
INFRASTRUCTURE ELEMENT

DATA INVENTORY AND ANALYSIS

Purpose

The purpose of the Infrastructure Element is to provide for necessary public facilities and services correlated to future land use designations. This element addresses general utilities which are provided by or managed by the City of Port St. Lucie. These include:

- Sanitary Sewer
- Solid Waste
- Drainage and Natural Groundwater Recharge
- Potable Water

SANITARY SEWER SUBELEMENT

Introduction

The Sanitary Sewer Sub element provides a description of the existing and projected sewage treatment and disposal methods in use in the City of Port St. Lucie. The relationship of the private utility systems and on-site treatment facilities is noted.

Existing Planning Documents

The City completed the Water Delivery & Wastewater Collection Master Plan ~~2008-2012~~ Update which will serve as the overall planning document until subsequent updates occur.

Geographic Service Area

~~The City's utility service area is currently comprised of approximately 132 square miles, including the entire city limits and some unincorporated areas of St. Lucie County adjacent to the city limits as described in Sec. 63.24 of the City Code of Ordinances. Figure 1 of the Water Supply Facility Work Plan outlines the general areas of sanitary sewer service for the major regional facilities operating in the City or within the service area which exceeds City limits.~~ The major regional facilities are:

- Port St. Lucie Utility Systems Department
- St. Lucie West Services District (Community Development District)
- The Reserve (Private)

Regional Facilities

The City of Port St. Lucie is the responsible entity for the sanitary sewer collection and treatment facilities. The facilities are managed and operated by the Port St. Lucie Utility Systems Department (PSLUSD). The PSLUSD owns and operates two wastewater treatment facilities. The first wastewater treatment facility, identified as the Glades Wastewater Treatment Facility (WWTF) has a capacity of 12.0 Million Gallons per Day (MGD). The second wastewater treatment facility, identified as the Westport WWTF has a permitted capacity of 6.00 MGD. Combined these two facilities have a capacity of 18.00 MGD.

The Westport WWTF is to be expanded by the PLSUD to 12.0 MGD in stages. The Glades WWTF is expandable to 30.0 MGD capacity yielding a build-out capacity of 40.0 MGD. Effluent disposal is accomplished via reclaimed water for irrigation, deep well injection and Rapid Infiltration Basins.

Private Utilities with Capacities Greater than 0.1 MGD

St. Lucie West Services District

St. Lucie West is a large mixed use development of approximately seven square miles in the western part of the City. Wastewater treatment and disposal facilities to serve the community are provided through this Community Development District. Wastewater effluent is treated to reclaimed water standards. According to Tom Stirtzinger, Assistant Utilities Director, St. Lucie West Services District (SLWSD), in 2020, the permitted treatment capacity is 2.02.13 MGD three-month average daily flow (TMADF) with IQ water storage of 15-3.0 MG. All wastewater from the Reserve goes to the St. Lucie West facility. All disposal is effluent reuse into HDPE lined ponds. The wastewater plant has a 3 MG HDPE lined pond for reject/non-compliant effluent. The facility, which is operated by the St. Lucie West Services District (SLWSD), also provides alternative wastewater treatment/disposal for The Reserve through a 12" force main, and may ultimately receive all of the flow from The Reserve.

~~Effluent reuse combined with percolation ponds is the current methods of disposal. A deep injection well is used for disposal of reverse osmosis concentrate, as well as an alternative for disposal of plant effluent. Expansion of this facility is planned in 1.0 MGD increments, as necessary, to provide service commensurate with growth. However, the community is approaching build-out. The SLWSD wastewater Master Plan states that the Level of Service is 100 gpcd.~~

The Reserve Community Development District (RESERVE CDD) Utility Corporation

This facility, which is operated by the Reserve Community Development District (CDD), serves The Reserve at PGA Village, a gated residential/golf course community located outside the City of Port St. Lucie near the intersection of St. Lucie West Boulevard and Interstate 95. CDD The Reserve Utility Corporation also serves the Reserve Commerce Centre, which is within City limits. ~~Design capacity of the wastewater treatment plant is 0.175 MGD annual average daily flow (AADF). The permitted capacity of the plant is 0.043 MGD. The plant was taken out of operation in 2004 for major rehabilitation, during which, influent flow was diverted to St. Lucie West. The plant permit allows for step increases in the design flow based on provision of additional percolation ponds; however, it is likely that any flows beyond those that the plant can currently accommodate will be diverted to St. Lucie West. Ultimately, all of the raw wastewater flow will be pumped to St. Lucie West for treatment and disposal. All flows are pumped to an onsite surge tank. From the surge tank all flows are pumped to St. Lucie West Services District. The treatment plant was taken out of operation May 2013. The proper protocol was completed per F.D.E.P. regulations.~~

Package Treatment Plants

Package treatment plants are essentially small treatment systems that have a collection network, treatment plant, and disposal system. According to the DEP, one permitted package plant is located within the City's Utility Service Area, the Savannah Club WWTF. Package plants may be designed to provide any level of treatment, but plants providing secondary treatment, or enhanced

secondary treatment, are most commonly used. Package plants are available in a range of capacities up to one-million gallons per day. They are generally used to serve isolated ~~developments, and~~ developments and are usually modular units partially or completely pre-assembled by the manufacturer prior to shipment to the site of use.

Effluent disposal in package plants may take a variety of forms. Most common in Port St. Lucie are drain fields and percolation ponds. Small package plants usually do not require full-time attendance by an operator, and private operating services runs many small package plants in the County. Some of the larger package plants have their own operators, usually for only a portion of the day.

