Sanitary Sewer System. This Capital Improvement Project will improve the health and safety of the environment and the public.

Each of the Communities was evaluated for their peak design flow and then ranked as a priority to replace the septic systems with a public sanitary sewer collection system. The ranking factors include:

- 1) Population Density for Loading Concentrations
- 2) Availability of a Public Water System – Potable Water System
- 3) Classification of Surface Water
- 4) Proximity to Surface Waters
- 5) Location of the Community in Relation to the 100-year Flood Plain – FEMA Flood Plain
- 6) Depth of the Ground Water Table
- 7) Soil Conditions of the Drain Field – Soil Type
- 8) Age of the Surface Water Management System
- 9) Nitrogen/Nitrate Load Contribution to the Groundwater
- 10) Verified Presence of Human Fecal Markers – Human Biological Markers

A summary table of priority rankings (Section 3.11) and supplementary exhibits used to determine the Communities respective scores are enclosed in the report.

3.0 METHOD OF EVALUATION

3.1 Population Density

The Martin County Navigator GIS map was utilized to determine the population and the zoning for each of the Communities. The existing and future population for each subdivision was estimated by the parcel count and the density allowed by the zoning classification. The zoning classification that permitted less than two units per acre was assigned to the low density category, two to five units per acre to the medium density category, and five or more units per acre to the high density category. The population density was ranked from low to high priority with 4 points assigned for low density, 8 points for medium density, and 12 points for high density populations.

3.2 Potable Water Systems

The availability of a public water system was included in the study as a primary health concern due to potential contamination to the water supply in areas that utilize onsite wells for drinking water in conjunction with a septic system. The Martin County Navigator GIS database was used to determine which areas were served by a public water system, an onsite water well system, or utilized both systems as their potable water supply. The areas ranged from a score of 4 points for areas with a public water system and 12 points for areas with an onsite well drinking water system, and an average of 8 points for Communities that contained both systems.

3.3 Classification of Surface Water

The Florida Administrative Code (FAC), Chapter 62-302.400, Surface Water Quality Standards classifies and defines the water quality standards for Class I, II, III, IV waters. Class II is regulated to maintain water quality standards for shell fish harvesting and propagation. Class III water quality standards are defined to maintain a healthy

environment for wildlife, fishing, and recreational activities. The Florida Department of Environmental Protection agency has delineated and assigned a Water Body Identification Number (WBID) to each water body in the State of Florida. In Martin County, Class II waters are located in the Great Pocket (St Lucie Estuary to Peck's Lake, WBID-3208A1) and the Indian River Lagoon (N. Martin County Line to the St. Lucie Inlet, east of Intracoastal centerline, WBID-5003A). The two communities in the vicinity of Class II waters include the Town of Sewall's Point and Rosewalk Galleon Bay. The remaining water bodies are considered Class III waters. The major Class III water bodies in Martin County are the North Fork (WBID-3194B), South Fork (WBID-3210), St. Lucie Estuary (WBID-3193), and Manatee Pocket (WBID-3208C). Class II waters were assigned a score of 12 points, due to their more stringent water quality standards. Communities with boundaries along the Class III waters were assigned a lower score of 8 points. Likewise, Communities without a boundary along Class II or Class III waters would be assigned a score of 4 points.

3.4 Proximity of Surface Waters

Due to the potential of contamination from septic tank drain fields to adjacent surface waters, the Communities were evaluated by their proximity to these water bodies. Three major water bodies bordered by the Communities are the C-23 Canal, the Indian River Lagoon, and the St. Lucie Estuary. Many of the Communities without an adjacent border to a water body have drainage systems that outfall into creeks and drainage canals that flow into one of the major water bodies. The lowest score of 4 points was assigned to areas inland and without any direct connection to these major water bodies. The areas located upstream with creeks and drainage canals connected to these water bodies were assigned a score of 8 points. The highest score of 12 points was reserved for areas that bordered along these major water bodies.

3.5 FEMA Flood Plain

The current FEMA Flood Insurance Maps for Martin County were used to determine which Communities are prone to flooding during the 100-year storm event. Martin County consists of a substantial amount of water front property along creeks, rivers, and canals. As a result, many of the areas lie within the 100 year flood plain. Septic tanks located within the 100-year flood plain introduce a potential safety hazard to surrounding waters if the septic system fails. According to the FEMA Flood maps, Communities outside the flood plain generally had minimal area along a water body. These areas were assigned a score of 4 points to represent a low risk for polluting adjacent surface water systems. However, properties along creeks, canals, the St. Lucie Estuary, and the Indian River Lagoon were prone to flooding and were assigned a score of 8 points if the area was less than 50% within the flood plain and 12 points if the area was more than 50% within the flood plain.

3.6 Ground Water Table

The USDA Soil Conservation Service topographic information was utilized to determine the groundwater water table for the Communities. According to the FAC Chapter 64-E6 design criteria, the septic tank drain fields should be installed in areas with a minimum depth ranging between 42 and 48 inches to the ground water table. Communities with

septic systems designed with more than 48 inches to the ground water table were assigned a score of 4 points, equal to 48 inches assigned 8 points, and less than 48 inches were assigned a score of 12 points.

3.7 Soil Types

The National Resource Conservation Service (NRCS) Soil Survey of the Martin County Area, Florida (USDA, SCS 1981) was used to determine the soils types located within the Communities. The majority of the areas consist of a mixture of well drained and poorly drained fine sands, namely Paola (Type A), St Lucie (Type A), Lawnwood (Type B/D), Waveland (Type B/D), Nettles (Type D), and Immokalee (Type D) soils.

According to FAC Chapter 64 E6, desirable soils for septic system drain fields consist of a loamy coarse sand gradation with a slightly limited percolation rate of 2-4 min/inch. Undesirable soils consist of very fine sand/sandy clay with moderately limited percolation rate of 5-14 min/inches, and clay/organic soils with severely limited percolation rates between 15-30 min/inch, and coarse sand /gravel / bedrock with a season high water table within 48" of drain fields with percolation rates less than 1 min/inch.

The NRCS Soil Survey, Table 12-Sanitary Facilities, provides descriptive terms for the restrictive soil features suitability for use with Septic Tank Absorption Fields. For the evaluation, soils with slight limitations were assigned a score of 4 points, soils described as having moderate limitations were assigned 8 points, and severe limitations were assigned a score of 12 points.

3.8 Surface Water Management System

The South Florida Water Management District water quality standards for stormwater runoff became more stringent during 1978 and 1988 to achieve nutrient load reductions of nitrogen and phosphorus within the St. Lucie River Watershed. Water quality criteria became more stringent again in 1994 after legislation passed for the Everglades Forever Act. The age of the Surface Water Management System was used for drainage system priority rankings. Older surface water systems with lower water quality standards have an increase potential of septic tank discharges into the surface waters.

The Martin County Clerk of Court contains information documenting the date that Subdivisions and Communities were platted. This information was used to determine the time frame that each of the Communities surface water management systems were constructed.

For the priority rankings, developments platted before 1978 were assigned a score of 12 points to represent stormwater runoff with the lowest water quality requirements, 8 points for developments platted between 1978 and 1988, and 4 points for developments platted after 1988. The areas with multiple platted dates were weighted by the area platted and the date of the recorded plat.

3.9 Nitrogen/Nitrate Load Contribution to Groundwater

The March 2007 Wekiva River Basin Nitrate Sourcing Study Phase 1 Report, prepared for the St. Johns River Water Management District and Florida Department of Environmental Protection, assumes that 20 lbs of nitrogen is discharged to the environment each year from each septic tank. The report also states that between 50%-90% of the nitrogen released from septic tanks reach the groundwater. An average of 70% of the nitrogen from each septic tank reaches the groundwater, releasing approximately 14 lbs of nitrogen per year.

The nitrogen contribution was based on the estimated number of septic tanks for each Community. A nitrogen contribution factor was then prorated with the highest contribution (Hibiscus Park – 18,886 lbs/year) receiving 12.0 points and the lowest contribution (Rosewalk / Galleon Bay – 350 lbs/year) receiving 0.22 points.

3.10 Verified Presence of Human Fecal Source Markers

In an effort to identify potential bacterial sources contributing to the St. Lucie River, the Florida Department of Environmental Protection coordinated with Martin County Utilities and performed sampling in June, July and August of 2014. The results and evaluation of these samples were published by the Florida Department of Environmental Protection in the St. Lucie River Microbial Source Tracking Wet Season Study, dated November 7, 2014. This study focuses on 14 areas of human biological markers. Of the 14 areas sampled, 5 sites had detections of chemical and/or biological markers and elevated bacterial counts during at least 2 of the 3 sampling events. The human fecal source marker (qPCR Bacteroidales HF183) was found within the surface waters adjacent to the Golden Gate Subdivision and the All American Ditch (Martin Downs / Sunset Gardens) Subdivision. Additionally, the study concludes that inadequately treated human waste water sources may be present at these sites as apparent by the elevated counts of fecal coliform bacteria, the presence of human markers, and the detection of sucralose in the samples taken. A human biological marker factor of 12 was given to areas where human fecal source markers were found. Areas where no human fecal source markers were found received a factor of 0.

3.11 Priority Rankings Summary:

A summary of the scoring criteria is depicted in Table 3.11.1 below and the rankings are summarized in Table 3.11.2.

Table 3.11.1 - Design Evaluation Summary

Evaluation Factors	Scores
Population Density	4 points: Low Density < 2 units/acre
	8 points: Medium Density 2-5 units/acre
	12 points: High Density > 5 units/acre
Potable Water System (PWS)	4 points: Majority with Pubic PWS (> 75%)
	8 points: Both public and onsite well system (25% ≤ PWS ≤ 75%)
	12 points: Majority with onsite well system (PWS < 25%)
Classification of Surface Water	4 points: No Borders along Class II or Class III waters
	8 points: Bordered by Class III waters
	12 points: Bordered by Class II waters
Proximity of Surface Waters	4 points: Communities inland with no connection to Estuary/Canal
	8 points: Communities with upstream connection to Estuary/Canal
	12 points: Communities with boundary along an Estuary/Canal
FEMA Flood Plain	4 points: Outside 100-year flood plain
	8 points: Up to Half of community within 100-year flood plain
	12 points: > 50% of their area within 100-year flood plain
Ground Water Table (GWT)	0 - 7 points: GWT > 48 inches
	8 points: GWT = 48 inches
	9 - 12 points: GWT < 48 inches
Soil Types	0 - 4 points: Slightly limited percolation rates for septic adsorption fields
	5 – 8 points: Moderately limited percolation rates for septic adsorption fields
	9 - 12 points: Severely limited percolation rates for septic adsorption fields
Surface Water Management Systems	4 points: Developments platted after 1988
	8 points: Developments platted between 1978 and 1988
	12 points: Developments platted before 1978
Nitrogen/Nitrate Load Contribution to Groundwater	0 – 4.0 points: Slight Contribution
	4.1 – 8.0 points: Moderate Contribution
	8.1 – 12.0 points: Severe Contribution
Verified Presence of Human Fecal Source Markers	0 Points: None Found
	12 Points: Human Markers Found

Table 3.11.2 - Priority Summary Table

Ranking	Communities	Population Density	Potable Water Systems	Classification of Surface Water	Proximity to Surface Water	FEMA Flood Plain	Ground Water Table	Soil Type	Surface Water Management	Nitrogen Contribution	Human Biological Markers	Total Score
1	Martin Downs / Sunset Gardens (Old Palm City)	8	8	8	12	8	10.38	11.38	12	9.59	12	99.35
2	Golden Gate	12	4	8	8	8	9.96	10.00	12	6.89	12	90.85
3	Beau Rivage	4	12	8	12	12	11.23	12.00	12	2.28	0	85.51
4	Gaines Ave	4	12	8	12	12	9.92	11.99	12	2.46	0	84.37
5	Hibiscus Park	12	8	4	8	4	10.93	12.00	12	12.0	0	82.93
6	Port Salerno / New Monrovia	12	8	8	8	8	8.09	10.40	12	7.81	0	82.30
7	Salerno / Manatee Pocket	8	8	8	12	12	7.65	10.00	12	4.25	0	81.90
8	North Mapp Road	8	4	8	12	12	11.22	11.98	12	1.46	0	80.66
9	Evergreen G&CC (Hideaway Isles / Mid Rivers)	4	8	8	12	8	10.39	11.38	10	7.87	0	79.64
10	South Mapp Road	4	8	8	12	12	11.03	12.00	12	0.33	0	79.36
11	South Fork Area	8	12	8	12	8	9.91	12.00	4	2.42	0	76.33
12	Sewall's Point	4	4	12	12	8	4.07	10.22	12	8.28	0	74.57
13	Rio / St. Lucie (East)	8	8	8	12	8	8.38	6.66	12	2.94	0	73.98
14	Rosewalk / Galleon Bay	4	4	12	12	12	8.93	12.00	8	0.22	0	73.15
15	Stuart Yacht & Country Club	8	4	8	8	8	9.54	10.67	12	4.48	0	72.69
16	Four Rivers	4	12	8	12	12	7.17	11.99	4	0.94	0	72.10
17	Crane Creek Country Club	4	12	8	8	8	8.89	7.37	12	3.39	0	71.65
18	North Rivers Shore - PH 2	4	4	8	12	12	10.08	6.67	12	2.60	0	71.35
19	Tropical Farms	4	12	4	8	8	8.43	12.00	9	5.80	0	71.17
20	River's End	4	12	8	12	8	9.79	12.00	4	1.01	0	70.80
21	Vista Salerno / US 1 Area	8	12	4	4	4	10.54	12.00	12	2.08	0	68.62
22	Rio / St. Lucie (West)	4	8	8	12	8	6.86	8.80	12	0.86	0	68.52
23	Captain's Creek	4	12	8	8	8	8.25	12.00	4	1.49	0	65.74
24	Lake Grove	4	12	4	4	4	8.85	12.00	4	0.68	0	53.53

4.0 PRELIMINARY PUBLIC WATER SYSTEM COST ESTIMATE

According to Martin County GIS database and water use records, ten of the communities are served primarily by onsite well water systems and eight communities are served by a combination of onsite and public water systems (Section 3.2). Costs for extending the Public Water System (PWS) to the remaining residents in the communities were estimated using the 2012 Martin County Utilities (MCU) Underground Utility Construction & Maintenance Unit Average Prices and recent contracts that have been executed with contractors. The proposed PWS will consist of water service connections, 8” water mains and associated appurtenances including water valves spaced every 750-ft and Fire hydrants spaced every 500-ft.

A 20% contingency was applied to the total costs to cover any potential utility conflicts and restoration. A 10% engineering cost was also applied to cover cost with engineering design and inspection. Appendix A contains Public Water System Cost Estimates.

Table 4.0.1 - Public Water System Unit Costs

Description	Item	Unit	Unit Cost
Water Meter	Single 1” Meter, Per Lot	EA	\$ 250.00
Water Mains, Valves, Fire Hydrants	8”PVC/HDPE	LF	\$ 70.00

Table 4.0.2 - Public Water System Cost Estimate

	Development	# Of Parcels	Total Cost (\$)	Estimated Cost Per Parcel (\$)
1	Martin Downs / Sunset Gardens (Old Palm City) Area	629	\$3,353,025	\$5,331
2	Salerno / Manatee Pocket Area	177	\$512,525	\$2,896
3	Golden Gate Subdivision	---	---	---
4	Hibiscus Park Area	709	\$3,652,025	\$5,151
5	Rosewalk / Galleon Bay Subdivisions	---	---	---
6	Vista Salerno / US 1 Area	202	\$1,112,150	\$5,506
7	Evergreen G&CC (Hideaway Isles / Mid Rivers)	575	\$3,854,175	\$6,703
8	Tropical Farms Area	499	\$3,028,675	\$6,069
9	North Rivers Shore - Phase 2	---	---	---
10	Town of Sewall's Point	---	---	---
11	Beau Rivage Subdivision	256	\$1,821,300	\$7,114
12	Rio / St. Lucie (West)	27	\$172,575	\$6,392
13	Rio / St. Lucie (East)	141	\$509,925	\$3,616
14	River's End Subdivision	113	\$946,725	\$8,378
15	Crane Creek Country Club	352	\$3,408,600	\$9,684
16	North Mapp Road Area	---	---	---
17	Stuart Yacht & Country Club	---	---	---
18	Port Salerno / New Monrovia Area	647	\$2,667,275	\$4,123
19	Lake Grove Subdivision	76	\$479,700	\$6,312
20	Four Rivers Subdivision	106	\$853,450	\$8,051
21	Captain's Creek Subdivision	167	\$1,546,675	\$9,262
22	South Mapp Road	27	\$190,775	\$7,066
23	Gaines Ave Area	274	\$2,191,150	\$7,997
24	South Fork Area	272	\$1,835,600	\$6,749
	TOTAL	5,249	\$32,136,325	\$6,122

--- Communities primarily served by the Public Water System ($\geq 80\%$ of Parcels currently on Public Water) were excluded from the Cost Estimate

5.0 PRELIMINARY SANITARY SEWER COST ESTIMATE

5.1 Peak Flow Determination

The peak flows were determined by obtaining existing water demand records from Martin County Utilities. Each Community's individual water consumption was then calculated in gallons per day (gpd) and converted to Average Annual Daily Flows (AADF). A peaking factor was applied to the AADF as recommended by Ten State Standards. Peaking factors ranged from 3.40 to 4.29 resulting in peak hour flows from 15 gpm for low population density areas (i.e. Rosewalk and Galleon Bay) to 647 gpm for high population density areas (i.e. Golden Gate). Appendix B contains Peak Flow rates for the 24 development areas.

