

VII. SANITARY SEWER, POTABLE WATER, SOLID WASTE, DRAINAGE, AND NATURAL GROUNDWATER AQUIFER RECHARGE ELEMENT

PURPOSE

The purpose of this element is to describe the existing sanitary sewer, solid waste, drainage, and potable water facilities and services in the New Smyrna Beach planning area, and to correlate these facilities and services to future land use projections. It is also the purpose of this element to describe the existing natural groundwater aquifer recharge system in the planning area, and to correlate this system to future land use goals and objectives within the planning area.

STANDARDS

The information presented in this element applies to the New Smyrna Beach planning area, and is correlated with the future land uses shown on the Future Land Use Map. Most of the information presented in this element was supplied by the City of New Smyrna Beach Planning and Zoning Department and the Utilities Commission, City of New Smyrna Beach, an agency "created and made part of the government of the City of New Smyrna Beach" (City of New Smyrna Beach Charter, Chapter 15). The Utilities Commission, City of New Smyrna Beach has a service area that encompasses an area larger than the corporate limits of the City of New Smyrna Beach. Therefore, the population projections and demands on sanitary sewer, potable water, solid waste, drainage, and natural groundwater aquifer are not the same as the City of New Smyrna Beach.

EXISTING CONDITIONS

SANITARY SEWER

As defined by Rule 9J-5, *Florida Administrative Code*, sanitary sewer facilities are "structures or systems designed for the collection, transmission, treatment, and disposal of sewage, and includes trunk mains, interceptors, treatment plants, and disposal systems."

The Utilities Commission, City of New Smyrna Beach (hereinafter referred to as the Utilities Commission) is the entity having operational responsibility for the sanitary sewer system serving most of the developed areas within the City limits, as well as some unincorporated areas of Volusia County near the City. Areas within the City that are not served by the central sewer system have their own septic tanks.

WASTEWATER TREATMENT PLANT

The Utilities Commission currently owns and operates one (1) wastewater treatment plant, located immediately west of Interstate 95 and north of State Route 44, serving the beachside and the mainland.

1. Geographic Service Area – The wastewater treatment plant serves all developed areas within the City limits (both on the beachside and the mainland) that are not on private septic tanks. The Utilities Commission also serves scattered developments and individual customers in unincorporated areas of Volusia County near to the City.

An Interlocal Agreement is currently in effect with the cities of Edgewater (south of New Smyrna Beach) and Port Orange (north of New Smyrna Beach) by which all parties have agreed not to encroach on each other's potential sanitary sewer service connections in unincorporated areas of Volusia County. It has been further agreed that the municipality that is best able to provide the service at the time it is needed may serve new development in fringe areas. Such connections will be decided on a case-by-case basis, subject to the approval of both municipalities involved.

New Smyrna Beach has negotiated an agreement with Volusia County whereby the

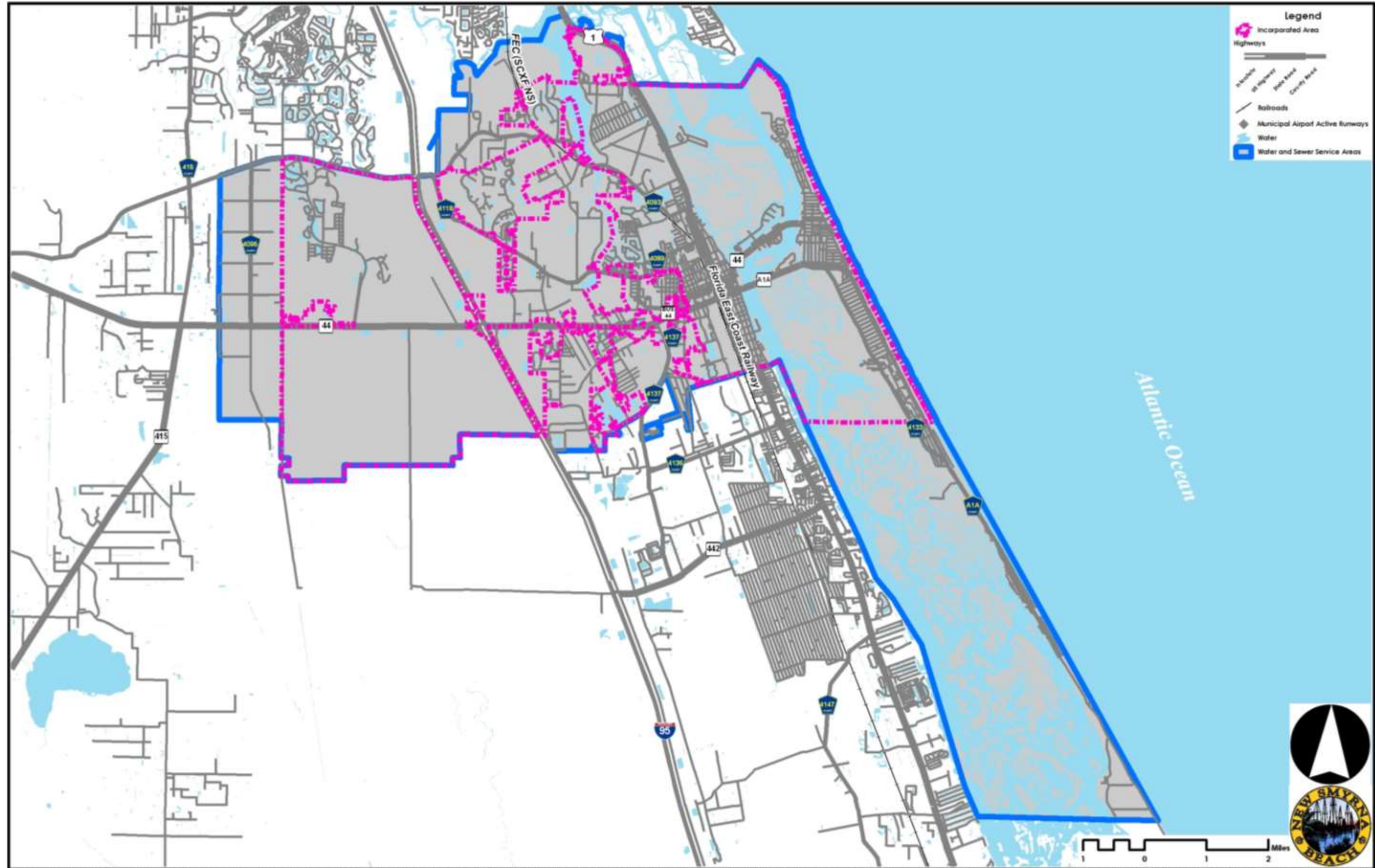
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Utilities Commission provides service to certain "service areas" near the City. These service areas are shown on Map VII-1 on the following page.

2. Types of Adjacent Land Use – Existing land uses adjacent to the wastewater treatment plant include the Interstate 95 right-of-way to the east and vacant City owned properties on the north, south, and west.
The wastewater treatment plant has little if any impact on these adjacent land uses. Public views of the plant are partially screened by vegetation. A few complaints have been received regarding unpleasant odors.
3. Types of Land Uses Served – The major land use served by the wastewater treatment plant is residential. The plant also serves a significant amount of commercial land use, particularly along the North Causeway between the beachside and the mainland; on both sides of Flagler Avenue on the peninsula heading toward the beach; in the downtown area on the mainland; along both sides of US Highway 1 and State Road 44 on the mainland; and along both sides of State Road A1A on the beachside. Two (2) significant industrial areas are also served: the New Smyrna Beach Municipal Airport north of the City on the west side of US Highway 1, and the railroad yard / warehouse / manufacturing strip along the west side of US Highway 1 south of Lytle Avenue and north of 10th Street.
4. Design Capacity – The Utilities Commission operates one (1) wastewater treatment plant with a rated capacity of 7.0 million gallons per day (mgd) that has been in operation since 2000.
5. Current Demand and Level-of-Service – According to the Utilities Commission, average daily flow at the wastewater treatment plant is 3.63 mgd. Maximum daily flow is 4.50 mgd and minimum daily flow is 2.95 mgd. This information is based on the latest available data for Fiscal Year 2005 (October 1, 2004 through September 30, 2005). These flows are serving a current population of approximately 24,818, based on the traffic analysis zone data in the *Central Florida Regional Planning Model (CFRPM)*, version 4.02. Historical wastewater flows for Fiscal Years 1996 through 2005 are shown in Table VII-1.
6. Plant Performance – The Wastewater Treatment Plant uses a 5-Stage Bardenpho Biological Nutrient Removal Activated Sludge Facility. The 5-Stage Bardenpho process is an activated sludge process which utilizes fermentation, first anoxic, aerobic, second anoxic, and re-aeration treatment zones to achieve nitrogen and phosphorous reduction. Upland sand filters are provided for reduction of total suspended solids. The treatment product is disinfected and discharged to a public access reclaimed water distribution system or a permitted surface discharge point in the Indian River Lagoon. The Utilities Commission effluent discharge concentrations to the Indian River Lagoon were established by permit #FL0172090, issued September 19, 2003, and expires February 17, 2008. The plant is well maintained, and structures, components, and equipment are in good condition. Daily operation and maintenance and preventive maintenance are performed with the assistance of computerized schedules. In addition, regularly scheduled training sessions are held for plant operators and maintenance technicians.
7. Impact on Adjacent Natural Resources – Operation of the wastewater treatment plant has had no known impact on adjacent natural resources.

Map VII-1 Water and Sewer Service Areas



Map VII-1 Water and Sewer Service Areas. City of New Smyrna Beach, Florida. All rights reserved. No part of this map may be reproduced without the prior written permission of the City of New Smyrna Beach. The City of New Smyrna Beach is not responsible for any errors or omissions on this map. The City of New Smyrna Beach is not responsible for any damages, including but not limited to, consequential damages, arising from the use of this map. The City of New Smyrna Beach is not responsible for any damages, including but not limited to, consequential damages, arising from the use of this map. The City of New Smyrna Beach is not responsible for any damages, including but not limited to, consequential damages, arising from the use of this map.

Table VII-1 Historical Wastewater Flows, Fiscal Years 1997-2006

Fiscal Year Ending September 30	Accounts	Average Daily Flow (mgd)	Peak Month Average Daily Flow (mgd)	Peak Average Ratio (mgd)	Average Daily Flow Per Account (gd)
1997	14,197	2.41	2.67	1.11	170
1998	14,355	2.53	2.96	1.17	176
1999	14,698	3.14	3.81	1.21	214
2000	14,940	3.37	4.16	1.23	226
2001	15,452	4.11	7.72	1.88	266
2002	15,832	3.62	4.36	1.20	229
2003	16,589	3.84	5.06	1.32	231
2004	17,239	3.62	4.81	1.33	210
2005	17,933	3.63	4.93	1.36	202
2006	18,243	3.49	4.22	1.21	191
Average				1.30	212

Source: Utilities Commission, City of New Smyrna Beach

COLLECTION SYSTEM

There are a total of 86 lift stations serving the New Smyrna Beach area. All the lift stations are equipped with Supervisory Control and Data Acquisition (SCADA) telemetry, and are monitored and controlled for the wastewater reclamation facility by the Utilities Commission. The New Smyrna Beach wastewater collection system currently comprises approximately 99 miles of gravity sewer lines and 52 miles of force mains ranging in size from three (3) to twelve (12) inches in diameter. Access is provided to the collection lines by 2,610 manholes.

The collection system has had three (3) major expansions. In 1981, sewer lines were extended to five (5) previously unserved areas within the City; in 1984, lines were extended into the unincorporated south beachside area, providing service to the many condominiums in that location and allowing phase-out of the package plants formerly providing wastewater treatment; and in 1999, a relocated and expanded wastewater treatment plant was placed in a central location to serve the service area. The system is continually and incrementally expanded to provide service to additional customers.