Septic Tanks

Septic tank systems are most commonly used to serve single or small multiple housing units, although relatively large-scale systems, up to 10,000 gallons per day capacity, have proven successful in some applications. The tank receives wastewater from the residence and provides a period of ~~settling~~ settling during which time a significant portion of the suspended solids settle out to be biologically (anaerobically) degraded. The effluent is discharged through underground, perforated drainage pipes (drainfield) and percolate into the soil where microorganisms and filtration purify the liquids. Map FLU-2 Soils indicates the general soil types present in the City as identified in the 1990 Natural Resource Conservation Service (NRCS) SSURGO Soils Maps. The soils located within the city have moderate or severe limitations for drainfields. Due to the soil conditions, the St. Lucie County Health Department requires removing and replacing 95 percent of existing soils when permitting a drainfield. Septic tanks generally require cleaning every two to three years to remove accumulated solids. These solids, called septage, are generally transported to treatment and disposal facilities.

Septic tanks can be adversely affected by a number of conditions, including high water table, poor drainage, lack of space, and miscellaneous effects from other conditions such as overloads from washing machines. In areas not previously provided with municipal utility service, but where such service is now available, residences may retain their on-site systems until they fail, at which time connection to the utility system is mandatory.

Level of Service Analysis ~~(Kevin – Utilities?)~~

The level of service standard adopted by the City of Port St. Lucie for sanitary sewer facilities is 85% of the Potable Water LOS of 115 gallons/capita/day, which is 97.75 gallons/capita/day.

Table 4-1: Projected Capacity, Sanitary Sewer, Million Gallons per Day

Sanitary Sewer (million gallons per day)	2011	2016	2021	2025	2030	2035
City's Westport Facility	6.00	10.00	12.00	12.00	12.00	12.00
City's Glades Facility	12.00	18.00	24.00	30.00	30.00	30.00
Total of City Facilities	18.00	28.00	36.00	42.00	42.00	42.00
Reserve	0.18	0.18	0.18	0.18	0.18	0.18
St. Lucie West	1.00	1.00	1.00	1.00	1.00	1.00

Sanitary Sewer (million gallons per day)	2011	2016	2021	2025	2030	2035
<i>A. Grand Total Capacity</i>	49.18	29.18	41.18	43.18	43.18	43.18

TMADF=Three Month Average Daily Flow [KM1]

Source: Port St. Lucie Utility Systems Department, 2011, for City Facilities. [KM2]

In accordance with Chapter 62-600.405 F.A.C, if the Capacity Analysis Report documents that the permitted capacity will be equaled or exceeded within 5 years, planning and preliminary design for expansion must be initiated.

1. Level of Service Analysis

The level of service standard adopted by the City of Port St. Lucie for sanitary sewer facilities is 85% of the Potable Water LOS of 100 gallons/capita/day, which is 85.0 gallons/capita/day.

2. Table 4-1: Projected Capacity, Sanitary Sewer, Million Gallons per Day

Sanitary Sewer (million gallons per day)	2020	2025	2030	2035	2040	2045
City's Westport Facility	6.00	12.00	12.00	12.00	12.00	12.00
City's Glades Facility	12.00	12.00	12.00	12.00	12.00	12.00
Total of City Facilities	18.00	24.00	24.00	24.00	24.00	24.00
Reserve Utility	.18*	.18*	.18*	.18*	.18*	.18*
St. Lucie West Services District	2.13	2.60	2.60	2.60	2.60	2.60
<i>A. Grand Total Capacity</i>	20.31	26.78	26.78	26.78	26.78	26.78

TMADF = Three Month Average Daily Flow

* = Reserve Utility sends all raw wastewater to St. Lucie West Services District for treatment.

Source: McCarty Water Supply Plan 2019, the Bureau of Economic and Business Research (BEBR) 2018 Estimated Water Use Report for the City Facilities only.

Needs Assessment

Below is a table projecting wastewater ~~demand~~flows:

Table 4-2: Projected Demand, Sanitary Sewer, Million Gallons per Day

Year	Population	Projected Wastewater Demand (MGD)
Total Service Area		
2010	464,603	16.1
2014	466,042	16.2
2016	205,258	20.1
2020	235,895	23.1
2025	274,285	26.8
2030	310,847	30.4
2035	342,967	33.5

Table 4-2: Projected Demand, Sanitary Sewer, Million Gallons per Day

Year	Population	Projected Wastewater Demand (MGD)
Total Service Area		
2016	178,092	17.8
2020	201,787	20.17
2025	230,816	23.08
2030	257,258	25.7
2035	280,529	28
2040	302,261	30.2

Source: Shimberg Center for Housing Studies-Population Projections, Total (Permanent + Institutional), 2010-2040; Bonnie C. Landry & Associates 2020

*Demand based upon 100 gallons per day per person

Source: Shimberg Center for Housing Studies, Calvin, Giordano & Associates, Inc. 2012

1. Needs Assessment

Below is a table projecting wastewater flows:

2. Table 4-2: Projected Demand, Sanitary Sewer, Million Gallons per Day

Year	Population	Projected Wastewater Demand (MGD)
Total Service Area		
2020	167,326	9.1
2025	201,301	11.0
2030	231,111	12.6
2035	255,857	13.9
2040	280,769	15.3
2045	307,141	16.7

Source: McCarty Master Water Supply Plan 2019

Five-Year Capital Projection (Anticipated)

The wastewater capital improvements anticipated to occur within the next five years ~~can be separated into two categories; namely, expansion or modification of existing facilities, and construction of new facilities. Though the two cannot be uniquely separated, in general it can be said that the existing facilities will be expanded or modified to provide treatment sufficient to meet the demands of the remaining growth within the current Utility Service Areas (USAs meet the demands of the remaining growth within the current service areas).~~ The anticipated capital improvement program can be found in the Capital Improvement Element.

SOLID WASTE SUBELEMENT

INTRODUCTION

The solid waste management practices of the City presently consist solely of collection of solid waste by a private contractor. Residential collection is made twice per week for household refuse, once per week for recyclable materials and yard trash, and by request for special items such as white goods (i.e. appliances). Commercial collection is made twice or more each week. All solid waste including yard waste generated within the City is disposed of at the St. Lucie County Baling and Recycling Facility as per an interlocal agreement with the County.

Existing Planning Documents

The St. Lucie County Comprehensive Plan updated in 20~~18~~¹⁴ will serve as the overall planning document for this sub element.