Ten State Standards: Peaking Factor Equation:

$$PHF = \frac{18 + \sqrt{Population/1,000}}{4 + \sqrt{Population/1,000}}$$

Table 5.1 – Peak Flow Rates

	Development	# Of Parcels	Peak Hour Flow (GPM)
1	Martin Downs / Sunset Gardens (Old Palm City)	1,078	512
2	Salerno / Manatee Pocket	478	243
3	Golden Gate	775	647
4	Hibiscus Park	1,349	621
5	Rosewalk / Galleon Bay	25	15
6	Vista Salerno / US 1 Area	234	125
7	Evergreen G&CC (Hideaway Isles / Mid Rivers)	885	426
8	Tropical Farms	652	324
9	North River Shores - Phase 2	292	154
10	Town of Sewall's Point	931	445
11	Beau Rivage	256	136
12	Rio / St. Lucie (West)	97	54
13	Rio / St. Lucie (East)	331	173
14	River's End	113	63
15	Crane Creek Country Club	381	197
16	North Mapp Road	164	89
17	Stuart Yacht & Country Club	504	255
18	Port Salerno / New Monrovia	878	423
19	Lake Grove	76	43
20	Four Rivers	106	59
21	Captain's Creek	167	91
22	South Mapp Road	37	21
23	Gaines Ave	277	146
24	South Fork Area	272	144
TOTAL		10,358	

5.2 Conventional Gravity Sewer System Cost Estimate

Cost Estimates for installing gravity sewer lines and force mains were obtained from the 2012 Martin County Utility (MCU) Underground Utility Construction & Maintenance Unit Prices. The general guideline for determining the number of lift stations was based on conventional wet well installation depths of 16 – 22 feet and gravity sewer design standards. According to Martin County Design Standards, 8” gravity sewer mains shall be sloped at a minimum of 0.4% to maintain cleansing velocities of ± 2.0 fps. As a result, maximum lengths of gravity sewer mains were assumed to be approximately 2,500 ft. Installation depths of the sewer lines ranged from a minimum of 4 feet to 14 feet to provide adequate pipe cover and a maximum depth of the proposed lift station wet wells of 22 feet. Communities with natural grade elevations varying more than 10 feet allowed for greater depths and sewer lengths were calculated over 2,500 ft. These Communities in general are located along creeks, canals, the St. Lucie Estuary, and the Indian River Lagoon.

In most cases, the number of lift stations was determined by the depths of the sewer lines and the configuration of the gravity sewer system. Lift stations were placed in low lying areas to collect sewage from gravity lines. A preliminary layout of each sanitary sewer system was designed to avoid installation of gravity lines across creeks and to evaluate allowable sewer main lengths based upon topography. Prices generally reflect Type “A” lift stations with 6-ft diameter wet wells in accordance with Martin County Utility and Solid Waste Construction Standards (2012). To maintain a minimum velocity of 2.0 fps, 6” PVC force mains were anticipated to accommodate peak water flow demands. The cost per each lift station and backup generator/emergency pump was estimated to be approximately \$225,000 and \$50,000, respectively.

In addition to the gravity sewer and lift station costs, roadway restoration was also considered in the preliminary estimates. Items such as demolition and replacement of existing roadways with new asphalt/base/subgrade to original grades were evaluated. The costs for the roadway restoration were obtained from the FDOT-6 Month Moving Average (July – December 2013) Statewide Estimates and 2012 MCU Underground Utility Construction & Maintenance Unit Prices. The roadway restoration was based on a typical section of FDOT Type 1.5-inches SP-9.5 Asphalt, Optional Base Group 6, and 12-inches of Type “B” Stabilized subgrade. See Table 5.2 for gravity sewer collection system unit costs, including roadway restoration items.

A contingency of 20% was applied to the gravity sewer cost estimate to account for potential utility conflicts, creek/canal crossings, and possible increases in construction costs due to inflation. A 10% engineering cost was also applied to cover cost with engineering design and inspection. It was assumed that lift stations would be placed on parcels owned by Martin County and Land Acquisition Costs were not included in this estimate. Additionally, this estimate only includes sewer improvements within the right-of-way. This estimate does not include additional cost associated with the connection of the sewer service from the house to the right-of-way or abandonment of existing on-site sewer disposal systems. Appendix C contains Gravity Sanitary Sewer System Cost Estimates.

5.2.1 Existing Dry Sanitary Sewer Lines and Proposed Rehabilitation

The Town of Sewalls Point (TOSP) contains existing gravity sewer dry lines primarily of poly vinyl chloride (PVC) pipes serving as mains and laterals. Older developments within the TOSP contain vitrified clay pipe (VCP) that may require rehabilitation before service can commence. The gravity sewer rehabilitation of the mains entails a TV inspection, cleaning, lining, reinstalling laterals, and mechanically removing roots and any possible grease buildup within the pipes. Unit prices for the rehabilitation of the lines were obtained from Martin County Utilities Department’s current continuing services contract with Lanzo Lining Services. The Communities with existing gravity sewer lines within the TOSP are as follows:

Town of Sewalls Point Existing Dry Gravity Sewer Lines	Type of Pipe Material
Riverview Subdivision	VCP
Rio Vista Subdivision	VCP
Knowles Subdivision	VCP
Marguerita Subdivision	PVC
Oakwood Subdivision	PVC
Kingston Court Subdivision	PVC
Pineapple Lane Subdivision	PVC
Ridgeland Subdivision	VCP
Hillcrest Subdivision	PVC
Heritage Place Subdivision	PVC
Rivercrest Subdivision	PVC

Table 5.2 Gravity Sewer Unit Costs

Description	Item	Unit	Unit Cost
Gravity Sewer (GS)	6" PVC Service Laterals Min. Slope 1.00% (4' – 8' Depth)	LF	\$ 17.00
	8" PVC Mains Min. Slope 0.40% (4' – 12' Depth)	LF	\$ 39.00
	4'Dia Sanitary Sewer Manholes (8' – 16' Depth) (Assumed every 400-ft of GS)	EA	\$3,975
Lift Stations Type "A"	4" PVC Force Mains/Fittings	LF	\$ 15.00
	Lift Station (6' Dia Wetwell, Grinder Pumps, & Control Panel)	EA	\$ 225,000
	Backup Generator/Emergency Pump	EA	\$ 50,000
Roadway Restoration	Demolition	SY	\$ 22.00
	1.5" Type SP-9.5 Asphaltic Concrete (20' Width)	SY	\$ 13.00
	8" Optional Base Group 6 (21' Width)	SY	\$ 13.00
	12" Type 'B' Stabilized Subgrade (22' Width)	SY	\$ 3.00
Gravity Sewer Rehabilitation	CIP Liner 8" Gravity Mains for (VCP) Only	LF	\$24.00
	Reinstate Laterals & Grout Annular Space	EA	\$ 150.00
	Sewer Main Cleaning & TV Inspection	LF	\$ 2.00
	Mechanical Root & Grease Removal	LF	\$ 3.00
Final Surface Restoration	Sod	SY	\$3.00

See Table 6 for total Gravity Sewer System Cost Estimates

5.3 Vacuum Sewer System Cost Estimates

Vacuum Sewer Systems are a very cost effective option for large, relatively flat service areas. However, the vacuum lift stations are much more expensive than traditional lift stations and are not a cost effective option for communities with less than 200 units. The communities considered for this alternative reflect communities with service areas that included more than 200 units in order to offset the cost of the large vacuum pump station. The cost estimate includes unit prices for installation of hybrid valve pits, vacuum main lines, master vacuum pump lift station, excavation, backfill, surface restoration, and portable vacuum pump for testing. The roadway impacts from vacuum main installation would be reduced due to less design constraints in the placement of these mains. Roadway and surface restoration costs were included in the estimate for the Vacuum Sewer System.

In addition, a 20% contingency was included to cover unforeseen costs and potential utility conflicts. A 10% engineering cost was applied to cover cost with engineering design and inspection. It was assumed that lift stations would be placed on parcels owned by Martin County and Land Acquisition Costs were not included in this estimate. The existing gravity sewer dry lines within the Town of Sewalls Point (TOSP), referenced in Section 5.2.1, were not considered in this analysis. This estimate only includes sewer improvements within the right-of-way. This estimate does not include additional cost associated with the connection of the sewer service from the house to the right-of-way or abandonment of existing on-site septic disposal systems. Appendix D contains Air Vacuum System Cost Estimates.

Table 5.3 Vacuum Sewer Unit Costs

Description	Item	Unit	Unit Cost
Valve Pit Package	Valve Pit /Suction Pit/Cleanout	EA	\$5,200
Lift Station / Collection System	Vacuum Station (Building, Tank, Pumps, & Control Panel)	EA	\$ 750,000
	Backup Generator	EA	\$75,000
	Vacuum mains/fittings	LF	\$ 25.00
	4" PVC Force Mains/Fittings	LF	\$ 15.00
Roadway Restoration	Demolition	SY	\$ 22.00
	1.5" Type SP-9.5 Asphaltic Concrete (20' Width)	SY	\$ 13.00
	8" Optional Base Group 6 (21' Width)	SY	\$ 13.00
	12" Type 'B' Stabilized Subgrade (22' Width)	SY	\$3.00
Final Surface Restoration	Bahia Sod	SY	\$3.00

See Table 6 for total Vacuum Sewer System Cost Estimates

5.4 Grinder Pump Sewer System Cost Estimates

Individual low pressure sewage systems were considered as another alternative for each development area. The grinder pump system would connect each residence to a grinder station which would pump the influent to a 4" low pressure force main. The low pressure force mains would then connect to a Regional Type B Lift Station before connecting to an existing force main. The grinder pump package with installation was estimated to be \$7,500 and includes the installation of 4" gravity service line from the house to the grinder station, a simplex grinder pump station with controls, and a 2" discharge service line from the grinder station to the proposed 2" service connection stub out. The force mains will generally be installed in green spaces, within road right-of-ways, and along the side of the road with the least amount of residences to minimize driveway restoration costs. One Regional Lift Station would be provided for every 500 lots and would also include an emergency pump and backup generator. Cost Estimates also include roadway and sod restoration for disturbed areas.

In addition, a 20% contingency was included to cover unforeseen costs and potential utility conflicts. A 10% engineering cost was also applied to cover cost with engineering design and inspection. It was assumed that lift stations would be placed on parcels owned by Martin County and Land Acquisition Costs were not included in this estimate. The existing gravity sewer dry lines within the Town of Sewalls Point (TOSP), referenced in Section 5.2.1, were not considered in this analysis. This estimate includes costs associated with the connection of the sewer service from the house to the right-of-way and the abandonment of existing on-site sewer disposal systems. The 2" Double – Sanitary Service Connection and Valve at the right-of-way would be installed during the installation of the force main. This will reduce permitting and construction cost of the grinder stations. This estimate does not include any electrical modifications that may be necessary for the grinder installation and no major dewatering is anticipated. Appendix E contains Grinder Pump System Cost Estimates.

Table 5.4 Grinder Pump Unit Costs

Description	Item	Unit	Unit Cost
Grinder System Package	4" Gravity Intake Pipe 4-ft Fiberglass Basin Simplex Grinder Pump 2" Low Pressure Service Line 2" Check Valve With Box	EA	\$7,500
Lift Station / Collection System	Lift Station (Type A) (6' Dia Wetwell, Grinder Pumps, & Control Panel)	EA	\$ 225,000
	Lift Station (Type B) (4' Dia Wetwell, Grinder Pumps, & Control Panel)	EA	\$ 100,000
	Emergency Pump / Backup Generator	EA	\$50,000
	4" PVC Force mains	LF	\$ 11.00
	2" HDPE Double Sanitary Service Connection/Valves	EA	\$ 1,450
Roadway Restoration	Demolition	SY	\$ 22.00
	1.5" Type SP-9.5 Asphaltic Concrete (20' Width)	SY	\$ 13.00
	8" Optional Base Group 6 (21' Width)	SY	\$ 13.00
	12" Type 'B' Stabilized Subgrade (22' Width)	SY	\$3.00
Final Surface Restoration	Bahia Sod	SY	\$3.00

See Table 6 for Total Grinder Sewer Cost Estimates

6.0 CONCLUSION

Alternative sanitary sewer cost estimates were calculated for each of the 24 development areas within the Martin County Service Area. Summarized in Table 6.0 are cost estimates for replacing the septic tank systems with three (3) alternative options:

- 1) Gravity Sewer System
- 2) Air Vacuum System
- 3) Grinder Pump System

In general, air vacuum systems are the most cost effective option for developments with greater than 200 parcels. Grinder pump systems remain competitive and in some cases offer a cost savings benefit.

The cost estimates do not include Administrative Fees, Land Acquisition Costs, or Legal Services. Operation and Maintenance cost were **NOT** evaluated in this study. Capital Facility Charges (CFC) or Connection Fees that may be assessed by MCU for providing sanitary sewer service to the lots are also not included in the estimated project costs.

Table 6.0 Alternative Sanitary Sewer Cost Estimate Summary

Ranking	Communities	# of Parcels	Totals Cost			Cost Per Parcel		
			Vacuum Collection System*	Gravity Sewer System*	Grinder Pump System**	Vacuum Collection System*	Gravity Sewer System*	Grinder Pump System**
1	Martin Downs / Sunset Gardens (Old Palm City) Area	1078	\$13,532,368	\$20,852,279	\$16,412,724	\$12,553	\$19,343	\$15,225
2	Golden Gate Subdivision	775	\$9,589,163	\$15,656,572	\$11,923,663	\$12,373	\$20,202	\$15,385
3	Beau Rivage Subdivision	256	\$3,974,236	\$5,909,039	\$4,029,218	\$15,524	\$23,082	\$15,739
4	Gaines Ave Area	277	\$4,445,731	\$6,817,429	\$4,447,102	\$16,050	\$24,612	\$16,055
5	Hibiscus Park Area	1349	\$14,165,566	\$18,617,161	\$18,924,589	\$10,501	\$13,801	\$14,029
6	Port Salerno / New Monrovia Area	878	\$10,536,133	\$14,665,435	\$12,878,941	\$12,000	\$16,703	\$14,668
7	Salerno / Manatee Pocket Area	478	\$5,434,992	\$7,858,844	\$6,905,908	\$11,370	\$16,441	\$14,448
8	North Mapp Road Area	164	--	\$4,313,514	\$2,755,476	--	\$26,302	\$16,802
9	Evergreen G&CC (Hideaway Isles / Mid Rivers)	885	\$12,148,965	\$18,450,985	\$13,675,056	\$13,728	\$20,849	\$15,452
10	South Mapp Road	37	--	\$1,906,220	\$857,571	--	\$51,519	\$23,178
11	South Fork Area	272	\$3,969,317	\$5,804,776	\$4,188,318	\$14,593	\$21,341	\$15,398
12	Town of Sewall's Point	931	\$11,559,281	\$16,658,298	\$14,024,705	\$12,416	\$17,893	\$15,064
13	Rio / St. Lucie (East)	331	\$4,223,304	\$6,408,478	\$4,894,485	\$12,759	\$19,361	\$14,787
14	Rosewalk Galleon Bay	25	--	\$1,173,985	\$437,729	--	\$46,959	\$17,509
15	Stuart Yacht & Country Club	504	\$7,065,980	\$9,910,480	\$7,596,348	\$14,020	\$19,664	\$15,072
16	Four Rivers Subdivision	106	--	\$3,171,393	\$1,955,547	--	\$29,919	\$18,449
17	Crane Creek Country Club	381	\$6,462,014	\$10,991,624	\$6,385,546	\$16,961	\$28,849	\$16,760
18	North Rivers Shore - Phase 2	292	\$4,186,403	\$6,168,524	\$4,484,891	\$14,337	\$21,125	\$15,359
19	Tropical Farms Area	652	\$9,846,595	\$14,796,687	\$10,299,471	\$15,102	\$22,694	\$15,797
20	River's End Subdivision	113	--	\$3,050,687	\$2,011,467	--	\$26,997	\$17,801
21	Vista Salerno / US 1 Area	234	\$3,404,083	\$4,781,277	\$3,558,041	\$14,547	\$20,433	\$15,205
22	Rio / St. Lucie (West)	97	--	\$2,197,773	\$1,582,174	--	\$22,657	\$16,311
23	Captain's Creek Subdivision	167	--	\$4,591,743	\$2,769,291	--	\$27,495	\$16,583
24	Lake Grove Subdivision	76	--	\$2,027,883	\$1,395,236	--	\$26,683	\$18,358
Totals***		10,358	\$118,082,117	--	\$20,150,037			

Total Cost****	\$138,232,154
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Notes: **Bold** prices represent the most cost efficient construction option for the community.