Steps have also been taken in recent years to reduce the amount of infiltration/inflow (I/I) in the system. Periodic television inspection is conducted throughout the system, and in areas where excessive I/I is detected, a specially equipped truck is dispatched to clean and grout the pipes.

The Utilities Commission completed a pilot study in 2002, which included closed circuit video inspection of a limited number of suspected inflow and infiltration areas. The report concluded that a majority of the sewer lines studied showed signs of deterioration. Based upon the Utilities Commission's review of the findings, the Utilities Commission determined a full scale I/I assessment should be implemented.

EFFLUENT DISPOSAL

The Utilities Commission wastewater treatment plant is an advanced wastewater treatment facility. Currently, chlorine gas is used as a disinfectant. Upgrading the plant to Sodium Hypochlorite (NaOCl) disinfection would require the addition of nearly 10,000 gallons of storage in three (3) 3,300 gallon tanks. All chlorinated effluent not used as reclaimed irrigation is dechlorinated prior to discharge into the Indian River Lagoon. Discharge flows come directly from the reuse distribution system and are dechlorinated at the outfall facility.

The wastewater treatment facility uses a 5-Stage Bardenpho biological nutrient removal process. The process is an activated sludge process which uses fermentation, first anoxic, aerobic, second anoxic, and re-aeration treatment zones to achieve nitrogen and phosphorous reduction. Upflow sand filters are provided for reduction of total suspended solids. The treated product is disinfected and discharged to a public access reclaimed water distribution system or a permitted surface discharge point in the Indian River Lagoon.

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The Utilities Commission advanced wastewater treatment plant has a history of regularly meeting its discharge compliance requirements. A review of regulated effluent parameters has shown that the operating permit for the wastewater treatment plant on average has not exceeded by any parameters. Levels have exceeded single sample concentrations on various occasions. The single sample excursions show that the biological system is somewhat docile in how it reacts to changes.

SEPTIC TANKS

Few wholesale areas in the City are served by septic tanks; however, a limited number of individual homes and businesses do use them. There is no readily available information regarding the exact number of septic tanks currently in use in the New Smyrna Beach area. It is acknowledged that some older sections of the City did have neighborhoods served by septic tanks prior to installation of the central sanitary sewer system. It is also acknowledged that septic tanks are in use in developed portions of unincorporated Volusia County near the City that fall under the sanitary sewer service area.

The existing septic tank systems are generally performing well, with a normal number of repair permits being issued for failing systems that are unable to be served by the central sanitary sewer system. If any problems do exist, they probably occur in areas where the drainfield beds are subject to inundation and/or saturation, which deprive the sewage-treating bacteria of oxygen and results in the formation of solids on the drainfield.

There are no apparent rules or regulations governing the pump-out of septic tanks. Consequently, it is assumed that an unknown number of tanks are not being pumped out, and that subsequent solids buildup has caused some drainfields to fail.

In 2001, the United States Department of Agriculture, Natural Resources Conservation Service completed a soil survey of Volusia County, including New Smyrna Beach. The survey included the suitability of soils for the use of septic tanks. There are three (3) categories of septic tank suitability of soils, as follows:

1. Slight limitation designation indicates that site features are generally favorable for septic tank use and limitations are minor and easily overcome;
2. Moderate limitation designation indicates that site features are unfavorable for septic tank use but limitations can be overcome by special planning and design; and
3. Severe limitation designation indicates that site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required.

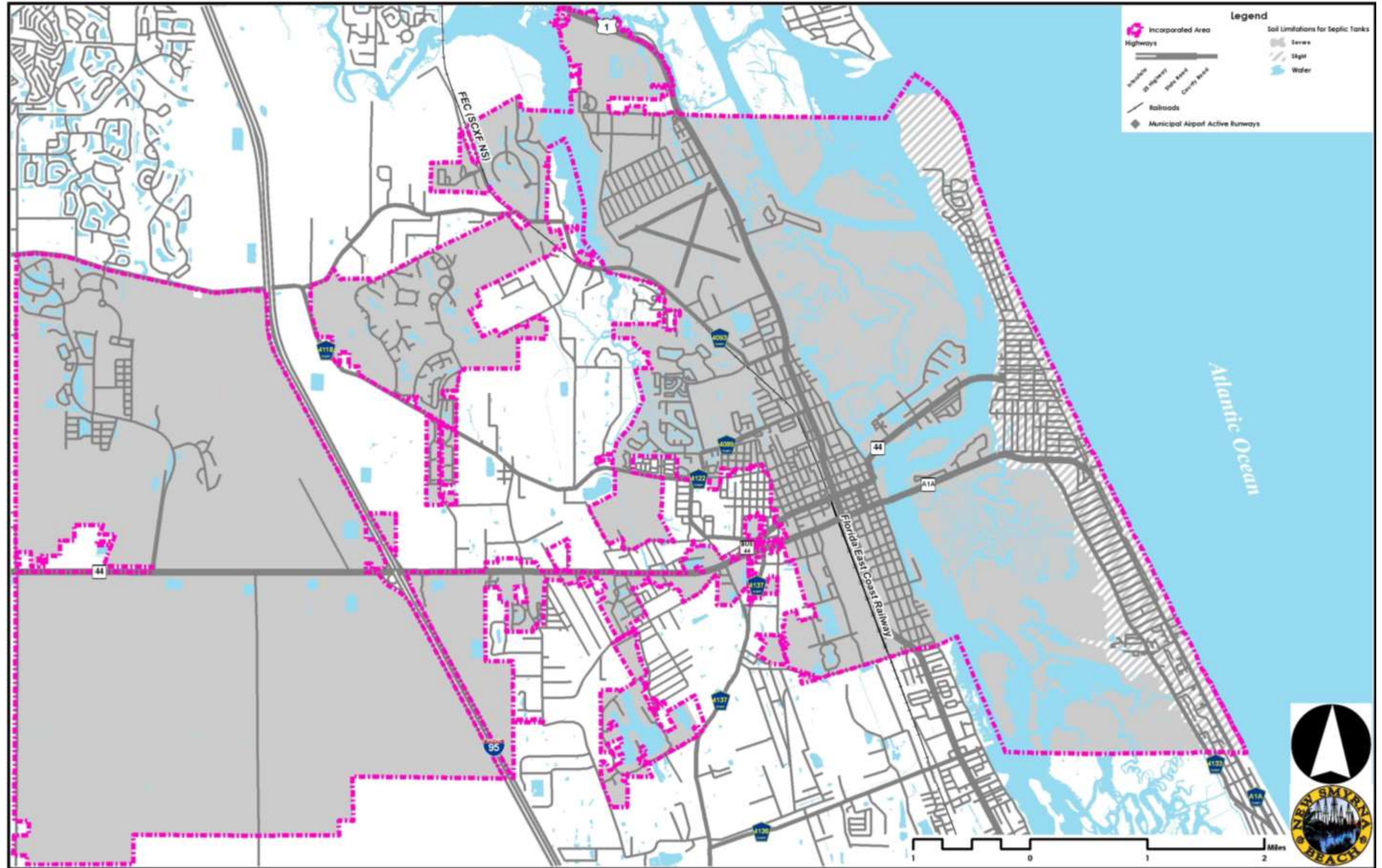
The majority of soils in the City have severe limitations for septic tank use. The locations of soils having severe and slight limitation for septic tank use are shown on Map VII-2. No soils within the City are designated as moderate. Most of the septic tanks within the City are located on the mainland and in soils with severe limitation for septic tank suitability. These areas are fairly undeveloped; as development progresses, the areas are being served by the central sewer system. Because there are so few areas served by septic tanks and the number of lots is becoming fewer, the impact on natural resources is minimal.

SLUDGE DISPOSAL

According to the Utilities Commission, approximately 24,500 wet tons, or 1,000 dry tons, of wastewater sludge is disposed annually. This translates to approximately 2.68 dry tons per day. Based on the average daily flow of 3.9 mgd in Fiscal Year 2006 (the last complete 12 month period for which data is available), approximately 980.42 dry tons of sludge were disposed during that year.

Currently, the wastewater treatment plant uses rotary drum thickeners and lime addition to stabilize and dewater residuals (sludge). The United States Environmental Protection Agency (EPA) Part 503 regulations govern the processes for reduction of pathogens. Part 503 establishes criteria for Class 'A' and Class 'B' biosolids handling. Generally, Class 'A' biosolids may be land applied without permits or subsequent monitoring requirements. Class 'B' sludge is a digested sludge product which has restrictive land application requirements. Land application sites receiving Class 'B' biosolids are permitted and monitored. Sludge generators contributing to Class 'B' land application sites retain liability for the product

Map VII-2 Soil Limitations for Septic Tanks



Sources: Volusia County Growth and Resource Management and Volusia County Property Appraiser's Office

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and the manner in which it is handled. After dewatering, the sludge is hauled off-site for land spreading. The percent solids of the disposed sludge varies from four to eight percent (4-8%).

IMPACT ON ADJACENT NATURAL RESOURCES

Operation of the wastewater treatment and disposal facilities has had no known adverse impact on adjacent natural resources. This is also true of the landscaping operation by which the treated wastewater sludge is disposed.

POTABLE WATER

As defined by Rule 9J-5, *Florida Administrative Code*, potable water facilities are “structures designed to collect, treat, and distribute potable water, and include water wells, treatment plants, storage reservoirs, and distribution mains.”

The Utilities Commission is the entity having operational responsibility for the water system serving the developed areas within the City limits, as well as some unincorporated areas of Volusia County near the City.

WATER TREATMENT PLANT

The Utilities Commission currently owns and operates one (1) water treatment plant located at 2640 Paige Avenue, immediately east of South Glencoe Road in unincorporated Volusia County.

1. Geographic Service Area – The area served by the water treatment plant is the same as that served by the wastewater treatment plant (i.e., all developed areas within the City limits, both on the beachside and the mainland, that are not on private wells, and scattered developments and individual customers in unincorporated areas of Volusia County near the City).

The Interlocal Agreement (previously mentioned on page VII-1) also applies to potential water service areas. In addition, there is an existing agreement with the City of Edgewater by which the Utilities Commission can provide water to Edgewater on an emergency basis; however, there is no reciprocal provision for New Smyrna Beach to receive water from Edgewater.

The proportional capacity of the potable water system allocated to the City and the county is 78.8 percent and 21.2 percent, respectively.

2. Types of Adjacent Land Use – The existing land uses adjacent to the water treatment plant are primarily Low-Density Residential. To date, there are no known impacts on these adjacent land uses due to plant operations. However, the chlorine gas system is subject to federal risk management guidelines. The Utilities Commission has prepared a Risk Management Plan for storage and handling. An element of the plan requires public notification for residents and businesses within close proximity of the plant. As development moves closer to the plant, safer disinfection options may need to be considered. These options include:

- Bulk Liquid Sodium Hypochlorite (NaOCl)
- On-site NaOCl generation
- Ozonation

The first two (2) options are compatible with the existing treatment processes and could be implemented without major plant modifications. Use of NaOCl, also known as bleach, has safety advantages over chlorine gas and it is relatively simple to deliver, store, and inject. The primary disadvantage is cost. Chemical costs associated with NaOCl are approximately 10-20 percent higher than chlorine gas.

