

5.0 SANITARY SEWER, SOLID WASTE, STORMWATER MANAGEMENT, POTABLE WATER, AND NATURAL GROUNDWATER AQUIFER RECHARGE ELEMENT

5.1 INTRODUCTION TO ELEMENT

The primary focus of this element is to (1) identify existing sanitary sewer, solid waste, stormwater management, potable water and natural groundwater aquifer recharge protection systems currently in place in Hallandale Beach, (2) to provide methods for meeting existing and future needs; and (3) to identify general facilities that will be required for meeting the City's needs.

5.2 CITY OF HALLANDALE BEACH GOALS, OBJECTIVES, AND POLICIES

5.2.1 INTRODUCTION

The City's goals, objectives and policies were derived from an analysis of existing sanitary sewer, solid waste, stormwater management, potable water and natural groundwater aquifer recharge protection systems, in relation to future needs.

Goal 1: Public facilities shall be provided in a manner which protects investments in existing facilities and meets future needs in an economical fashion.

Objective 1.1: Public facilities and services that meet or exceed the levels of service adopted in this Plan shall be available concurrent with the impacts of development.

Policy 1.1.1: The following level of service standards are hereby adopted, and shall be used as the basis for determining the availability of facility capacity and the demand generated by a development:

Facility	Level of Service Standard
Sanitary Sewer	Average Sewage Generation Rate; 190 gallons per capita per day
Solid Waste Rate:	Average Solid Waste Generation; 5.65 4.75 pounds per capita per day
Stormwater Management - New Development:	Design Storm for onsite retention: 5 year frequency: 1 hour duration; 3.3 total inches

Existing Development:	To meet South Florida Building Code drainage standards.
Potable Water -	175 gallons per capita per day of finished water (Max. day)

Policy 1.1.2: All improvements for replacement, expansion or increase in capacity of facilities shall be compatible with the adopted level of service standards for the facilities.

Policy 1.1.3: The Departments of Public Works, and Development Services shall jointly develop procedures to update facility demand and capacity information as development orders or permits are issued.

Policy 1.1.4: The Departments of Public Works, and Development Services shall prepare summaries of capacity and demand information for each facility once every two years.

Objective 1.2: The City will maintain a five-year schedule of capital improvement needs for public facilities, to be updated annually in conformance with the review process for the Capital Improvement Element of this plan.

Policy 1.2.1: A Capital Improvement Program will be submitted annually to the City Commission with the operating budget.

Policy 1.2.2: Capital improvement projects will be identified and budgeted by the City Commission each fiscal year.

Goal 2: The City of Hallandale Beach will provide sanitary sewer, solid waste, stormwater management and potable water facilities and services to correct deficiencies and to meet existing and projected demands identified in this Plan.

Objective 2.1: Existing deficiencies will be corrected by undertaking the following projects by the year 2010:

- a. Installation of a relief force main in the SE area southeast section.
- b. ~~The sanitary sewer collection system will be rehabilitated to mitigate infiltration/inflow (I/I) in this area.~~ Installation of two (2) subaqueous water mains in the southeast section of the City.
- c. ~~Replacement/upgrade of Intracoastal force main crossing.~~ Implementation of commingled recycling system for residential and multi-family customers.

Policy 2.1.1: Projects shall be undertaken in accordance with the schedule provided in the Capital Improvements Element of this Plan.

Policy 2.1.2: Projects needed to correct existing deficiencies shall be given priority in the annual work programs of the City Departments.

Policy 2.1.3: Permits will not be issued for new developments which would result in an increase in demand that would exceed the ability of the City to provide the level of service adopted for the facility.

Objective 2.2: Project demands through the year 2048~~12~~ will be met by undertaking the following projects:

a. Sanitary Sewer Projects

1. Provide rehabilitation for two collection system lift stations per year.
2. Locate and eliminate major sources of I/I in sewer system to prevent increase over present unmetered sewer flow to Hollywood Regional Treatment Plant (R.T.P.)
3. Replace existing 16" Intracoastal force main crossing with new 24" force main.
4. Collaborate ~~ien~~ with other large users for use of existing wastewater treatment plant capacity.
5. Implement first phase of wastewater reuse program.

b. Solid Waste Projects

1. ~~Removal of vegetative waste from garbage waste disposal.~~ Enhance and expand City's recycling program through curbside service and commingled recycling.
2. ~~Replacement of manual garbage trucks with automated trucks.~~ Increase automation and versatility of sanitation fleet.

c. Stormwater Management Projects

1. Meet monitoring and removal of contaminants from surface water discharges to National Pollutant Discharge Elimination System (NPDES) Stormwater Permit requirements.
2. Evaluate major storm (hurricane) related drainage problems to ascertain needs to mitigate flood damages.
3. ~~Perform vegetative trimming and dredging in drainage canals.~~

4. ~~Install large diameter, Class 5, drainage wells in Eastern areas of the City subject to flash flooding.~~ Implement major drainage improvement projects in the northeast section of the City.

d. Potable Water Projects

1. Install major water distribution mains in Golden Isles area ~~and~~ and across the Intracoastal Waterway to improve pressure, increase capacity and improve looping.
2. Pursue new treated water interconnections with neighboring utilities, especially City of Hollywood.
3. Continue to upgrade distribution system by improved looping, adding fire hydrants, and upgrading water main sizes where appropriate.
4. Coordinate with the City of North Miami Beach for future purchase of potable water as may be required.
5. Begin implementation of projects required for City's 10-Year Water Supply Facilities Plan.

Policy 2.2.2: The City shall review the annual work program of the Public Works and Utilities Department to ensure that projects are scheduled to minimize disruption of services, duplication of effort, and to maintain the adopted levels of service for all facilities.

Policy 2.2.3: All required Federal and State permits shall be obtained before the City undertakes or authorizes contractors to undertake construction and/or operation maintenance of facilities listed in the capital improvements program schedule projects through 2010.

Objective 2.3: Project demands for the period 2008¹² through 2018²⁰ will be met by undertaking the following projects:

a. Sanitary Sewer Projects

1. Ongoing maintenance rehabilitation of sewer lines to reduce I/I.
2. Replacement of aging infrastructure as required.

b. Solid Waste Projects

1. ~~Removal of vegetative waste and recyclables from garbage waste stream.~~ Establishment of disposal agreement(s) for City garbage.

2. Continued implementation of enhanced recycling, including curbside service and commingled recycling

c. Stormwater Management Projects

1. Ongoing installation of drainage facilities to comply with adopted policies.
2. Implementation of major drainage improvement projects as required

d. Potable Water Projects

1. Establish interconnect(s) with neighboring jurisdictions.
2. Implementation of distribution improvements to accommodate growth.
3. Implementation of projects to meet future water supply needs, including possible utilization of reverse osmosis technology.
4. Replacement of aging infrastructure as required.

Policy 2.3.1: The summaries of facility capacity and demand information prepared by the Public Works and Development Services Departments shall be used to evaluate the scheduling of projects to extend or increase the capacity of existing facilities.

Policy 2.3.2: All projects required to meet projected demands for the years 2008–2018 shall be submitted to the City and considered for scheduling in the Capital Improvements Element of this plan.

Goal 3: Adequate stormwater drainage facilities will be provided to afford reasonable protection from minor flooding and to prevent degradation of quality of receiving waters in conformance with the requirements of the NPDES Stormwater permit.

Objective 3.1: The City shall maintain or improve its existing drainage facilities and shall require installation of new facilities at new development sites through the development approval process.

Policy 3.1.1: The City shall continue to enforce storm drainage requirements of hard surface parking areas and of existing City streets so that no nuisance will be caused to adjacent properties.

Policy 3.1.2: The City shall establish desired levels of service including impacts on natural resources for drainage facilities within the City and shall investigate

the sizes, capacities, and drainage basins of existing facilities in order to establish a present as-built "level of service" for each basin.

Policy 3.1.3: New development shall provide water storage capacity equal to that which existed under predevelopment conditions consistent with the water management regulations and plans of the South Florida Water Management District, and the Broward County Environmental Protection Department.

Goal 4: Quality potable water will be provided to meet existing and future needs of the City of Hallandale Beach during both normal and emergency situations.

Objective 4.1: The City will continue to provide sufficient quality treated water to serve present and future citizen needs.

Policy 4.1.1: City shall adopt the 10-Year Water Supply Facilities Work Plan to increase the coordination between land use and water supply planning within 18 months of the adoption of the regional water supply plan, as required by the Chapter 163, Florida Statutes. (See Exhibit 5-1)

Policy 4.1.2: Planning for additional capacity and/or a reduction in per capita demand shall be included in the 10-Year Water Supply Facilities Work Plan as required in Chapter 163 of Florida Statutes to increase the coordination of local land use and future water supply planning.

Policy 4.1.3: City will evaluate all requirements of the Safe Drinking Water Act (SDWA) and State of Florida standards to assure that the quality of treated water meets all standards.

Policy 4.1.4: City will provide the necessary capital funds to upgrade the water plant to meet all needs.

Objective 4.2: City will work towards a water system that meets its needs under emergency situations.

Policy 4.2.1: The City will secure any needed water main interconnections with neighboring utilities to provide emergency service.

Policy 4.2.2: City will continue to improve looping and upgrading of water distribution system.

Objective 4.3: City of Hallandale Beach will follow a course of action which assures a long-term water supply for the present and future development of the City.

Policy 4.3.1: Maintain a long-term agreement with Broward County for long-term water supply and develop a reverse osmosis facility to provide raw water supply, if needed.

Policy 4.3.2: The City will negotiate with the City of Hollywood to procure interconnects as a backup system to the current system.

Policy 4.3.3: The City will study the possibility of the cost effective use of sewage effluent wastewater reuse for City irrigation needs.

Policy 4.3.4: The City shall establish landscaping guidelines which require planting materials which are low water users.

Policy 4.3.5: The City shall study the viability of using grey water on public areas, golf courses, race tracks and other large irrigation areas.

Policy 4.3.6: The City will work in conjunction with the South Florida Water Management District to coordinate the monitoring of the saltwater front along the Southeast Broward County coast.

Policy 4.3.7: The City will develop and implement a program to curtail excess water use during excessively dry periods. In addition, the City will implement a plan to promote the use of water-efficient appliances and continue to coordinate efforts for water resource conservation with the SFWMD.

Policy 4.3.8: The City will work with private parties, SFWMD, FDEP, City of Hollywood, and Broward County in evaluating and implementing a wastewater reuse program within Hallandale Beach.

Goal 5: The City shall enforce preservation of existing pervious areas and conversion of unnecessary impervious areas to pervious areas to increase groundwater aquifer recharge.

Objective 5.1: The City shall continue to encourage aquifer recharge opportunities through enforcement of minimum pervious area requirements of the Hallandale Beach Zoning and Land Development Code at time of development review.

Policy 5.1.1: At time of development review, the City shall require on-site, stormwater detention such that past development runoff rates and quantities do not change from predevelopment values. Detention methods will provide a direct means of aquifer recharge. All aspects of stormwater management will include the use of Best Management Practices (BMP's).