*DOES NOT include cost of service connection beyond right-of-way and abandonment of existing disposal system

**DOES include cost of service connection beyond right-of-way and abandonment of existing disposal system

***Accumulation of all the **Bold** prices in the column.

****Grand total of all the Total Cost **Bold** prices.



**APPENDIX A
MARTIN COUNTY
Septic Elimination Study
Public Water System Cost Estimate**

Job No: 1352.6
February 13, 2015



Developments	No of Parcels	Water Supply Summary		Subtotals (\$)			Total Cost (\$)	Estimated Cost per Parcel (\$)	
		Water Mains (LF)	Water Meters (EA)	Water Supply	Contingency (20%)	Engineering (10%)			
1	Martin Downs / Sunset Gardens (Old Palm City) Area	629	34,600	629	\$ 2,579,250	\$ 515,850	\$ 257,925	\$ 3,353,025.00	\$ 5,330.72
2	Salerno / Manatee Pocket Area	177	5,000	177	\$ 394,250	\$ 78,850	\$ 39,425	\$ 512,525.00	\$ 2,895.62
3	Golden Gate Subdivision	---	---	---	---	---	---	---	---
4	Hibiscus Park Area	709	37,600	709	\$ 2,809,250	\$ 561,850	\$ 280,925	\$ 3,652,025.00	\$ 5,150.95
5	Rosewalk / Galleon Bay Subdivisions	---	---	---	---	---	---	---	---
6	Vista Salerno / US 1 Area	202	11,500	202	\$ 855,500	\$ 171,100	\$ 85,550	\$ 1,112,150.00	\$ 5,505.69
7	Evergreen G&CC (Hideaway Isles / Mid Rivers)	575	40,300	575	\$ 2,964,750	\$ 592,950	\$ 296,475	\$ 3,854,175.00	\$ 6,702.91
8	Tropical Farms Area	499	31,500	499	\$ 2,329,750	\$ 465,950	\$ 232,975	\$ 3,028,675.00	\$ 6,069.49
9	North Rivers Shore - Phase 2	---	---	---	---	---	---	---	---
10	Town of Sewall's Point	---	---	---	---	---	---	---	---
11	Beau Rivage Subdivision	256	19,100	256	\$ 1,401,000	\$ 280,200	\$ 140,100	\$ 1,821,300.00	\$ 7,114.45
12	Rio / St. Lucie (West)	27	1,800	27	\$ 132,750	\$ 26,550	\$ 13,275	\$ 172,575.00	\$ 6,391.67
13	Rio / St. Lucie (East)	141	5,100	141	\$ 392,250	\$ 78,450	\$ 39,225	\$ 509,925.00	\$ 3,616.49
14	River's End Subdivision	113	10,000	113	\$ 728,250	\$ 145,650	\$ 72,825	\$ 946,725.00	\$ 8,378.10
15	Crane Creek Country Club	352	36,200	352	\$ 2,622,000	\$ 524,400	\$ 262,200	\$ 3,408,600.00	\$ 9,683.52
16	North Mapp Road Area	---	---	---	---	---	---	---	---
17	Stuart Yacht & Country Club	---	---	---	---	---	---	---	---
18	Port Salerno / New Monrovia Area	647	27,000	647	\$ 2,051,750	\$ 410,350	\$ 205,175	\$ 2,667,275.00	\$ 4,122.53
19	Lake Grove Subdivision	76	5,000	76	\$ 369,000	\$ 73,800	\$ 36,900	\$ 479,700.00	\$ 6,311.84
20	Four Rivers Subdivision	106	9,000	106	\$ 656,500	\$ 131,300	\$ 65,650	\$ 853,450.00	\$ 8,051.42
21	Captain's Creek Subdivision	167	16,400	167	\$ 1,189,750	\$ 237,950	\$ 118,975	\$ 1,546,675.00	\$ 9,261.53
22	South Mapp Road	27	2,000	27	\$ 146,750	\$ 29,350	\$ 14,675	\$ 190,775.00	\$ 7,065.74
23	Gaines Ave Area	274	23,100	274	\$ 1,685,500	\$ 337,100	\$ 168,550	\$ 2,191,150.00	\$ 7,996.90
24	South Fork Area	272	19,200	272	\$ 1,412,000	\$ 282,400	\$ 141,200	\$ 1,835,600.00	\$ 6,748.53
TOTAL		5,249	334,400		Total Project Costs / Cost per Parcel			\$ 32,136,325.00	\$ 6,122.37

Notes

--- Denotes Communities Primarily Served by Public Water System ($\geq 80\%$) were excluded from the Cost Estimate

Calculations

Watermain extension cost based upon the following assumptions from historic pricing:

Potable Water Supply construction (includes main, appurtenances, restoration, etc.)
Water Meter (Per Parcel)

Unit Costs

\$ 70.00 LF
\$ 250.00 EA



**APPENDIX B
MARTIN COUNTY
Septic Elimination Study
Peak Flow Rates**

Job No: 1352.6
February 13, 2015



No.	Development	# Parcels	# New Lift Stations	Area (AC)	Parcel /AC	Sewer Flows AADF			Peaking Factor Ten State Standards	Peak Hour Flows PHF - (GPM)
						(GPD/unit)	(GPD)	(GPM)		
1	^{A)C)} Martin Downs / Sunset Gardens (Old Palm City) Area	1,078	6	634	1.70	195	211,604	147	3.48	512
2	Salerno / Manatee Pocket Area	478	4	290	1.65	195	93,210	65	3.75	243
3	^{B)D)} Golden Gate Subdivision	775	4	430	1.80	330	258,956	180	3.60	647
4	^{E)} Hibiscus Park Area	1,349	7	522	2.58	195	263,055	183	3.40	621
5	Rosewalk / Galleon Bay Subdivisions	25	2	31	0.81	195	4,875	3	4.29	15
6	Vista Salerno / US 1 Area	234	2	147	1.59	195	45,630	32	3.94	125
7	Evergreen G&CC (Hideaway Isles / Mid Rivers)	885	5	876	1.01	195	172,575	120	3.55	426
8	^{F)G)} Tropical Farms Area	652	5	490	1.33	195	127,837	89	3.65	324
9	North River Shores - Phase 2	292	3	211	1.38	195	56,940	40	3.88	154
10	Town of Sewall's Point	931	7	650	1.43	195	181,545	126	3.53	445
11	Beau Rivage Subdivision	256	3	170	1.51	195	49,920	35	3.92	136
12	Rio / St. Lucie (West)	97	2	64	1.52	195	18,915	13	4.12	54
13	Rio / St. Lucie (East)	331	4	169	1.96	195	64,545	45	3.85	173
14	River's End Subdivision	113	1	136	0.83	195	22,035	15	4.09	63
15	Crane Creek Country Club	381	2	775	0.49	195	74,295	52	3.81	197
16	North Mapp Road Area	164	2	94	1.74	195	31,980	22	4.02	89
17	Stuart Yacht & Country Club	504	6	390	1.29	195	98,280	68	3.73	255
18	^{H)I)} Port Salerno / New Monrovia Area	878	4	389	2.26	195	171,210	119	3.55	423
19	Lake Grove Subdivision	76	1	64	1.19	195	14,820	10	4.16	43
20	Four Rivers Subdivision	106	1	87	1.22	195	20,670	14	4.10	59
21	Captain's Creek Subdivision	167	3	170	0.98	195	32,565	23	4.01	91
22	South Mapp Road	37	2	91	0.41	195	7,215	5	4.25	21
23	Gaines Ave Area	277	3	180	1.54	195	54,015	38	3.90	146
24	South Fork Area	272	3	189	1.44	195	53,040	37	3.90	144
Total		10,358								

Notes:

- A),B), F), H) Commercial Sewer Flows included in Total Flows
- C) Old Palm City undeveloped lots adjacent to 34th Street included in the study area were considered to be medium density and counted as 5 units per acre, based on existing zoning to be conservative.
- D) Golden Gate undeveloped lots in the study area were counted as 3 units per acre, based on existing zoning.
- E) Hibiscus undeveloped lots in the study area were counted as 5 units per acre, based on existing medium density zoning.
- G) Tropical Farms undeveloped lots in the study area were counted as 2 units per acre, based on existing zoning.
- I) Port Salerno / New Monrovia undeveloped lots in the study area were counted as 2 units per acre, based on existing zoning.



APPENDIX C
MARTIN COUNTY
 Septic Elimination Study
Gravity Sewer Cost Estimate
 Job No: 1352.6
 February 13, 2015



No	Developments	Gravity Sewer System						Roadway Restoration				Final Surface Restoration/ Sod (SY)	Subtotals			Mobilization	Total Cost	Engineering Services (10%)	Total Cost w/ Contingency (20%)	Estimated Cost Per Parcel
		No of Parcels	Service (LF)	GS Mains (LF)	Manholes (EA)	Force Main (LF)	L. Stations & Generators (EA)	Demolition (SY)	Asphalt (SY)	Base (SY)	Subgrade (SY)		^{1) 2)} Gravity Sewer System	Roadway Restoration	Final Surface Restoration/ Sod					
1	Martin Downs / Sunset Gardens (Old Palm City) Area	1,078	21,560	77,759	195	300	6	172,798	172,798	181,438	190,078	51,840	\$ 5,999,900	\$ 8,976,858	\$ 155,520	\$ 907,937	\$ 16,040,215	\$ 1,604,021	\$ 20,852,279	\$ 19,343
2	Salerno / Manatee Pocket Area	478	9,560	27,864	70	150	3	61,920	61,920	65,016	68,112	18,576	\$ 2,430,608	\$ 3,216,744	\$ 55,728	\$ 342,185	\$ 6,045,265	\$ 604,526	\$ 7,858,844	\$ 16,441
3	Golden Gate Subdivision	775	15,500	59,318	149	200	4	131,818	131,818	138,409	145,000	39,546	\$ 4,395,224	\$ 6,847,947	\$ 118,638	\$ 681,709	\$ 12,043,517	\$ 1,204,352	\$ 15,656,572	\$ 20,202
4	Hibiscus Park Area	1,349	26,980	65,552	164	350	7	145,672	145,672	152,955	160,239	43,702	\$ 5,811,519	\$ 7,567,652	\$ 131,106	\$ 810,617	\$ 14,320,893	\$ 1,432,089	\$ 18,617,161	\$ 13,801
5	¹⁾ Rosewalk / Galleon Bay Subdivisions	25	500	3,197	8	500	2	7,105	7,105	7,460	7,815	2,132	\$ 476,452	\$ 369,100	\$ 6,396	\$ 51,117	\$ 903,065	\$ 90,307	\$ 1,173,985	\$ 46,959
6	Vista Salerno / US 1 Area	234	4,680	15,179	38	150	3	33,732	33,732	35,418	37,105	10,120	\$ 1,686,993	\$ 1,752,369	\$ 30,360	\$ 208,183	\$ 3,677,906	\$ 367,791	\$ 4,781,277	\$ 20,433
7	Evergreen G&CC (Hideaway Isles / Mid Rivers)	885	17,700	69,220	174	3,500	5	153,823	153,823	161,514	169,205	46,147	\$ 5,260,141	\$ 7,991,102	\$ 138,441	\$ 803,381	\$ 14,193,066	\$ 1,419,307	\$ 18,450,985	\$ 20,849
8	Tropical Farms Area	652	13,040	54,289	136	250	5	120,643	120,643	126,675	132,707	36,193	\$ 4,361,819	\$ 6,267,401	\$ 108,579	\$ 644,268	\$ 11,382,067	\$ 1,138,207	\$ 14,796,687	\$ 22,694
9	North Rivers Shore - Phase 2	292	5,840	21,048	53	150	3	46,774	46,774	49,112	51,451	14,032	\$ 2,004,438	\$ 2,429,899	\$ 42,096	\$ 268,586	\$ 4,745,019	\$ 474,502	\$ 6,168,524	\$ 21,125
10	²⁾ Town of Sewall's Point	326	6,520	51,150	128	11,000	10	113,667	113,667	119,350	125,034	34,100	\$ 6,081,453	\$ 5,904,997	\$ 102,300	\$ 725,325	\$ 12,814,075	\$ 1,281,408	\$ 16,658,298	\$ 17,893
11	Beau Rivage Subdivision	256	5,120	20,010	51	150	3	44,467	44,467	46,690	48,914	13,340	\$ 1,938,050	\$ 2,310,057	\$ 40,020	\$ 257,288	\$ 4,545,415	\$ 454,541	\$ 5,909,039	\$ 23,082
12	Rio / St. Lucie (West)	97	1,940	5,979	15	100	2	13,287	13,287	13,951	14,616	3,986	\$ 892,687	\$ 690,256	\$ 11,958	\$ 95,694	\$ 1,690,595	\$ 169,059	\$ 2,197,773	\$ 22,657
13	Rio / St. Lucie (East)	331	6,620	20,325	51	200	4	45,167	45,167	47,425	49,684	13,550	\$ 2,263,493	\$ 2,346,422	\$ 40,650	\$ 279,034	\$ 4,929,599	\$ 492,960	\$ 6,408,478	\$ 19,361
14	River's End Subdivision	113	2,260	11,248	29	500	1	24,996	24,996	26,246	27,496	7,499	\$ 892,808	\$ 1,298,546	\$ 22,497	\$ 132,831	\$ 2,346,682	\$ 234,668	\$ 3,050,687	\$ 26,997
15	Crane Creek Country Club	381	7,620	40,030	101	1,500	4	88,956	88,956	93,404	97,852	26,687	\$ 3,275,176	\$ 4,621,268	\$ 80,061	\$ 478,590	\$ 8,455,096	\$ 845,510	\$ 10,991,624	\$ 28,849
16	North Mapp Road Area	164	3,280	14,995	38	100	2	33,323	33,323	34,989	36,655	9,997	\$ 1,369,153	\$ 1,731,127	\$ 29,991	\$ 187,816	\$ 3,318,088	\$ 331,809	\$ 4,313,514	\$ 26,302
17	Stuart Yacht & Country Club	504	10,080	31,684	80	1,050	6	70,409	70,409	73,930	77,450	21,123	\$ 3,470,806	\$ 3,657,755	\$ 63,369	\$ 431,516	\$ 7,623,446	\$ 762,345	\$ 9,910,480	\$ 19,664
18	Port Salerno / New Monrovia Area	878	17,560	54,697	137	200	4	121,549	121,549	127,627	133,704	36,465	\$ 4,218,678	\$ 6,314,478	\$ 109,395	\$ 638,553	\$ 11,281,104	\$ 1,128,110	\$ 14,665,435	\$ 16,703
19	Lake Grove Subdivision	76	1,520	6,877	18	750	1	15,283	15,283	16,047	16,811	4,585	\$ 663,910	\$ 793,949	\$ 13,755	\$ 88,297	\$ 1,559,910	\$ 155,991	\$ 2,027,883	\$ 26,683
20	Four Rivers Subdivision	106	2,120	11,824	30	300	1	26,276	26,276	27,590	28,904	7,883	\$ 912,756	\$ 1,365,042	\$ 23,649	\$ 138,087	\$ 2,439,533	\$ 243,953	\$ 3,171,393	\$ 29,919
21	Captain's Creek Subdivision	167	3,340	14,539	37	150	3	32,309	32,309	33,925	35,540	9,693	\$ 1,624,641	\$ 1,678,460	\$ 29,079	\$ 199,931	\$ 3,532,110	\$ 353,211	\$ 4,591,743	\$ 27,495
22	South Mapp Road	37	740	4,811	13	700	2	10,692	10,692	11,226	11,761	3,208	\$ 818,258	\$ 555,441	\$ 9,624	\$ 82,999	\$ 1,466,323	\$ 146,632	\$ 1,906,220	\$ 51,519
23	Gaines Ave Area	277	5,540	23,928	60	150	3	53,174	53,174	55,832	58,491	15,952	\$ 2,137,101	\$ 2,762,379	\$ 47,856	\$ 296,840	\$ 5,244,176	\$ 524,418	\$ 6,817,429	\$ 24,612
24	South Fork Area	272	5,440	19,526	49	150	3	43,392	43,392	45,561	47,731	13,018	\$ 1,919,204	\$ 2,254,206	\$ 39,054	\$ 252,748	\$ 4,465,212	\$ 446,521	\$ 5,804,776	\$ 21,341
Total		9,753						Total Project Costs / Average Cost per Parcel					\$ 64,905,269	\$ 83,703,455	\$ 1,450,122	\$ 9,003,531	\$ 159,062,377	\$ 15,906,238	\$ 206,781,086	\$ 24,372

¹⁾ Rosewalk / Galleon Bay (Type B Lift Stations)

Lift Station (Type B) Package Costs			
for communities with less than 25 Parcels			
	Quantity (EA)	Unit Costs	Subtotals
No of Parcels	25		
Lift Station (Type B)	2	\$ 100,000.00	\$ 200,000.00
Emergency Pump / Backup Generator	2	\$ 50,000.00	\$ 100,000.00
			\$ 300,000.00