3. Types of Land Uses Served – The major land use served by the water treatment plant is residential. The plant also serves a significant amount of commercial land use, particularly along the North Causeway between the beachside and the mainland; on both sides of Flagler Avenue on the peninsula heading toward the beach; in the downtown area on the mainland; along both sides of US Highway 1 and State Road 44 on the mainland; and along both sides of State Road A1A on the beachside. Two (2) significant industrial areas are also served: the New Smyrna Beach Municipal Airport north of the City on the west

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side of US Highway 1, and the railroad yard / warehouse / manufacturing strip along the west side of US Highway 1, south of Lytle Avenue and north of 10th Street.

4. Design Capacity – The water treatment plant was built in 1977 at a design (peak) capacity of 6.2 mgd and was expanded in the early 1990's to 10.38 mgd. Raw water transmission limitations limit maximum capacity to 9.0 mgd. The facility has room for potential expansion to 12.4 mgd.
5. Current Demand and Level-of-Service – According to the Utilities Commission, current peak-day demand at the water treatment plant is 7.12mgd. Average daily demand is 4.53 mgd. This information is based on the latest available data for Fiscal Year 2004 (October 1, 2003 through September 30, 2004). This demand is serving a current population of approximately 24,818, based on the traffic analysis zone data in the *Central Florida Regional Planning Model (CFRPM)*, version 4.02. Historical water demand for Fiscal Years 1996 through 2004 is shown in Table VII-2.
6. Plant Performance – The water treatment plant uses a process consisting of aeration, lime softening, pH adjustment, filtration, fluoridation, and disinfection with a chlorine solution. It has received numerous awards, including the FDEP Best Operated Water Plant, Class A Category, in the St. Johns River Water Management District (1980, 1981, 1984 and 1986), and the American Waterworks Association's "Award of Recognition for Best Class A/B Water Plant in the State of Florida" (1985 and 1986). The plant is well maintained, and structures, components, and equipment are in good condition. Daily operation and maintenance and preventive maintenance are performed with the assistance of computerized schedules. In addition, regularly scheduled training sessions are held for plant operators and maintenance technicians.
7. Impact on Adjacent Natural Resources – Operation of the water treatment plant has had no known impact on adjacent natural resources.

Table VII-2 Historical Water Demand, Fiscal Years 1996-2006

Fiscal Year Ending September 30	Accounts	Average Daily Demand (mgd)	Peak Day Demand (mgd)	Total Treated Water Production (mg)	Average Daily Flow Per Account (gd)
1996	16,486	4.30	6.18	1,573	261
1997	16,691	4.28	5.85	1,562	256
1998	17,029	4.54	6.62	1,659	267
1999	17,505	4.57	6.13	1,667	261
2000	17,935	4.82	7.06	1,763	269
2001	18,569	4.54	5.96	1,658	245
2002	19,521	4.73	6.62	1,726	242
2003	19,978	4.78	7.20	1,744	239
2004	20,900	4.53	7.12	1,660	217
2005	22,261	4.43	6.07	1,617	199
2006	22,765	4.75	6.93	1,734	209
Average				1,679	240

Source: Utilities Commission, City of New Smyrna Beach

The Florida Department of Environmental Protection requires water treatment plants to perform "Capacity Analysis Reports." This authority is established in Rule 62-600.405, *Florida Administrative Code*. This report allows a community to evaluate existing plant processes and establish a schedule for future expansion

WATER SUPPLY

Over the years, New Smyrna Beach has had to continue seeking water supplies farther inland due to saltwater intrusion in its wells. In fact, the City's original Smith Street wellfield is no longer being used, due to this intrusion. Consequently, the Utilities Commission now operates the following three (3) wellfields:

1. water treatment plant, about three (3) miles inland;

2. Samsula, approximately seven (7) miles farther west; and
3. Intersection of State Road 44 and Pioneer Trail (County Road 4118)

The water treatment plant wellfield currently has seven (7) wells, providing 3,230 gallons per minute (gpm). The Samsula wellfield has six (6) wells, providing 1,850 gpm. The State Road 44 / Pioneer Trail wellfield has six (6) wells, providing 2,770 gpm. Each of the wells at the sites range from 183 to 364 feet deep, drawing water from the Floridan Aquifer. Each well also has a pump house and a fence surrounding it. Ten (10) of the wells have auxiliary engines for emergency pumping in the case of power failure. According to the Utilities Commission, the cone of influence for saltwater intrusion has been reduced at the water treatment plant wellfield due to increased use of the Samsula wellfield and less pumping at the water treatment plant wellfield. Total permitted peak capacity for all three (3) wellfields is 10.5 mgd; the average capacity is 5.00 mgd.

Well Data

Well #	Wellfield	Year Built	Depth	Production (gpm)
1	water treatment plant	1956	183'	300
2	water treatment plant	1958	200'	300
3	water treatment plant	1958	unknown	500
4	water treatment plant	1966	abandoned	
5	water treatment plant	1966	200'	300
6	water treatment plant	1972	200'	450
7	water treatment plant	1976	200'	690
8	water treatment plant	1976	200'	690
9	Samsula	1981	255'	150
10	Samsula	1981	255'	350
11	Samsula	1981	255'	400
12	Samsula	1981	255'	150
13	Samsula	1981	255'	400
14	Samsula	1986	255'	400
15	State Road 44 / Pioneer Trail	1993	260'	470
16	State Road 44 / Pioneer Trail	1993	260'	345
17	State Road 44 / Pioneer Trail	1993	260'	460
18	State Road 44 / Pioneer Trail	1993	260'	585
19	State Road 44 / Pioneer Trail	1993	260'	475
20	State Road 44 / Pioneer Trail	1993	364'	435

Water quality and well levels within the wellfields has remained relatively consistent with some increase in chlorides over the past ten (10) years. The Utilities Commission withdraws approximately 40 and 60 percent of its water from the water treatment plant and State Road 44 / Pioneer Trail wellfields, respectively. The primary constraint limiting the groundwater withdrawals is defined in the Consumptive Use Permit (CUP) #8747, issued by the St. Johns River Water Management District (SJRWMD) on January 10, 2006, and will expire on February 9, 2020. Allocation requests were increased and five (5) new wells were approved for construction.

Table VII-3 Permitted Groundwater Withdrawal Limits (Annual and Maximum Daily), 2005 and 2006

Year	Permitted Annual Average Withdrawal (mgd)	Permitted Maximum Daily Withdrawal (mgd)
2005	6.12	9.33
2006	5.58	10.72

Source: Consumptive Use Permit #8747, St. Johns River Water Management District (SJRWMD), 2006

The CUP allows the Utilities Commission to draw an average of up to 6.04 million gallons of water daily for the year 2007. The maximum allowed daily ground water withdrawal from the wellfields for the year 2007 is 10.84 mgd. However, the water treatment plant capacity, with the largest well out of service, is 7,320

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gpm and 10.38 mgd. To date, the plant has not operated above 50 percent of capacity. In order to maintain average well operating times at 12 hours a day or less, a capacity factor of two (2) is necessary. Current capacity exceeds existing average demand by a factor of two (2), allowing for wells to be rotated with one-half (1/2) of the wells operating, approximately 12 hours per day or less.

To keep all utility agencies from regularly exceeding the CUP, the SJRWMD has safeguards in place. In any calendar year, if the actual volume of water withdrawn equals or exceeds 95 percent of the amount of water allocated for use by the permit, then the Utilities Commission shall submit a report to the SJRWMD by the following February 15 that explains why the withdrawal of water exceed this threshold. The report must include a breakdown of the population currently being served by the utility agency, an updated projection of anticipated population that will be served for the following year, an evaluation as to whether the utility agency anticipates whether it will be able to meet the water needs of the revised projected population without violating the allocations set forth in this permit, and a corrective action plan setting actions that the utility agency intends to take if the evaluation indicates that allocations will be exceeded during the following year. Also, the report evaluates the effect of the following on the volume of water withdrawn by the Utilities Commission:

1. Climatic shortfalls (drought);
2. Greater than anticipated growth in the service area;
3. Inefficient usage within the service area; and/or
4. Other factors.

If utility agencies regularly exceed the CUP, the SJRWMD and possibly the Department of Environmental Protection would impose a moratorium on new water hookups throughout the utility agency's service area.

In addition to groundwater pumping capacity, the Utilities Commission must also consider raw water transmission capacity as a constraint. The water treatment plant receives 60 percent of the raw water from an existing 20 inch transmission main from the Samsula and State Road 44 / Pioneer Trail wellfields. Existing raw water transmission main capacity is adequate. However there is no redundancy. If this transmission main is damaged, or taken out of service for maintenance, the service area could immediately lose more than one-half (1/2) of the water production capacity. The Utilities Commission has two (2) completed water interconnects with the cities of Port Orange and Edgewater, which can provide up to two (2) mgd capacity, and is inadequate to sustain demand for an extended period.

STORAGE FACILITIES

According to the Utilities Commission, there are four (4) water storage tanks having a total storage capacity of 4.35 million gallons. They are ground storage tanks located at different sites throughout the service area. However, the actual useable storage is approximately 75 percent of the nominal storage. Therefore, actual storage is 3.26 million gallons.

DISTRIBUTION SYSTEM

The existing distribution system consists of approximately 290 miles of transmission mains and distribution pipes ranging in size from 6 to 20 inches in diameter, along with four (4) master pump stations with a total capacity of 14.26 mgd. A schedule of main and pipe sizes is as follows:

Size (inches)	Length (feet)
6	431,657
8	177,604
10	58,499
12	172,452
14	646,000
16	31,091
18	6,852
24	7,833
Total	1,531,988

Source: *Utilities Commission, City of New Smyrna Beach*

SLUDGE DISPOSAL

According to the Utilities Commission, the quantity of water lime sludge disposed is 1.95 dry tons per day per million gallons of treated water. Based on the average daily demand of 4.53 mgd in Fiscal Year 2004, approximately 3,225 dry tons of sludge were disposed.

Before disposal, the sludge is dewatered in lagoons, followed by on-site stockpiling at the water treatment plant. For final disposal, the sludge is hauled off-site for land spreading to the following sites:

Site Name	Address	County
Dear Park	6254 Kempfer Road	Brevard
Charles Cowart	County Road 305	Flagler
Henry	County Road 305	Flagler
Shelley's	6505 West Jones Avenue	Orange
Deseret	13754 Deseret Lane	Osceola
Shane's Pl.	3360 South Kenansville Road	Osceola
Yeehaw	South Kenansville Road	Osceola
Killbee	Old Mims Road	Seminole
Cowart	County Road 305	Volusia
Durrance	County Road 305	Volusia
Lukas Ranch	1731 Pell Road	Volusia

The percent solids of the disposed sludge is approximately 40 to 50 percent. The land spreading operation has had no known adverse impact on adjacent natural resources.

DRAINAGE

Most of New Smyrna Beach is low, flat, and poorly drained, thereby lending itself to a number of drainage problems of various magnitudes. These problems are further intensified by the Indian River tidal level (i.e., flooding is worse during high tide than at low tide). When too much rainfall occurs during high tide, water backs up in the natural drainage systems that outfall to the Indian River, as well as in their tributaries, and prevents sufficient discharge flow. Consequently, the City is continually exploring ways to improve both natural drainage features and manmade facilities within its jurisdiction in order to protect the public health, safety, and welfare from the adverse impacts of flood conditions. In particular, the City developed a master plan for each drainage basin. This and other objectives will be discussed in the Future Conditions section of this element, as well as in the Goals and Objectives section.

Depending upon the facilities developed, and their location, operational responsibility may rest with either private property owners, the State of Florida, Volusia County, or the City of New Smyrna Beach.

NATURAL FEATURES

New Smyrna Beach lies within the Silver Bluff marine terrace formed during the last glacial age (Pleistocene area). Elevations range as follows:

- 0 to 5 feet above mean sea level (msl) in the Indian River marshland and Turnbull Creek/Bay area.
- 5 to 10 feet above msl in the flat terrace area comprising most of the City.
- 10 to 15 feet above msl in the ridge/dune area of the beachside, and along US Highway 1 and the Florida East Coast Railway on the mainland.