5.3 INVENTORY

The primary focus of this section is to (1) identify existing sanitary sewer, solid waste, stormwater management, potable water and natural groundwater aquifer recharge protection systems currently in place in Hallandale Beach, (2) to provide methods for meeting existing and future needs over the next 10 years; and (3) to identify general facilities that will be required for meeting the City's needs over the next 10 years.

Since 1997, the City has had much success in modernizing public works technology, which has resulted in the ability to better analyze the City's infrastructure and improve the service delivery system. In addition, the City has made significant improvements in the various infrastructure systems during the planning period. A great deal of the original infrastructure was designed and built many years ago under different growth projections and prior to more modern designs, environmental programs and products being available. The City has spent a great deal of time re-designing older system components and retrofitting / rebuilding infrastructure.

5.3.1 Sanitary Sewer System

5.3.1.1 Background

Terms and Concepts

Regional Facilities. Regional facilities are large scale sanitary sewer systems which generally provide service to densely populated areas. These facilities are comprised of three components which perform the basic functions of collection, treatment and disposal of sewage. The City of Hollywood, Florida, acts as the regional agency under the Broward County 201 Wastewater Facilities Plan.

Collection System. The collection system within Hallandale Beach is composed of a network of sewer pipes which collect sewage from individual establishments and convey it to the regional system for treatment and disposal. The collection network is generally laid out in a pattern analogous to the branching pattern of a tree.

The major components of the collection network are the trunk gravity mains and gravity interceptors, force mains and pump stations. Interceptors are defined as gravity sewers which connect directly to and convey sewage to the regional treatment plant. Trunk gravity mains are defined as sewers which connect directly to and convey sewage by gravity flow to an interceptor.

Due to the relatively level terrain of Hallandale Beach, a pumping system is used internally and in conjunction with the major components of the regional collection system. This allows sewage to be conveyed under pressure within the City and

to the metering facilities of the Hollywood regional system. In conjunction with this type of system, the term "force main" is applied to the pressurized sewers without regard to their location within the network.

Treatment Facilities. The City of Hollywood operates the Regional Sewage Treatment Facility which functions to remove solid and organic materials from the sewage. The Hollywood facility is categorized as a secondary treatment facility.

Secondary treatment processes remove between 80 and 90 percent of total organic materials and suspended solids from sewage. This level of treatment generally requires multiple steps involving one biological process and one or more processes for removal of suspended solids.

Septic Tanks. Septic tank systems are usually used to serve isolated single housing units. Since the City is nearly fully served by sewers, septic tank use is being phased out, less than 10 units remain on septic systems. Only one unit remains in use which is the Three Islands Fire Station.

Broward County Environmental Protection Department and Broward County Health Department have regulatory authority and have established construction and operational standards which are met by the City of Hallandale Beach.

The City of Hallandale Beach has a "Large User Agreement" with the City of Hollywood as the Regional Agency. The Large User Agreement provides for certain standards of sewage quality and quantity pumped to Hollywood from Hallandale Beach.

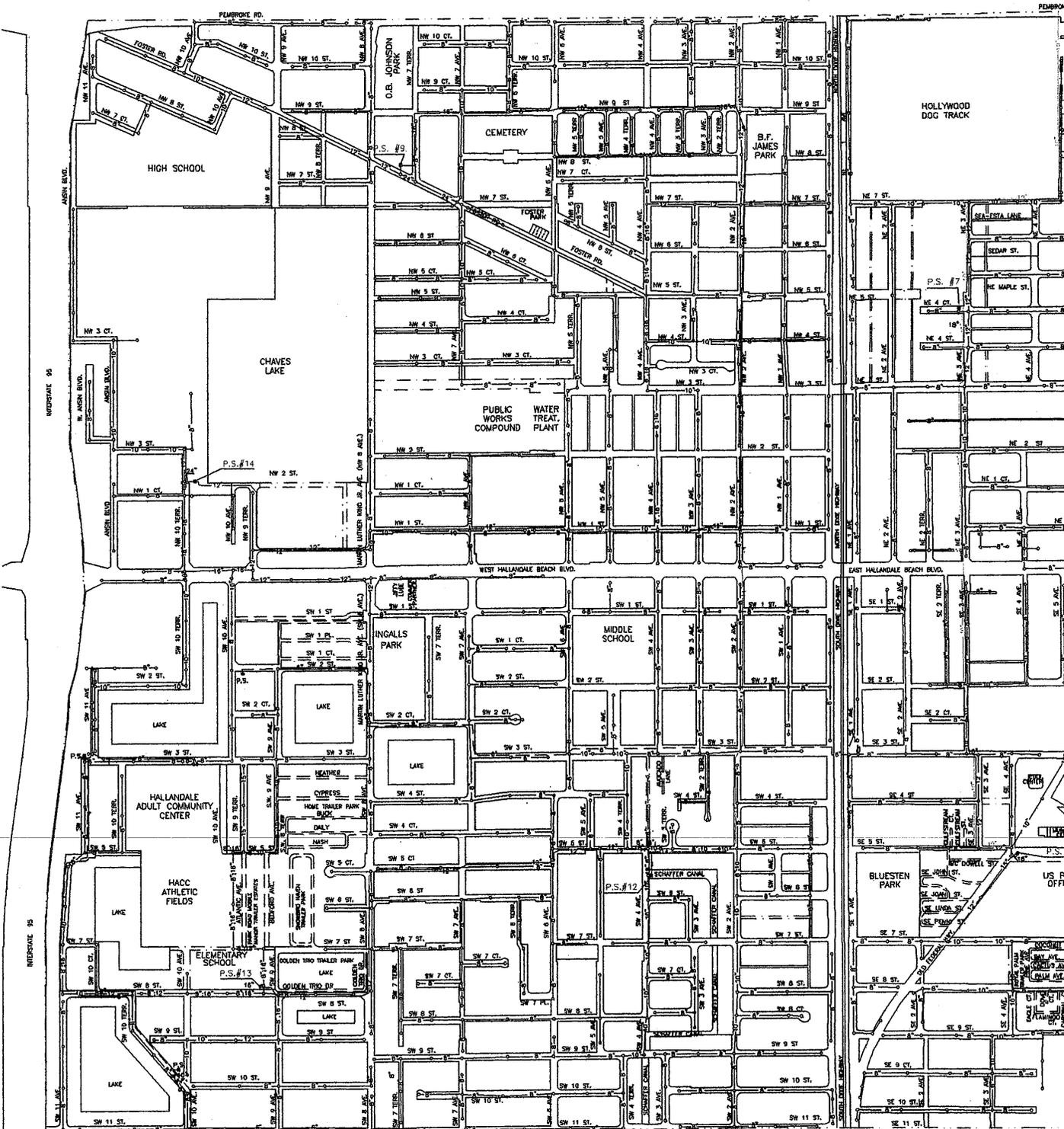
To ensure economic efficiency in the operation of its own sanitary sewer collection system, Hallandale Beach has adopted regulations which require establishments to connect to the sewer system when service is made available (Ordinance No. 79-32). The Public Works Department has also adopted design standards and review procedures to ensure that all connections to the system are compatible with system design.

5.3.1.2 System Description

Collection System. The sewage collection system was installed in phases between 1961 and 1988. Each phase functions as a separate entity with its own collection and pumping facilities.

Sanitary Sewer Improvement Project (SSI) No. 1 was started in 1961, with the establishment of a collection system in the area south of Moffett Street, north of Hallandale Beach Boulevard, west of De Soto Waterway and east of U.S. Highway 1. (See Figure 5-1).

CITY OF HALL SANITARY



PUMP STATION NUMBER..... P.S.#
GRAVITY SEWER

- 4" FORCE MAIN
- 6" FORCE MAIN
- 8" FORCE MAIN
- 10" FORCE MAIN
- 12" FORCE MAIN

NO.	DATE	REVISION	BY

Designed: MJM
 Drawn: DAM
 Checked: MJM

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The construction of SSI No. 2 was begun in 1964. This project provided a system in the area from the Atlantic Ocean, east of U.S. Highway 1, and south of Hallandale Beach Boulevard.

SSI No. 3 sewered the area east of Florida East Coast Railway, west of U.S. Highway 1, south of ~~Moffett Street~~ Pembroke Road, and north of Miami-Dade County line and was started in 1967.

The final SSI No. 4 provides a sewer collection system for the area of the City west of Dixie Highway. Due to the cost of constructing SSI No. 4, the City divided the work into phases. The last phase of SSI No. 4 was completed in early 1988 providing a sewer collection system for the entire City. ~~Hallandale Beach is currently seeking compliance with regulations which require homes and establishments to connect to the completed sewers.~~

The sanitary sewer collection system on Three Islands was constructed and paid for by the developers and accepted by the City to be included in the overall sewer collection system.

The current collection system consists of 72.61 miles of gravity sewer and force mains and 44 15 lift stations. ~~In order to recover initial engineering and construction costs of SSI No. 4 not paid for by government grants, property owners are assessed a Capital Contribution Charge of .020009 dollars per square foot of property upon connection to the sewer system.~~ Operation and maintenance of the collection system is funded solely through user fees.

The Treatment Facility is located on a 32 acre site in the central section of Hollywood. In addition to serving the cities of Hollywood and Hallandale Beach, the regional treatment facility also serves the cities of Dania Beach, Pembroke Park, eastern Pembroke Pines, eastern Miramar, as well as portions of unincorporated Broward County. The total service area is currently 139,802 acres.

The design capacity of the Hollywood plant is 48.75 mgd with a possible re-rate to 50 mgd. The plant rating and ability to meet needs is based on the average day during the peak month. In 2008 the 12-month average daily flow was 39.57 mgd. The City of Hallandale Beach has a reserved capacity of 7.85 mgd in the Hollywood Regional Facility as stipulated by the Large User Agreement.

Over the last ten years the City's average daily flow has ranged from a high of 7.3 mgd to a low of 5.9 mgd. Recent average daily flow is approximately 6.9 mgd.

System Problem Areas. ~~There are presently no problems with sewer system capacity or demands placed on the system.~~ The current collection system capacity is estimated to be 14.75 mgd, while the average daily flow is 6.9 mgd.

However, the Hallandale Beach collection system experiences significant infiltration / inflow (I/I). I/I is defined as extraneous flow that enters the sanitary sewer system during high groundwater conditions or inflow. Water may enter the system through pipe joints, sewer line defects, (including main sewer lines and building sewer laterals), manhole walls, benches and pipe seals that are defective, and pump station wetwell walls. Hallandale Beach has year round relatively high groundwater. Much of the gravity collection system is always below the water table.

Hallandale Beach has been actively working to reduce the I/I since 1980. The City received a Federal Grant and did repair a portion of the system in 1980. The City also purchased a televising and sealing vehicle in 1982 which has been used extensively to address the I/I problem.

Several consultants field investigative surveys and resultant rehabilitation projects, as well as the City's on-going in-house rehabilitation program, have been successful in reducing excessive I/I in selected areas. However, continued I/I problems cause higher flows not reflective of actual use. In addition, the City has rehabilitated, rebuilt and upgraded lift stations and pumping facilities to meet demand. Per capita flows appear to be higher than in 1997, primarily due to I/I. Shortcomings include the fact that the City is near the allowable capacity at the Hollywood Treatment Plant and additional capacity must be reserved.

5.3.1.3: Existing Populations, Flows and Levels of Service

Current Population. Table 5-1 presents population and housing estimates.