EXISTING CONDITIONS

The St. Lucie County Baling and Recycling Facility

Solid waste collected within Port St. Lucie is transported to the St. Lucie County Baling and Recycling Facility, the only solid waste disposal facility currently permitted in St. Lucie County. The 333 acre site is owned and operated by St. Lucie County.

The Class I landfill area of the Baling and Recycling Facility is planned in six phases. Phase I of the Baling and Recycling Facility was a Class I landfill which comprised 28 acres of the site and is now closed and capped. Phases II, IIIA and IIIB are currently in operation and accepting Class I waste. Phase II is 28 acres, Phase III is 25 acres, Phases IV and V are 21 acres. Phase VI is 9.9 acres. The C & D (Construction & Demolition) Debris Landfill is 35 acres. The remainder of the site is utilized for processing, buildings, roads, stormwater management, buffers, leachate management or gas management. Per the St. Lucie County's 2018 Data and Analysis for Infrastructure, closure has been completed for Phase I, II and IIIA including capping the fill with a polyethylene liner. Phase IIIB is currently active and accepting Class I waste. Phase IVA is being constructed began receiving Class I waste in January 2019.

Total estimated capacity remaining of Class I Landfill is 13,886,728 cubic yards (per St. Lucie County Comprehensive Plan). At the current rate of use, the landfill will be able to meet demand for Class I waste until year 2050 based on the average generation rate of 3.88 pounds per capita per day. Total estimated capacity of the C & D Debris landfill is 1,090,101 pounds. At the current rate of use, the landfill will be able to meet demand for C & D Debris until year 2042 based on the average generation rate of 0.81 pounds per capita per day. After that time the County will either have to co-dispose of

~~C & D and Class I waste or reallocate future landfill phases. The County is investigating this matter and has yet to reach a decision.~~

~~Total estimated capacity remaining of Class I Landfill is 15,598,190 cubic yards (per St. Lucie County Comprehensive Plan). At the current rate of use, the landfill will be able to meet demand for Class I waste until year 2047 based on the average generation rate of 5.10 pounds per capita per day. Total estimated capacity of the C & D Debris landfill is 1,646,624 pounds. At the current rate of use, the landfill will be able to meet demand for C & D Debris until year 2024 based on the average generation rate of 2.80 pounds per capita per day. After that time the County will either have to co-dispose of C & D and Class I waste or reallocate future landfill phases. The County is investigating this matter and has yet to reach a decision.~~

Level of Service Analysis

~~The Level of service adopted for solid waste is 3.88 pounds per capita day for Class I waste and 0.81 pounds per capita day for C & D waste.~~

~~The Level of service adopted for solid waste is 5.10 pounds per capita day for Class I waste and 2.80 pounds per capita day for C & D waste.~~

Needs Assessment

~~The City via their interlocal agreement with St. Lucie County has solid waste disposal facilities sufficient to satisfy the needs of the City for the short term planning period. The County will assess disposal options beginning in year 2024. However, the County will need to assess alternative disposal site between 2018 – 2022.~~

Future Waste Stream Reduction

~~The County is planning exploring alternative water conversion technologies to explore the use of Plasma Arc Gasification to reduce the volume of the waste stream that must be landfilled to extend the life of the Baling and Recycling Facility.~~

STORMWATER, NATURAL GROUNDWATER AND AQUIFER RECHARGE SUBELEMENT

INTRODUCTION

This subelement addresses the stormwater and natural groundwater aquifer recharge issues for the City of Port St. Lucie. The stormwater and aquifer recharge issues have been combined in this subelement because they are intimately related and should be viewed in this perspective.

Surface Water

Prior to development by man, the area that presently comprises St. Lucie County had drainage patterns that were controlled by major topographic features such as the Atlantic Coastal Ridge and more subtle features such as minor relict beach dunes (U.S. 1 south of Fort Pierce), Green Ridge (south central County), Osceola Plain (southwest County), Ten Mile Ridge (north central County), and overall a gentle slope from west to east (about 60 feet to about 5 feet). The alignment of these surface features generally parallels the existing coastline and thus traditionally served to impede sheetflow; the St. Johns Marsh, Allapattah Flats, and the Savannahs were wetlands formed by these impediments. The Allapattah Flats and the south portion of the St. Johns Marsh slowly flowed east and south to form the headwaters of the North Fork of the St. Lucie River (NFSLR), which drained almost all of mainland St. Lucie County. The Savannahs normally percolated through the Atlantic Coastal Ridge to the Indian River, but during extremely high water stages there could be overflow to the North Fork of the St. Lucie River through Platts Creek. These wetland marshes stored water and provided recharge to the shallow aquifer.

Within the City of Port St. Lucie there were minor drainageways such as Howard Creek, Blakeslee Creek and Winters Creek, but the NFSLR is the dominant drainage feature of both the City and the County. The NFSLR varies from 200 to 400 feet in width and meanders through a lush floodplain that is approximately one-half mile wide in the City. The floodplain has been subjected to very little development in the City and the Future Land Use Plan proposes continued restriction of floodplain development.

Most of the natural tributaries of the NFSLR have been channelized as part of the original drainage plan and, due to the upland placement of control structures, brackish water can now penetrate further into the upland than before development. Additionally, these drainageways promote a greater ground water discharge to tidewater than would occur naturally. Map FLU-3 Topography shows the ground surface elevations and Map FLU-5 Water Bodies shows the surface water bodies within the City.

Groundwater

There are two distinct sources of groundwater in the City of Port St. Lucie: the shallow unconfined or semi-confined Surficial Aquifer, and the deep artesian Floridan Aquifer. These aquifer systems are separated by a layer of relatively impermeable green clay, known as the Hawthorne formation, which is approximately 400 feet thick and starts at approximately 150-180 feet below the average land surface.