The soils underlying the New Smyrna Beach area consist mostly of quartz sand, with small amounts of clay and fine to medium shell. (Specific mapping of these soils is available from the United States Department of Agriculture, Natural Resources Conservation Service.) These soils are moderately to poorly drained, and have only moderate percolation characteristics. Consequently, much of the rainfall from locally heavy storms runs off into surrounding surface water bodies and the numerous naturally occurring depressions scattered throughout the area.

The primary drainage basin for New Smyrna Beach is the Indian River, which receives as much as 40 to 50 percent of the runoff from a heavy rainfall. The remainder is either retained in local depressions,

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percolates into the ground, or evaporates.

The primary north-south drainage artery is Turnbull Creek bisecting the City, and the primary east-west arteries are: Murray Creek / Redland Canal adjacent to the northern City limit; the Wayne Avenue and Canal Street drainage systems toward the center of the City; and the Gabordy Canal at the southern City limit. There are also five (5) secondary drainage arteries: two (2) on the mainland and three (3) on the beachside. All of these drainage arteries, primary and secondary, eventually flow into the Indian River, except for Turnbull Creek, which flows into the Halifax River just north of the Ponce de Leon Inlet.

Existing land use adjacent to the primary drainage basin (i.e., the Indian River) is mostly residential with some commercial, particularly along the navigable portion of the river. There are also a few recreation sites located on the mainland and the North Causeway. The entire non-navigable portion of the river (i.e., the marshlands) is classified as conservation area.

The primary impact of the various land uses adjacent to the Indian River and the drainage arteries, particularly the development associated with the residential and commercial land uses, has been stormwater runoff from streets, parking lots, and other types of impervious surfaces. Contained in this runoff are various types of pollutants (such as grease and oil from streets and parking lots), which have a detrimental impact on the water quality of the receiving streams. In addition, as more development occurs, more pervious land areas are claimed, resulting in additional runoff and more potential for flooding in low-lying areas.

MAN-MADE DRAINAGE SYSTEMS

Man-made drainage systems in New Smyrna Beach include curbs and gutters, street inlets, storm sewer pipes, underground culverts, open channels (such as swales, ditches and canals), retention ponds, and detention facilities. These systems are designed to handle locally heavy and frequent rainfalls that occur during the normal rainy seasons, as well as more severe but less frequent rainfalls such as the five (5) and ten (10) year storm events. The primary discharge point for these systems is the Indian River.

Overflow from seldom occurring rainfalls, such as the 25, 50, and 100 year storm events, is handled by surface water bodies, including Turnbull Creek, the Indian River, and the man-made canal systems.

The City has three (3) general categories of drainage areas. The older downtown area with older stormwater management systems that directly discharge into the Indian River; new subdivisions constructed after 1979 with effective stormwater management systems; and the remaining portion of the City which has no man-made drainage systems.

The older downtown drainage systems serve a relatively small portion of the City and perform generally well. These systems require maintenance because they are nearly 60 years old and have exceeded the expected life by approximately 10 years. Because of the direct discharge nature of the systems, they have a relatively high impact upon adjacent natural resources.

All subdivisions developed since 1979 have excellent stormwater management systems that perform well at a very adequate level-of-service. These systems are generally in excellent condition, have an expected life of approximately 50 years, and have very little impact on adjacent natural resources.

The remaining portion of the City has no man-made drainage systems and thus has localized flooding problems during heavy rains. These areas also have a relatively high impact on adjacent natural resources. However, the City has an ongoing drainage program to lessen the flooding and impact on natural resources in these areas.

FLOOD-PRONE AREAS

According to Florida Department of Environmental Protection (FDEP) criteria, low-lying areas zero (0) to seven (7) feet above msl are considered to be flood-prone areas. As previously mentioned, the flat terrace area comprising most of the City is approximately five (5) to ten (10) feet above msl. Consequently, a major part of the City is flood-prone, particularly the areas adjacent to the Indian River, along the beach, where tidal surge would be a significant factor during a hurricane, and west of Interstate 95. Existing land uses in the flood-prone areas are primarily residential and commercial, along with some recreation and industrial uses.

STORMWATER MANAGEMENT

The City's existing Stormwater Management and Conservation Ordinance requires that post-development stormwater runoff rates and volumes must approximate pre-development conditions and that precautions must be taken to prevent erosion, sedimentation, and flooding. In particular, the ordinance requires that:

1. On-site retention shall be provided for no less than one and one-half (1½) inch of runoff from all roofed, paved, and other impervious areas caused by or resulting from the project.
2. The peak discharge rate and total runoff volume leaving the developed or redeveloped site for a 25 year storm of 24 hours duration shall be limited to 110 percent of the pre-development or pre-redeveloped peak discharge rate and total discharge volume.
3. Stormwater runoff shall be subjected to "best management" practices prior to discharge into natural or artificial drainage systems. Best management shall mean a practice or combination of practices determined by the City Engineer to be the most effective practical means of preventing or limiting the pollution generated by the project to a level compatible with Florida water quality standards found in Rule 17-3, *Florida Administrative Code*.
4. Runoff computation shall be based on the most critical situation and conform to acceptable engineering practices using rainfall data and other local information applicable to the affected area.
5. No site development or alteration shall cause siltation of wetlands, pollution of downstream wetlands, reduction in the natural retention or filtering capabilities of wetlands, or reduction in the elevation of the existing water table.
6. No site alteration shall allow water to become a health hazard or contribute to the breeding of mosquitoes.
7. Site development or alteration activities shall include construction or installation of such water retention facilities, settling structures, and flow attenuation devices as may be necessary to insure that the foregoing standards and requirements are met.
8. Design of water retention or detention structures and flow attenuation devices shall be subject to the approval of the City Engineer.
9. In subdivisions and on parcels where stormwater retention meeting current standards is not provided, filling of low lots shall not be allowed within required yard areas except that a minimum amount of fill may be allowed for:
 - a. A driveway and up to five (5) feet on either side of the driveway; and
 - b. No more than six (6) inches of fill may be allowed within the required yard areas provided an adequate drainage scheme is constructed to not allow stormwater onto adjacent lots. Construction techniques allowed to elevate the first floor of a structure include use of stem wall and pier foundations.

The City has a Flood Damage Prevention Ordinance, which is required by §166.021, *Florida Statutes*. The Ordinance requires that the flood stage elevations remain constant before and after development within the floodplain. In addition, the Ordinance requires building floor elevations to be elevated above the base flood elevation as indicated on the National Flood Insurance Program, Flood Insurance Rate Map (FIRM). Finally, the Ordinance requires that buildings constructed along the Atlantic Ocean withstand wave action.

The positive aspects of the Ordinance are that life, property, and the functions of nature are preserved. Also, building costs in the long run are lowered because the need for reconstruction is reduced or eliminated. However, initial building costs are usually higher when construction is in compliance with the Ordinance.

This Ordinance has a weakness in that developments containing a large percentage of impervious area will be under designed while developments having low percentage of impervious areas and good soil conditions tend to be over designed. The strength of the Ordinance is that surface and ground water is

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protected due to the filtering of stormwater. Also, the negative impacts of flooding such as the breeding of vermin, safety hazards, and costly cleanup are avoided with proper stormwater management.

NATURAL GROUNDWATER AQUIFER RECHARGE

Rule 9J-5, *Florida Administrative Code*, defines aquifer recharge areas as "land or water areas through which groundwater is recharged." Recharge areas are one (1) of two (2) types, primary or secondary, and are described below.

PRIMARY RECHARGE AREAS

Primary recharge areas are those which recharge aquifers used for public drinking water supplies, or which have the proper combination of elevation and soils to potentially serve this purpose. The aquifer from which New Smyrna Beach draws its drinking water is the Floridan Aquifer. The potentiometric surface of this aquifer (in which recharge could occur) is 30 to 35 feet above MSL, which is higher than the elevation of most of the City (which is five [5] to ten [10] feet above MSL). Consequently, there are no primary recharge areas in New Smyrna Beach.

SECONDARY RECHARGE AREAS

Secondary recharge areas are those that replenish the uppermost surficial aquifer, which generally occurs five (5) to ten (10) feet below the ground surface. Recharge of the surficial aquifer is via percolation of rainfall. Consequently, the aquifer does not supply large quantities of water; and what water it does supply is not of sufficient quality for drinking. However, the surficial aquifer in New Smyrna Beach provides some prevention of lateral saltwater intrusion; and some residents pump water from it for irrigation purposes.

Areas of New Smyrna Beach in which the surficial aquifer occurs include the Atlantic Coastal Ridge on the beachside and the US Highway 1 / Florida East Coast Railway area on the mainland. Existing land uses in these areas are a mixture of residential and commercial, with some industrial uses in the US Highway 1 / Florida East Coast Railway area. The impact these land uses have on the aquifer's recharge areas is primarily that of stormwater runoff from impervious surfaces (streets, parking lots, sidewalks, etc.). However, the natural function of the recharge areas has not been adversely impacted; and the natural filtering ability of the soil tends to mitigate any major impact from oil, grease, or other pollutants contained in the runoff.

SOLID WASTE

Rule 9J-5, *Florida Administrative Code*, defines solid waste as "sludge from a waste treatment works, water supply treatment plant, or air pollution control facility; or garbage, rubbish, refuse, or other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from domestic, industrial, commercial, mining, agricultural, or governmental operations." Based on this definition, the types of solid waste generated by New Smyrna Beach include: water and wastewater sludge, and garbage, rubbish, refuse and other discarded material. Collection and disposal of these wastes is described below.

WATER SLUDGE

Sludge generated by the water treatment plant is dewatered in lagoons, followed by on-site stockpiling at the water treatment plant. For final disposal, the sludge is hauled off-site for land spreading to the following sites:

Site Name	Address	County
Dear Park	6254 Kempfer Road	Brevard
Charles Cowart	County Road 305	Flagler
Henry	County Road 305	Flagler
Shelley's	6505 West Jones Avenue	Orange
Deseret	13754 Deseret Lane	Osceola
Shane's Pl.	3360 South Kenansville Road	Osceola

Yeehaw	South Kenansville Road	Osceola
Killbee	Old Mims Road	Seminole
Cowart	County Road 305	Volusia
Durrance	County Road 305	Volusia
Lukas Ranch	1731 Pell Road	Volusia

WASTEWATER SLUDGE

Sludge generated by the wastewater treatment plant is aerobically and thermophillically digested, then dewatered by thickening only (no mechanical dewatering is employed). Treated influent is mixed with return activated sludge and then enters one (1) of two (2) process trains, each consisting of a fermentation basin, first anoxic zone, aerobic zone, second anoxic zone, and a re-aeration basin. Each train has a 3.5 mgd capacity. After dewatering, the sludge is hauled off-site for land spreading at the same site described above for water sludge.

GARBAGE, RUBBISH, REFUSE

Since 2001, the New Smyrna Beach Public Works Department has contracted with private interests to collect garbage, rubbish, refuses, and other discarded material from residential, commercial, industrial, and governmental sources within the City limits. Collection from all sources other than residential are classified as commercial pickups.

Refuse/solid waste collection is mandatory for all residents and businesses within the City limits. Pickups are made twice each week for residential customers, and daily for commercial accounts. Once collected, the refuse/solid waste is hauled to the Volusia County Landfill for final disposal. The Volusia County Landfill (Tomoka Farms Road Landfill) is a 3,400 acre site, with 400 acres currently active accepting approximately 1300 tons of solid waste per day. City of New Smyrna Beach is responsible for disposing of approximately 40-45 tons per day in the County Landfill per day. Thus, the City of New Smyrna Beach, having approximately 4.5 percent of the County population (2006 City population of 22,732 and 2006 County population of 503,844), only generates approximately 3.2 percent of the solid waste disposed of in the landfill.