Existing Levels of Service. The existing per capita sewage flows were calculated by dividing the total system average daily flow by the total population of the Hallandale Beach service area. The existing average sewer service need for the City of Hallandale Beach is 190 gallons per capita per day. Based on the peak needs of the system, the peak hourly flow is estimated to be 0.72 mgd. The peaking factor of 2.5 is based on studies of flows in the South Florida area. The existing level of service is calculated by dividing the total system capacity by the total population of the service area. The total system capacity was taken to be the capacities of the lift stations which transport wastewater to the Hollywood Wastewater Treatment Plant. The existing capacity level for the Hallandale Beach facility is 389 gallons per capita per day.

**TABLE 5-1
POPULATION AND HOUSING ESTIMATES**

	2006	2010	2015	2020	2025
Population	34,622	39,406	43,996	48,493	52,149
Housing Units	25,176	26,825	28,025	29,229	30,169

Level of Service Required by Law and Desired Level of Service. The level of treatment service required by FDEP is determined by the method of effluent disposal utilized. Disposal by ocean outfall requires secondary treatment to levels below 30 mg/l BOD and 30 mg/l total suspended solids in the effluent. In addition, FDEP requires that the capacity of the treatment plant be greater than the service needs of the population being served. It is based on the average daily sewage flow during the peak months flow. In 2008 the Florida legislature passed a law that requires all ocean outfalls to be closed by the year 2025. This will require alternative methods to dispose of effluent including deep well injection and greater reuse efforts.

Since Hallandale Beach's sanitary sewer system does not include its own wastewater treatment plant, capacity is determined by the effluent limit stipulated in the Large User Agreement with Hollywood and capacities of the pump stations that transport Hallandale Beach's wastewater to Hollywood. This level of service is maintained by proceeding with the design of new facilities when flows reach 80 percent of respective capacities. The City of Hallandale Beach has reserved 7.85 mgd capacity in the Hollywood Wastewater Treatment Plant.

5.3.2 Solid Waste System

5.3.2.1 System Description

There are no public or private solid waste disposal facilities located in the City of Hallandale Beach.

The City of Hallandale Beach provides collection and then, via a contract, disposal service for most of the City's residents. In addition to the City provided services, there are 6 private companies that service private, commercial and multi-family accounts. The City collected approximately ~~18,437~~ 26,800 tons of solid waste garbage in ~~1994~~ 2007. The private companies collected approximately ~~11,135~~ 4,700 tons of garbage in ~~1994~~ 2007. In addition to garbage, approximately 3,500 tons of trash (primarily bulky waste) was collected in 2007.

The City has implemented a mandatory newspaper separation which impacts the waste tonnage by ~~2,000~~ approximately 600 tons per year. The Sanitation Division collects newspapers and sells them directly to a recycling company. An estimated ~~2,100~~ 650 tons of newspaper and office paper is diverted from the Reuter Recycling facility as a result of this program.

The City of Hallandale Beach has ~~moved towards~~ a fee (sanitation fee) supported system. The sanitation fees ~~have been added onto~~ are included in the water and sewer bill. This has produced a single City "Utility Service Bill". The Sanitation Fund is an enterprise fund and is financed entirely by user charges.

Rather than joining the Broward County Interlocal Agreement group, the City entered into a Solid Waste Disposal Agreement with Reuter Recycling of Florida, Inc. (more recently acquired by Waste Management, Inc.), to accept and process its solid waste. According to this contract, the City of Hallandale Beach generates 30,000 tons of solid waste per year. The Reuter facility will also serve the cities of Dania, Pembroke Pines, and Pompano Beach. These cities are required to deliver a "Minimum Guaranteed Tonnage" of 153,000 tons to the recycling facility under the provisions of the Solid Waste Disposal Agreement. The City of Hallandale Beach may franchise out a portion of its commercial and multi-family collection. This agreement will expire in 2011. If the City does not renew this contract, one result would be more flexibility in the operation of the Sanitation Division.

5.3.3 Stormwater Management

5.3.3.1 System Description

The City of Hallandale Beach's existing drainage system utilizes two separate primary types of systems to control stormwater runoff; positive drainage and a French drain filter bed drainage system. The positive drainage system consists of drainage lines that channel stormwater directly to nearby waterways, canals and lakes. This system is utilized extensively in the eastern sector of the City. The French drain filter bed system collects stormwater runoff and allows the water to drain slowly through perforated pipes or to dry wells where the water percolates into the soil. Figure 5-2 shows the current drainage system for the City of Hallandale Beach.

As the City is near the coast, many areas of the City, primarily in the eastern portion of the City, have older but adequate stormwater discharge features. Improvements were made in 1995-96 to install injection well systems in the northeast quadrant of the City. In the central and western areas, however, periodic flooding continues to occur. In the western areas, there are a number of lakes dug for fill when I-95 was built and as retention areas. However, the western areas of the City have low topographical elevations and I-95 acts as a dam. This area was one of a few in the county that did not have either an ocean

outfall system or injection well system. Frequent flooding was common in the western areas until about 2000 when a major storm flooded the area, which led FDOT to acknowledge that I-95 was built without sufficient drainage and its design contributes to problems for the adjoining lands. FDOT, together with the City of Hallandale Beach and the Town of Pembroke Park west of I-95, jointly participated to design, building and operation of a major pumping facility. FDOT utilized the railroad corridor adjacent to I-95 to construct a force main to pump stormwater from the pumping station in the Town of Pembroke Park between Hallandale Beach Boulevard and Pembroke Road to the existing outfall canal at Hollywood Boulevard.

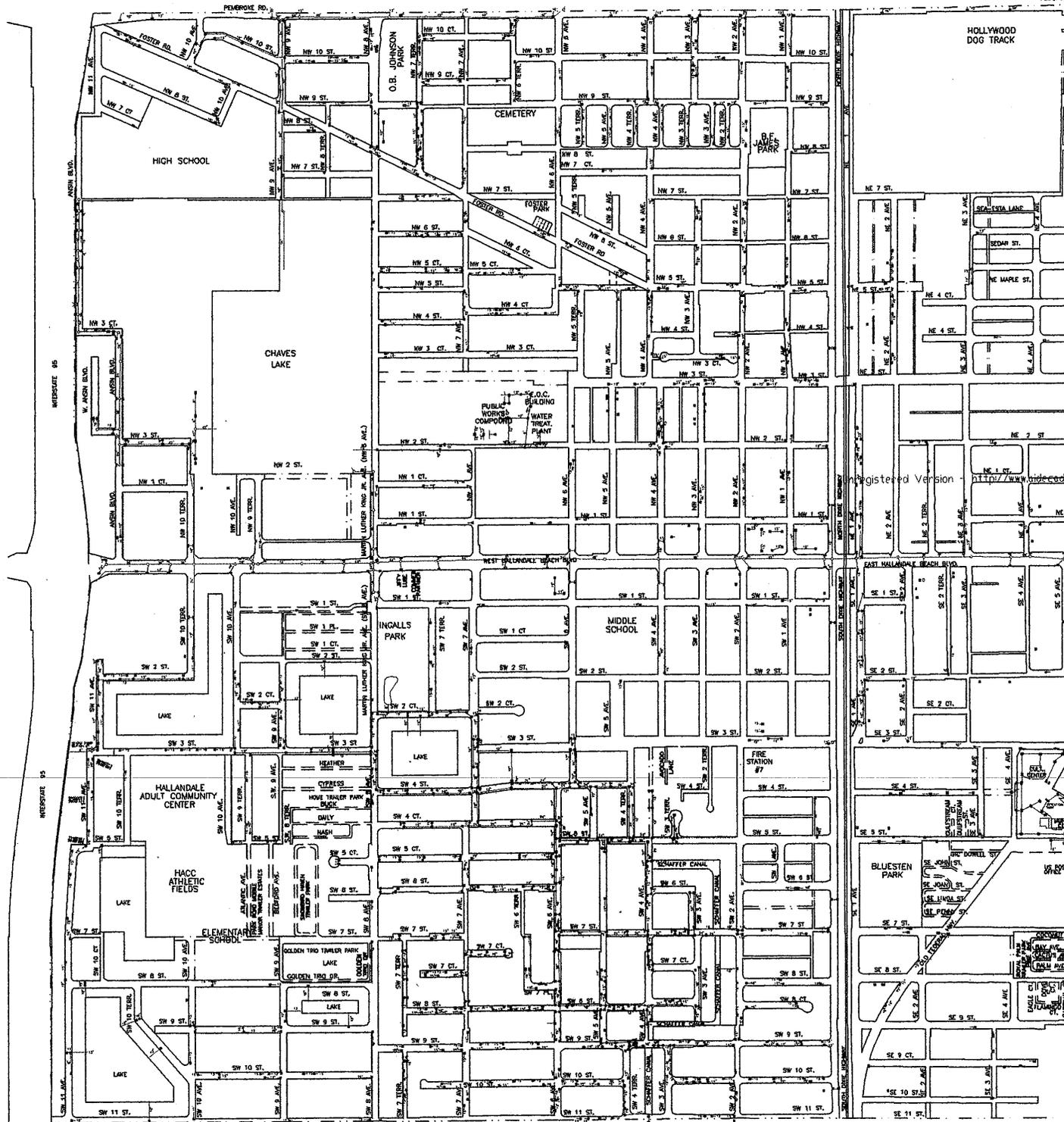
Much of the original system is undersized and inadequate for the volume of stormwater discharge needed and current water quality discharge requirements. SFWMD is pushing for deep well injection to store stormwater, rather than discharging directly to the Intracoastal Waterway and ocean. Increased pollution measures including NPDES permit regulations require pre-treatment prior to discharge.

Beginning in 1996, the City installed several drainage wells to further relieve flooding, particularly in the northeast quadrants of the City. Major drainage improvement projects have been implemented since that time to address areas of particular concern. These projects have proven successful in the northwest, southwest and southeast quadrants of the City. Several drainage improvements have been undertaken in the northeast quadrant and additional major improvements are being designed and budgeted for implementation in the near future.

In FY 95/96 the City has budgeted to construct 2 large diameter class 5 drainage wells in the NE quadrant of the City east of US 1 and north of Hallandale Beach Boulevard. These wells are the first in a proposed on-going program to install drainage wells in areas of the NE quadrant subject to flash flooding, east of US-1. Drainage wells are the only drainage improvement option feasible in this area due to its low ground elevation, already over-capacity positive drainage outfalls and unsuitable ground conditions for French drain type systems.