The shallow aquifer system is comprised of one to five feet of fine-grained sands and silts of the Pamlico Sand that overlie the Anastasia formation. The latter formation is variable and consists of interbedded layers and lenses of sand, shell, sandy limestone, and sandstone. Beds and lenses tend to be elongated in a direction that parallels the coast. Most of the permeable zones, which are primarily shell beds, are thin and, as a result, well yields generally are low to moderate. (USGS, FBOG, Water Available in Canals and Shallow Sediments in St. Lucie County, Florida, 1972.) A thorough exploration of the shallow aquifer has not been conducted.

~~Water quality is variable in the shallow aquifer due to natural and artificial causes. Water quality ranges from fair in the southeast mainland part of the County to brackish in the northwestern part of the County. The poorer water quality has been associated with the use of the brackish artesian aquifer for irrigation of citrus. The concentration of minerals in the connate water increases with depth to the base of the shallow aquifer and at that point it exceeds the mineral content of the artesian aquifer. Water quality in the shallow aquifer in St. Lucie County varies from fair to brackish, but within the City the water quality is generally acceptable for domestic use without additional treatment and acceptable as a public supply with conventional (i.e., lime softening) treatment. The hazards of salt water intrusion by way of the uncontrolled portions of the City drainage system have not been assessed.~~ Groundwater quality is further described in the Potable Water Subelement.

The natural groundwater recharge that was affected by ponding in the past on the flat terrain during the rainy season has essentially been eliminated by stormwater drainage systems. The fine textured soils do not allow rapid infiltration of rainfall and a major portion of potential recharge is now lost as runoff. Although some recharge occurs through bank storage in canals, this is of relative short duration and small area extent. The canals are normally groundwater discharge areas.

There are no defined natural groundwater aquifer recharge areas in the City of Port St. Lucie. The SFWMD has not developed nor adopted any topographic map depicting City recharge areas. Both the DEP Mining Atlas and Water Resources Atlas of Florida indicate there are no recharge areas to the Floridan aquifer located within the City. The Floridan aquifer in St. Lucie County is recharged in the regions of West Central Florida (Polk, Lake and Orange Counties).

Artificial Drainage Systems

Major drainage modifications and improvements in St. Lucie County commenced with the formation of the North St. Lucie River Water Management District and the Fort Pierce Farms Water Management District. During the 1960's, the USACOE constructed canals C-23A, C-24 and C-25 and their control structures. Canal C-24 discharges to the NFSLR in the City and C-23 discharges just south of the City. This was done in order to improve drainage, provide irrigation supply, and to divert a portion of the headwaters of the NFSLR which originates in the marshes to the west. Canal C-25 allowed diversion by a separate route to tidewater. However, almost all of the drainage modifications have been designed for agricultural land use (except for Fort Pierce and Port St. Lucie in the incorporated areas) which is generally one inch per day of rainfall. As land is urbanized, the volumes of stormwater have increased and the times of concentration (run-off times) have decreased. Since the urbanized areas are in the tailwater or downstream areas of much of the drainage system, the potential for flooding has increased in several urban areas.

Agricultural drainage to the west of the urbanized coastal area has removed the major sources of groundwater recharge and lowered the water table. Areas such as the St. John's Marsh and the Allapattah Flats previously stored water above the land surface to provide the hydraulic gradient needed to recharge the slightly permeable surficial aquifer. Because of the lack of recharge and the low storage coefficient of the soils, there is insufficient water for irrigation during the extended dry season. SFWMD canals C-23, C-24, and C-25 provide irrigation supply for many areas, but the Floridan aquifer is also used for much of the irrigation demand. Irrigation return flows from Floridan aquifer water are mineralized and will mineralize the receiving canals. Since flood irrigation is a common practice, the volume of return flows can be significant and recharge from the canals can degrade the water quality in nearby wells.

The Regional Canal System

The function of the regional canal system is to provide basin-wide flood protection, drainage for agriculture and urban/residential development, management of ground water table elevations to prevent saltwater intrusion, and water supply. This canal system consists of 55 miles of major canals in the local Surface Water Improvement and Management District (SWIM). The control structures associated with this system maintain elevations in the canals by discharging excess water from the basins and by attempting to maintain levels during dry periods. All of the canals discharge to SWIM priority water bodies.

The C-23 canal provides drainage for 168 square miles in southern St. Lucie, including Port St. Lucie, northern Martin, and eastern Okeechobee Counties. The C-23 and its structures remove excess water from the C-23 Basin, supply water to the basin (and, occasionally, to the C-24 Basin), and maintain ground water elevations to prevent saltwater intrusion into local ground water.

The C-24 canal provides drainage to 167 square miles in central St. Lucie and east central Okeechobee Counties. The C-23 and its structures remove excess water from the C-24 Basin, supply water to the basin, and maintain ground water table elevation adequate to prevent saltwater intrusion into local ground water.

The C-23A canal is in reality the lower 1.25 miles of Ten Mile Creek from the end of C-24 to the mouth of the St. Lucie River. There are no controlling structures connected with this canal. SFWMD's C-23, C-23A, and C-24 Canals are the only drainage facilities within other local government's jurisdiction which serve the City, not including the North Fork of the St. Lucie River or the Indian River. Of these major canals built by SFWMD, the City has 21% (11.59 miles) within its City limits. The average depth of these canals is 10 feet although in some areas there are depths of up to 20 feet. The three canals within the City limits are C-23 (4.89 mi), C-23A (1.25 mi), and C-24 (5.45 mi). All of the smaller drainage canals and swales are located within the City limits.

Eastern Watershed Improvement Project

In August of 2008, Tropical Storm Fay deposited over 14 inches of rainfall in a 48 hour period. This event was greater than the SFWMD 100-Year 3-Day storm. The result was flooding of local roads, businesses and residences in the eastern part of the City. Additionally, US Highway 1, which is an arterial evacuation route for the City was also flooded. Upon review of the situation, the City Council approved a program known as the Eastern Watershed Improvement Project (EWIP) to improve stormwater management of approximately 4,860 acres of the eastern part of the City so that flooding of that magnitude would not result from a similar rainfall event. The EWIP includes the construction of new stormwater treatment areas to improve water quality and attenuation, new collection/transmission systems, pumps to increase conveyance, as well as improvements to increase or restore the original capacity of existing culverts, ditches, swales and canals.