FUTURE CONDITIONS

SANITARY SEWER

Future planning for the New Smyrna Beach sanitary sewer system is designed to provide sufficient wastewater collection, treatment and disposal services for meeting projected flows for the planning period. The system improvements that will be required are contained in the *Utilities Commission, City of New Smyrna Beach Wastewater & Reclaimed Water System Facility Plan* (Quentin L. Hampton Associates, 2006).

WASTEWATER TREATMENT PLANT

The Utilities Commission operates one (1) wastewater treatment plant with a rated capacity of 7.0 mgd. Based upon the referenced population and flow projections future average daily wastewater flows will be sufficient through 2025 as shown on Table VII-4. The treatment plant will be serving an estimated 26,278 accounts in 2020 and 29,848 accounts in 2025. .

The wastewater treatment plant will continue to be operated and maintained at its current high level of performance and upgraded as necessary to meet existing and any future EPA/FDNR treatment and discharge requirements. Plant operators and maintenance technicians will continue to receive regularly scheduled training; and the computerized operation and maintenance and preventive maintenance programs will continue to be used and improved.

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Table VII-4 Wastewater Flow Projections (Average Daily Demand)

Year	Accounts	Average Daily Flow (mgd)	Peak Month Average Daily Flow (mgd)	Peak Average Ratio (mgd)	Average Daily Flow Per Account (gd)
2007	18,870	4.00	5.19	1.30	212
2008	19,357	4.10	5.32	1.30	212
2009	19,857	4.21	5.47	1.30	212
2010	20,369	4.32	5.60	1.30	212
2015	23,136	4.90	6.36	1.30	212
2020	26,278	5.57	7.23	1.30	212
2025	29,848	6.33	8.21	1.30	212

Sources: Utilities Commission, City of New Smyrna Beach Wastewater & Reclaimed Water System Facility Plan, *Quentin L. Hampton Associates, 2006*; and Utilities Commission, City of New Smyrna Beach Water System Report, *Quentin L. Hampton Associates, 2005*

COLLECTION SYSTEM

Several collection system improvements are contained in the *Utilities Commission, City of New Smyrna Beach Five (5) Year Plan Capital Improvement Program FY 2008 to 2012*. The Utilities Commission five (5) year capital improvement program is updated annually and addresses needs of the Collection System.

EFFLUENT DISPOSAL

Due to the expanding wastewater reuse system, the City will continually rely less on effluent disposal through the existing outfall and rely more on effluent disposal through land irrigation. The wastewater treatment plant has a history of regularly meeting its discharge compliance requirements. A review of regulated effluent parameters has shown that the operating permit for the wastewater treatment plant on average has not been exceeded by any parameters.

SEPTIC TANKS

The City requires that new development must hookup to the central sanitary sewer system. Existing buildings must connect to sanitary sewer lines within one (1) year when such line is available.

There are several small areas that are served by septic tanks within the City. However, once sewerage becomes available to these areas, the septic tanks must be abandoned and the property is required to be served by the central sanitary sewer system. The term "available" means a sanitary sewer line is within 100 feet of the lot line.

SLUDGE DISPOSAL

According to the Utilities Commission, future wastewater sludge disposal volumes are projected as follows:

Wastewater		
Year	Sludge Volume	Flow (Average Daily)
2010	1,090 dry tons	4.32 mgd
2015	1,230 dry tons	4.90 mgd
2020	1,400 dry tons	5.57 mgd
2025	1,600 dry tons	6.33 mgd

These volumes are based on a sludge generation rate of 0.58 dry tons per day per million gallons of treated wastewater. The United States Environmental Protection Agency (EPA) Part 503 regulations govern the processes for reduction of pathogens. Part 503 establishes criteria for Class 'A' and Class 'B' biosolids handling. Generally, Class 'A' biosolids may be land applied without permits or subsequent monitoring requirements. Class 'B' sludge is a digested sludge product which has restrictive land application requirements. Land application sites receiving Class 'B' biosolids are permitted and monitored. Sludge generators contributing to Class 'B' land application sites retain liability for the product and the manner in which it is handled. Sludge disposal currently consists of hauling the sludge off-site for land spreading. However, the Utilities Commission is aware that alternative disposal methods may have

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to be investigated sometime during the overall planning period. There are several sludge processing alternatives being considered by the Utilities Commission. They are as follows:

1. Composting – Composting involves controlled aerobic degradation or decomposition of organic waste materials to produce a commercially valuable end product. The resulting product can be beneficially used as soil amendment or mulch. Composting results in an additional 20 to 30 percent reduction in the volatile solids content of anaerobically digested biosolids. The primary drawbacks to composting are: space requirements, material handling, and odors. Space required to allow for curing and windrowing is considerable. Given annual rainfall depths in Florida, curing/windrowing areas must be covered. Screening, blending, and windrowing compost heaps require significant labor.
2. Thermal Drying – Thermal drying reduces the water content of dewatered biosolids through accelerated evaporation caused by heating. The process produces granules or soil-like material that normally contains less than 10 percent moisture. The product can be used as fertilizer and amendment on agricultural land, golf courses, parks, and as potting material used in horticulture. The material can also be used as fuel for generating heat and power. Thermal drying options are as follows:
 - a. Direct Rotary Drum Drying – Direct rotary drum drying technology evaporates water from biosolids through direct contact with a stream of hot air or gas as the biosolids are conveyed through a rotating drum. This technology is the predominant drying technology used in the United States.
 - b. Indirect Dryers – There are a number of different indirect dryer configurations. However, they all use conduction of heat from metal surfaces for drying. Indirect dryers can use paddles, disks, and screw conveyors to mix the material and deliver heat. Indirect dryers are widely used in food, petrochemical, and pharmaceutical industries and have been installed for municipal biosolids drying applications. There are advantages and disadvantages to using direct or indirect dryers.
 - i. Advantages
 - Relatively low land/space requirement
 - Can be automated to reduce material handling using front-end loads, which may reduce labor costs and safety issues.
 - Odor potential is low since the facility is entirely enclosed and only a small air volume from the process requires scrubbing due to internal air recirculation
 - Greatly reduced volume of final product and elimination of the need for amendments reduces hauling traffic
 - ii. Disadvantages
 - Requires use of natural gas or other fuel source, thus is expensive
 - The process is mechanically complex
 - Expansion of the facility in small increments is not economical. However, increased production can be achieved by increasing hours of operation
 - Product may be odorous when re-wetted if not adequately stabilized before drying
 - Special precautions are required to prevent fires and explosions
3. Chemical Stabilization – There is a wide range of chemical stabilization options available that use alkali and other chemical treatment processes. These processes can be grouped into three (3) categories that reflect their key differences:
 - a. Neat-alkali processes – These processes use a high-quality lime product such as quick lime;
 - b. Fly ash and waste alkali processes – These processes use low-quality, but frequently cheaper, alkaline waste products such as fly ash from cement kilns; and
 - c. Neutralization processes – These processes use an alkali with sulfuric acid to produce a product with a neutral pH.

Odor control is a significant concern with chemical stabilization processes. The high pH and temperature associated with the process lead to volatilization of ammonia and

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volatile organic compounds that should be controlled. Ammonia emissions from high-pH processing of biosolids are generally higher than from composting facilities due to the pH difference between the two (2) processes. Some products that have solids content below forty percent are difficult to market and handle.

4. "Cannibal" Solids Reduction Process – An alternative process, which may prove viable for the Utilities Commission, is a proprietary system marketed under the trade name. It uses a combination of solids separators and side stream processes to remove inert materials and biologically reduce sludge volumes.

GEOGRAPHIC SERVICE AREA

The Utilities Commission is continually expanding its geographic service area. The major areas of expansion have been to the west of Interstate 95, north and south of State Route 44, as well as other properties east of Interstate 95 within the corporate limits and adjacent areas in unincorporated Volusia County. The Utilities Commission has also expanded its service area (via interlocal agreement) into the unincorporated area west of the City.

The service area extends as far north as Spruce Creek, as far west as State Road 415, and as far south as the line negotiated with the City of Edgewater generally aligned with 10th Street, near the New Smyrna Beach / Edgewater boundary.

The City should enact Chapter 180, *Florida Statutes*, which would allow the City to declare a service area that extends up to a five (5) mile radius beyond our boundaries. Currently, the State Route 44 / Pioneer Trail wellfield is further than five (5) miles from the western boundary of the City. However, if the City decides to annex land west of the existing borders, passage of a Chapter 180 ordinance would allow the City to exercise some control of the land in which the western State Route 44 / Pioneer Trail wellfield is located.

FUTURE LAND USES SERVED

Future land uses served by the Pollution Control Plant will be as described in the Future Land Use Element, and as depicted on the Future Land Use Map (Map II-3) for the City of New Smyrna Beach. Service into unincorporated areas will be consistent with the Future Land Use Element of the *Volusia County Comprehensive Plan*.

IMPACT ON ADJACENT NATURAL RESOURCES

The improvements and modifications planned for the Utilities Commission's sanitary sewer system will have no known adverse impact on adjacent natural resources.

POTABLE WATER

Many of the improvements that will be required for meeting future potable water needs (see Table VII-5) in the planning period are contained in the *Utilities Commission, City of New Smyrna Beach Water Plan* (Quentin L. Hampton Associates, 2005). This plan will be continually monitored and modified to provide for new and additional equipment and facilities as demands dictate during the planning increments.

WATER TREATMENT PLANT

The Utilities Commission increased the water treatment plant peak-flow capacity from 6.2 to 10.38 mgd in the early 1990's. Improvements associated with this increase included: aeration facilities, yard piping, site work, lime softening unit, sludge piping, filtration expansion, fluoridation modification, high-service pumping station, 2.0 mg ground storage reservoir, sludge handling facilities, and electrical/instrumentation systems. However, current plant capacity can only be met by the well output and raw water transmission limitations limit maximum capacity to 9.0 mgd.

The water treatment plant will continue to be operated and maintained at its current high level of performance to meet existing and any future EPA/FDEP treatment requirements. Plant operators and maintenance technicians will continue to receive regularly scheduled training; and the computerized operation and maintenance and preventive maintenance programs will continue to be used and improved.

WATER SUPPLY

The Utilities Commission operates 19 wells, with five (5) new wells to be added in the near future. The water treatment plant wellfield currently has seven (7) wells, providing 3,230 gpm. The Samsula wellfield has six (6) wells, providing 1,850 gpm. The State Road 44 / Pioneer Trail wellfield has six (6) wells, providing 2,770 gpm. Each of the wells at the sites range from 183 to 364 feet deep, drawing water from the Floridan Aquifer. Ten (10) of the wells have auxiliary engines for emergency pumping in the case of power failure. Total permitted peak capacity for all three (3) wellfields is 10.5 mgd; the average capacity is 5.00 mgd. Table VII-5 indicates the projected well demands and additional capacity requirements.