CITY OF HALL STORM WATER

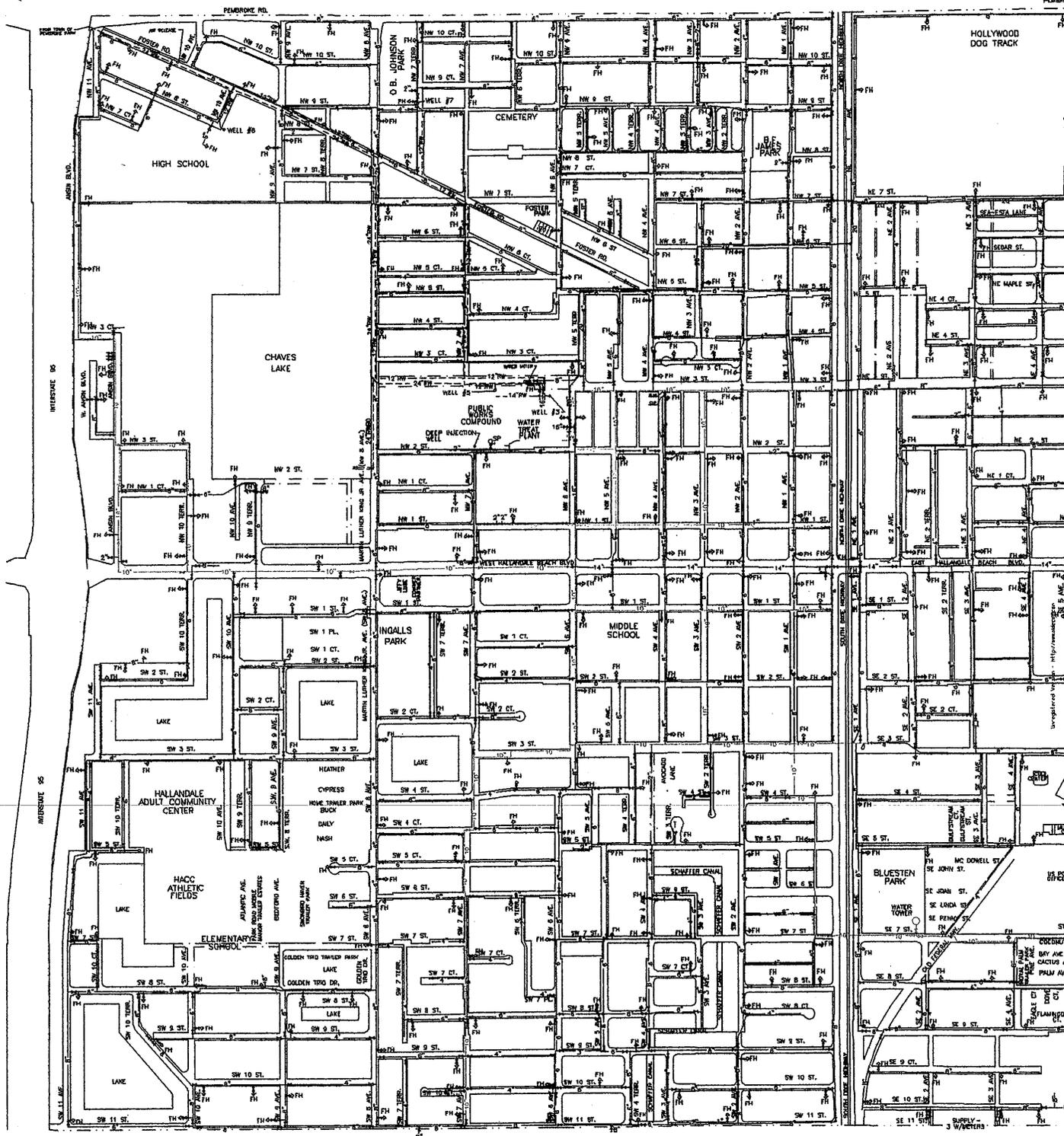


NO.	DATE	REVISION	BY

Designed: M.J.M.
 Drawn: D.A.M.
 Checked: M.J.M.

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CITY OF HALLOWELL WATER DISTRICT



FIRE HYDRANT ◊ FH
WATER VALVE ◊ DV

RAW WATER MAIN ———
1" - 6" WATER MAIN - - - - -
8" WATER MAIN ———

NO.	DATE	REVISION	BY

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5.3.4 Potable Water System

5.3.4.1 System Description

The City has four permitted water supply wells and a raw water supply connection from Broward County; a supplemental water supply; a water treatment plant; pumping facilities, elevated and ground storage facilities. The treatment plant utilizes two treatment technologies. The first treatment process utilizes the lime softening process with filtration and chlorination. The second utilizes nanofiltration membrane treatment. The distribution system consists of 76.2 miles of piping which provides service for the entire City. The types of land uses served by City facilities are shown on the existing Land Use Map, a copy of which is included with the Plan.

Water Resources. Hallandale Beach currently utilizes two City-owned wells (#7 and #8) as raw water resources (Two wells, #3 and #5, are reserved for emergency purposes). The South Florida Water Management District (SFWMD) has limited the withdrawal from these wells to 3.5 mgd. Four City wells were decommissioned permanently because of potential saltwater intrusion and local wellfield protection ordinances. Water resources, in addition to the City wells, were acquired to supply the City's total demand for potable water (approximately 5.27 mgd). The additional resources consist of an interconnect with North Miami Beach, for an emergency supply of bulk treated water, and linkage to Broward County's Southern Regional Wellfield for supply of untreated well water. The synthesis of these three resources enables the City to supply its full demand. In February 2008, the City added a membrane treatment plant which enables treatment of exclusively Broward County wellfield water. These modifications allow the plant to treat the City's full demand for water and meet drinking water standards. The City of North Miami Beach inter-connect will be maintained as an emergency supply; however, the City is negotiating with NMB to purchase a set amount of finished water on a permanent basis (no final agreements have been reached). Additional water supply projects will be implemented, such as water conservation programs and reuse water to ensure the City is fully capable of supplying water to future residents beyond a 10-year planning period. Although the City's projections indicate that it is not necessary to pursue additional alternative water supply projects, the City of Hallandale Beach is taking all precautions to ensure it will be able to provide potable water to its residents even under the most extreme circumstances.

Softening Units. Water softening at the Hallandale Beach Water Treatment Plant is currently handled by two units, each with a 5.0 mgd capacity. The first softener, an EIMCO softener, was installed in 1968. The second, an Infilco unit, was installed in 1982. The two treatment units are used to soften and clarify raw water, and operate in basically the same way to accomplish this objective.

Filters. There are a total of 10 filters split into two filter banks. The capacity of all 10 filters is 10.0 mgd.

Fluoridation (Fluosilic Acid). The existing system supplements the natural level of fluoride in the water. The two feed pumps are positive displacement and each pump delivers flow to the effluent of one of the treatment units. It is functioning properly at the present time and there is no requirement to modify the system.

High Service Pumps. There are six existing high service pumps, four of which are driven by electric motors and two by diesel engines. The individual pump capacities and drive method are:

RATED CAPACITY

Pump No.	gpm	mgd	Drive Type
1	3,000	4.3	Diesel
2	3,000	4.3	Electric
3	3,000	4.3	Electric
4	1,500	2.2	Electric
5	500	0.7	Electric
6	4,200	6.0	Diesel (auxiliary)
TOTAL	15,200	21.8	

If we consider the condition when the largest unit is out of service, then the capacity of the remaining five units is 15.8 million gallons per day. Under conditions of an electric power outage, the two diesel driven pumping units could supply a flow rate of 10.3 million gallons per day at rated capacity.

Backwash and Transfer Pumps. The three dual purpose pumps installed for backwash and transfer usage have the theoretical capability of transferring 10 to 12 mgd into storage with one pump out of service.

Ground Storage Facilities. The existing ground storage facilities consist of two 1.0 mg and one 2.0 mg prestressed (CROM type) concrete tanks. A transfer pump bypass around the storage reservoirs and directly to the high service pumps does exist and could be utilized during high flows or in case the reservoirs are out of service. During the bypass operation, the ground storage reservoir(s) will ride on the system and meet the storage function, but the flow will not pass through the reservoir(s).

Elevated Storage. The City has two small elevated storage tanks. One older 200,000 gallon tank near S.E. 7th Street and S.E. 2nd Avenue, and a newer 500,000 gallon tank on the beach at Hallandale Beach Boulevard. Each tank has an altitude valve to control its operation.

Sludge and Backwash Facilities. Calcium carbonate precipitate from the lime softening treatment units is gravity purged to a concrete sludge basin containing two submersible pumps. The pumps transfer the sludge to a City owned lake 1/4 mile west of the water plant. The lake has the capacity to receive approximately 150 years of Hallandale Beach generated carbonate sludge.

Water spent from filter backwashing is gravity fed to a concrete receiving basin. Approximately 85% of the backwash water is recovered the remainder is wasted to the sludge basin and pumped to the City-owned lake.

Distribution System. Over the years there have been occasional difficulties in the distribution system. The existing system has been improved to address previous problems. It consists of piping from 3/4" service lines up to 20-inch diameter mains. There are no consistently low pressure areas in the community during high use periods. Major capital improvements have been completed to remedy this problem. Figure 5-3 shows the distribution system for the City.

5.3.4.2 Existing Population, Flows and Levels of Service

Current Population. See Existing Conditions, Sanitary Sewer, Section 5.3.1.4, "Current Population".

Current Flow. Current flow is described as average daily flow (ADF). ADF is the average daily flow leaving the treatment plant. Table 5-2 shows the historical average daily flow for 2007. This value was dramatically reduced due to Phase III water restrictions imposed by the South Florida Water Management District. The ADF for this period was 5.38 mgd.

Existing Levels of Service. The existing demand was calculated by dividing the total system average daily flow by the total population of the Hallandale Beach service area. The existing average demand for the City of Hallandale Beach is 146 gallons per capita per day. Under maximum day conditions, the demand is estimated to be near 175 gpcd. The maximum day demand is calculated at 1.2 times the average day demand. The existing level of service is determined by the maximum gallons per capita per day demand. The existing capacity level is 279 gallons per capita per day. The City of Hallandale Beach presently delivers a minimum of 40 psi static pressure at the meter for each customer.

**Table 5-2
HALLANDALE BEACH WATER TREATMENT PLANT**

Month	ADF(mgd)
01/07	6.18
02/07	5.28
03/07	6.10
04/07	5.53
05/07	4.99
06/07	4.81
07/07	4.73
08/07	5.16
09/07	5.02
10/07	5.16
11/07	5.47
12/07	5.73

Yearly Average Daily Flow: 5.38

Level of Service Required by Law and Desired Level of Service. The current level of service required by law, based on static line pressure delivered, is 20 psi at any fire hydrant within the City's distribution system. In addition, the FDEP requires that the capacity of the treatment plant be greater than the demand of the population being served. In high growth areas, this level of service is maintained by initiating the design of a treatment plant expansion when the treatment plant is at 80 percent of its usable capacity. The treatment plant should be under construction when flows are at 90 percent of the plant capacity. Hallandale Beach currently meets all water capacity requirements.

It is the policy of the Hallandale Beach Department of Public Works and Utilities to maintain the current level of service of 40 psi and to provide for a minimum of 200 gallons per capita per day at the water treatment plant. It is also a policy of this utility to monitor the high quality of water that leaves the plant. The utility currently meets all primary and secondary effluent standards as required by the State of Florida Health Department.

In addition to the City's system, the Gulfstream Park Racetrack has a small reverse osmosis plant that produces water for irrigation purposes at the facility and the Diplomat Country Club golf course is irrigated with reuse water received from the City of Hollywood.