Alternatives to Standard Stormwater Management

Recently the desire to reduce environmental impacts from development has led to a new approach in stormwater management design and operation. This new approach differs from the traditional drainage systems by attempting to mimic a site's predevelopment hydrology by using design techniques that process stormwater runoff on the site by using infiltration, evaporation, detention, filtration or storage and is generally identified as Low Impact Development (LID). Some of the LID practices include bioswales or bioretention areas, which detain or retain water and are planted with native materials other than grasses to increase the amount of runoff captured on a site and to filter the runoff prior to being discharged off site.

The use of grassed swales to convey water instead of a closed system of underground pipes is an LID practice. Other practices include pervious paving systems which reduce runoff by allowing the rainwater to percolate into the ground. Green (vegetated) roofs are another potential practice for capturing a portion of rainwater that would traditionally be lost as runoff. Rainwater can be captured via above ground rain barrels, which are barrels located at roof gutter downspouts or underground storage vaults called cisterns and used to irrigate site landscaping in another common LID practice. A site designed with LID features will still meet the level of service requirements for stormwater runoff.

Level of Service

Level of service standards for stormwater quantity and quality reflect the applicable South Florida Water Management District (SFWMD) and National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permits and rules.

~~Evidence of compliance with level of service will be The level of service adopted for stormwater management facilities for existing platted development and surface water management systems shall be as shown in~~ the South Florida Water Management District (SFWMD) permit ~~governing said system~~. In the event that a SFWMD permit does not cover the system, the system shall be developed in accordance with the SFWMD rules in effect at the time of construction and discharge rates, should one not be specified for the receiving body, shall be limited to 0.5 cubic feet per second (cfs) per acre.

Building floor elevations for existing platted developments without SFWMD permits shall be at least 2-feet above the crown of the road.

Building floor elevations for new development and surface water management systems shall be at or above the 100-year flood elevation, as determined from the greater of the Federal Flood Insurance Rate Maps or by calculations performed in accordance with the latest SFWMD rules.

All new development regardless of size must comply with Chapter 17-25, Rule 17-25.025, F.A.C. and Chapter 17-3, Rule 17-3.051, F.A.C. for water quality and direct stormwater discharge to Outstanding Florida Waters and Aquatic Preserves as well as South Florida Water Management District Rules.

POTABLE WATER SUBELEMENT

INTRODUCTION

The Potable Water Subelement provides a summary of existing potable water supplies and treatment facilities in the City of Port St. Lucie. The facilities include regional systems and project specific systems in addition to systems for individual residences.

EXISTING PLANNING DOCUMENTS

The City of Port St. Lucie completed their Water Supply Facility Work Plan Work Plan 2017 Update in December of 2018 (revised) which will serve as the overall planning document for potable water facilities until further updates occur.

Geographic Service Area

Figure 1 in the Water Supply Facility Work Plan outlines the geographic service areas of potable water service for the major regional facilities operating in the City. The major regional facilities are:

- Port St. Lucie Utility Systems Department
- St. Lucie West Services Department (Community Development District)
- The Reserve (Private)

Regional Facilities

The City of Port St. Lucie is the responsible entity for the potable water facilities and distribution system. The facilities are managed and operated by the Port St. Lucie Utility Systems Department (PSLUSD). The PSLUSD owns and operates three water treatment facilities. The first water treatment facility, identified as the Prineville Lime Softening Water Treatment Facility (WTF) has a permitted capacity of 8.0 MGD. The second water treatment facility, identified as the Prineville Reverse Osmosis (RO) WTF has a permitted capacity of 11.15 MGD. The third water treatment facility, identified as the James E. Anderson Water RO WTF has a permitted capacity of 22.50 MGD. Combined these three facilities have a capacity of 41.65 MGD.

Private Utilities with Capacities Greater than 0.1 MGD

St. Lucie West Services District

The St. Lucie West Services District provides potable water for its seven square mile service area. The water supply is from the brackish Floridan aquifer with treatment provided by a 3.4 MGD RO WTF. The brine concentrate from this process, which is approximately twenty-five (25) percent of the raw water processed, is disposed of by deep well injection at the wastewater treatment plant. Expansion of treatment and storage capacity is planned to match the rate of development.

The Reserve

The Reserve is a large development that is surrounded by the City. A 336.42 acre portion of the Reserve, known as the Go Team Industrial Park, is located within the City limits. The Reserve is supplied with potable water from two sources, its own Reserve Utility Corporation and by the St. Lucie West Services District. The Reserve Utility Corporation owns and maintains a 0.41 MGD WTF supplied by Surficial Aquifer Wells.

Domestic Self Supply

It is estimated that there are approximately ~~3,415,000~~ homes in the City that depend on on-site domestic wells for potable water.

Water Supply Wells

PSLUSD water supply wells draw groundwater from both the brackish Floridan Aquifer and some from the shallow unconfined aquifer known as the Surficial Aquifer. Withdrawal rates from the wells are contained in Consumptive Use Permit No. 56-00142-W issued Jul. 10, 2008. The annual allocation for the Surficial Aquifer Wells is 1,825 Million Gallons (MG), which corresponds to 5 MGD, and the maximum monthly allocation is 186 MG or 6.11 MGD. The annual allocation for the Floridan Aquifer Wells is 16,929 MG or 46.381 MGD, and the maximum monthly allocation is 1,726.6 MG or 55.697 MGD. The City has a Wellfield Protection Ordinance in place for the protection of water supply wells. The ordinance provides for setbacks from water supply wells and regulates land uses to try to prevent contamination of the wells. See Map FLU-9 Wellfield Protection Areas.

Level of Service Analysis

The Level of Service and capacity analysis based upon future demand is contained in Section 3 of the Water Supply Facility Work Plan. The analysis shows sufficient capacity for the both the short and long term planning periods.