²⁾ Town of Sewalls (Gravity Sewer Rehabilitation)

Accounted for in Gravity Sewer System Subtotal				
	No. of Parcels	CIP Liner (LF)	Cleaning & TV Inspect. (LF)	Reinstate Laterals (EA)
Dry Gravity Sewer Lines (VCP)	194	13,806	13,806	97
Dry Gravity Sewer Lines (PVC)	411	10,876	10,876	206
Subtotals	605	\$ 331,344	\$ 123,410	\$ 45,450

Calculations	Unit Costs	Unit
Service Lines- 30 LF per connection(ROW only)	\$ 17.00	LF
Service/Cleanout	\$ 317.54	EA
GS Mains: Equivalent to LF of Roadway	\$ 39.00	LF
Manholes: For Every 400' of Gravity Sewer Mains	\$ 3,975.00	EA
Force Main: (4" PVC and Fittings/Restrains)	\$ 15.00	LF
Gravity Sewer Rehabilitation		
--- CIP Liner (8") Gravity Mains (LF of Dry Lines)	\$ 24.00	LF
--- Including Cleaning & TV Inspection	\$ 2.00	LF
--- Mechanical Root or Grease Removal	\$ 3.00	LF
--- Reinstate Laterals (Serves Every 2 Parcels)	\$ 150.00	EA
Lift Station (A) Package		
--- Lift Station (EA) Depth of 16'-22' Depth	\$ 225,000.00	EA
--- Emergency Pump Backup Generator (Per Lift Station)	\$ 50,000.00	EA

Calculations	Unit Costs	Unit
Demolition: 20'W of Roadway * Linear Feet of Roadway / 9 sq. ft.	\$ 22.00	SY
1 1/2" Asphalt: 20W * Linear Feet of Roadway/ 9 sq. ft.	\$ 13.00	SY
8" Base: 21'W * Linear Feet of Roadway / 9 sq. ft.	\$ 13.00	SY
12" Subgrade: 22'W * Linear Feet of Roadway	\$ 3.00	SY
Final Restoration (Bahia SOD):	\$ 3.00	SY
Mobilization: % of Subtotals (Sewer System & Roadway Restoration)	6.0%	
Engineering Services	10.0%	
Roadway Restoration		
Asphalt Width	20	FT
Base Width	21	FT
Subbase Width	22	FT
Sod	6	FT

Acronyms		
GS - Gravity Sewer	FM - Force Main	VCP - Vitrified Clay Pipe

- Notes**
- 1) Type B Lift Station were used for communities with less than 25 parcels due to low flow volumes. Rosewalk and Galleon Bay are two separate communities with less than 20 parcels.
 - 2) Town of Sewalls Point Gravity Sewer System Parcels represent residents without gravity sewer service. Parcels with existing dry lines proposed for rehabilitation were estimated separately and included in the Gravity Sewer Subtotals column.
 - 3) Estimate does not include cost associated with sanitary service connection from house to right-of-way or abandonment of existing on-site sewer disposal system



**APPENDIX D
MARTIN COUNTY
Septic Elimination Study
Vacuum Sewer Cost Estimate**
Job No: 1352.6
February 13, 2015



Developments	Vacuum Sewer System				Roadway Restoration				Final Surface Restoration/ Sod (SY)	Subtotals					Mobilization	Total Cost Estimate	Engineering Services (10%)	Total Cost w/ Contingency (20%)	Estimated Cost Per Parcel
	No. of Parcels	From VM Road ROW Line (LF)	FM from L. Station to Exist. FM (LF)	Vacuum Station Package (EA)	Demolition (SY)	Asphalt (SY)	Base (SY)	Subgrade (SY)		Valve Pit Package	Total VM Road ROW and L.S. FM	Master L. Station Package	Roadway Restoration	Final Surface Restoration/ Sod					
1 Martin Downs / Sunset Gardens (Old Palm City) Area	1078	77,759	300	2	69,120	69,120	72,576	76,032	129,599	\$ 2,242,240	\$ 1,948,475	\$ 1,650,000	\$ 3,590,784	\$ 388,797	\$ 589,218	\$ 10,409,514	\$ 1,040,951	\$ 13,532,368	\$ 12,553
2 Salerno / Manatee Pocket Area	478	27,864	150	1	24,768	24,768	26,007	27,245	46,440	\$ 994,240	\$ 698,850	\$ 825,000	\$ 1,286,706	\$ 139,320	\$ 236,647	\$ 4,180,763	\$ 418,076	\$ 5,434,992	\$ 11,370
3 Golden Gate Subdivision	775	59,318	200	1	52,728	52,728	55,364	58,000	98,864	\$ 1,612,000	\$ 1,485,950	\$ 825,000	\$ 2,739,212	\$ 296,592	\$ 417,525	\$ 7,376,279	\$ 737,628	\$ 9,589,163	\$ 12,373
4 Hibiscus Park Area	1349	65,552	350	3	58,269	58,269	61,182	64,096	109,254	\$ 2,805,920	\$ 1,644,050	\$ 2,475,000	\$ 3,027,069	\$ 327,762	\$ 616,788	\$ 10,896,589	\$ 1,089,659	\$ 14,165,566	\$ 10,501
5 Rosewalk / Galleon Bay Subdivisions	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6 Vista Salerno / US 1 Area	234	15,179	150	1	13,493	13,493	14,168	14,842	25,299	\$ 486,720	\$ 381,725	\$ 825,000	\$ 700,965	\$ 75,897	\$ 148,218	\$ 2,618,525	\$ 261,853	\$ 3,404,083	\$ 14,547
7 Evergreen G&CC (Hideaway Isles / Mid Rivers)	885	69,220	3,500	2	61,530	61,530	64,606	67,682	115,367	\$ 1,840,800	\$ 1,783,000	\$ 1,650,000	\$ 3,196,474	\$ 346,101	\$ 528,983	\$ 9,345,358	\$ 934,536	\$ 12,148,965	\$ 13,728
8 Tropical Farms Area	652	54,289	250	2	48,258	48,258	50,670	53,083	90,482	\$ 1,356,160	\$ 1,360,975	\$ 1,650,000	\$ 2,506,989	\$ 271,446	\$ 428,734	\$ 7,574,304	\$ 757,430	\$ 9,846,595	\$ 15,102
9 North Rivers Shore - Phase 2	292	21,048	150	1	18,710	18,710	19,645	20,581	35,080	\$ 607,360	\$ 528,450	\$ 825,000	\$ 971,978	\$ 105,240	\$ 182,282	\$ 3,220,310	\$ 322,031	\$ 4,186,403	\$ 14,337
10 Town of Sewall's Point	931	75,832	11,000	2	45,467	45,467	47,740	50,014	126,387	\$ 1,936,480	\$ 2,060,800	\$ 1,650,000	\$ 2,362,007	\$ 379,161	\$ 503,307	\$ 8,891,755	\$ 889,175	\$ 11,559,281	\$ 12,416
11 Beau Rivage Subdivision	256	20,010	150	1	17,787	17,787	18,676	19,566	33,350	\$ 532,480	\$ 502,500	\$ 825,000	\$ 924,031	\$ 100,050	\$ 173,044	\$ 3,057,105	\$ 305,710	\$ 3,974,236	\$ 15,524
12 Rio / St. Lucie (West)	97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13 Rio / St. Lucie (East)	331	20,325	200	1	18,067	18,067	18,970	19,874	33,875	\$ 688,480	\$ 511,125	\$ 825,000	\$ 938,577	\$ 101,625	\$ 183,888	\$ 3,248,695	\$ 324,870	\$ 4,223,304	\$ 12,759
14 River's End Subdivision	113	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15 Crane Creek Country Club	381	40,030	1,500	1	35,583	35,583	37,362	39,141	66,717	\$ 792,480	\$ 1,023,250	\$ 825,000	\$ 1,848,534	\$ 200,151	\$ 281,365	\$ 4,970,780	\$ 497,078	\$ 6,462,014	\$ 16,961
16 North Mapp Road Area	164	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
17 Stuart Yacht & Country Club	504	31,684	1,050	2	28,164	28,164	29,572	30,980	52,807	\$ 1,048,320	\$ 807,850	\$ 1,650,000	\$ 1,463,116	\$ 158,421	\$ 307,662	\$ 5,435,369	\$ 543,537	\$ 7,065,980	\$ 14,020
18 Port Salerno / New Monrovia Area	878	54,697	200	2	48,620	48,620	51,051	53,482	91,162	\$ 1,826,240	\$ 1,370,425	\$ 1,650,000	\$ 2,525,809	\$ 273,486	\$ 458,758	\$ 8,104,718	\$ 810,472	\$ 10,536,133	\$ 12,000
19 Lake Grove Subdivision	76	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20 Four Rivers Subdivision	106	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
21 Captain's Creek Subdivision	167	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22 South Mapp Road	37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23 Gaines Ave Area	277	23,928	150	1	21,270	21,270	22,333	23,397	39,880	\$ 576,160	\$ 600,450	\$ 825,000	\$ 1,104,970	\$ 119,640	\$ 193,573	\$ 3,419,793	\$ 341,979	\$ 4,445,731	\$ 16,050
24 South Fork Area	272	19,526	150	1	17,357	17,357	18,225	19,093	32,544	\$ 565,760	\$ 490,400	\$ 825,000	\$ 901,699	\$ 97,632	\$ 172,829	\$ 3,053,320	\$ 305,332	\$ 3,969,317	\$ 14,593
Total	10,358									\$ 19,911,840	\$ 17,198,275	\$ 19,800,000	\$ 30,088,920	\$ 3,381,321	\$ 5,422,821	\$ 95,803,177	\$ 9,580,318	\$ 124,544,131	\$ 12,024

Calculations	Unit Costs	Unit
Force Main: (4" PVC and Fittings/Restrains)	\$ 15.00	LF
Vacuum Main/fittings:	\$ 25.00	LF
Valve Pit Package:	\$ 5,200.00	EA
--Includes		
Two Piece Air Vac Valve Pit		2.5 Parcels Per Valve Pit
Suction Pit / Controls		
Cleanout/Discharge Service Line		
Master Lift Station Package		
--- Vacuum Lift Station	\$ 750,000.00	EA
--- Emergency Backup Generator	\$ 75,000.00	EA
Width of Sod Restoration	15.00	FT

Calculations	Unit Costs	Unit
Demolition: 20'W of Roadway * Linear Feet of Roadway / 9 sq. ft.	\$ 22.00	SY
1 1/2" Asphalt: 20'W * Linear Feet of Roadway / 9 sq. ft.	\$ 13.00	SY
8" Base: 21'W * Linear Feet of Roadway / 9 sq. ft.	\$ 13.00	SY
12" Subgrade: 22'W * Linear Feet of Roadway	\$ 3.00	SY
Final Surface Restoration Bahia Sod (SY)	\$ 3.00	SY
Mobilization: % of Subtotals (Sewer System & Roadway Restoration)	6.00%	
Engineering Services	10.00%	

Acronyms		
GS - Gravity Sewer	FM - Force Main	--- Represents zero quantities
LS - Lift Station	VM - Vacuum Main	

- Notes**
1) Estimate does not include cost associated with sanitary service connection from house to right-of-way or abandonment of existing on-site sewer disposal system
2) The existing gravity sewer dry lines within the Town of Sewalls Point (TOSP), referenced in Section 5.2.1, were not considered in this analysis.