5.3.5 Natural Groundwater Aquifer Recharge

5.3.5.1 Background

Terms and Concepts

The City of Hallandale Beach, along with the majority of surrounding municipalities in Broward and Miami-Dade Counties, derives its potable water supply from the Biscayne Aquifer. There are no surface water supplies providing water directly to a treatment plant in Broward County and, therefore, 100 percent of potable water needs are met by utilizing local groundwater. The South Florida area is very fortunate to have access to the Biscayne Aquifer which is one of the most productive in the world. The Biscayne Aquifer is an unconfined aquifer with depths ranging from over 200 feet in eastern Broward County to less than 50 feet in the extreme western areas of the County. The high porosity and transmissivity of the aquifer are both beneficial and detrimental in that the aquifer is readily rechargeable, and at the same time easily penetrated by pollutants and saltwater intrusion from the ocean.

It is crucial that the this aquifer be protected from contamination because it is the area's only primary source of potable water. In addition to saltwater intrusion due to lowering of the water table, water quality is also threatened by chemical contamination from increased commercial and industrial development. In 1979, the EPA designated the Biscayne Aquifer to be a sole source water supply, thereby allowing more stringent regulation of the aquifer.

In February of 2007 the South Florida Water Management District (SFWMD) approved a Lower East Coast Water Supply Plan which identified current and future water supply needs. One of the key objectives of that plan is to maintain or reduce water withdrawal from the Biscayne Aquifer and require the use of water from the Floridan Aquifer, a deeper aquifer approximately 1,000 deep.

5.3.5.2 Regulatory Framework

Federal. In 1986, the Federal Safe Drinking Water Act (PL 93-523) was amended to strengthen protection of public water system wellfields and aquifers that are the sole source of drinking water for a community. The amendments for wellfield protection require states to work with local governments to map wellhead areas and develop land use controls that will provide long-term protection from contamination for these areas. The aquifer protection amendments require EPA to develop criteria for selecting critical aquifer protection areas. The program calls for state and local governments to map these areas and develop protection plans, subject to EPA review and approval. Once a plan is approved, EPA may enter into an agreement with the local government to implement the plan.

State. In implementing the Florida State Safe Drinking Water Act (Ch. 403, F.S.), FDEP has developed rules classifying aquifers and regulating their use (Chapter 17-22, Part III, F.A.C.). These rules are currently being amended to strengthen protection of sole source aquifers and wellfields tapping them. FDEP has also established regulatory requirements for facilities which discharge to groundwater (Section 17-4.245, F.A.C.) and which inject materials directly underground (Chapter 17-28, F.A.C.).

The task of identifying the nature and extent of groundwater resources available within the state has been delegated to the various regional water management districts. Each district must prepare and make available to local governments a Groundwater Basin Resource Availability Inventory (GWBRAI), which the local governments are to use to plan for future development in a manner which reflects the limits of available resources. The criteria for the inventories, and legislative intent for their use, are found in Chapter 373, Florida Statutes, which reads:

-- Each water management district shall develop a groundwater basin resource availability inventory covering those areas deemed appropriate by the governing board. This inventory shall include, but not be limited to, the following:

- 1) A hydrogeologic study to define the groundwater basin and its associated recharge areas.
- 2) Site specific areas in the basin deemed prone to contamination or overdraft resulting from current or projected development.
- 3) Prime groundwater recharge areas.
- 4) Criteria to establish minimum seasonal surface and groundwater levels.
- 5) Areas suitable for future water resource development within the groundwater basin.
- 6) Existing sources of wastewater discharge suitable for reuse as well as the feasibility of integrating coastal wellfields.
- 7) Potential quantities of water available for consumptive uses.

Upon completion, a copy of the groundwater basin availability inventory shall be submitted to each affected municipality, county, and regional planning agency. This inventory shall be reviewed by the affected municipalities, counties, and regional planning agencies for consistency with the local government comprehensive plan and shall be considered in future revision of such plan. It is the intent of the Legislature that future growth and development reflect the limitations of the available groundwater or other available water supplies.

The Florida Legislature has also directed local governments to include topographic maps of areas designated by the water management districts as prime recharge areas for the Floridan or Biscayne Aquifers in local comprehensive plans, and to give special consideration to these areas in zoning and land use decisions.

Local. On August 24, 1984, the Broward County Board of County Commissioners enacted Ordinance No. 84-60 which recognizes the importance of protecting existing and future public utility potable water supply from contamination. On the same date, the Board enacted Resolution No. 84-2025, the Wellfield Protection Ordinance (WPO), which established wellfield protection rules and regulations. On July 9, 1985, the Board adopted a resolution which provided administrative procedures for the determination of compensation eligibility and for the application for special exemptions.

At the present time, Hallandale Beach has no special regulatory programs related to protection of natural groundwater aquifer recharge areas. Since Hallandale Beach is almost fully developed, there are no designated natural groundwater recharge areas within the City limits.

5.3.5.3 Existing Recharge Areas

Percolation of rainfall into the aquifer is most important in recharging the groundwater. In spite of the relatively large amount of rainfall in the Broward County Area, only a small portion of that mean annual rainfall is readily available to use for potable water supply. The rainfall moves rapidly into the ground as infiltration, over land as surface runoff, and into the atmosphere through evaporation and transpiration. The urbanization of Broward County in recent years has resulted in large impervious areas, thus reducing recharge by rainfall. To help compensate for the loss of percolative areas, there is a regulation calling for retention of stormwater runoff. This requires a balance between,

- the need to recharge the aquifer by retaining as much rain as possible and,
- the necessity to control flooding. The retention of runoff during periods of low rainfalls is particularly vital.

During periods of inadequate rainfall, the Biscayne Aquifer is also replenished by a system of canals which divert water from Lake Okeechobee and the Conservation Areas to the County.

In Broward County, saltwater intrusion began early in the twentieth century when the first major drainage canals were excavated. These canals shifted groundwater discharge points inland and caused a lowering of piezometric head levels in the coastal portions of the Biscayne Aquifer. In addition, these canals allowed sea water to flow far inland during periods of low freshwater flows. The

inland extent of saltwater in drainage canals has been reduced in certain areas of the county by the construction of salinity control structures in the canals. They not only prevent the movement of sea water into inland areas, but also help to maintain the levels of piezometric head in their vicinity above mean sea level. Operation is based on maintaining a freshwater elevation at the dams sufficiently above mean sea level to keep saltwater from entering the Biscayne Aquifer. A primary function of the Everglades Conservation Areas is maintaining the required water elevation behind the salinity barriers. The salinity barriers on the SFWMD canals, however, are located inland to the point that they do not provide protection to Hallandale Beach from saltwater intrusion. As a result, the six water supply wells near the Hallandale Beach Water Treatment Plant have shut down (two are available for emergency standby use). The closure of these six wells is due to threatened saltwater intrusion. Assuming that conditions continue as present, the advancing saltwater front will eventually contaminate the two remaining water supply wells. Because of the water transmitted from the Broward County South Regional Wellfield, some of the water supply can be replenished. However, recent State legislature limits the quantity of water that the City can draw from this wellfield. The City is making contingency plans in the event that the remaining wells will be shut down due to saltwater intrusion.

In Broward County, the use of hazardous chemicals in the zones of influence of water supply wells is now regulated by the Broward County Wellfield Protection Ordinance.

The City of Hallandale Beach has made ground water recharge a priority. By Ordinance all new development is required to provide on-site drainage improvements sufficient that the stormwater developed by a storm up to 5 year intensity is retained on-site and recharged to the aquifer. The City also installed large diameter class 5 drainage wells in portions of NE Hallandale Beach, east of US-1, where flash flooding presently can occur. These improvements will benefit the fresh water recharge of the aquifer and may slow down the rate of saltwater intrusion in the area.

5.4 ANALYSIS OF EXISTING CONDITIONS

5.4.1 Sanitary Sewer

5.4.1.1 Projected Growth, Flows, and Levels of Service

Projected Flows. Flows were projected by multiplying the population projections by an average day per capita flow rate. This average day per capita flow rate was determined from the current flow rate and population within the Hallandale Beach collection system service area. The average per capita flow rate was determined to be 190 gallons per capita per day. Table 5-3 shows the projected flow rates for 2008, 2010, 2015, and 2018.

**TABLE 5-3
PROJECTED SANITARY SEWER FLOW RATES**

	2008	2010	2015	2018
Population	37,014	39,406	43,996	46,694
Flow Rate (mgd)	7.03	7.48	8.35	8.87

**TABLE 5-4
PROJECTED LEVELS OF SERVICE**

	2008	2010	2015	2018
Level of Service Provided (gpcd)	398	374	335	315

5.4.1.2. Projected Facility Deficiencies or Surpluses

The City of Hallandale Beach sanitary sewer and water force main system capacity is limited by capacities of the pump stations that transfer sewage flow to the Hollywood meters. The combined capacity of these pump stations is 14.75 mgd. The current system capacity will be more than sufficient to meet future needs as illustrated by Table 5-4.

The Hollywood Large User Agreement currently reserves an average day capacity of 7.85 mgd for the City of Hallandale Beach. As illustrated by Table 5-3, projected sewer flows will surpass the current large user capacity limit of 7.85 mgd in late 2012. The Large User Committee is currently formulating a methodology to provide additional capacity from a pooled reserve of unused plant capacity; this methodology would provide Hallandale Beach with an additional 1.02 mgd of capacity bringing ~~our~~ the City's capacity to 8.87 mgd. In addition, Hallandale Beach is aggressively working to reduce I/I flows which, once reduced, will lower ~~our~~ average daily flow by as much as 1 mgd. With the additional large user capacity of 1.02 mgd combined with I/I reductions of 1 mgd, Hallandale Beach will have more than enough capacity to meet the demands through 2018.

5.4.1.3. Expansion/Replacement Recommendations

Due to future capacity requirements, a new 20" force main has been installed from the SE 5th Avenue lift station under the FEC Railroad to SW 2nd Avenue. This improvement was completed in 2008. Another major capital improvement will be the installation of a new force main across the Intracoastal Waterway. This project is scheduled for 2009.

The City anticipates undertaking the following projects to meet the projected demands through the year 2018:

1. Provide rehabilitation for two collection system lift stations per year.
2. Locate and eliminate major sources of I/I in sewer system to prevent increase over present unmetered sewer flow to Hollywood Regional Treatment Plant (R.T.P.)
3. Replace existing 16" Intracoastal force main crossing with new 24" force main.
4. Collaboration with other large users for use of existing wastewater treatment plant capacity.

5.4.2. Solid Waste

5.4.2.1 Projected Demands

The projected volume of solid waste per capita is shown in Table 5-5, below, assuming per capita generation remains the same.

**TABLE 5-5
PROJECTED SOLID WASTE GENERATION RATES**

Year	Estimated Solid Waste Population				Pounds per Capita per Day*	
				(tons/year)		
1995	<u>2010</u>	<u>31,367</u>	<u>39,406</u>	<u>30,450</u>	<u>33,944</u>	<u>5.32</u> <u>4.72</u>
2000	<u>2015</u>	<u>32,313</u>	<u>43,996</u>	<u>30,400</u>	<u>37,818</u>	<u>5.15</u> <u>4.71</u>
2005	<u>2020</u>	<u>33,384</u>	<u>48,493</u>	<u>31,300</u>	<u>41,595</u>	<u>5.14</u> <u>4.70</u>
2010	<u>2025</u>	<u>34,427</u>	<u>52,149</u>	<u>32,200</u>	<u>44,636</u>	<u>5.12</u> <u>4.69</u>

5.4.2.2 Projected Deficiencies/Surpluses

The City of Hallandale Beach operates a one-acre residential trash transfer station for in-house trash transfer of primarily vegetative materials the collection of Class III residential waste and for the production of mulch. The transfer station

is licensed by Broward County Environmental Protection Department of Natural Resource Protection under the Broward County Natural Resource Protection Code. This expansion of trash services has created a mechanism to divert waste from landfill disposals. The operation of this facility enhances the efficiency and effectiveness of City operations. When the current contract with Waste Management expires in 2011, greater operational flexibility and efficiency is anticipated.