Water Demand Projections

The potable water demand projections for the City's Utility Service Area were based on the population projections and the historical per capita potable water usage. The 2016 UEC Water Supply Plan Update projected the per capita use rate (PCUR) of finished water to be 79 for the City of Port St. Lucie Utility Systems Department (PSLUSD) which is the result of water conservation efforts. This number is significantly lower than the value of 104 gpcd used in projections presented in the prior 2012 Work Plan. This average daily consumption number of 79 will be adopted by the City for current planning, although the level of service value of 115 gpcd is used by the PSLUSD to provide for more extreme drought occurrences when designing new facilities.

Based on the water demand projections, it is anticipated that the City of Port St. Lucie will not need to implement the construction of additional water supply wells, additional treatment facilities and additional water delivery infrastructures to ensure that safe and reliable drinking water is supplied to the existing and future customers to meet projected potable water demands through the year 2030. However, for the near future (until 2025) it is anticipated that periodic repair and replacement of pumping equipment and wells, pipelines, and treatment plant equipment will be required to maintain the water system. Also, as new housing developments are built additional water distribution piping will be required.

Table 9, Water Demand Projections

Year	Population	PCUR	Finished Water Demand MGD	Raw to Finished Factor	Raw Water Demand MGD	Drought Demand Factor	1 in 10 Yr Drought Demand MGD
2010	167,205	79	13.21	1.23	16.25	1.167	18.96
2015	183,545	79	14.50	1.23	17.84	1.167	20.81
2020	209,272	79	16.53	1.23	20.33	1.167	23.73
2025	238,538	79	18.84	1.23	23.18	1.167	27.05
2030	263,782	79	20.84	1.23	25.63	1.167	29.91
2035	283,958	79	22.43	1.23	27.59	1.167	32.20
2040	304,296	79	24.04	1.23	29.57	1.167	34.51

Notes: Based on SFWMD UEC Water Supply Plan 2016.

Capital Improvement Projects

The planned capital improvements are located in the Capital Improvements Element (CIE).

GOALS, OBJECTIVES, AND POLICIES

SANITARY SEWER SUBELEMENT

GOAL 4.A.1: PROVIDE CENTRAL SEWAGE COLLECTION AND TREATMENT FOR EXISTING AND FUTURE DEVELOPMENT.

Objective 4.A.1.1: The City shall continue to meet wastewater collection system needs, by providing service to the current Port St. Lucie Water and Sewer Service Area and any additions that may be established.

Policy 4.A.1.1.1: The design of low pressure wastewater systems (aka, grinder systems) shall be in accordance with FDEP regulations, and in accordance with Port St. Lucie Utility Systems Department (PSLUSD) standards. Low pressure systems shall only be constructed in the existing Low Pressure Sewer System Area.

Policy 4.A.1.1.2: PSLUSD shall maintain or concurrently construct adequate treatment facilities for sewage flows that will be generated by any additional sewer connections.

Policy 4.A.1.1.3: Priorities will be established for facility replacement and providing for future facility needs.

Policy 4.A.1.1.4: The City will continue to promote connection of existing non-residential development to an approved central wastewater system within 365 days of written notice. New nonresidential development on platted lots shall be required to connect when a service line is located adjacent to the new development or when required by the St. Lucie County Health Department.

Policy 4.A.1.1.5: The LOS standard for sanitary sewer shall be 85% of the potable water LOS.

GOAL 4.A.2: THE USE OF RECLAIMED DOMESTIC WASTEWATER SHALL BE REQUIRED FOR NONRESIDENTIAL IRRIGATION WHERE NOT EXPRESSLY PROHIBITED BY STATUTE, RULE OR ORDINANCE.

Objective 4.A.2.1: The City will continue to update and implement the Reclaimed Water Master Plan to serve parks, golf courses, and commercial properties within the City.

Policy 4.A.2.1.1: The engineering and economic feasibility of concurrent construction of sewage collection systems and reclaimed water mains to serve new sewage service areas that are being proposed will be included.

Policy 4.A.2.1.2: PSLUSD will continue to investigate the feasibility of expanded use of reclaimed wastewater for residential landscaping.

SOLID WASTE SUBELEMENT

GOAL 4.B.1: PROVIDE SOLID WASTE MANAGEMENT SYSTEMS FOR THE CITY OF PORT ST. LUCIE.

Objective 4.B.1.1: The City has and will continue to compile solid waste background data to quantify solid waste generation. This data is and will be made available to St. Lucie County.

Policy 4.B.1.1.1: The City will continue to require the solid waste hauler to audit the materials collected and maintain baseline solid waste data.

Objective 4.B.1.2: The City will continue to develop solid waste management plans in accordance with City Ordinance 91-33, and in conjunction with St. Lucie County's policies and the terms of the Florida Solid Waste Management and Volume Reduction Act of 1988. The plans will include levels of service and solid waste volume reduction efforts by the City, which will maximize existing facilities.

Policy 4.B.1.2.1: The City will continue to evaluate the feasibility and probable costs of establishing recycling centers within the ~~City, and~~ City and continue to use the recycling facilities at the County landfill.

Policy 4.B.1.2.2: The City will continue to monitor mandatory recycling of glass, aluminum, plastic, and newsprint waste products.

Policy 4.B.1.2.3: The City will continue to support curbside recycling for residential properties.

Objective 4.B.1.3: The City shall continue to cooperate with St. Lucie County to insure that development permits are issued only when adequate facility capacity is available to serve the development.

Policy 4.B.1.3.1: The level of service standard adopted for solid waste facilities is 5.10 pounds/capita/day.

Policy 4.B.1.3.2: The City will coordinate the St. Lucie County to ensure that the needs of future development are addressed.

GOAL 4.B.2: DEVELOP AND IMPLEMENT A HAZARDOUS MATERIAL MANAGEMENT PLAN FOR THE CITY.

Objective 4.B.2.1: The City will continue to support the County emergency response plan in accordance with the Superfund Amendments and Reauthorization Act 1(SARA), of 1986, Title III, 40 CFR Part 370.