Table VII-5 Potable Water Wellfields Capacity Projections and Requirements

Year	Accounts	Average Daily Demand (mgd)	Peak Day Demand (mgd)	Average Daily Flow Per Account (gd)	Existing Wellfields Capacity (mgd)	Wellfields Capacity Requirement (mgd)	Surplus / (Deficit) (mgd)
2010	27,042	6.49	9.28	240	10.50	12.98	(2.48)
2015	27,958	6.71	9.60	240	10.50	13.42	(2.92)
2020	29,167	7.00	10.01	240	10.50	14.00	(3.50)
2025	29,667	7.12	10.18	240	10.50	14.24	(3.74)

Source: Utilities Commission, City of New Smyrna Beach Wastewater & Reclaimed Water System Facility Plan, *Quentin L. Hampton Associates, 2006*

Water quality and well levels within the wellfields has remained relatively consistent with some increase in chlorides over the past ten (10) years. The Utilities Commission withdraws approximately 40 and 60 percent of its water from the water treatment plant and State Road 44 / Pioneer Trail wellfields, respectively. The primary constraint limiting the groundwater withdrawals are defined in the Consumptive Use Permit (CUP) #8747, issued by the St. Johns River Water Management District (SJRWMD) on January 10, 2006, and will expire on February 9, 2020. Allocation requests were increased and five (5) new wells were approved for construction. In order to maintain average well operating times at 12 hours a day or less, a capacity factor of two (2) is necessary. A tabular listing of permitted withdrawals is detailed in Table VII-6, as follows:

Table VII-6 Permitted Groundwater Withdrawal Limits (Annual and Maximum Daily), 2007-2020

Year	Permitted Annual Average Withdrawal (mgd)	Permitted Maximum Daily Withdrawal (mgd)
2007	6.04	10.84
2008	6.62	11.00
2009	7.13	11.17
2010	7.63	11.33
2011	8.06	11.51
2012	8.33	11.68
2013	8.33	11.84
2014	8.33	12.02
2015	8.33	12.19
2016	8.33	12.36
2017	8.33	12.54
2018	8.33	12.75
2019	8.33	12.75
2020	8.33	12.75

Source: *Consumptive Use Permit #8747, St. Johns River Water Management District (SJRWMD), 2006*

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The CUP permits increasing annual average withdrawals up to the year 2012, when it plateaus at 8.33 mgd until the year 2020 and increasing maximum daily average withdrawals up to the year 2018, when it plateaus at 12.75 mgd. Therefore, the wellfields are permitted to withdrawal enough water to meet the permitted CUP allowance of 8.33 mgd through the year 2020. Well output and raw water transmission constraints limit maximum capacity at the treatment plant to 9.0 mgd. Therefore, there is an insufficient supply to accommodate the treatment plant of 10.38 mgd. Thus, the treatment plant capacity exceeds the production and distribution from the wellfields. Additionally, the first of five (5) new wells is being installed northwest of the interchange of Interstate 95 and State Road 44 with a capacity of 350 gpm each, resulting in a total of 2.52 mgd of additional capacity.

In addition to groundwater pumping capacity, the Utilities Commission must also consider raw water transmission capacity as a constraint. The water treatment plant receives 60 percent of the raw water from an existing 20 inch transmission main from the Samsula and State Road 44 / Pioneer Trail wellfields. Existing raw water transmission main capacity is adequate. However there is no redundancy. If this transmission main is damaged, or taken out of service for maintenance, the service area could immediately lose more than one-half (½) of the water production capacity. The Utilities Commission has two (2) completed water interconnects with the cities of Port Orange and Edgewater, which can provide up to two (2) mgd capacity, and is inadequate to sustain demand for an extended period. In order to provide operation redundancy, the Utilities Commission should pursue the following:

1. Additional finished water interconnects
2. Alternative water supplies
3. A secondary raw water main

The Utilities Commission was recently participating in the "Water Facilities Plan" in association with the Water Authority of Volusia (WAV). However, it was determined by the City Commission that solving the future potable water needs would be more economical without being a member of WAV.

ALTERNATIVE WATER SUPPLY

Currently, SJRWMD has not identified groundwater deficits associated with future aquifer withdrawals from the wellfields through the year 2020. SJRWMD has the legislative authority to limit Consumptive Use Permit holders based on cumulative groundwater withdrawals and the potential effect upon spring flows. Therefore, future regional groundwater deficits may be assigned countywide, not on a utility by utility basis. In the event that this occurs, the Utilities Commission needs to be prepared to meet future demands not only for the residents of New Smyrna Beach, but also for their customers in unincorporated Volusia County. Some of the alternative sources, which may be considered by the City, are as follows:

1. Artificial Recharge – The Floridan Aquifer is largely constrained by naturally occurring recharge to the Floridan Aquifer and secondary impacts to the surficial aquifer. Secondary impacts to the surficial aquifer (i.e., lowering of the water table) have the potential to alter adjacent wetland hydroperiods and create unacceptable wetland impacts. To date, this does not appear to have occurred.
In order to assure adjoining property owners and regulatory agencies that wetland hydroperiods are maintained, a piezometric monitoring program is required. The monitoring plan consists of shallow monitoring wells. Water levels in wetlands adjacent to wells are continuously monitored and compared to levels in 'reference' wetlands. If levels in "pumped" wetlands are consistently lower than levels in "reference" wetlands, the City is obligated to reduce pumping from adjoining well sites. Another option is artificial recharge. Artificial recharge could involve land application of reclaimed water in wetlands to offset withdrawals. This option entails permitting hurdles with respect to FDEP effluent disposal regulations.
2. Brackish Groundwater – may be withdrawn from the Lower Floridan Aquifer without affecting the Upper Floridan Aquifer. The Lower Floridan Aquifer is hydraulically separated from the Upper Floridan Aquifer by a hard, dense dolomite and layers of chalky, low permeable limestone, which acts as a confining layer.
Wells completed in the Lower Floridan Aquifer could be treated using membrane

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processes or blended with water from the Upper Floridan Aquifer. If used as blend wells, the amount of water from this source would be limited by an acceptable blend ratio, which would maintain a safe concentration level below the Drinking Water Standard for Chlorides and Sulfates of 250 mg/L. This blend ratio would depend on the final use of the finished water. For finished potable water, the blend would need to be between 150 and 200 mg/L.

The brackish water of the Lower Floridan Aquifer could also be treated using membrane treatment technology to produce high quality drinking water or lower quality irrigation water. The primary problem in developing brackish water membrane treated water supply is concentrate disposal. The preferred concentrate disposal method is deep well injection. This method has been used in both southeast and southwest Florida. However, the occurrence of an injection zone has not been proven in Volusia County.

3. Surficial Aquifer – The surficial aquifer is a semi-confined zone overlying the Floridan Aquifer. This water-bearing zone is the source bed for recharge to the Upper Floridan Aquifer (UFA), however, confining layers separating the surficial aquifer from the Upper Floridan Aquifer limit recharge potential throughout most of Volusia County. Therefore, the majority of water in the surficial aquifer is lost to evapotranspiration, or runoff within the drainage ditches.

It is possible to withdraw significant quantities of water from the surficial aquifer without reducing the volume of water recharged to the UFA. Additionally, artificial recharge and recharge enhancement to the surficial aquifer may be accomplished far easier than increasing recharge to the Upper Floridan Aquifer.

The preferred method for water withdrawal from the surficial aquifer is via horizontal wells. Horizontal wells consist of shallow, less than 25 feet deep, linear drainage pipes connected to a submersible pump. A horizontal wellfield could be developed near the existing wells without impacting recharge to the Upper Floridan Aquifer. Water from the horizontal wells could be blended with raw water from the western wells or treated independently via a low-pressure membrane process.

A relatively wide range of water quality from the surficial aquifer, as well as variable quantity (rainfall dependent) has made surficial supply less popular than Upper Floridan water. Additionally, the water treatment plant may require modifications to treat shallow aquifer water, if this option is used.

4. Desalination – Demineralization of seawater, or water from coastal estuaries, is widely practiced around the world. Treatment costs are significantly higher than for any of the previously described sources.

Another drawback relates to concentrate disposal. Due to the relatively high total dissolved solids concentration of the source water greater than 1,500 mg/L, the volume and concentration of brine is extremely high. Currently, there are no seawater demineralization facilities with permitted surface water discharges in east central Florida. The only proven methodology for the referenced brine product is deep well injection. Unfortunately, the presence of an adequate confining zone is unproven in Volusia County. An alternative disposal method is ocean outfall. However, current FDEP regulations dictate that ocean outfalls must extend offshore to a point where the prevailing water depth is a minimum of 90 feet. In Volusia County, this translates to a distance approximately 30 miles offshore. A sub-aqueous pipeline of this length is currently cost prohibitive. As a result of these factors, seawater demineralization is the most costly treatment option at this time.

5. Lower Floridan Aquifer Water Supply – The Utilities Commission, as the City of New Smyrna Beach water supplying entity, has determined and selected to develop the Lower Floridan Aquifer Water Supply Program, which includes aquifer storage and recovery for the City of New Smyrna Beach potable and irrigation needs, as the primary and feasible alternative water supply source option. This methodology is accepted and used elsewhere in Florida and is well-suited to meet the unique environmental and upper Florida recharge

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characteristics of this immediate geographical area.

If sufficient rainfall occurs, additional or supplemental sourcing from the surficial aquifer and artificial recharge for blending or storage may also be potentially used as a secondary and supplemental methodology, but such sources are not considered as reliable for drought conditions. Conservation, efficiency improvements, and educational programs remain as an integral part of the Lower Floridan Water Supply Program. Preliminary examination and studies for application of this system by the Utilities Commission have been made and satisfied in accordance with §373.0361(8)(b), *Florida Statutes*, and other applicable provisions of §373.0361.

The proposed location of the Alternative Water Supply source will be the from the Lower Floridan Aquifer beneath the 800± acre property owned by the Utilities Commission located northwest of Interstate 95 and State Road 44. The initial proposed withdrawal will be 1.2 mgd.

The Utilities Commission did not submit nor sponsor the Swoope regional desalinization project currently listed as Project 15 in the 2005 SJRWMD Water Supply Plan. Various information inconsistencies may exist from previous submittal documents provided for other purposes and presented prior to the adoption of the Utilities Commission selection of the Lower Floridan Aquifer Water Supply Program. Clarifications and corrections are expected through the Lower Floridan Aquifer Water Supply Program's adoption process.

It is also essential that the SJRWMD amend, as previously requested, the SJRWMD Water Supply Plan to include the Lower Floridan Aquifer Water Supply Program at the Utilities Commission property, located northwest of Interstate 95 and State Road 44, to provide the opportunity for the proposed project to qualify for State funding as may be available.

The Utilities Commission has provided and will participate in the development of updates to the SJRWMD water supply assessment, Water Supply Plan, and other water supply development-related initiatives facilitated by the SJRWMD.

DISTRIBUTION

Several distribution system improvements are contained in the Utilities Commission five (5) year capital improvement program. The Utilities Commission five (5) year capital improvement program is updated annually and addresses needs of the distribution system.

STORAGE

The storage facilities include the 2.0 MG ground storage tank included as part of the water treatment plant expansion. There is sufficient storage capacity for meeting both projected peak-day demands and established fire flow requirements through the planning period.

Storage Capacity	
Location	Capacity (mg)
Smith Street	1.35
South Beachside	1.00
Water Treatment Plant	2.00
Total	4.35

SLUDGE DISPOSAL

According to the Utilities Commission, future water lime sludge disposal volumes are projected as follows:

Wastewater		
Year	Sludge Volume	Water Flow (Average Day)
2010	4,620 dry tons	6.49 mgd
2015	4,780 dry tons	6.71 mgd
2020	4,985 dry tons	7.00 mgd
2025	5,070 dry tons	7.12 mgd

These volumes are based on a sludge generation rate of 1.95 dry tons per day per million gallons of water treated. There are no immediate plans to use a different method of sludge disposal, which currently

consists of dewatering in lagoons followed by on-site stockpiling, with final disposal via off-site land spreading.