APPENDIX E
MARTIN COUNTY
 Septic Elimination Study
 Grinder Pump Cost Estimate

Job No: 1352.6
 February 13, 2015



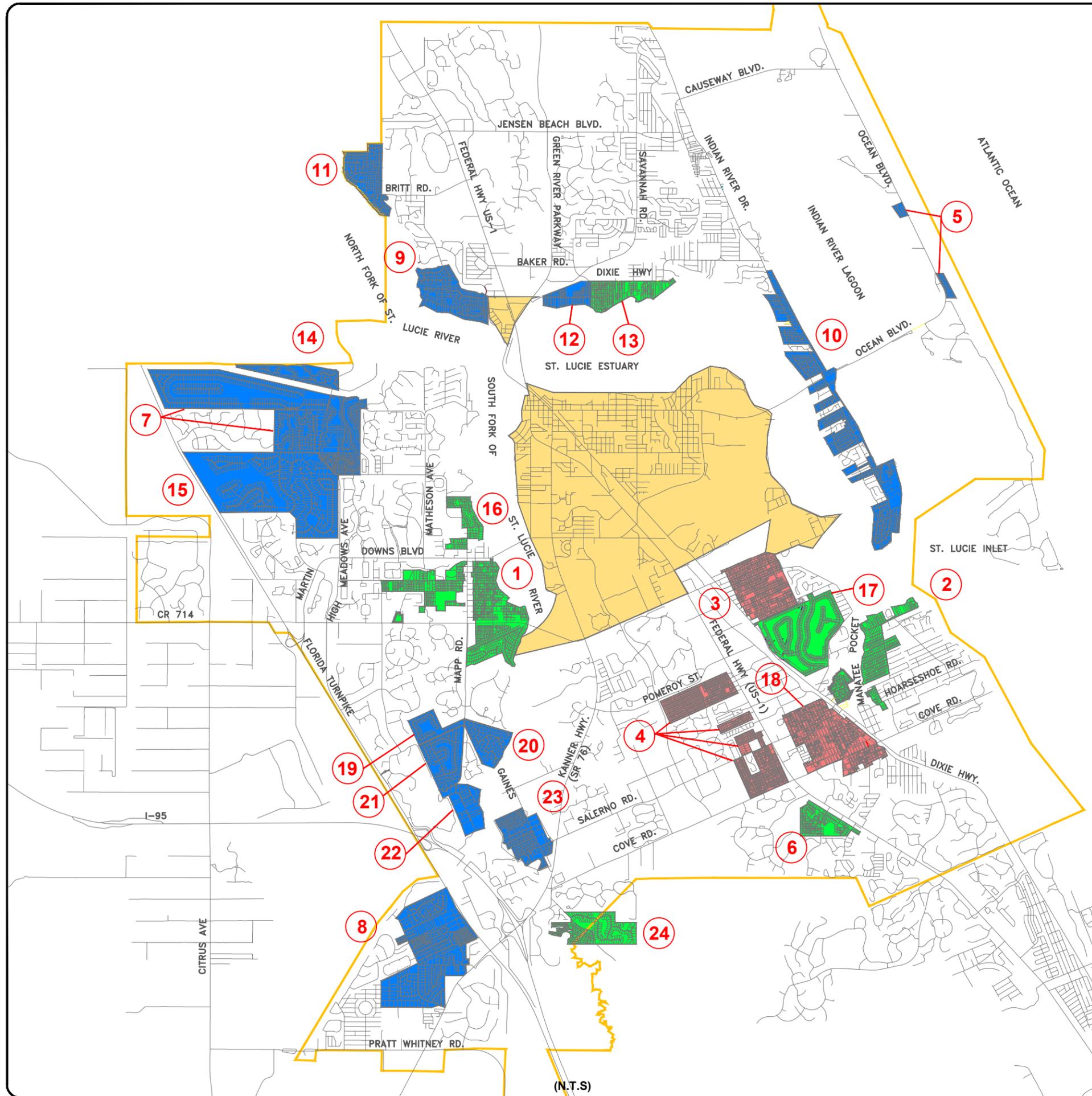
No.	Developments	Grinder Pump Sewer System				Roadway Restoration				Final Surface Restoration/ Sod (SY)	Subtotals						Mobilization	Total Cost Estimate	Engineering Services (10%)	Total Cost w/ Contingency (20%)	Estimated Cost Per Parcel
		No. Grinder Pump Packages	FM Road ROW Line (LF)	FM from L. Station to Exist. FM (LF)	Master L. Station Package (EA)	Demolition (SY)	Asphalt (SY)	Base (SY)	Subgrade (SY)		Grinder Pump Package	Sanitary Service Connections	Total FM Road ROW and L.S. FM	Master L. Station Package	Roadway Restoration	Final Surface Restoration/ Sod					
1	Martin Downs / Sunset Gardens (Old Palm City) Area	1078	77,759	300	3	25,920	25,920	27,216	28,512	129,599	\$ 8,085,000	\$ 781,550	\$ 858,649	\$ 450,000	\$ 1,346,544	\$ 388,797	\$ 714,632	\$ 12,625,172	\$ 1,262,517	\$ 16,412,724	\$ 15,225
2	Salerno / Manatee Pocket Area	478	27,864	150	1	9,288	9,288	9,753	10,217	46,440	\$ 3,585,000	\$ 346,550	\$ 308,154	\$ 150,000	\$ 482,520	\$ 139,320	\$ 300,693	\$ 5,312,237	\$ 531,224	\$ 6,905,908	\$ 14,448
3	Golden Gate Subdivision	775	59,318	200	2	19,773	19,773	20,762	21,750	98,864	\$ 5,812,500	\$ 561,875	\$ 654,698	\$ 300,000	\$ 1,027,211	\$ 296,592	\$ 519,173	\$ 9,172,049	\$ 917,205	\$ 11,923,663	\$ 15,385
4	Hibiscus Park Area	1349	65,552	350	3	21,851	21,851	22,944	24,036	109,254	\$ 10,117,500	\$ 978,025	\$ 724,922	\$ 450,000	\$ 1,135,165	\$ 327,762	\$ 824,002	\$ 14,557,376	\$ 1,455,738	\$ 18,924,589	\$ 14,029
5	¹⁾ Rosewalk / Galleon Bay Subdivisions	25	3,197	500	0	1,066	1,066	1,119	1,173	5,329	\$ 187,500	\$ 18,125	\$ 40,667	\$ -	\$ 55,376	\$ 15,987	\$ 19,059	\$ 336,714	\$ 33,671	\$ 437,729	\$ 17,509
6	Vista Salerno / US 1 Area	234	15,179	150	1	5,060	5,060	5,313	5,566	25,299	\$ 1,755,000	\$ 169,650	\$ 168,619	\$ 150,000	\$ 262,867	\$ 75,897	\$ 154,922	\$ 2,736,955	\$ 273,695	\$ 3,558,041	\$ 15,205
7	Evergreen G&CC (Hideaway Isles / Mid Rivers)	885	69,220	3,500	2	23,074	23,074	24,228	25,381	115,367	\$ 6,637,500	\$ 641,625	\$ 799,920	\$ 300,000	\$ 1,198,697	\$ 346,101	\$ 595,431	\$ 10,519,274	\$ 1,051,927	\$ 13,675,056	\$ 15,452
8	Tropical Farms Area	652	54,289	250	2	18,097	18,097	19,002	19,907	90,482	\$ 4,890,000	\$ 472,700	\$ 599,929	\$ 300,000	\$ 940,142	\$ 271,446	\$ 448,453	\$ 7,922,670	\$ 792,267	\$ 10,299,471	\$ 15,797
9	North Rivers Shore - Phase 2	292	21,048	150	1	7,017	7,017	7,367	7,718	35,080	\$ 2,190,000	\$ 211,700	\$ 233,178	\$ 150,000	\$ 364,520	\$ 105,240	\$ 195,278	\$ 3,449,916	\$ 344,992	\$ 4,484,891	\$ 15,359
10	Town of Sewall's Point	931	75,832	11,000	2	17,051	17,051	17,903	18,756	126,387	\$ 6,982,500	\$ 674,975	\$ 955,152	\$ 300,000	\$ 885,792	\$ 379,161	\$ 610,655	\$ 10,788,235	\$ 1,078,823	\$ 14,024,705	\$ 15,064
11	Beau Rivage Subdivision	256	20,010	150	1	6,671	6,671	7,004	7,338	33,350	\$ 1,920,000	\$ 185,600	\$ 221,760	\$ 150,000	\$ 346,551	\$ 100,050	\$ 175,438	\$ 3,099,399	\$ 309,940	\$ 4,029,218	\$ 15,739
12	Rio / St. Lucie (West)	97	5,979	100	1	1,994	1,994	2,093	2,193	9,965	\$ 727,500	\$ 70,325	\$ 66,869	\$ 150,000	\$ 103,578	\$ 29,895	\$ 68,890	\$ 1,217,057	\$ 121,706	\$ 1,582,174	\$ 16,311
13	Rio / St. Lucie (East)	331	20,325	200	1	6,776	6,776	7,114	7,453	33,875	\$ 2,482,500	\$ 239,975	\$ 225,775	\$ 150,000	\$ 352,001	\$ 101,625	\$ 213,113	\$ 3,764,989	\$ 376,499	\$ 4,894,485	\$ 14,787
14	River's End Subdivision	113	11,248	500	1	3,750	3,750	3,937	4,125	18,747	\$ 847,500	\$ 81,925	\$ 129,228	\$ 150,000	\$ 194,806	\$ 56,241	\$ 87,582	\$ 1,547,282	\$ 154,728	\$ 2,011,467	\$ 17,801
15	Crane Creek Country Club	381	40,030	1,500	1	13,344	13,344	14,011	14,678	66,717	\$ 2,857,500	\$ 276,225	\$ 456,830	\$ 150,000	\$ 693,217	\$ 200,151	\$ 278,035	\$ 4,911,958	\$ 491,196	\$ 6,385,546	\$ 16,760
16	North Mapp Road Area	164	14,995	100	1	4,999	4,999	5,249	5,499	24,992	\$ 1,230,000	\$ 118,900	\$ 166,045	\$ 150,000	\$ 259,699	\$ 74,976	\$ 119,977	\$ 2,119,597	\$ 211,960	\$ 2,755,476	\$ 16,802
17	Stuart Yacht & Country Club	504	31,684	1,050	2	10,562	10,562	11,090	11,618	52,807	\$ 3,780,000	\$ 365,400	\$ 360,074	\$ 300,000	\$ 548,694	\$ 158,421	\$ 330,755	\$ 5,843,344	\$ 584,334	\$ 7,596,348	\$ 15,072
18	Port Salerno / New Monrovia Area	878	54,697	200	2	18,233	18,233	19,145	20,056	91,162	\$ 6,585,000	\$ 636,550	\$ 603,867	\$ 300,000	\$ 947,208	\$ 273,486	\$ 560,767	\$ 9,906,878	\$ 990,688	\$ 12,878,941	\$ 14,668
19	Lake Grove Subdivision	76	6,877	750	1	2,293	2,293	2,408	2,522	11,462	\$ 570,000	\$ 55,100	\$ 83,897	\$ 150,000	\$ 119,125	\$ 34,386	\$ 60,750	\$ 1,073,258	\$ 107,326	\$ 1,395,236	\$ 18,358
20	Four Rivers Subdivision	106	11,824	300	1	3,942	3,942	4,139	4,336	19,707	\$ 795,000	\$ 76,850	\$ 133,364	\$ 150,000	\$ 204,785	\$ 59,121	\$ 85,147	\$ 1,504,267	\$ 150,427	\$ 1,955,547	\$ 18,449
21	Captain's Creek Subdivision	167	14,539	150	1	4,847	4,847	5,089	5,331	24,232	\$ 1,252,500	\$ 121,075	\$ 161,579	\$ 150,000	\$ 251,795	\$ 72,696	\$ 120,579	\$ 2,130,224	\$ 213,022	\$ 2,769,291	\$ 16,583
22	South Mapp Road	37	4,811	700	1	1,604	1,604	1,684	1,765	8,019	\$ 277,500	\$ 26,825	\$ 60,621	\$ 150,000	\$ 83,327	\$ 24,057	\$ 37,340	\$ 659,670	\$ 65,967	\$ 857,571	\$ 23,178
23	Gaines Ave Area	277	23,928	150	1	7,977	7,977	8,375	8,774	39,880	\$ 2,077,500	\$ 200,825	\$ 264,858	\$ 150,000	\$ 414,392	\$ 119,640	\$ 193,633	\$ 3,420,848	\$ 342,085	\$ 4,447,102	\$ 16,055
24	South Fork Area	272	19,526	150	1	6,509	6,509	6,835	7,160	32,544	\$ 2,040,000	\$ 197,200	\$ 216,436	\$ 150,000	\$ 338,150	\$ 97,632	\$ 182,365	\$ 3,221,783	\$ 322,178	\$ 4,188,318	\$ 15,398
Total		10,358									\$ 77,685,000	\$ 7,509,550	\$ 8,495,091	\$ 4,950,000	\$ 12,556,162	\$ 3,748,680	\$ 6,896,669	\$ 121,841,152	\$ 12,184,115	\$ 158,393,497	\$ 15,292

Calculations	Unit Costs	Unit
Force Main (2"-4" PVC): Eq. to Linear Feet of Roadway	\$ 11.00	LF
2" HDPE Sanitary Service Connection w/ 4x2 Saddle	\$ 1,450.00	EA
Grinder Pump Package:	\$ 7,500.00	EA
--Includes		
4" Gravity Service		
4-ft Fiberglass Basin / Piping		
Simplex Grinder Pump / Controls		
2" Discharge Service Line		
2" Check Valve and Box		
Master Lift Station Package		
--- Lift Station (Type A)	\$ 225,000.00	EA
--- Lift Station (Type B)	\$ 100,000.00	EA
--- Emergency Pump / Backup Generator	\$ 50,000.00	EA
No. of Lots per LS	500	Lots
Width of Sod Restoration	15.00	FT

Calculations	Unit Costs	Unit
Demolition: 20'W of Roadway * Linear Feet of Roadway / 9 sq. ft.	\$ 22.00	SY
1 1/2" Asphalt: 20W * Linear Feet of Roadway / 9 sq. ft.	\$ 13.00	SY
8" Base: 21'W * Linear Feet of Roadway / 9 sq. ft.	\$ 13.00	SY
12" Subgrade: 22'W * Linear Feet of Roadway	\$ 3.00	SY
Final Surface Restoration Bahia Sod (SY)	\$ 3.00	SY
Mobilization: % of Subtotals (Sewer System & Roadway Restoration)	6.00%	
Engineering Services	10.00%	

Acronyms		
GS - Gravity Sewer	FM - Force Main	--- Represents zero quantities
LS - Lift Station		

- Notes**
- 1) The proposed Grinder Pump Systems for *Rosewalk* (10 parcels) and *Galleon Bay* (15 Parcels) will tie into existing lift stations due to their low population densities and sanitary sewer flow rates. *Rosewalk* will tie into the lift station to the east currently serving the *Beachwood Villa Condominiums* (L. Station No. 417). Likewise, *Galleon Bay* will tie into the lift station to the north serving the *Islander 12 Condominium* (L. Station No. 421). Existing Lift Station IDs are from MCU GIS Database.
 - 2) Estimate does not include cost associated with residential electrical modifications
 - 3) No major dewatering has been anticipated in this estimate
 - 4) The existing gravity sewer dry lines within the Town of Sewalls Point (TOSP), referenced in Section 5.2.1., were not considered in this analysis.



RANKING CRITERIA POPULATION DENSITY FACTOR

LEGEND

- POPULATION DENSITY**
- LOW DENSITY (4 PTS)
 - MEDIUM DENSITY (8 PTS)
 - HIGH DENSITY (12 PTS)
 - MARTIN COUNTY UTILITIES AREA
 - CITY OF STUART

DEVELOPMENTS

1. OLD PALM CITY AREA
2. SALERNO / MANATEE POCKET AREA
3. GOLDEN GATE SUBDIVISION
4. HIBISCUS PARK AREA
5. ROSEWALK / GALLEON BAY SUBDIVISIONS
6. VISTA SALERNO / US-1 AREA
7. EVERGREEN GOLF & COUNTRY CLUB (HIDEAWAY ISLES / MID RIVERS)
8. TROPICAL FARMS AREA
9. NORTH RIVER SHORES (PHASE II)
10. TOWN OF SEWALLS POINT
11. BEAU RIVAGE SUBDIVISION
12. RIO ST. LUCIE WEST
13. RIO ST. LUCIE EAST
14. RIVER'S END SUBDIVISION
15. CRANE CREEK COUNTRY CLUB
16. NORTH MAPP ROAD AREA
17. STUART YACHT & COUNTRY CLUB
18. PORT SALERNO / NEW MONROVIA AREA
19. LAKE GROVE SUBDIVISION
20. FOUR RIVERS SUBDIVISION
21. CAPTAIN'S CREEK SUBDIVISION
22. SOUTH MAPP ROAD AREA
23. GAINES AVE AREA
24. SOUTH FORK AREA



301 NW Flagler Ave, Ste. 201
Stuart, Florida 34994
Phone: (772) 692-4344
Fax: (772) 692-4341

Engineering Business
No. EB-007657
Civil Engineering Professionals

DATE:	12/02/14
DRAWN BY:	AMS
DESIGNED BY:	RRK
CHECKED BY:	JWC
PROJECT No.:	1352.6
HORIZ. SCALE:	NTS
VERT. SCALE:	NTS
CADD FILE:	PARCEL MAP

NO.	DATE	BY	REVISIONS

SCALE	1" = 1' (AS SHOWN)
VERIFICATION	SOLID BAR IS EQUAL TO ONE INCH ON ORIGINAL DRAWING. ADJUST ALL SCALED DIMENSIONS ACCORDINGLY.

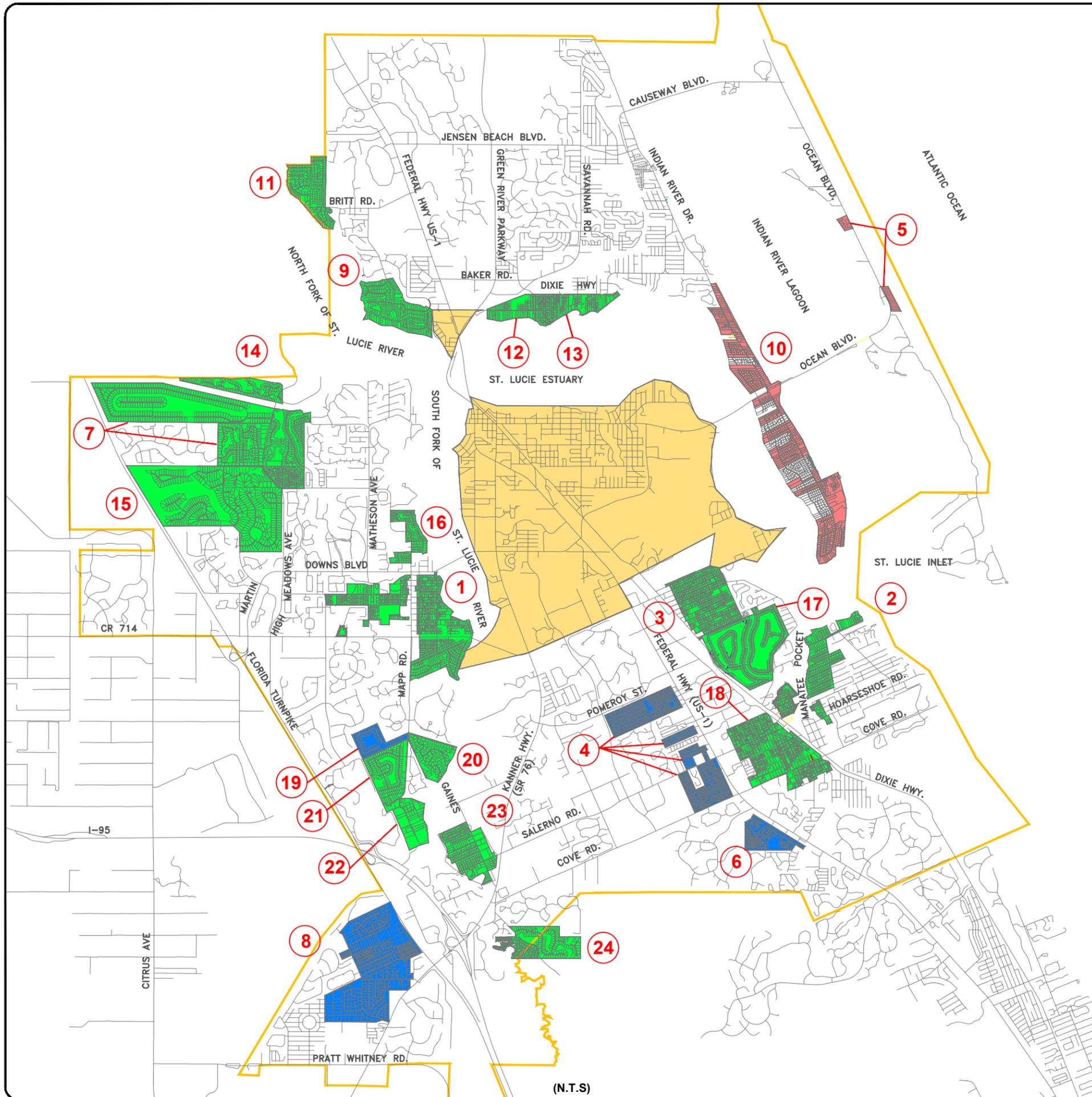
MARTIN COUNTY
SEPTIC SYSTEM
ELIMINATION STUDY RANKING CRITERIA
POPULATION DENSITY
EXHIBIT

Joseph W. Capra
301 N.W. Flagler Ave, Ste. 201
Stuart, Florida 34994
P.E. No. 37638

Printed Date:

JOB No.: 1352.6
SHEET
1 OF 10

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(N.T.S)



RANKING CRITERIA SURFACE WATER CLASS FACTOR

LEGEND

- SURFACE WATER CLASS**
- INLAND (4 PTS)
 - CLASS III - RECREATIONAL (8 PTS)
 - CLASS II - SHELLFISH PROPAGATING & HARVESTING (12 PTS)

- MARTIN COUNTY UTILITIES AREA
- CITY OF STUART

- DEVELOPMENTS**
1. OLD PALM CITY AREA
 2. SALERNO / MANATEE POCKET AREA
 3. GOLDEN GATE SUBDIVISION
 4. HIBISCUS PARK AREA
 5. ROSEWALK / GALLEON BAY SUBDIVISIONS
 6. VISTA SALERNO / US-1 AREA
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Engineering Business
No. EB-007657