Policy 4.B.2.1.1: The City will meet with representatives of St. Lucie County, the Treasure Coast Regional Planning Council, the St. Lucie County Health Department, and the regulated members of the business community to update the countywide hazardous materials management plan as necessary.

Policy 4.B.2.1.2: The City will utilize data from the County Government Hazardous Waste Assessment for St. Lucie County along with occupational license data collected by the St. Lucie County Health Unit, to identify the potential locations of hazardous waste or hazardous materials.

Objective 4.B.2.2: The City will review, revise, and adopt new regulations as needed regarding a hazardous materials management plan for the City in accordance with Objective 4.B.2.1.

Policy 4.B.2.2.1: The plan will continue to include elements for protection of wellfields and watersheds.

Policy 4.B.2.2.2: The plan will include provisions for spill prevention control and countermeasures (SPCC) plans at regulated business.

Policy 4.B.2.2.3: The plan will include provision for periodic inspection by code enforcement officers.

Policy 4.B.2.2.4: The City shall continue to support St. Lucie County with its educational program to inform the City's residents of effective methods to safely store and dispose of household and commercial hazardous material, and procedures to follow in emergencies.

Policy 4.B.2.2.5: The City will continue to cooperate with the County in "Amnesty Days" and other methods to be used to encourage the collection and disposal of household and commercial hazardous waste material.

STORMWATER, NATURAL GROUNDWATER AND AQUIFER RECHARGE SUBELEMENT

GOAL 4.C.1: TO PROVIDE ADEQUATE CITYWIDE DRAINAGE AND STORMWATER MANAGEMENT FOR ALL RESIDENTS OF THE CITY.

Objective 4.C.1.1: The City will document efforts to review and refine the citywide flood mitigation program.

Policy 4.C.1.1.1: The City will continue to maintain an inventory of flooding complaints.

Policy 4.C.1.1.2: The City will continue to investigate and plan for correcting flooding problems.

Policy 4.C.1.1.3: The City will continue to update and maintain the base map survey that shows the inverts, elevations, sizes, and materials of street culverts and drainage conveyance systems.

Policy 4.C.1.1.4: The City's Floodplain Protection Ordinance shall maintain consistency with program policies of the Federal Insurance and Mitigation Administration.

Objective 4.C.1.2: The City will document efforts to continue to review and refine drainage improvements as needed.

Policy 4.C.1.2.1: The City will continue to inventory and map problem areas and determine the adequacy of existing drainage plans in protecting life, property, and the environment.

Policy 4.C.1.2.2: The City will maintain the computer data bases connected with the topographical maps.

Policy 4.C.1.2.3: The City will continue to update and maintain the base map survey that shows the inverts, elevations, sizes, and materials of the street culverts and drainage conveyance systems.

Policy 4.C.1.2.4: The City will continue to limit development in the floodplain of the NFSLR to preservation, conservation, and public recreation uses and public interest projects of overriding public benefit, such as roads, hurricane evacuation routes, marinas, etc.

Policy 4.C.1.2.5: The City will continue to implement the improvements identified in the Eastern Watershed Improvement Project.

Policy 4.C.1.2.6: The City will continue to address the drainage and stormwater needs of future development.

Policy 4.C.1.2.7: The City will insure continuing funding for the preparation of surveys and engineering studies included in the most recent Capital Improvements Element five year plan.

Objective 4.C.1.3: The City shall continue to adopt a schedule of prioritized improvements to be included and funded in the Capital Improvements Program.

Policy 4.C.1.3.1: Funds for the prioritized improvements will be included in the Capital Improvements Program.

Objective 4.C.1.4: The City will continue to review existing regulations and enact provisions if needed in the Land Development Code (and other codes and ordinances, as necessary) for the design, construction, maintenance, and monitoring of stormwater management systems and to maximize the use of existing facilities and discourage urban sprawl.

Policy 4.C.1.4.1: The land development regulations will continue to address the following management techniques:

- a. The monitoring, inspection, and maintenance of all existing and future stormwater facilities.
- b. Limiting maximum impervious surface coverage and building coverage on residential, commercial, institutional, and industrial lots.
- c. The use of erosion and runoff control devices during construction.
- d. The existing 10-year or current 25-year level of service requirement, as appropriate.
- e. The protection of the functions of natural drainage features.

Policy 4.C.1.4.2: Property in flood prone areas that is damaged to 50% of its value will not be rebuilt in the flood prone location.

Policy 4.C.1.4.3: To achieve long-term benefits such as improved water quality and improved groundwater infiltration and recharge, the City shall encourage low impact development best management practices, and green infrastructure as a part of the stormwater management system.

Policy 4.C.1.4.4: The City will develop policies and plans that set short-,intermediate- and long-range goals and establish adaptive management implementation strategies for water and wastewater resources under their jurisdiction to address the potential impacts of climate change, and its operational, economic and environmental effects.

Policy 4.C.1.4.5: The City shall require that construction meet or exceed the Federal Emergency Management Agency (FEMA) standards.

Objective 4.C.1.5: The City shall continue to implement procedures in cooperation with its stormwater management system providers to coordinate the extension of, and/or increase the capacity of, stormwater management facilities in order to meet future needs and to insure that development permits are issued only when adequate facility capacity is available to serve the development.

Policy 4.C.1.5.1: The levels of service standards for drainage are as follows:

- a) The level of service adopted for stormwater management facilities for existing platted development and surface water management systems shall be as shown in the South Florida Water Management District (SFWMD) permit governing said system. In the event that a SFWMD permit does not cover the system, the system shall be developed in accordance with SFWMD rules in effect at the time of construction and discharge rates, should one not be specified for the receiving body, shall be limited to 0.5 cfs per acre.
- b) Building floor elevations for existing platted developments without SFWMD permits shall be at least 2-feet above the crown of the road.
- c) Building floor elevations for new development and surface water management systems shall be at or above the 100-year flood elevation, as determined from the greater of the Federal Flood Insurance Rate Maps or by calculations performed in accordance with the latest SFWMD rules.
- d) All new development regardless of size must comply with Chapter 17-25, Rule 17-25.025, F.A.C. and Chapter 17-3, Rule 17-3.051, F.A.C. for water quality and direct stormwater discharge to Outstanding Florida Waters and Aquatic Preserves as well as South Florida Water Management District Rules.