5.4.2.3. Expansion Recommendations

Plans are underway and funding has been budgeted to expand the city's recycling services in 2009 to include residential curbside recycling as well as condominium and commercial recycling. Unless the City deviates from their current mode of operation and takes over responsibility for collection of all solid wastes in the City, it would appear that the City's solid waste collection facilities will not need to be expanded; however, some revision to existing equipment or the addition of supplemental equipment will be necessary to implement a resource recovery/recycling program.

5.4.3 Drainage Facilities

The effectiveness of a drainage system is frequently measured by the extent to which it reduces damage and inconvenience from flooding. Except during periods of unusually high rainfall and/or hurricane conditions, the City's drainage facilities are adequate to prevent large-scale flooding and/or ponding of waters. There are still several small areas within the City, most notably in the northeast quadrant of the City, where localized ponding can and does occur. The City has developed a recommended approach for addressing these localized problems and is correcting them as they are brought to the City's attention.

Being a coastal community with a relatively low-lying, flat topography, the City would be subject to substantial flooding in the event of a hurricane, tropical storm, or very large rainfall storm. It may not be possible to completely prevent potential flooding from these types of events due to the low level of many roads and structures. A thorough evaluation of the situation has been undertaken to establish possible mechanisms to reduce the extent of flooding and damage.

5.4.3.1 Projected Demands

Aside from infrequent, unusual weather conditions such as hurricanes and/or abnormal rainfall, the City's drainage system is adequate to serve current and projected demands. To address specific localized ponding of rainwaters, the City has developed criteria for stormdrain construction. Essentially, the criteria for whether or not the City should install additional stormdrains is as follows:

1. Ponding water must be primarily the result of street drainage and not caused by run-off from private property.
2. Ponding must substantially occupy a travel lane of a City of Hallandale Beach maintained public street. A storm drain will not be installed by the City adjacent to any property that does not have a proper swale as prescribed by City Code.
3. Water at least 1-inch deep must remain 12 hours of daylight following the end of a rainfall event.
4. At locations where drainage swales can be installed without destroying landscaping or sod, they will be constructed in lieu of stormdrains. However, such swales should drain within 24 hours. Areas holding water for longer than 24 hours will be equipped with drains.

5.4.3.2 Projected Deficiencies/Surpluses

Areas of the NE, SE and SW quadrants of the City are subject to flash flooding conditions during intense rainfall storms. Minor deficiencies that are brought to the attention of the City are being corrected in accordance with the adopted guidelines. Monies continue to be budgeted to deal with these localized problems.

5.4.3.3 Expansion Recommendations

The City has constructed extensive drainage improvements in areas in the NW, SW and SE quadrants of the City which have greatly improved drainage and reduced flooding. Drainage improvements in the NE have begun, but additional improvements are required. Major drainage projects are being planned, designed and funded in this quadrant which are anticipated to greatly improve drainage and reduce flooding. The City has begun a proposed 5 year program to install large diameter class 5 drainage wells in eastern parts of the City which are subject to flash flooding and where class 5 drainage wells can be permitted due to salt water intrusion having already destroyed the fresh water aquifer. Also proposed, but not yet budgeted, are exfiltration trench type drainage improvements to improve flash flooding conditions in the Southwest and Southeast areas of the City.

5.4.4 Potable Water

5.4.4.1 Projected Growth, Flows and Levels of Service Projected Population

Projected Flows. The average day per capita flow rate was determined by dividing the current population into the average day flow within the Hallandale Beach distribution system. The average day capita flow rate was determined to

be 146 gallons per capita per day. The projected flow rates are shown in Table 5-6. Based on previous evaluations, the maximum day demand is calculated at 1.2 times the average day demand. This results in a demand of 175 gallons per day, well below the plant capacity.

Projected Capacity Level. The projected maximum capacity available is shown in Table 5-7. It is calculated by dividing the current water softening treatment facility capacity (10.00 mgd) by the projected populations. With the recent completion of the nanofiltration membrane treatment plant, the level of service for treatment capacity has vastly increased from 10.0 mgd to 16.0 mgd. However, the 10.0 mgd is used in light of the overriding limitation in water supply.

**TABLE 5-6
PROJECTED POTABLE WATER FLOW RATES**

	2010	2015	2020	2025
Population	39,406	43,996	48,493	52,149
Flow Rate (mgd)	5.8	6.4	7.1	7.6

**TABLE 5-7
PROJECTED MAXIMUM CAPACITY AVAILABLE**

	2010	2015	2020	2025
Gallons per Capita per Day (gpcd)	253	227	206	192

5.4.4.2 Water Supply/Wells

Water Treatment. With the completion of the membrane treatment plant in 2008, the present plant meets all presently adopted and anticipated standards for water treatment. ~~However, two events, the SDWA Amendments and a revised water supply source, will necessitate an evaluation of the plant treatment methods to assure that the SDWA requirements will be met by the plant.~~

As the City is located near the coast, continued groundwater withdrawal is causing some saltwater intrusion to occur. In the 1990's the City was forced to cease using 6 4 wells because of saltwater intrusion and well field protection ordinances. Because water consumption continues to increase as well as saltwater intrusion, some municipalities are outsourcing water production / treatment or converting to reverse osmosis plants by taking brackish ground

water and/or sea water to produce drinking water. This is anticipated to continue as demand is expected to increase. The State legislature for several years has set, but modified timeframes to plan for long-term water use. Although this has essentially occurred in the past when municipal water withdrawal permits are renewed by the South Florida Water Management District (SFWMD), a formal plan is now required. SFWMD has prepared its 10-year plan for the southeast basin area, which includes the City. All government agencies were required to prepare a municipal 10-year plan by August 15, 2008. The City has prepared and adopted a 10-year Water Supply Plan, as required (See Exhibit 5-1).

The greatest challenge currently facing the City's potable water utility is that of water supply. Recent legislation limits withdrawal of raw water from the Biscayne Aquifer. One of the options under consideration to meet future water supply entails withdrawal from the Floridan Aquifer and implementation of reverse osmosis technology.

Filters. The existing lime softening filters have been functioning satisfactorily and at rates less than 4 gpm/ft². There is a possibility that the filters could be operated at slightly higher rates of 4 to 5 gpm/ft² but the hydraulics and the turbidity would have to be closely monitored. The filters at 4 gpm/ft² have a rating of 10 mgd. With the largest filter out of service and a 24-hour-a-day operation on the other filters, a 10.4 mgd volume can be filtered. If all filters are operating at 4 gpm/ft², but for only 20 hours per day, 9.6 mgd will be produced. This will be easily sufficient to meet future demands, considering that no more than 3.5 mgd is anticipated.

High Service Pumps. The high service pumps that exist can meet the peak demands on the system and the plant. The pressure at the plant will drop 5 to 10 psi at such peak demand periods. With a 5 to 10 psi drop in plant pressure, the high service pumps will pump over 18 mgd with the largest pump (#6) out of service. If the largest pump (#6) is in service and one of the other large pumps is out of service (#3, #4 or #5) the pumping capability will be 21 mgd.

In the distant past the maximum hourly flow has peaked at 2.1 times average of peak days flow (1972). In 1990's this peaking factor has been normally in the 1.4 to 1.8 range. With the fact that peaking factors generally diminish as the system size increases, it is felt that the high service capability should be sufficient to meet future needs. A peaking factor of 1.35 is sufficient for future calculations.

An item of concern is that the connections to the distribution system are concentrated in one location at the front of the plant. Consideration should be given to improving the piping system and valving from the high service pumps to the 24-inch main located in N.W. 6th Avenue at the southeast corner of the plant. A second connection would improve the long range reliability.

Backwash and Transfer Pumps. The backwash and transfer pumps installed have sufficient capacity to meet the rated lime softening plant capacity of 10.0 mgd. With the last storage tank addition, the transfer head loss was reduced such that these pumps could probably transfer in the range of 12 mgd; more than sufficient to handle the future plant needs.

Storage Reservoirs. The City has 4.0 mg of ground storage and 0.7 mg of elevated storage. This is about normal storage capacity for this area of the Country. While generally more storage is preferable, the City has the major Federal Highway interconnect with North Miami Beach, another small interconnect with North Miami Beach, and a small interconnect with the City of Hollywood. With these storage reservoirs and emergency interconnects, Hallandale Beach should have adequate backup to meet most circumstances. Furthermore, the City is negotiating with the City of Hollywood to construct additional interconnects.

Distribution System. Hallandale Beach has implemented several Capital Improvement Projects in order to update its potable water system. The City has been aggressively planning and constructing larger pumps and lines to serve the growing areas of the community. A new 16" water main is planned to extend from the mainland under the Intracoastal Waterway to the beach area near Hallandale Beach Boulevard and another further south to loop the system in the future to provide more and better pressure for the high-rise development on the barrier island. Also, improvements have been made to serve the Gulfstream Park expanded facility, including a new 16" water main extension under US 1 from the west to east side of the roadway and extending along the county line and connecting on SE 14th Avenue. There are still several areas where additional looping of mains, upsizing, or closing of gaps would improve the overall system. Future water main projects include:

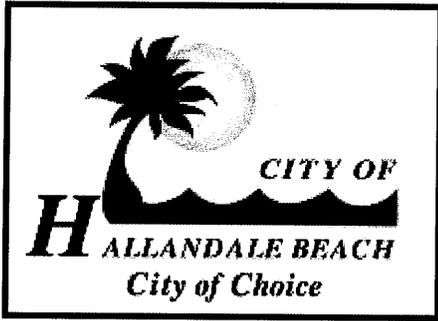
- A 12" 16" water main across the Intracoastal Waterway
- A 12" 16" water main looping Golden Isles Drive to Oleander Drive.

5.4.5 Natural Groundwater Recharge

5.4.5.1 Needs Assessment

The City realizes the importance of groundwater aquifer recharge and has required all new development to provide on-site drainage facilities to retain on-site and direct to the aquifer the stormwater run-off which would be developed by a storm up to 5 year frequency magnitude. Installation of exfiltration type drainage systems throughout Hallandale Beach has resulted in a combined mitigation of flooding and enhancement of aquifer supply. Additional utilization of this method is proposed for future projects.