DATE:	12/29/2014
DRAWN BY:	ASM
DESIGNED BY:	RBK
CHECKED BY:	JWC
PROJECT No.:	1352.6
HORIZ. SCALE:	NTS
VERT. SCALE:	NTS
CADD FILE:	PARCEL MAP

NO.	DATE	BY	REVISIONS

SCALE VERIFICATION

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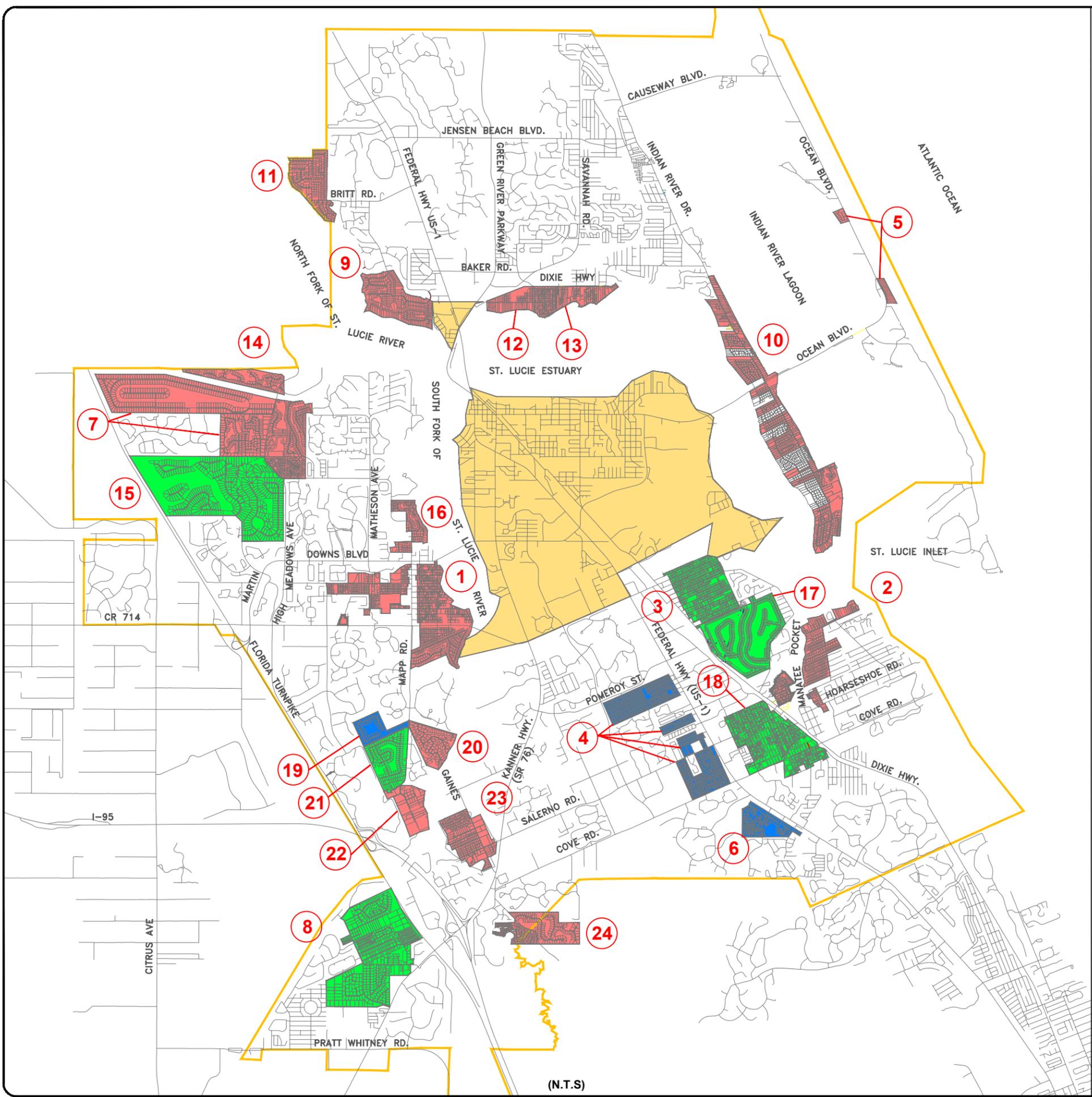
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MARTIN COUNTY
SEPTIC SYSTEM
ELIMINATION STUDY RANKING CRITERIA
SURFACE WATER CLASS
EXHIBIT

Joseph W. Capra
301 N.W. Flagler Ave., Ste. 201
Stuart, Florida 34994
P.E. No. 37638

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(N.T.S)



RANKING CRITERIA PROXIMITY TO SURFACE WATERS FACTOR

LEGEND

- PROXIMITY TO SURFACE WATERS**
- INLAND - (4 PTS)
 - BORDERED BY CREEKS & DRAINAGE DITCHES (8 PTS)
 - BORDERED BY MAJOR WATER BODY (12 PTS)
 - MARTIN COUNTY UTILITIES AREA
 - CITY OF STUART

- DEVELOPMENTS**
1. OLD PALM CITY AREA
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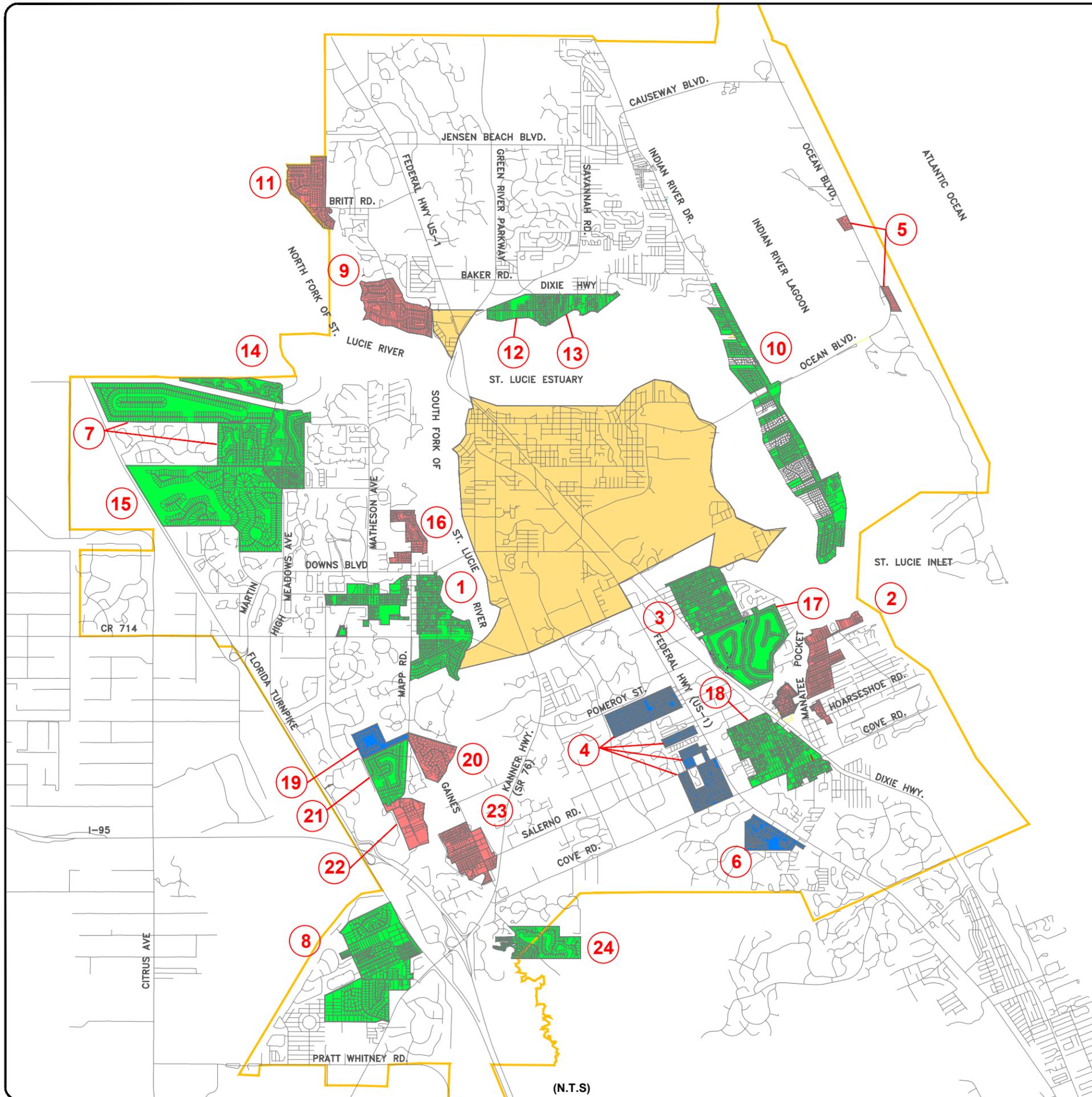
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MARTIN COUNTY
SEPTIC SYSTEM
ELIMINATION STUDY RANKING CRITERIA
PROXIMITY TO SURFACE
WATERS EXHIBIT

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(N.T.S)



RANKING CRITERIA FEMA FLOODPLAIN FACTOR

LEGEND

- FEMA FLOODPLAIN**
- OUTSIDE 100 YEAR FLOODPLAIN (4 PTS)
 - LESS THAN 50% WITHIN FLOODPLAIN (8 PTS)
 - PREDOMINATELY WITHIN FLOODPLAIN (12 PTS)
 - MARTIN COUNTY UTILITIES AREA
 - CITY OF STUART

- DEVELOPMENTS**
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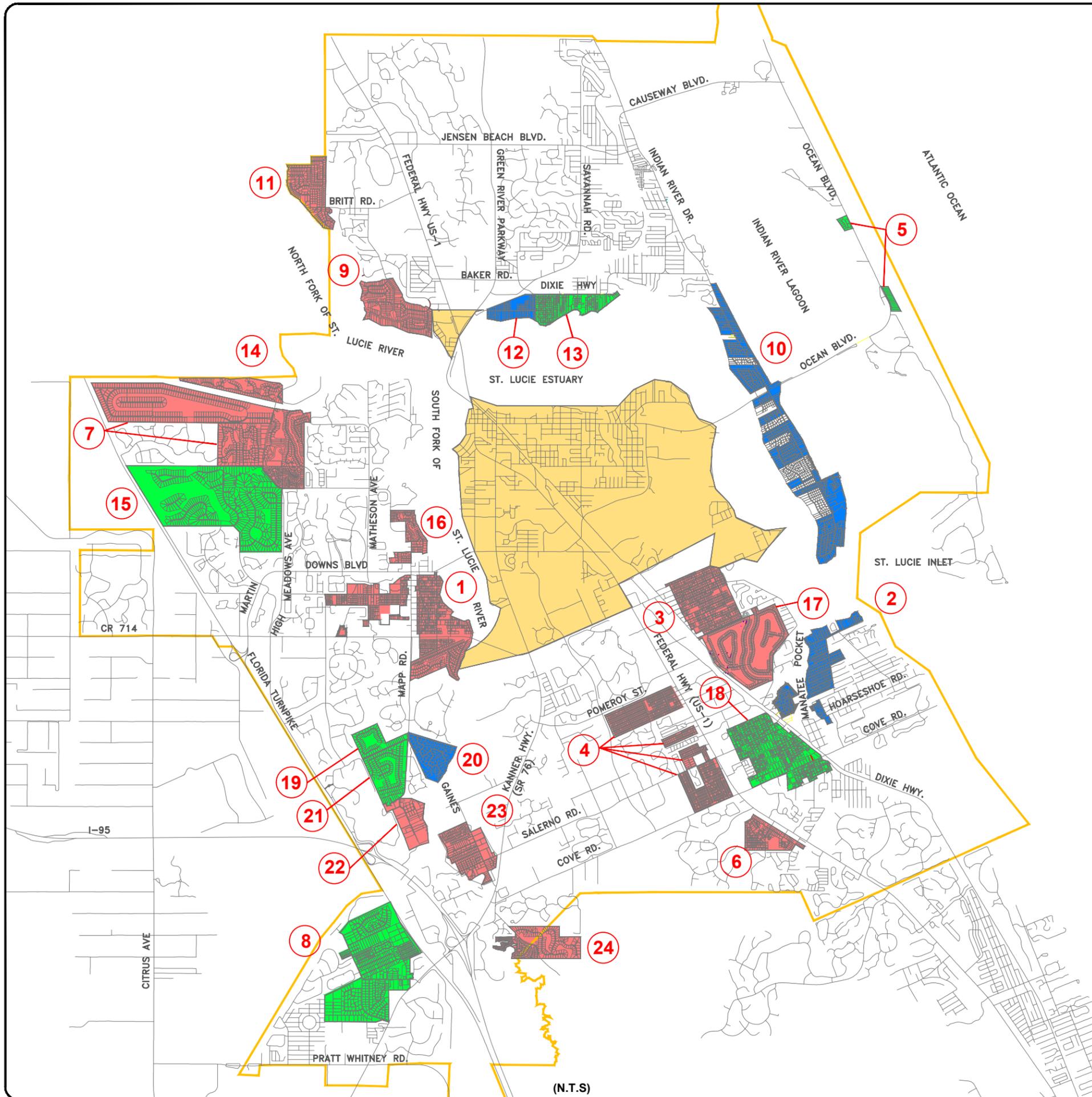
SCALE
VERIFICATION

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**MARTIN COUNTY
 SEPTIC SYSTEM
 ELIMINATION STUDY RANKING CRITERIA
 FEMA FLOODPLAIN
 EXHIBIT**

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(N.T.S)



RANKING CRITERIA GROUND WATER TABLE FACTOR

LEGEND

- GROUND WATER TABLE (GWT)**
- DEPTH TO GWT > 48" (0-8 PTS)
 - DEPTH TO GWT = 48" (8 PTS)
 - DEPTH TO GWT < 48" (9-12 PTS)
- MARTIN COUNTY UTILITIES AREA
- CITY OF STUART

- DEVELOPMENTS**
1. OLD PALM CITY AREA
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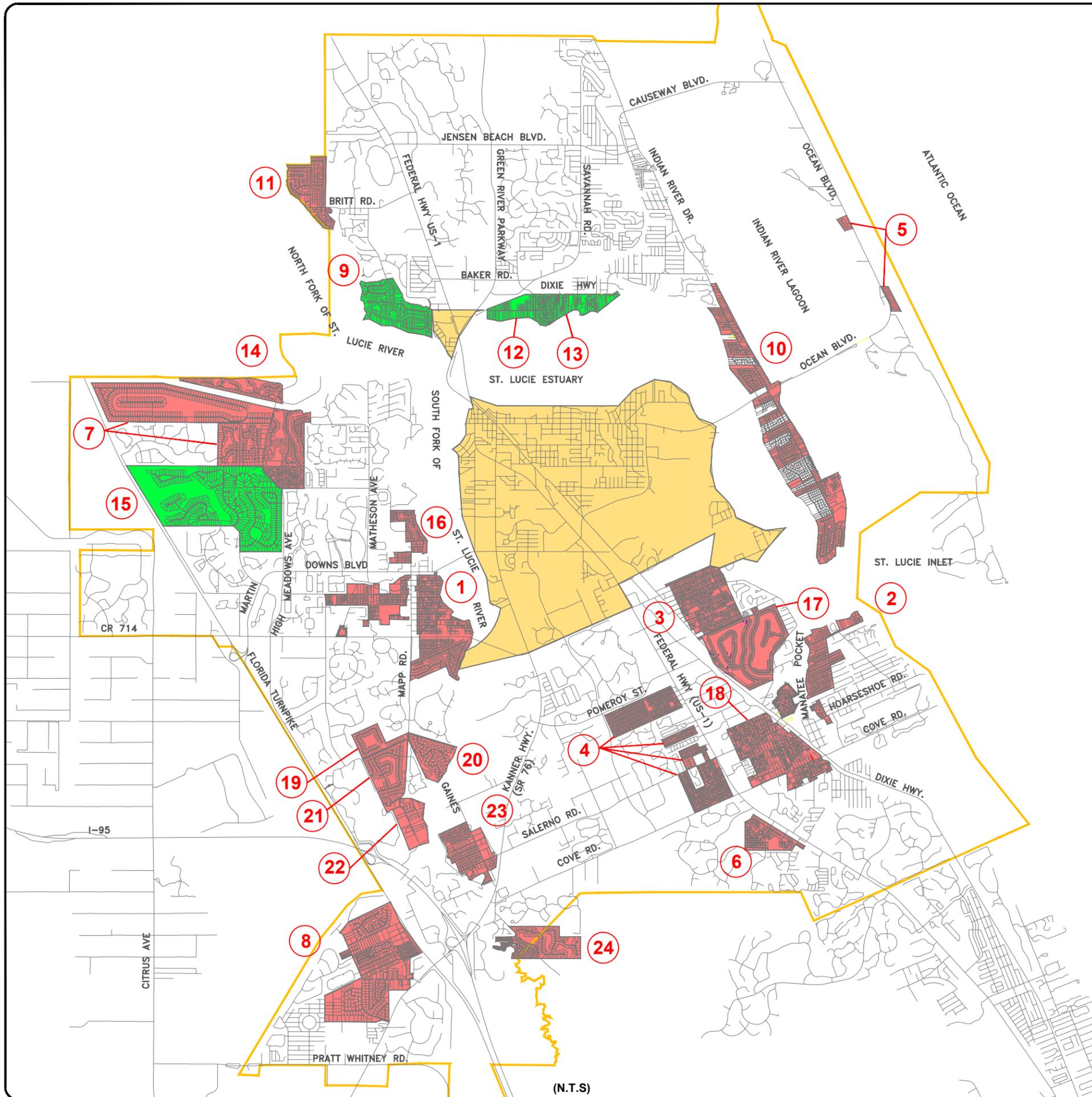
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MARTIN COUNTY
SEPTIC SYSTEM
ELIMINATION STUDY RANKING CRITERIA
GROUND WATER TABLE
FACTOR EXHIBIT