GOAL 4.C.2: INCREASE GROUNDWATER RECHARGE WHERE PRACTICABLE THROUGHOUT THE CITY.

Objective 4.C.2.1: The City will continue to assist SFWMD and USGS (United States Geological Survey) in implementing a comprehensive groundwater monitoring plan which includes monitoring wells, instrumentation devices, and database format to establish groundwater response to rainfall and artificial recharge systems.

Policy 4.C.2.1.1: The City will require that new developments with internal stormwater management system monitor rainfall, groundwater levels, and surface water levels within the new development as needed.

Policy 4.C.2.1.2: The City will continue to maintain monitoring stations at selected locations in the city to establish the baseline monitoring network.

Policy 4.C.2.1.3: The City and SFWMD will compile monitoring data.

Objective 4.C.2.2: The City shall provide for protection of natural groundwater recharge areas.

Policy 4.C.2.2.1: The City will continue to review and revise as needed land development regulations to include criteria for regulating land use and development to protect the functions of natural groundwater recharge areas.

Policy 4.C.2.2.2: The City shall promote stormwater management facility design guidelines that support joint use of retention and detention basins for passive recreation, habitat, and open space.

POTABLE WATER SUBELEMENT

GOAL 4.D.1: THE PROVISION OF SAFE, HEALTHY, AND DEPENDABLE POTABLE WATER TO ALL RESIDENTS OF PORT ST. LUCIE AND OTHER SECTIONS OF THE CITY'S SERVICE AREA.

Objective 4.D.1.1: The City shall continue to enact ordinances and agreements for provision of potable water service to the City's service area and maximize existing facilities.

Policy 4.D.1.1.1: The system design shall be consistent with the citywide master utility plan and Ten Year Water Supply Facilities Work Plan, as amended.

Policy 4.D.1.1.2: PSLUSD shall maintain or concurrently construct adequate treatment, storage and pumping capacity for potable water demands generated by development occurring within the PSLUSD Service Area.

Policy 4.D.1.1.3: The City shall continue to encourage connection for non-residential properties to an approved public drinking water system when it becomes available.

Policy 4.D.1.1.4: The City will continue to implement a cross-connection control and enforcement program for all residences, businesses, and/or irrigation systems connected to the public drinking water systems.

Policy 4.D.1.1.5: Properties with domestic wells that are connected to the public drinking water system may use the wells for irrigation purposes provided that they meet the cross-connection control requirements of Policy 4.D.1.1.4.

Policy 4.D.1.1.6: The City will coordinate projections of future water supply and consumption with the South Florida Water Management District.

Policy 4.D.1.1.7: Calculated fire flows for system design shall be based on the Insurance Services Office Guide for Determination of Required Fire Flow, latest edition.

Policy 4.D.1.1.8: Priorities will be established for facility replacement and providing for future facility needs.

Policy 4.D.1.1.9: The City will continue to investigate the feasibility of expanded use of reclaimed water for irrigation and landscaping in order to reduce the demand for potable water where it is economically feasible to do so.

Policy 4.D.1.1.10: For increased reliability, all water mains shall be looped.

Objective 4.D.1.2: The City shall continue to implement procedures to insure that development permits are issued only when adequate facility capacity is available to serve the development.

Policy 4.D.1.2.1: The level of service standard adopted for potable water is as follows:

For residential uses, single and multi-family, the following level of service standards shall apply:

Port St. Lucie Utility System Department-115 gallons per capita per day (GPCD)
St. Lucie West Services District-85 gallons per capita per day (GPCD)

For non-residential uses, the following level of service standards shall apply:

1. Commercial, 125 gallons per day per 1000 square feet
2. Hotel/Motel, 112.5 gallons per day per room

3. Industrial, 150 gallons per day per 1000 square feet
4. Office/School/Institutional, 120 gallons per day per 1000 square feet

Policy 4.D.1.2.2: The level of service for the provision of water and sewage treatment for development in areas outside of existing Utility Service Areas shall be based on verification and acceptance of an approved water well and septic system by the County Health Department.

Policy 4.D.1.2.3: The City shall continue to address the potable water needs of future development.

GOAL 4.D.2: PROTECT AND CONSERVE PUBLIC DRINKING WATER SUPPLIES.

Objective 4.D.2.1: The City in conjunction with PSLUSD, St. Lucie County and the South Florida Water Management District, will have established the locations and zones of groundwater influence of existing and proposed public water supply wells and/or wellfields to provide a water supply through build-out of the City, and abide by FDEP district standards.

Policy 4.D.2.1.1: The City shall adopt by reference and implement the City of Port St. Lucie, Florida, Water Supply Facility Work Plan 2017, revised December 4, 2018, in accordance with the SFWMD Upper East Coast Water Supply Plan, as amended.

Policy 4.D.2.1.2: The siting of new wells or wellfields shall consider the sanitary and water quality hazards of existing and proposed land uses. Hazards may include, but not be limited to, septic tanks, canals, surface water management systems (recharge areas), commercial properties, abandoned dumpsites and transportation systems.

Policy 4.D.2.1.3: The City shall continue to prohibit by ordinance the installation of septic tanks or the application of reclaimed (IQ) water from wastewater effluent within two hundred (200) feet of any existing or proposed public water supply well in the shallow aquifer.

Policy 4.D.2.1.4: The City, through its Planning and Zoning Department and Utility Services Department, shall continue to review proposed development, for the potential for release of hazardous materials that may contaminate public drinking water supply wells, in accordance with the Wellfield Protection Ordinance.

Objective 4.D.2.2: The City will continue to enforce Ordinances requiring water conserving plumbing fixtures and irrigation systems in new construction.

Policy 4.D.2.2.1: The City will continue to require the use of reclaimed (IQ) water instead of drinking water for irrigation of commercial and public properties wherever it is practicable and feasible.