Add Exhibit 5-1 (10-Year Water Supply Plan)



CITY OF HALLANDALE BEACH

2008 WATER SUPPLY FACILITIES WORK PLAN

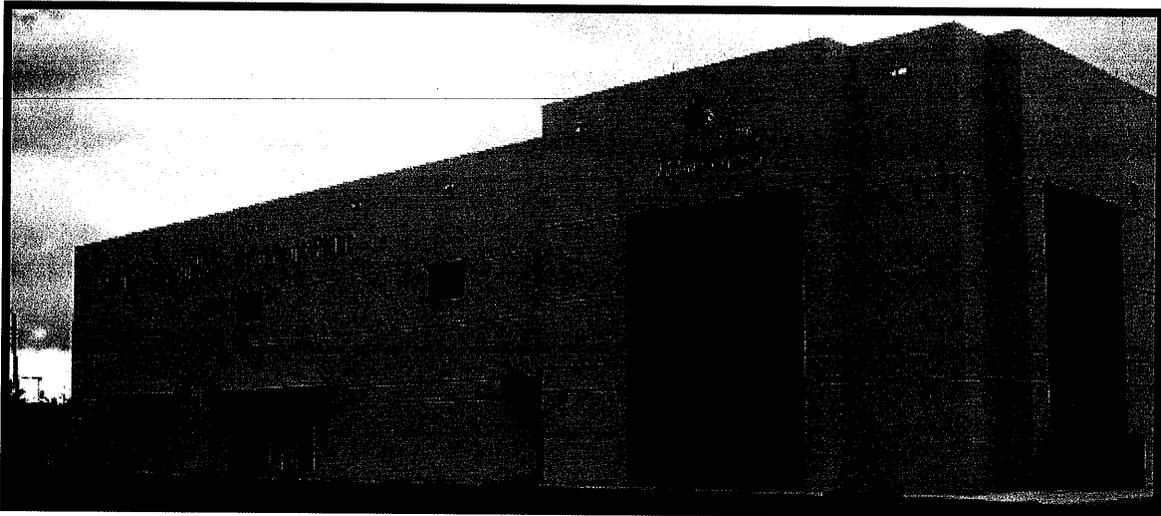


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STATUTORY REQUIREMENTS

The City of Hallandale Beach (City) is subject to the jurisdiction of the South Florida Water Management District (SFWMD). The SFWMD is one of four Florida water management districts that have concluded traditional water supply sources will not be sufficient to meet the demands of the growing population and needs of the environment, agriculture and industry over the next two decades. As this view has gained more prominence in recent years, the Florida Legislature enacted bills in 2002, 2004, and 2005 to more directly address the state's water supply needs by requiring more coordination between local land use planning and water supply planning.

The focus of the initial legislation was to add requirements to Chapter 163, Florida Statutes (FS), for local governments to prepare 10-year water supply facilities work plans and to incorporate the work plans into their comprehensive plans. The legislative change emphasized the need for local comprehensive plans to consider the applicable regional water supply plans prepared by the water management districts. In the case of the SFWMD, the applicable plan is the Lower East Coast Water Supply Plan (LEC Plan), most recently updated in 2005-2006.

In 2005, the Florida Legislature changed Chapters 163 and 373, FS, to improve the coordination between water supply and land use planning. Senate Bills 360 and 444 were designed to strengthen the statutory linkage between the regional water supply plans prepared by the water management districts and comprehensive plans prepared by the local governments, with the goal of ensuring that adequate water supplies and public facilities are available to serve the water supply demands of Florida's growing population.

Local governments subject to a regional water supply plan must prepare a minimum 10-year work plan for building public, private, and regional water supply facilities to serve existing and new development within the local government's jurisdiction. This work plan must be adopted into the comprehensive plan within 18 months after the water management district approves a regional water supply plan or its update. The work plan and the comprehensive plan amendment must address the development of traditional and alternative water supplies (AWS), bulk sales agreements, and conservation and reuse programs that are necessary to serve existing and new development for at least a 10-year planning period.

In addition to the water supply plan requirements, the following amendments to the comprehensive plan must be made:

- Revise the Infrastructure Element within 18 months after the water management district approves an updated regional water supply plan to:

- Identify and incorporate the alternative water supply projects selected by the local government
 - Identify the traditional and alternative water supply projects, bulk sales agreements, and the conservation and reuse programs necessary to meet current and future water use demands within the local government's jurisdiction.
 - Include a water supply facilities work plan for at least a 10-year planning periods for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new development.
- Revise the 5-year schedule of capital improvements to include any water supply, reuse, and conservation projects and programs to be implemented during the 5-year period;
 - Revise the Conservation Element to ensure that projected water needs and sources are for at least a 10-year planning period, considering the appropriate regional water supply plan(s) or, in the absence of an approved regional water supply plan, the applicable district water management plan;
 - Revise the Intergovernmental Coordination Element to ensure coordination of the comprehensive plan with the applicable regional water supply plans and regional water supply authorities.

BACKGROUND

Overview

The City of Hallandale Beach was founded in 1897 and is one of the oldest communities in Broward County. The City is located at the southeast corner of Broward County and is characterized by its many medium and high-rise residential structures, primarily along the beach area and by the two pari-mutuel facilities (Gulfstream Park / Mardi Gras Gaming Center). The City is a full service community offering police service, fire/rescue protection, public works, water and sewer utilities, community development, code enforcement, and parks and recreation services.

The City is currently over 95% built-out, as is the case with most municipalities in Broward County. Development in the City has primarily consisted of high density residential and commercial buildings on the City's east side, while the west side of the City has remained relatively low density residential and commercial. However, there has been a development trend in the western portion of the City involving infill development of vacant single-family, multiple-family and commercial lots and the re-development of underutilized properties. The following is a breakdown of the of the land use areas in Hallandale Beach:

Table 1- Citywide Existing Land Use

FUTURE LAND USE MAP AREAS	2008	2008
	Acres	% of Total
Residential		
- Single Family	438.36	15.5%
- Two Family	133.44	4.7%
- Three & Four Family	37.85	1.3%
- Multi-Family	501.28	17.7%
- Mobile Homes	63.54	2.2%
SUBTOTAL	1,174.47	41.5%
Business and Commercial	274.37	9.7%
Local Activity Center	60.80	2.1%
Industrial	48.39	1.7%
Agricultural	0	0
Water	243.48	8.6%

FUTURE LAND USE MAP AREAS	2008	2008
	Acres	% of Total
Recreation	38.09	1.3%
- Public	291.80	10.3%
- Private		
SUBTOTAL	329.89	11.6%
Community Facilities		
- Public	103.70	3.7%
- Private	38.81	1.4%
- Historic	0.64	0.02%
SUBTOTAL	143.15	5.1%
Transportation		
- Streets	422.41	14.9%
- Railroad	17.87	0.6%
SUBTOTAL	440.28	15.5%
Vacant	116.0	4.1%
TOTAL	2,830.83	100.0%

Source: 2006 City of Hallandale Beach Evaluation and Appraisal Report

Relevant Regional Issues

As the state agency responsible for water supply in the Lower East Coast planning area, the South Florida Water Management District (SFWMD) plays a pivotal role in resource protection, through criteria used for Consumptive Use Permitting. As pressure increased on the Everglades ecosystem resource, the Governing Board initiated rule making to limit increased allocations dependent on the Everglades system. As a result, the Regional Water Availability Rule was adopted by the Governing Board on February 15, 2007 as part of the SFWMD's Consumptive Use Permit Program. This reduced reliance on the regional system for future water supply needs, mandates the development of alternative water supplies, and increases conservation and reuse.

DATA AND ANALYSIS

Population Projections

The City's existing and future population numbers are derived from data published by Broward County's Planning Services Division. The Broward County Population Forecasting Model (Model), developed by the Planning Services

Division (PSD), was approved by the State of Florida's Department of Community Affairs as part of the adoption of the Broward County Comprehensive Plan in 1989.

The Model provides details about Broward County's expected population. With the assistance of municipal partners in the Broward County Population Forecasting Roundtable, these projections are assigned to Broward County's 31 municipalities, 279 census tracts and 902 traffic analysis zones.

The Model uses the cohort-survival method to project future population and housing units, and is based on the concept that future population equals the present population plus natural increase and net migration. Natural increase equals the difference between the number of births and deaths each year. Net Migration equals the number of people moving into the County less those moving out each year. Net migration includes both domestic and international migration.

Output from this model is used by many County agencies, as well as the School Board of Broward County, the South Florida Water Management District, the Metropolitan Planning Organization, and the Broward Sheriff's Office. These agencies use projections to estimate the existing level of service demand and project facilities and programs to meet future service demand.

The model covers a thirty year forecast period beginning with the most recent census year (2000). An annual update of the model allows for calibration of the model in response to changing demographic trends between the census years.

According to the Broward County data, Hallandale Beach is projected to increase from 34,282 in 2000 to 37,014 in 2008. The population is expected to increase to 39,406 in 2010; 43,996 in 2015; 48,493 in 2020; and 52,149 in 2025. The City has very little vacant land available; therefore, the majority of the growth will be a result of redevelopment.

Maps of Current and Future Areas Served

The City of Hallandale Beach provides water to all areas within its City Limits with the exception of the Diplomat Golf Course, which is irrigated with reuse water from the City of Hollywood.

At this time, the City has no plans to provide raw or finished water to any other municipality or area outside of its jurisdiction. Figure 1 below depicts the water areas served.

Population and Potable Water Demand Projections by Each Local Government or Utility

According to Broward County projections, the population in Hallandale Beach will continue to rise over the next 20 years. Table 2 shows the projected populations through 2028 and the estimated raw and finished water demand for average day and maximum day.

Water Supply Provided by Local Government

The City of Hallandale Beach has two water treatment facilities. The original water plant was built in 1951 with a maximum capacity of 3 million gallons per day (mgd). In 1968, the facility was expanded to a 10 mgd capacity in anticipation of extensive development within the city.

In 2008, the City's new membrane treatment plant was put online and was designed with the capability of meeting the City's future water demand. The current capacity of the facility is 6.0 mgd; however, it is expandable to 15 mgd with the installation of additional skids (although there are no plans at this time).

The City is presently producing approximately 5.27 million gallons per day (mgd) of finished water through the nanofiltration and lime-softening process at its two water treatment facilities. The City can treat water from its existing wells through lime softening while the Broward County Regional Water Source (BCRWS) supply is treated through nanofiltration.

The current water supply source for the City of Hallandale Beach is the Biscayne Aquifer. The City's last Consumptive Use Permit (CUP # 06-00138-W) allocated 2.8 mgd of Biscayne Aquifer water to the City, through the Broward County Regional Water Supply (BCRWS) transmission system (Piccolo Wellfield). In 2007, the SFWMD allocated an increased allowance of 3.4 mgd for the City's recently constructed water treatment facility. In addition to the raw water received from Broward County, the City also draws 3.5 mgd of raw water from the City's three wells. The City has applied with the SFWMD for a renewal of the permit and is awaiting approval from the district. Hallandale Beach has had discussions with the SFWMD and anticipates its CUP will be renewed allocating the aforementioned 6.2 mgd from the County and 3.5 mgd from the City wells.

Table 3- Raw Water Withdrawal Amount

Current Raw Water Permitted Allocations	
Broward County (South Regional Wellfield)	2.8 mgd
<ul style="list-style-type: none"> • Additional allowance for new membrane treatment plant 	3.4 mgd
Hallandale Beach City Wells	3.5 mgd
Total	9.7 mgd

Historic Rates

The historical water usage rates were analyzed using data from 2002-2007. As the population steadily increased each year so did the finished water demand, with the exception of 2007, which was a water conservation year. In 2007, the City experienced a 10% decrease in finished water demand.