Joseph W. Capra
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(N.T.S)



RANKING CRITERIA SOIL TYPE FACTOR

LEGEND

SOIL TYPE FOR SEPTIC TANK ABSORPTION FIELDS

- SLIGHT (4 < SCORE < 6 PTS)
- MODERATE (6 < SCORE < 10 PTS)
- SEVERE (10 < SCORE < 12 PTS)
- MARTIN COUNTY UTILITIES AREA
- CITY OF STUART

DEVELOPMENTS

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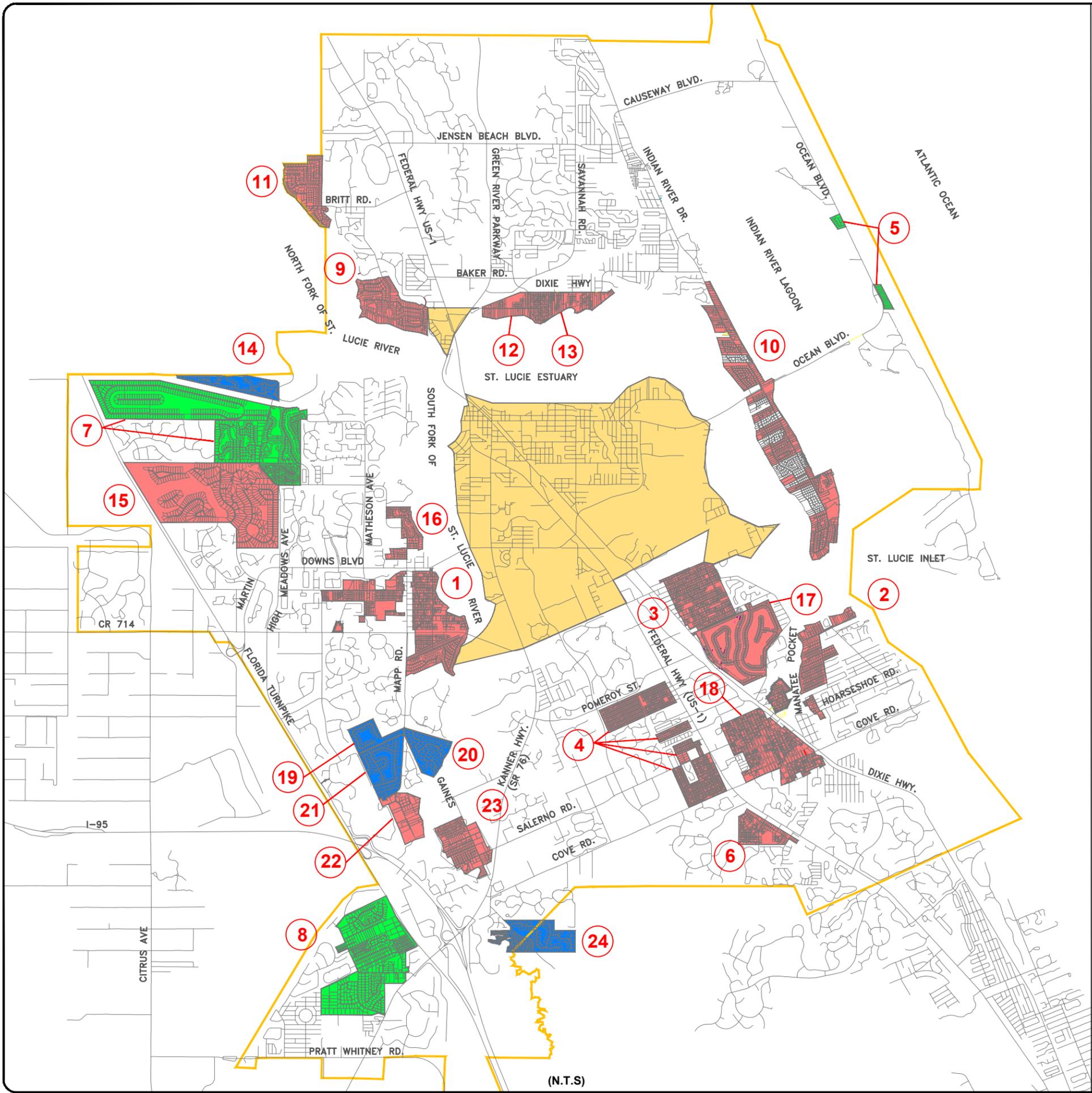
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MARTIN COUNTY
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 ELIMINATION STUDY RANKING CRITERIA
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(N.T.S)



RANKING CRITERIA SURFACE WATER MANAGEMENT FACTOR

LEGEND

- SURFACE WATER MANAGEMENT SYSTEM**
- PLATTED BEFORE 1978 (0 < SCORE < 4 PTS)
 - PLATTED BETWEEN 1978 & 1988 (4 < SCORE < 10 PTS)
 - PLATTED AFTER 1988 (8 < SCORE < 12 PTS)
 - MARTIN COUNTY UTILITIES AREA
 - CITY OF STUART

- DEVELOPMENTS**
1. OLD PALM CITY AREA
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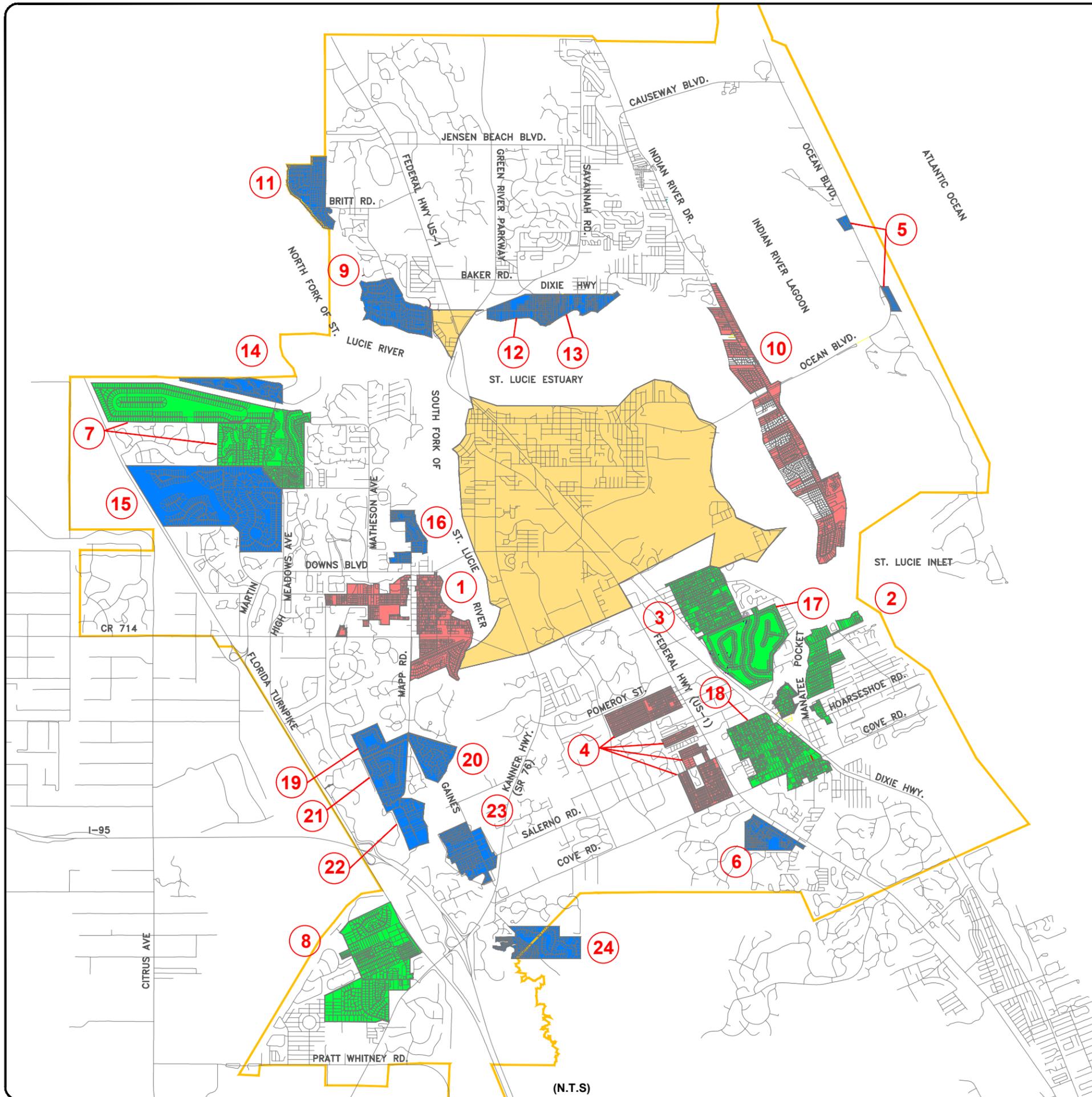
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MARTIN COUNTY SEPTIC SYSTEM ELIMINATION STUDY RANKING CRITERIA SURFACE WATER MANAGEMENT FACTOR EXHIBIT

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(N.T.S)



RANKING CRITERIA NITROGEN/NITRATE LOAD CONTRIBUTION TO GROUNDWATER LOCATION FACTOR

LEGEND

NITROGEN/NITRATE LOAD CONTRIBUTION TO GROUNDWATER FACTOR LOCATION

- SLIGHT (0 - 4 PTS)
- MODERATE (4 - 8 PTS)
- SEVERE (8 - 12 PTS)

- MARTIN COUNTY UTILITIES AREA
- CITY OF STUART

DEVELOPMENTS

1. OLD PALM CITY AREA
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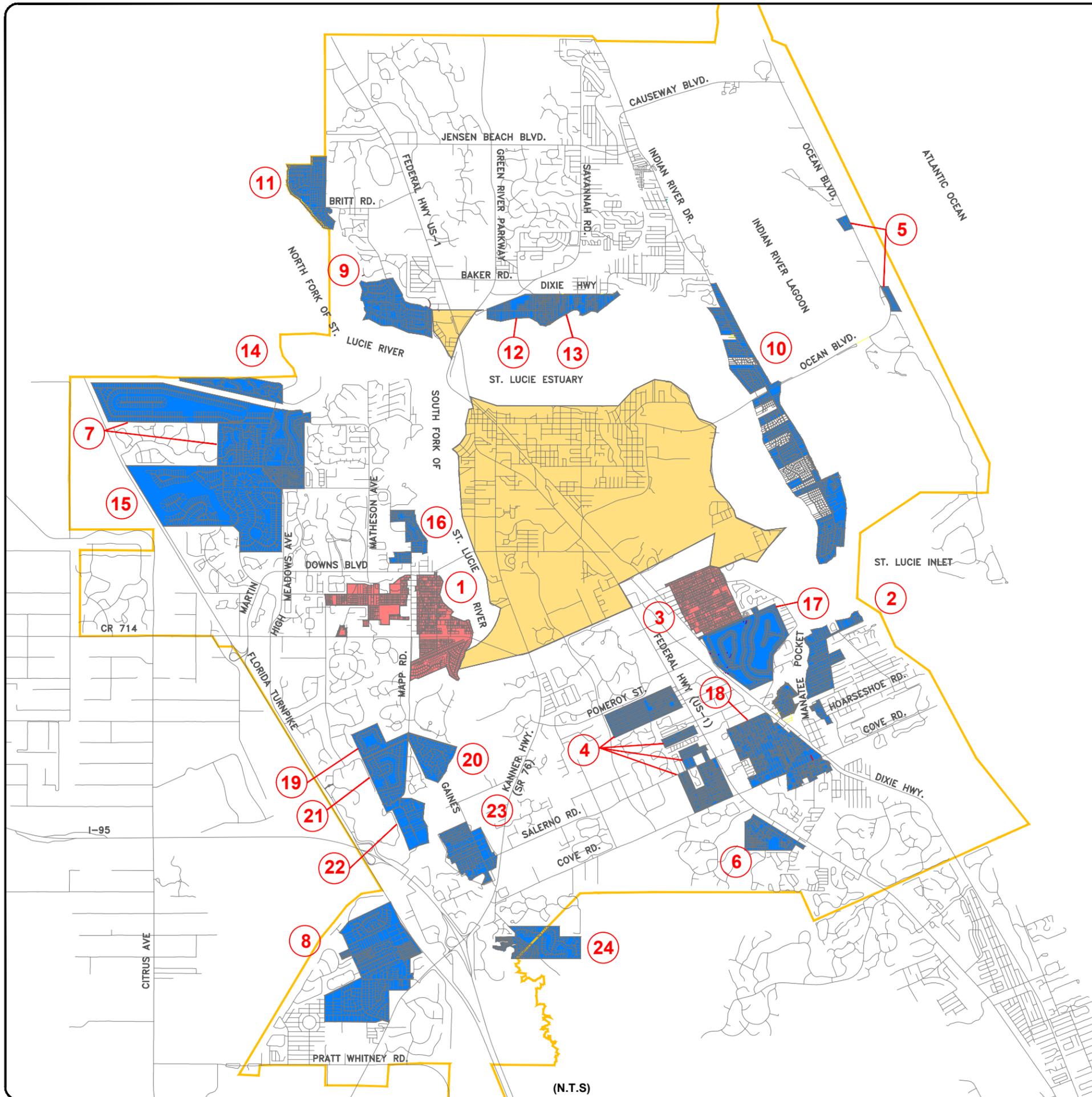
MARTIN COUNTY
SEPTIC SYSTEM
ELIMINATION STUDY RANKING CRITERIA
NITROGEN/NITRATE LOAD
CONTRIBUTION TO GROUNDWATER
LOCATION FACTOR EXHIBIT

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(N.T.S)



RANKING CRITERIA VERIFIED PRESENCE OF HUMAN FECAL SOURCE MARKER LOCATION FACTOR

LEGEND

HUMAN MARKER LOCATION
■ NONE FOUND (0 PTS)
■ HUMAN MARKERS FOUND (12 PTS)

MARTIN COUNTY UTILITIES AREA
 CITY OF STUART

- DEVELOPMENTS**
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MARTIN COUNTY SEPTIC SYSTEM ELIMINATION STUDY RANKING CRITERIA VERIFIED PRESENCE OF HUMAN FECAL SOURCE MARKER FACTOR EXHIBIT

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TOWN OF SEWALL'S POINT



PAMELA MAC'KIE WALKER
Town Manager

TO: Town of Sewall's Point Commission
FROM: Pamela Mac'Kie Walker, Town Manager
SUBJECT: Agenda Item 2
National Flood Insurance Program Community Rating System
Town Commission Workshop, December 12, 2016

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Using a point system, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three stated goals of the CRS to "reduce flood damage to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management."

A memorandum from the Town's Building Official summarizing the Town's participation in the program is attached, along with a summary of the program and the latest draft report on the Town's participation.



National Flood Insurance Program

Community Rating System

A Local Official's Guide to

Saving Lives

Preventing Property Damage

Reducing the Cost of Flood Insurance

FEMA B-573 / May 2015



FEMA

How the Community Rating System Works

Every year, flooding causes hundreds of millions of dollars' worth of damage to homes and businesses around the country. Standard homeowners and commercial property policies do not cover flood losses. So, to meet the need for this vital coverage, the Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP).

The NFIP offers reasonably priced flood insurance in communities that comply with minimum standards for floodplain management.

The NFIP's Community Rating System (CRS) recognizes community efforts beyond those minimum standards by reducing flood insurance premiums for the community's property owners. The CRS is similar to — but separate from — the private insurance industry's programs that grade communities on the effectiveness of their fire suppression and building code enforcement.

CRS discounts on flood insurance premiums range from 5% up to 45%. Those discounts provide an incentive for new flood protection

activities that can help save lives and property in the event of a flood.

To participate in the CRS, your community can choose to undertake some or all of the 19 public information and floodplain management activities described in the *CRS Coordinator's Manual*.

You're probably already doing many of these activities. To get credit, community officials will need to prepare an application documenting the efforts.

The CRS assigns credit points for each activity. Table 2 lists the activities and the possible number of credit points for each one. The table also shows the average number of credit points communities earn for each activity. These averages may give a better indication than the maximums of what your community can expect.