GEOGRAPHIC SERVICE AREA

The Utilities Commission's proposed service area for potable water is the same as the sanitary sewer service area. Please refer to the discussion of the proposed sanitary sewer service area for details.

FUTURE LAND USES SERVED

Future land uses served by the water treatment plant will be as described in the Future Land Use Element, and as depicted on the Future Land Use Map (Map II-3) for the City of New Smyrna Beach. The service areas in unincorporated Volusia County will be served consistent with the Future Land Use Element of the *Volusia County Comprehensive Plan*.

IMPACT ON ADJACENT NATURAL RESOURCES

The improvements and modifications planned for the potable water system will have no known adverse impact on adjacent natural resources.

DRAINAGE

The City will continue to maintain existing, and construct new, drainage systems for handling runoff from frequently occurring (2, 5, and 10 year) and seldom occurring (25 and 50 year) storm events. The City will also ensure that new drainage systems are designed to protect the functions of natural groundwater recharge areas and natural drainage features.

The City completed a technical study in support of adoption of a utility facility service fee. The study determined the design capacity of the City's drainage facilities; current facility demand; current level-of-service; projected demand for the initial planning increment, as well as the projected build out of the community; and adequacy of the current level-of-service.

New Smyrna Beach also intends to establish interlocal agreements with other municipalities and governmental entities regarding development of master plans for drainage basins that extend across jurisdictional boundaries.

NATURAL GROUNDWATER AQUIFER RECHARGE

As noted previously in the Existing Conditions section of this element, there are no primary aquifer recharge areas within New Smyrna Beach, which replenish the Floridan Aquifer from which potable water supplies are drawn. However, there are some secondary recharge areas within the City, which replenish the surficial aquifer that occurs five (5) to ten (10) feet below the ground surface.

The City intends to develop specific regulations or programs governing future land use and development in identified secondary aquifer recharge areas, in order to protect and maintain their natural function.

SOLID WASTE

New Smyrna Beach plans to continue using its current method and schedule of collecting and disposing of refuse/solid waste.

Portions of the Volusia County landfill have not been allocated for the municipalities served; instead, capacity analysis is based on population figures for both the incorporated and unincorporated areas of the county.

The Volusia County Landfill (Tomoka Farms Road Landfill) is a 3,400 acre site, with 400 acres currently active accepting approximately 1300 tons of solid waste per day. There is 4,422,418 cubic yards of disposal capacity remaining. The City of New Smyrna Beach is responsible for disposing of approximately 40-45 tons, or 3.2 percent of the solid waste disposed of, in the County Landfill per day. Thus, the City of New Smyrna Beach, having approximately 4.5 percent of the County population (2006 City population of 22,732 and 2006 County population of 503,844), only generates approximately 3.2 percent of the solid waste disposed of in the landfill.

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According to Volusia County's Solid Waste Manager, the Volusia County landfill is a 100+ year landfill. Approximately 12 percent of the landfill has been filled to date. This estimated capacity is based on five (5) assumptions:

1. The permitted height of the landfill is 192 National Geodetic Vertical Datum (NGVD).
2. The county will achieve 30 percent reduction of the solid waste stream, as mandated by the Solid Waste Management Act of 1988, which requires recycling.
3. Yard trash will be mulched.
4. Debris from demolition and construction projects will be segregated.
5. 200 of the additional 1,780 acres purchased for the landfill will be used as a buffer for a recycling and processing center.

The annual per capita solid waste capacity utilization was determined based on the historic filling rate of the landfill of the service area of the landfill during the past five (5) years. The projected level rate of Class I landfill utilization was estimated to be 0.91 cubic yards per person per year. Capacity analysis by the county is calculated on a generation rate of 6.4 pounds per capita for the county overall, which is considerably higher than the rate for New Smyrna Beach and other municipalities. This higher rate is used because land clearing, demolition, and construction debris constitutes a considerable portion of the solid waste disposed of at the county landfill. For additional information, please refer to the *Volusia County Comprehensive Plan*.

The average amount of refuse generated in New Smyrna Beach per day is approximately 127,326 pounds, or, estimated 63.6 tons per day for the year 2005. With an estimated 2006 City population of 22,732 year round residents and 6,254 seasonal residents (50 percent demand) and an estimated disposal rate of 45 tons per day, the current level-of-service provided by the county landfill is 4.9 pounds per person per day $(127,326 \text{ pounds} / [22,732 + (6,254)(0.5)] \text{ persons} = 4.9 \text{ pounds/person/day})$.

The solid waste generated by residents of the City of New Smyrna Beach in 2010 and 2015 will reach 144,749 pounds per day and 165,678 pounds per day, respectively, based upon the population projections in Table II-1 of the Future Land Use Element.

Private interests have handled the solid waste since 2001. The City no longer maintains a transfer station.

Also, in regard to the solid waste generated by the water and wastewater treatment plants (i.e., sludge), the Utilities Commission intends to continue its current method of disposal, as previously described in this element. The service area for solid waste management will expand as the City annexes more land. It is uncertain how much land will be annexed in the next several years. However, the service area boundary is proposed to be Spruce Creek on the north, the area beyond Interstate 95 on the west, to the line negotiated with the City of Edgewater generally aligned with 10th Street, near the New Smyrna Beach / Edgewater boundary, and the unincorporated beach area to the southeast.

GOALS, OBJECTIVES, AND POLICIES

SANITARY SEWER GOAL:

To develop, operate, and maintain an environmentally sound, economically efficient wastewater collection, treatment and disposal system for meeting current and future needs of New Smyrna Beach and unincorporated areas near the City. This goal will be met by initiating the objectives and policies stated herein, which will be more specifically defined in future *Comprehensive Plan* updates as local needs (and the City's ability to meet those needs) become better established.

OBJECTIVE:

1. To monitor and evaluate existing facilities on an annual basis to insure maximum use and efficiency.

POLICIES:

- a. Continue to operate and maintain the wastewater treatment plant within its design capacity to meet average day and peak-day flows, and continue to provide a level of treatment acceptable to the Florida Department of Environmental Protection

(FDEP).

- b. Continue to maintain a staff of qualified treatment plant operators, and ensure they receive regularly scheduled training and instruction regarding state-of-the-art operation procedures and the latest state and federal guidelines and regulations.
- c. Continue to operate and maintain existing collection lines and transmission mains within their design capacity to meet average-day and peak-day flows.
- d. Continue to produce a treated effluent, which meets or exceeds current Environmental Protection Agency (EPA) and FDEP discharge requirements.

OBJECTIVE:

2. To maintain a five (5) year schedule of capital improvement needs to correct existing facility deficiencies.

POLICIES:

- a. Use the Utilities Commission five (5) year capital improvement program and annual work program to establish priorities for correcting any facility deficiencies.
- b. Continue to maintain an adequate staff of qualified maintenance personnel to correct any immediate problems, deficiencies, or equipment failures, and to ensure that all equipment is properly serviced, maintained, and upgraded.
- c. Ensure that all maintenance personnel receive training and updating at regular intervals regarding state-of-the-art equipment and maintenance procedures.

OBJECTIVE:

3. To coordinate extension of, or increase the capacity of, wastewater facilities to meet future average day and peak-day flows without contributing to urban sprawl, in compliance with the Future Land Use Element and adopted Interlocal Service Area Agreement.

POLICIES:

- a. Continue to modify the Utilities Commission five (5) year capital improvement program, as needed, to provide for new and additional equipment/facilities as demands increase; and continue to monitor implementation of the program over the planning increments.
- b. Use 212 gpd per equivalent residential unit (ERU) as a general standard for service flow. (An ERU represents a nominal usage of 212 gallons of wastewater per day, or 0.833 times the nominal potable water usage per ERU.) The wastewater treatment plant design average daily flow is 7.0mgd, and the peak flow is 15.0 mgd. All system capacities are designed for peak flow. The relationship between water and wastewater flow has been determined by analyzing historical customer account records for water sales, and recorded flows at the wastewater treatment plant. Presented below is the ERU Determination Schedule for the Utilities Commission's system.

ERU Determination Schedule

- Category I – Dwelling units – 1 unit is equivalent to 1 ERU, with a minimum requirement of 1 ERU per unit.
- Category II – Retail and Churches – A value of 1 ERU shall be applied to every 2,000 square feet of building floor space, with a minimum requirement of 1 ERU per structure.
- Category III – Commercial – A value of 1 ERU shall be applied for each restroom facility with a minimum of 1 ERU per establishment.
- Category IV – Institutional/Recreational Facilities – A value of 1 ERU is applicable

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for every 1,000 square feet of building floor space, with a minimum requirement of 1 ERU per establishment.

- Category V – Manufacturing and Storage – 1 ERU is applicable for the first 2,000 square feet of building floor space. For area in addition to the initial 2,000 square feet, a rate of 1 ERU per 4,000 square feet is applicable. A minimum of 1 ERU per structure is required.
 - Category VI – Food Service – A value of 2.5 ERU per 1,000 square feet of building floor space is applicable, with a minimum requirement of 2.5 ERUs per establishment.
 - Category VII – Special Uses – 1 ERU should be added to the total facility use calculations for sanitary facilities (i.e., restrooms) for employee and customer use.
 - Category VIII – Individual Cases – These facilities must be considered on an individual, “case by case basis.”
- c. The New Smyrna Beach City Commission must approve any expansion of the sanitary sewer facility service area, and will approve such expansion only if it is consistent with the Interlocal Utilities Agreement with Volusia County.
- d. Prior to the issuance of development orders, require new site plans and/or subdivisions to provide the sanitary sewer infrastructure and services necessary to maintain the adopted level-of-service standards.

OBJECTIVE:

4. To discourage urban sprawl by maximizing use of existing facilities.

POLICIES:

- a. Continue to permit package treatment plants only as an interim facility, and only until such time as wastewater flows warrant full connection to the public system.
- b. Continue annual monitoring, reporting, and updating of the Utilities Commission five (5) year capital improvement program and the annual budget to meet the adopted level-of-service standards.

OBJECTIVE:

5. To reduce negative impacts on surface and groundwater from treated wastewater effluent.

POLICIES:

- a. Provide wastewater treatment to conform to the requirements of the Surface Water Improvement and Management Act.
- b. Investigate alternatives to surface water discharge of treated wastewater effluent.
- c. Severely limit the use of package wastewater treatment plants, as described in Policy 4.a. above.
- d. Limit the use of septic tanks to areas suitable for their use, as determined by the Volusia County Health Department.
- e. Continue to comply with the Surface Water Improvement and Management (SWIM) plans adopted by the SJRWMD and the National Estuary Program of the EPA.

OBJECTIVE:

6. To eliminate discharge of secondary treated effluent into the Indian River by the year 2000 by continuing to expand its wastewater reuse program for irrigation throughout the City.

POLICIES:

- a. Adopt land development regulations requiring new subdivisions to install reclaimed

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water mains if reclaimed water is available within 500 feet of the subdivision.

- b. Encourage existing commercial and residential developments to install reclaimed water mains.
- c. Investigate alternatives to surface water discharge of treated wastewater effluent.

OBJECTIVE:

- 7. To reduce the detrimental effects of on-site wastewater treatment systems on surface and groundwater.

POLICY:

Continue to require residents to abandon on-site wastewater treatment available, in order to provide wastewater treatment that conforms to the requirements of the Florida Department of Health and Rehabilitative Services.

OBJECTIVE:

- 8. To improve the collection, storage, and wastewater treatment plant capability to maintain system performance.

POLICIES:

- a. Modify the existing power distribution facilities at the wastewater treatment plant to incorporate an automatic transfer switch.
- b. Add a new 800 KW generator at the wastewater treatment plant to serve the high service pump station.