To be eligible for a CRS discount, your community must do Activity 310, Elevation Certificates. If you're a designated repetitive loss community, you must also do Activity 510,

Floodplain Management Planning. All other activities are optional.

Based on the total number of points your community earns, the CRS assigns you to one of ten classes. Your discount on flood insurance premiums is based on your class.

For example, if your community earns 4,500 points or more, it qualifies for Class 1, and property owners

in the floodplain get a 45% discount. If your community earns as little as 500 points, it's in Class 9, and property owners in the floodplain get a 5% discount. If a community does not apply or fails to receive at least 500 points, it's in Class 10, and property owners get no discount.

Table 1, below, shows the number of points required for each class and the corresponding discount.

Table 1:

How much discount property owners in your community can get

Rate Class	Discount		Credit Points Required
	SFHA*	Non-SFHA**	
1	45%	10%	4,500 +
2	40%	10%	4,000 - 4,499
3	35%	10%	3,500 - 3,999
4	30%	10%	3,000 - 3,499
5	25%	10%	2,500 - 2,999
6	20%	10%	2,000 - 2,499
7	15%	5%	1,500 - 1,999
8	10%	5%	1,000 - 1,499
9	5%	5%	500 - 999
10	0%	0%	0 - 499

* Special Flood Hazard Area

** Preferred Risk Policies are available only in B,C, and X Zones for properties that are shown to have a minimal risk of flood damage. The Preferred Risk Policy does not receive premium rate credits under the CRS because it already has a lower premium than other policies. Although they are in SFHAs, Zones AR and A99 are limited to a 5% discount. Premium reductions are subject to change.

Table 2:

What You Can Do to Get Credit

The CRS grants credit for 19 different activities that fall into four series:

Series 300	Public Information	Maximum Points*	Average Points*
	<p>This series credits programs that advise people about the flood hazard, flood insurance, and ways to reduce flood damage. The activities also provide data that insurance agents need for accurate flood insurance rating.</p>		
310	<p>Elevation Certificates</p> <ul style="list-style-type: none"> Maintain FEMA elevation certificates for new construction in the floodplain. (At a minimum, a community must maintain certificates for buildings built after the date of its CRS application.) 	116	46
320	<p>Map Information Service</p> <ul style="list-style-type: none"> Provide Flood Insurance Rate Map (FIRM) information to people who inquire, and publicize this service. 	90	63
330	<p>Outreach Projects</p> <ul style="list-style-type: none"> Send information about the flood hazard, flood insurance, flood protection measures, and/or the natural and beneficial functions of floodplains to flood-prone residents or all residents of a community. 	350	63
340	<p>Hazard Disclosure</p> <ul style="list-style-type: none"> Real estate agents advise potential purchasers of flood-prone property about the flood hazard. Regulations require notice of the hazard. 	80	14
350	<p>Flood Protection Information</p> <ul style="list-style-type: none"> The public library and/or community's website maintains references on flood insurance and flood protection. 	125	33
360	<p>Flood Protection Assistance</p> <ul style="list-style-type: none"> Give inquiring property owners technical advice on how to protect their buildings from flooding, and publicize this service. 	110	49
370	<p>Flood Insurance Promotion</p>	110	0
Series 300 Total		981	268

*Maximum and average points are subject to change. See the current *CRS Coordinator's Manual* for the latest information.

Series 400	Mapping and Regulations	Maximum Points*	Average Points*	
	This series credits programs that provide increased protection to new development.			
410	Floodplain Mapping <ul style="list-style-type: none"> • Develop new flood elevations, floodway delineations, wave heights, or other regulatory flood hazard data for an area not mapped in detail by the flood insurance study. • Have a more restrictive mapping standard. 	802	65	
420	Open Space Preservation <ul style="list-style-type: none"> • Guarantee that currently vacant floodplain parcels will be kept free from development. 	2,020	474	
430	Higher Regulatory Standards <ul style="list-style-type: none"> • Require freeboard. • Require soil tests or engineered foundations. • Require compensatory storage. • Zone the floodplain for minimum lot sizes of 1 acre or larger. • Require coastal construction standards in AE Zones. • Have regulations tailored to protect critical facilities or areas subject to special flood hazards (for example, alluvial fans, ice jams, subsidence, or coastal erosion). 	2,042	214	
440	Flood Data Maintenance <ul style="list-style-type: none"> • Keep flood and property data on computer records. • Use better base maps. • Maintain elevation reference marks. 	222	54	
450	Stormwater Management <ul style="list-style-type: none"> • Regulate new development throughout the watershed to ensure that post-development runoff is no worse than pre-development runoff. • Regulate new construction to minimize soil erosion and protect or improve water quality. 	755	119	
Series 400		Total	5,841	926

Series 500	Flood Damage Reduction	Maximum Points*	Average Points*
	This series credits programs that reduce the flood risk to existing development.		
510	Floodplain Management Planning <ul style="list-style-type: none"> • Prepare, adopt, implement, and update a comprehensive flood hazard mitigation plan using a standard planning process. (This is a minimum requirement for all repetitive loss communities.) 	622	123
520	Acquisition and Relocation <ul style="list-style-type: none"> • Acquire and/or relocate flood-prone buildings so that they are out of the floodplain. 	1,900	136
530	Flood Protection (Protection of existing floodplain development by floodproofing, elevation, or minor structural projects.)	1,600	136
540	Drainage System Maintenance <ul style="list-style-type: none"> • Conduct periodic inspections of all channels and retention basins, and remove debris as needed. 	570	214
Series 500	Total	4,692	609

Series 600	Flood Preparedness	Maximum Points*	Average Points*
	This series credits flood warning, levee safety, and dam safety projects.		
610	Flood Warning and Response <ul style="list-style-type: none"> • Provide early flood warnings to the public, and have a detailed flood response plan keyed to flood crest predictions. 	395	144
620	Levee Safety <ul style="list-style-type: none"> • Maintain existing levees not otherwise credited in the flood insurance rating system that provide some flood protection. 	235	0
630	Dam Safety (Communities in a state with an approved dam safety program that have at least one building subject to inundation from the failure of a high-hazard-potential dam receive some credit.)	160	0
Series 600	Total	790	144
All Series	Total	12,304	1,947

Extra Credit

Your community can get extra credit for regulating development outside the SFHA to the same standards as development inside the SFHA. Also, if your community faces growth pressures, the mapping and regulation activities in Series 400 receive extra credit. See the *CRS Coordinator's Manual* for full details.

Many communities can qualify for what the CRS calls “uniform minimum credit,” based on the activities a state or regional agency implements on behalf of its communities. For example, some states have disclosure laws eligible for credit under Activity 340, Hazard Disclosure. Any community in those states can receive the uniform minimum credit.

Your community may want to consider floodplain management activities not listed in the *CRS Coordinator's Manual*. You should evaluate these activities for their ability to increase public safety, reduce property damage, avoid economic disruption and loss, and protect the environment. In addition, you can request a review of these activities to determine whether they should be eligible for CRS credit. FEMA welcomes innovative ways to prevent or reduce flood damage.

How to Apply

Participation in the CRS is voluntary. If your community is in full compliance with the rules and regulations of the NFIP, you may apply. There's no application fee, and all CRS publications are free.

Your community's chief executive officer (that is, your mayor, city manager, or other top official) must appoint a CRS coordinator to handle the application work and serve as the liaison between the community and FEMA. The coordinator should know the operations of all departments that deal with floodplain management and public information. And the coordinator should be able to speak for the community's chief executive officer.

The first step in the application process is to get a copy of the CRS Application, which contains all the instructions and procedures you need for preparing and submitting your community's initial application for a CRS classification. The CRS Application includes easy-to-follow worksheets that provide credits for applicable activities. The CRS Application also identifies the documentation you must submit to support the credits you are requesting.

You may also want to order a copy of the *CRS Coordinator's Manual*, which describes the program in full and provides specific information, including eligible activities, required documentation, and resources for assistance.

Your designated CRS coordinator should fill out and submit your application. Help is also available through the contact information below. The CRS will verify the information and arrange for flood insurance premium discounts.

To order CRS publications at no charge, fax the order form on the following page to 201-748-1936, or mail to the address below. You can also e-mail your request to nfipcrs@iso.com. Both the CRS Application and the *CRS Coordinator's Manual* are also available at FEMA's CRS Resource Center website — www.training.fema.gov/emiweb/crs.

For more info, write, phone, or fax:

NFIP/CRS

P.O. Box 501016

Indianapolis, IN 46250-1016

Telephone: 317-848-2898

Fax: 201-748-1936

E-mail: nfipcrs@iso.com

Order Form

Fax to: 201-748-1936

Please send me these CRS publications:

No. of Copies _____ Document

_____ CRS Coordinator's Manual

_____ CRS Application

Name

Phone

Title

Street

City

State

ZIP

Community Name

NFIP Number

(if applicable)

(if applicable)





Town of Sewall's Point, FL

Verified Class 8

NFIP Number: 120164

Cycle

Date of Verification Visit: July 10, 2014

This Verification Report is provided to explain the recommendations of Insurance Services Office, Inc. (ISO) to DHS/FEMA concerning credits under the Community Rating System (CRS) for the above named community.

A total of 1094 credit points are verified which results in a recommendation that the community retrograde from a CRS Class 7 to a CRS Class 8. The following is a summary of our findings with the total credit points for each activity noted in parenthesis:

Activity 310 – Elevation Certificates: The Building Department maintains elevation certificates for new and substantially improved buildings. Copies of elevation certificates are made available upon request. (35 points)

Activity 320 – Map Information Service: Credit is provided for furnishing inquirers with basic flood zone information from the community's latest Flood Insurance Rate Map (FIRM). Credit is also provided for the community furnishing additional FIRM information, information about problems not shown on the FIRM and special flood related hazards. The service is publicized annually and records are maintained. (90 points)

Activity 330 – Outreach Projects: Credit is provided for informational outreach projects that include several items placed at public locations, general outreach projects that include a city wide newsletter and targeted outreach projects that include a brochure to floodplain properties. These projects are disseminated annually. (60 points)

Activity 340 – Hazard Disclosure: Credit is provided for state regulations requiring disclosure of flood hazards. (10 points)

Activity 350 – Flood Protection Information: Documents relating to floodplain management are available in the reference section of the Martin County Public Library. Credit is also provided for floodplain information displayed on the community's website. (35 points)

Activity 360 – Flood Protection Assistance: Credit is provided for offering one-on-one advice regarding property protection and making site visits before providing advice. (55 points)

Activity 420 – Open Space Preservation: Credit is provided for preserving approximately 1 percent of the Special Flood Hazard Area (SFHA) as open space. (16 points)

Activity 430 – Higher Regulatory Standards: Credit is provided for enforcing regulations that require freeboard for new and substantial improvement construction, and local drainage protection. Credit is also provided for the enforcement of building codes, a Building Code Effectiveness Grading Schedule (BCEGS) Classification of 4/4, and state mandated regulatory standards. (165 points)

Activity 440 – Flood Data Maintenance: Credit is provided for maintaining and using digitized maps in the day to day management of the floodplain. (116 points)

Activity 450 – Stormwater Management: The community enforces regulations for soil and erosion control and water quality. (32 points)

Section 502 - Repetitive Loss Category: The Town of Sewall's Point, FL is a Category A community for CRS purposes and no action is required. (No credit points are applicable to this section)

Activity 510 – Floodplain Management Planning: Credit is provided for the adoption and implementation of the Martin County Local Mitigation Strategy adopted December 1, 2015. A progress report must be submitted on an annual basis. An update to the credited plan will be due by October 1, 2020. (173 points)

Activity 520 – Acquisition and Relocation: Credit is provided for acquiring and relocating 2 buildings from the community's regulatory floodplain. (12 points)

Activity 540 – Drainage System Maintenance: All of the community's drainage system is inspected regularly throughout the year and maintenance is performed as needed. Credit is also provided for listing problem sites that are inspected more frequently, and for implementing an ongoing Capital Improvements Program. The community enforces a regulation prohibiting dumping in the drainage system, and annually publicizes the regulation or has appropriate signs posted. (295 points)

Activity 710 – County Growth Adjustment: All credit in the 400 series is multiplied by the growth rate of the county to account for growth pressures. The growth rate for Martin County, FL is 1.05.

Attached is the Community Calculations Worksheet that lists the verified credit points for the Community Rating System.

CEO Name / Address:

Pamela Mac'Kie Walker
Town Manager
1 South Sewall's Point Road
Sewall's Point, Florida 34996

CRS Coordinator Name / Address:

John Adams
Building & Facilities Director
1 South Sewall's Point Road
Sewall's Point, Florida 34996
(772) 287-2455

Date Report Prepared: October 7, 2015

DRAFT

720 COMMUNITY CREDIT CALCULATIONS (Cycle):

CALCULATION SECTION :

Verified Activity Calculations:				Credit
c310	35			35
c320	90			90
c330	60			60
c340	10			10
c350	35			35
c360	55			55
c370				
c410		x CGA	=	
c420	15	x CGA	1.05 =	16
c430	157	x CGA	1.05 =	165
c440	110	x CGA	1.05 =	116
c450	30	x CGA	1.05 =	32
c510	173			173
c520	12			12
c530				
c540	295			295
c610				
c620				
c630				

Community Classification Calculation:

cT = total of above	cT = <u>1094</u>
Community Classification (from Table 110-1):	Class = <u>8</u>

CEO Name/Address:

Pamela Mac'Kie Walker
 Town Manager
 1 South Sewall's Point Road
 Sewall's Point, Florida 34996

CRS Coordinator Name/Address:

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 Building & Facilities Director
 1 South Sewall's Point Road
 Sewall's Point, Florida 34996
 (772) 287-2455

Date Report Prepared: October 7, 2015

PAUL LUGER
Mayor

DAN MORRIS
Vice Mayor

VINCENT N. BARILE
Commissioner

JAMES W. CAMPO, C.F.P.
Commissioner

JACQUI THURLOW-LIPPISCH
Commissioner

TOWN OF SEWALL'S POINT



PAMELA MAC'KIE WALKER
Town Manager

LAKISHA Q. BURCH, CMC
Town Clerk

TINA CIECHANOWSKI
Chief of Police

JOHN ADAMS
Building & Facilities Director

MEMORANDUM

TO: Pam Walker, Town Manager
FROM: John Adams, Building Official
RE: CRS Audit

As you are aware, our five year Community Rating System (CRS) audit that began on July 10, 2014 has only now been completed and the results sent to me on October 7, 2015. This has been the most arduous process I have ever experienced in my entire career.

In 2009 we had our previous 5 year audit that lasted 3 hours, and achieved a score of 1707 points. This gave the Town a 15% discount with a rating of 7. For the next five years we reported our activities annually to ISO and maintained the 7 rating over that period with minimal effort. We felt confident that we could easily score an additional 300 points achieving a level 6 for a 20% discount in the coming audit cycle.

Our original audit on July 10th 2014 lasted 8 hours with the Insurance Services Office (ISO) CRS coordinator Lori Lehr and her supervisor. Joe Capra and I answered most of their questions, and needed to submit only some minor additional data which we sent the following week. At that time we were advised that due to changes made by FEMA in the CRS Manual, most communities were experiencing lower ratings for the activities in which they participate. **Our rating was predicted to drop from 1707 points to 1533 points (attached Excel spreadsheet), a substantial drop, but we would still retain our level 7 discount of 15%.**

On January 1, 2015 I received an e-mail from Lori Lehr stating that she was leaving ISO and pursuing other career goals, and that another coordinator would be finishing our audit. On February 3, 2015 I received an e-mail from ISO stating that our CRS audit had been reassigned. On March 12, 2015 I received an e-mail from David Arkens introducing himself as our new rater, and a long list of additional material he required to complete our audit. **Over the next 6 months we provided Mr. Arkens with different additional information that he requested on at least 12 different occasions.** The Town Engineer and two staff, the Town Manager, and I spent many days preparing and submitting this data.

Towards the end this 6 month process Mr. Arkens gave us preliminary results that indicated our point total was in the neighborhood of 850 points, but that he felt we could provide additional data that would raise that total. We all worked very hard to provide this data, and I expressed to him my dismay at how he was rating our activities, but we did provide the data he requested. **His final report was received on October 7, 2015, with a rating of 1094, level 8 (10% discount). The discount for the Town will amount to approximately \$51,000.00 this year.**

One South Sewall's Point Road, Sewall's Point, Florida 34996
Town Hall (772) 287-2455 • Fax (772) 220-4765 • E-Mail: townhall@sewallspoint.org
Police Department (772) 781-3378 • Fax (772) 286-7669 • E-Mail: sppd@sewallspoint.org

The new standards we adopted in our recently amended flood ordinance were not considered for this audit, and only would be considered after this past five years were rated.

It is my firm belief that FEMA and the NFIP' s intention was to purposely reduce the discounted rates they have been offering by making it extremely difficult to earn the points required. If I had to do this exercise over again, I would recommend that the Town drop out of the CRS. It just does not make financial sense spending more to produce the results required than the discount is worth.

It is my opinion that the Town does not have sufficient low cost clerical staff that other municipalities have to make this process affordable.