POTABLE WATER GOAL:

To develop, operate and maintain an environmentally sound, economically efficient potable water treatment and distribution system for meeting current and future needs of New Smyrna Beach and unincorporated areas near the City. This goal will be met by initiating the objectives and policies stated herein, which will be more specifically defined in future *Comprehensive Plan* updates as local needs (and the City's ability to meet those needs) become better established.

OBJECTIVE:

- 1. To monitor and evaluate existing facilities on an annual basis to insure maximum use and efficiency.

POLICIES:

- a. Continue to operate and maintain the water treatment plant, Samsula, and State Road 44 / Pioneer Trail wellfields to meet average day and peak-day demands and established fire flow requirements.
- b. Continue to operate and maintain the water treatment plant to meet average day and peak-day demands and established fire flow requirements, and to maintain satisfactory water pressure. Also continue to provide a level of treatment that complies with state and federal safe drinking water standards.
- c. Continue to maintain a staff of qualified treatment plant operators, and ensure they receive regularly scheduled training and instruction regarding state-of-the-art operation procedures and the latest state and federal guidelines and regulations.
- d. Continue to operate and maintain water storage facilities to provide adequate capacity for meeting peak-day demands and fire flow requirements.
- e. Continue to operate and maintain existing distribution lines, and upgrade the distribution system where necessary to meet future demands, as well as continue to provide sufficient water pressure to service area customers.

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- f. Make water distribution system improvements to the extent possible to allow the water service area to maintain current ISO (Insurance Service Organization) fire ratings.

OBJECTIVE:

2. To maintain a five (5) year schedule of capital improvement needs to correct existing facility deficiencies.

POLICIES:

- a. Establish priorities for correcting any existing facility deficiencies, using the Utilities Commission five (5) year capital improvement program and annual work program.
- b. Continue to maintain a staff of qualified maintenance personnel to correct any immediate problems, deficiencies, or equipment failures, and to ensure that all equipment is properly serviced and maintained.
- c. Ensure that all maintenance personnel receive training and updating at regular intervals regarding state-of-the-art equipment and maintenance procedures.

OBJECTIVE:

3. To coordinate extension of, or increase the capacity of, potable water facilities to meet future average day, peak-day, and fire flow demands/requirements without contributing to urban sprawl, in compliance with the adopted Interlocal Service Area Agreement and the Future Land Use Element.

POLICIES:

- a. Use 240 gpd per residential unit as the general standard for service demand; peak flow shall be the standard for capacity design.
- b. The New Smyrna Beach City Commission must approve any expansion of the potable water facility service area, and will approve such expansion only if it is consistent with the Interlocal Utilities Agreement with Volusia County.
- c. Upgrade the water treatment plant, distribution, and storage in order to maintain system performance and increase capacity to meet development needs.
 - i. Modify the following three (3) transfer pump systems:
 1. Replace the Smith Street pump station with a new pump station that allows full utilization of storage capacity and must have emergency power;
 2. Rehabilitate the storage tank at Smith Street; and
 3. Construct a new 1.0 mg pre-stressed concrete ground storage tank at the 3rd Avenue storage tank and pump station that is currently out of service.
 - ii. Improve the lime softening process by performing the following upgrades:
 1. Replace plant softeners, submerged gears, and troughs;
 2. Rebuild or replace softener drives; and
 3. Rehabilitate lime silo and electrical / instrumentation equipment.
- d. Prior to the issuance of development orders, require new site plans and/or subdivisions to provide the potable water (including Consumptive Use Permit) infrastructure and services necessary to maintain the adopted level-of-service standards.
- e. The New Smyrna Beach City Commission shall evaluate the benefits of enacting *Florida Statute* Chapter 180, which would allow the City to declare a service area that extends up to a five (5) mile radius beyond our boundaries.

OBJECTIVE:

4. To coordinate efforts to conserve potable water on an annual basis.

POLICIES:

- a. Continue to comply with water conservation policies adopted by the SJRWMD.
- b. Continue to lower system pressures when conditions require emergency conservation.
- c. Continue distribution of flow restrictors for fixtures, upon request.
- d. Require developments to conserve potable water supplies through the use of gray water systems, wastewater reuse, waste recovery systems, and non-potable water supplies.
- e. Require developments to conform to the State Water Conservation Act (§553.14, *Florida Statutes*).
- f. Require developments to use native species and non-potable irrigation water for landscaping.
- g. Strive to reduce projected demand for potable water by 10 percent by 2005 and by an additional 10 percent by 2015.

DRAINAGE GOAL:

To provide a safe, environmentally sound stormwater management and drainage system within New Smyrna Beach. This goal will be met by initiating the objectives and policies stated herein, which will be more specifically defined in future *Comprehensive Plan* updates as local needs (and the City's ability to meet those needs) become better established.

OBJECTIVE:

1. To continue to provide stormwater management and drainage facilities to accommodate runoff from frequently occurring and seldom occurring storm events. The City's annual budget program and development regulations will be used to accomplish this objective.

POLICIES:

- a. Maintain existing, and develop new, minor drainage systems for handling runoff from frequently occurring (2, 5, and 10 year) storm events, consistent with the Future Land Use Element.
- b. Maintain existing, and develop new, drainage systems and regulated floodways for handling seldom occurring 25 and 50 year storm events.
- c. Ensure that all stormwater management and drainage facilities comply with existing City, state, and federal stormwater management ordinances and regulations.
- d. Ensure that all new detention facilities are designed to handle the minimum stormwater requirements described in the City's stormwater ordinance.
- e. Regulate land uses and require design of drainage systems and developments to reduce non-point pollution and protect the function of natural groundwater recharge areas and natural drainage features. The following actions shall be required to reduce non-point pollution:
 - i. Follow proper pesticide and fertilizer application practices.
 - ii. Use pervious materials to reduce the amount of impervious areas.
 - iii. Properly maintain motor vehicles to prevent accumulation of pollutants that eventually run off into surface waters and the groundwater.
 - iv. Stabilize sloping yards with appropriate vegetation to prevent erosion, and to filter runoff.
 - v. Prohibit direct discharge of stormwater into any surface water body. All discharges shall be filtered using natural or man-made vegetative buffers.

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- vi. Require contractors to use erosion control devices during development and road construction.
- vii. Ensure that developments do not contain excessive and unnecessary impervious areas, such as parking lots.
- f. Acquire property or easements to ensure continued proper maintenance of system wide drainage facilities located on privately owned lands.
- g. Deny approval of any developments that impact water resources, unless they conform with local or regional comprehensive water basin management plans and Rule 17-25, *Florida Administrative Code*.
- h. Continue implementing the New Smyrna Beach stormwater drainage management program, which addresses retrofitting and improvement of inadequate existing drainage systems throughout the City.
- i. Require property owners to maintain stormwater management systems in accordance with the City's stormwater management requirements.

OBJECTIVE:

- 2. To monitor and evaluate existing drainage facilities during the next planning increment to insure maximum use and efficiency.

POLICIES:

- a. Prepare a complete inventory of existing drainage facilities within each drainage basin in the New Smyrna Beach area.
- b. Develop a master plan for each drainage basin, along with an implementation schedule, during the next planning increment.
- c. Adopt interlocal agreements with other municipalities and governmental entities regarding development of master plans for drainage basins that extend across jurisdictional boundaries.

OBJECTIVE:

- 3. To implement improvements that: (1) correct existing facility deficiencies, (2) coordinate the extension of, or increase in, capacity of drainage facilities to meet future needs, and (3) maximize the use of existing drainage facilities, thus discouraging urban sprawl.

POLICIES:

- a. Implement the comprehensive stormwater facility analysis addressing those improvements needed to correct existing facility deficiencies, extensions, or increases in capacity in order to meet future needs. Implement the recommendations of the study by plan amendment.
- b. Update the utility stormwater service fee by October 1, 2008, based on the analysis of the stormwater facility study.
- c. Require all new development and redevelopment to meet the performance and design standards of the City Stormwater Management and Conservation Ordinance, unless specifically exempted or until such time as amended or replaced as a result of completion of Policy 3.a. above.
- d. Implement changes or modifications to the City's Stormwater Management and Conservation Ordinance by amendment to the *Comprehensive Plan*.
- e. Comply with the stormwater requirements of the St. Johns River Water Management District.
- f. Comply with the Surface Water Improvement and Management (SWIM) plan adopted

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by the SJRWMD and the National Estuary Program of the Environmental Protection Agency. The Swim Act requires water management districts to protect the ecological, aesthetic, recreational, and economic value of the State's water bodies, keeping in mind that water quality degradation is frequently caused by point and non-point source pollution, and that degraded water quality can cause both direct and indirect losses of aquatic habitat. Stormwater outfalls will be retrofitted to improve water quality of discharge into the Indian River. A study to determine the cost and engineering measures appropriate will be completed and an implementation schedule adopted prior to October 1, 1995.

- g. Prior to the issuance of development orders, require new site plans and/or subdivisions to provide the drainage infrastructure necessary to maintain the performance and design standards.

NATURAL GROUNDWATER AQUIFER RECHARGE GOAL:

To protect the function of secondary aquifer recharge areas within New Smyrna Beach. This goal will be met by initiating the objectives and policies stated herein, which will be more specifically defined in future *Comprehensive Plan* updates as local needs (and the City's ability to meet those needs) become better established.

OBJECTIVE:

1. To continue to implement City regulations and programs to protect the function of natural groundwater recharge areas.

POLICIES:

- a. Restrict yard watering especially during times of drought.
- b. Educate residents regarding proper yard fertilizing and care techniques.
- c. Regulate the amount of impervious surface allowed on a lot.
- d. Allow pervious materials to be used in parking lot and other surface covering construction.

SOLID WASTE GOAL:

To ensure that a safe, environmentally sound, and efficient solid waste collection and disposal system will be provided for New Smyrna Beach. This goal will be met by initiating the objectives and policies stated herein, which will be more specifically defined in future *Comprehensive Plan* updates as local needs (and the City's ability to meet those needs) become better established.

OBJECTIVE:

1. To ensure collection of solid waste on a regular basis and in a safe, efficient manner, and to insure that adequate transfer facilities are available for disposal of solid waste collected within the City.

POLICIES:

- a. Ensure that refuse/solid waste is collected regularly, and that collections occur no more than 7 days apart.
- b. Encourage safe disposal of hazardous waste by promoting "amnesty days" for collection of hazardous wastes by the county and other agencies.
- c. Use 4.9 pounds per capita per day as a general standard for service demand.
- d. Evaluate existing facilities and coordinate improvements to existing facilities, and to support new growth by implementing improvements outlined in the Capital Improvements Element.

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OBJECTIVE:

2. To coordinate extension of, or increase the capacity of, solid waste facilities to meet future needs in compliance with the Future Land Use Plan.

POLICIES:

- a. Monitor Volusia County landfill operations as they pertain to adequate existing and future capacity.
- b. Participate in the state of Florida's solid waste recycling program.
- c. Cooperate with Volusia County in developing a permit tracking system. This system shall provide information on development and building activity within New Smyrna Beach. This information will be used by Volusia County to determine whether an area wide level-of-service is being maintained for the purposes of waste management.
- d. Monitor Volusia County's future analysis to determine when the landfill will have to be expanded to meet future demands. Currently, only 400 of the 3,400 acres at the Tomoka Farms Road Landfill are being used
- e. Prior to the issuance of development orders, require new site plans and/or subdivisions to provide the solid waste facilities and services necessary to maintain the adopted level-of-service standards.

OBJECTIVE:

3. To continue to assist in reducing the amount of solid waste disposed of in the county landfill.

POLICIES:

- a. Continue to maintain and expand the recycling program citywide.
- b. Continue an ongoing public education program for recycling and proper solid waste management.