Table 4-Historic Water Consumption Rates

Water Consumption Rates from Recent Years							
Year	Population	Raw Water Demand			Finished Water Supplied by WTP) (mgd)	Finished Water Demand (includes purchases from North Miami Beach) (mgd)	Finished Water Demand (gpcd)
		mg/year	(mgd)	(gpcd)			
2002	34856	2125.451	5.82	167	5.73	5.80	164
2003	35109	2125.613	5.82	166	5.76	5.81	164
2004	35362	2126.491	5.83	165	5.86	5.98	166
2005	35616	2131.433	5.84	164	5.67	5.79	159
2006	34622	2134.834	5.85	169	5.90	6.04	171
2007	35818	2125.379	5.82	163	5.37	5.43	150

The water consumption rates continued to decline between 2007 and 2008 as the Phase III restrictions continued to be effective. From June 2007 through May 2008, the City averaged 146 gallons per capita per day (gpcd).

Table 5- Recent Water Consumption Rates

Date	Water Use	X MM	12-Month Avg	Gallons per capita per day (gpcd)
May-08	149,327,500	149.3	158.2	130
April-08	166,505,000	166.5	159.2	150
March-08	163,028,200	163.0	161.3	142
Feb-08	174,929,600	174.9	162.0	163
Jan-08	164,416,600	164.4	163.6	143
Dec-07	153,485,400	153.5	165.4	138

Date	Water Use	X MM	12-Month Avg	Gallons per capita per day (gpcd)
N-07	153,161,000	153.2	165.3	143
O-07	153,443,492	153.4	167.6	138
S-07	167,504,600	167.5	167.0	156
A-07	149,503,900	149.5	168.7	135
J-07	144,840,600	144.8	170.5	130
J-07	158,472,400	158.5	171.1	147

Source: Hallandale Beach Finance Department- Water Billing Rates

Water Supply Provided by Other Entities

Broward County Water Facilities and Services Areas

Broward County is located along the lower east coast Florida, between Miami-Dade and Palm Beach Counties. It is made up of 31 municipalities, 28 utilities, and 22 drainage districts. The County has experienced significant population growth since 2000, which is expected to continue. The County's population is projected to increase thirty-one percent between 2005 and 2030, from 1.75 to 2.29 million. The County contains more than 1,225 square miles, however, only the eastern third of the county is urbanized. The remaining two-thirds is wetlands and constitutes a large part of the Everglades Water Conservation Areas.

In 1986, Broward County adopted the Regional Raw Water Supply Program, which called for inland wellfields safe from salt water intrusion to ensure a continual supply of potable water for Broward County. Under the program, new wellfields were constructed in the west to shift demand from the east to west. The new wellfields and raw water delivery systems were financed, constructed, and operated as a regional system, using general County revenues. Large Users Agreements were established with each entity receiving water from the wellfields and, at present, one such agreement is in place for the North Regional Wellfield (NRW) and four agreements for the South Regional Wellfield (SRW).

North Regional Wellfield

The NRW is located at Quiet Waters Park in Deerfield Beach. The NRW is comprised of 10 wells, each with a capacity of 2 million gallons per day, providing a total design capacity for the wellfield of 20 mgd and a firm capacity of 18 mgd with the largest well unit out of service. The anticipated maximum monthly and average annual daily withdrawals are 259.4 mgm and 7.1 mgd, respectively.

The NRW supplies raw untreated water to the City of Deerfield Beach under a large user raw water agreement. Per this agreement, the County is obligated to provide the City of Deerfield Beach with a minimum of 0.50 mgd and a maximum of 0.59 mgd annual average daily flow, a peak daily flow of 0.83 mgd, and a peak hourly flow of 2.0 mgd. Approximately 12% of current raw water withdraws from the NRW is pumped into the City of Deerfield Beach. The term of the agreement is endless and will continue in perpetuity unless there is mutual agreement for termination.

South Regional Wellfield

The South Regional Wellfield is located in the southern central portion of the County. The majority of the wells are located in Brian Piccolo Park. The SRW includes ten wells. Eight 4mgd wells and two 2mgd wells are currently in operation, providing a total design capacity for the wellfield of approximately 36 mgd and a firm capacity of 32 mgd with the largest unit out of service.

The SFWMD consumptive use permit for the SRW is currently being renewed. Based on the historically derived "base condition use" the anticipated maximum monthly withdrawal from the Biscayne Aquifer allowed from the SRW is 386.1 mgm and the average annual daily withdrawal is 15.2 mgd.

The SRW provides raw water to the City of Dania Beach, the City of Hallandale Beach, the City of Hollywood, and the Florida Power and Light Corporation under large raw water user agreements. The contractual agreements with each of the large users of the SRW run for an indefinite period with the exception of the City of Hollywood where their agreement has a four year term with an automatic renewal for four years. Figure 2 describes the breakdown of the Large User's raw water allocations.

**Figure 2-South Regional Wellfield
Base Conditions Water Use and Large User Allocations**

	SRW	Hallandale Beach	Hollywood	Dania Beach	FPL
	MGD	MGD	MGD	MGD	MGD
Base Condition Water Use (Wellfield Withdrawal)	11.84	2.87	5.99	1.13	1.85
Adjustment to Base Condition Use*	3.4	3.4	NA	NA	NA
Adjusted **Total Wellfield Withdrawal	15.24	6.27	5.99	1.13	1.85

* The water availability rule provides for an increase to the base condition water use to account for the additional volume used in Hallandale Beach's conversion of it's water treatment process. (SFWMD BOR, Section 3.2.1.E.(3)(a), page WU-BOR-64, September 2007.)

** Includes line flushing & water losses between withdrawal point and User's meter.

NA - Not Applicable

Source: Broward County Water Supply Plan 2008

North Miami Beach Water Facilities and Service Areas

The City of North Miami Beach is located in Miami-Dade County, just south of Hallandale Beach. NMB has approximately 42,000 residents and is 5.2 square miles in size.

The City of North Miami Beach's water system is the second largest in Miami-Dade County, with infrastructure of water supply, treatment, storage, transmission, and distribution. The water system provides services to approximately 32,800 metered connections in North Miami Beach, Sunny Isles, Miami Gardens, Aventura and portion of Northwest Miami-Dade, serving approximately a population base of over 180,000.

The Norwood Water Treatment Plant Expansion Program expanded the existing water treatment plant from a treatment capacity of approximately 16-million gallons per day to approximately 32-million gallons per day. This additional capacity will be used to replace water currently supplied by the Miami-Dade Water and Sewer Department.

Initial capacity for the membrane treatment system was 15 MGD, which includes 9 mgd of nanofiltration (NF) and 6 mgd of low pressure reverse osmosis treated water. The system is expandable to 20 mgd, with additional NF train of 3 mgd and additional RO membrane for 2 mgd. The permeate flow streams of the

membrane processes is combined for post treatment/stabilization and subsequently blended with finished water from the existing lime softening process and the filtered raw water blend. The blended finished water is then transferred to a new 4.2 million gallons (MG) and existing 2.0 MG ground storage tanks before it is pumped out to the water distribution system.

The City of Hallandale Beach maintains an emergency interconnect with North Miami Beach (NMB). The City currently has an agreement with NMB to purchase bulk treated water during emergency conditions, which the City has recently utilized during preparations in opening the new water treatment plant. Below are the past purchases of bulk treated water:

- FY05/06: 15.450 million gallons
- FY06/07: 45.120 million gallons
- FY07/08(to date): 48.200 million gallons

Although Hallandale Beach is capable of providing an adequate supply of water to meet future water demands beyond the 10-year planning cycle, the City has been in discussions with the City of North Miami Beach regarding the possibility of entering into an agreement whereby the City would purchase a set amount of bulk treated water from NMB in the future, if necessary. At this time, no final agreements have been reached.

Hollywood Water Treatment Facilities and Service Areas

The City of Hollywood is located just north of Hallandale Beach. Hollywood covers approximately 29 square miles bound by the Atlantic Ocean to the east and surrounded by seven cities, one town, a Seminole reservation, and unincorporated areas. Except for Port Everglades, the City of Hollywood jurisdiction is supplied with finished water produced at the City of Hollywood Water Treatment Plant. Port Everglades is supplied by the City of Fort Lauderdale Public Works Department.

The Hollywood water treatment plant is operated by the City of Hollywood Department of Public Utilities. The Hollywood Water Treatment Plant supplies both a retail service area, extending over most of the City of Hollywood jurisdiction, and a wholesale service area, covering Broward County Water and Wastewater Services Districts (BCWWS) 3A, 3B, and 3C.

In 2007, the Hollywood water treatment plant produced approximately 23 million gallons per day (mgd) of potable water, of which 16.3 mgd were served to nearly 40,000 connections in the retail area and the remaining 6.7 mgd were sold to the wholesale service area. All three BCWWS districts are served under an interlocal resale water agreement by which Broward County purchases potable water from The Hollywood-DPU for resale to its customers.

The Hollywood-DPU has implemented a reuse system by making use of treated effluent from Cooper City and the Town of Davie. The Hollywood-DPU delivers up to 4 mgd of reuse water for irrigation with chloride levels of 600 mg/liter or less to be within the salt tolerance of local turf grasses and ornamentals. Such reuse water flow offsets an otherwise potable water use. The existing reuse system serves primarily golf courses, schools, private developments, parks, and other entities that have a relatively large irrigation demand. These customers, classified as contract customers, are the most cost effective to serve.

Table 6- Hollywood Reuse System

Existing Reuse System Customers		
<i>Site</i>	<i>Area (Acres)</i>	<i>Demand (mgd)</i>
Diplomat Country Club*	115.4	0.446
Eco Grande Golf Course	28.2	0.109
Emerald Hills Country Club	173.7	0.671
Hillcrest Country Club	150.6	0.582
Hollywood Country Club	55.1	0.213
Orangebrook Country Club	229.8	0.888
Dowdy Field	7	0.027
Subtotal	760	2.94
* Portions Located in Hallandale Beach		
** Source: 2007 City of Hollywood Reuse Feasibility Study		

Hollywood plans to expand their existing reuse system in phases and the City of Hallandale Beach has been in discussions with Hollywood to reach an agreement increasing the amount of reuse water it currently receives from the city. The following Table-7 defines the likely phased expansion of Hollywood's existing system. Figure 4 also illustrates the coverage of the future reuse water service area.

The City has been communicating with the City of Hollywood and is anticipating receiving approximately 800,000 mgd of reuse water, although no final agreements have yet been reached.

Table 7- Hollywood Reuse Expansion

Expanded Reuse System Customers	
Site	Demand (mgd)
<i>Existing System</i>	2.94
<i>Phase I Expansion</i>	
TY Park	0.272
Rotary Park	0.035
Public Works Nursery	0.005
West Lake Park	0.210
Three Island Park*	0.583
Subtotal	1.11
<i>Phase II Expansion</i>	
Residential Customers	3.7
West Lake Village	0.089
Subtotal	3.79
System Total	7.83
* Portions Located in Hallandale Beach	
** Source: 2007 Reuse Feasibility Study	

Figure 3-Hollywood Reuse Water Service Area

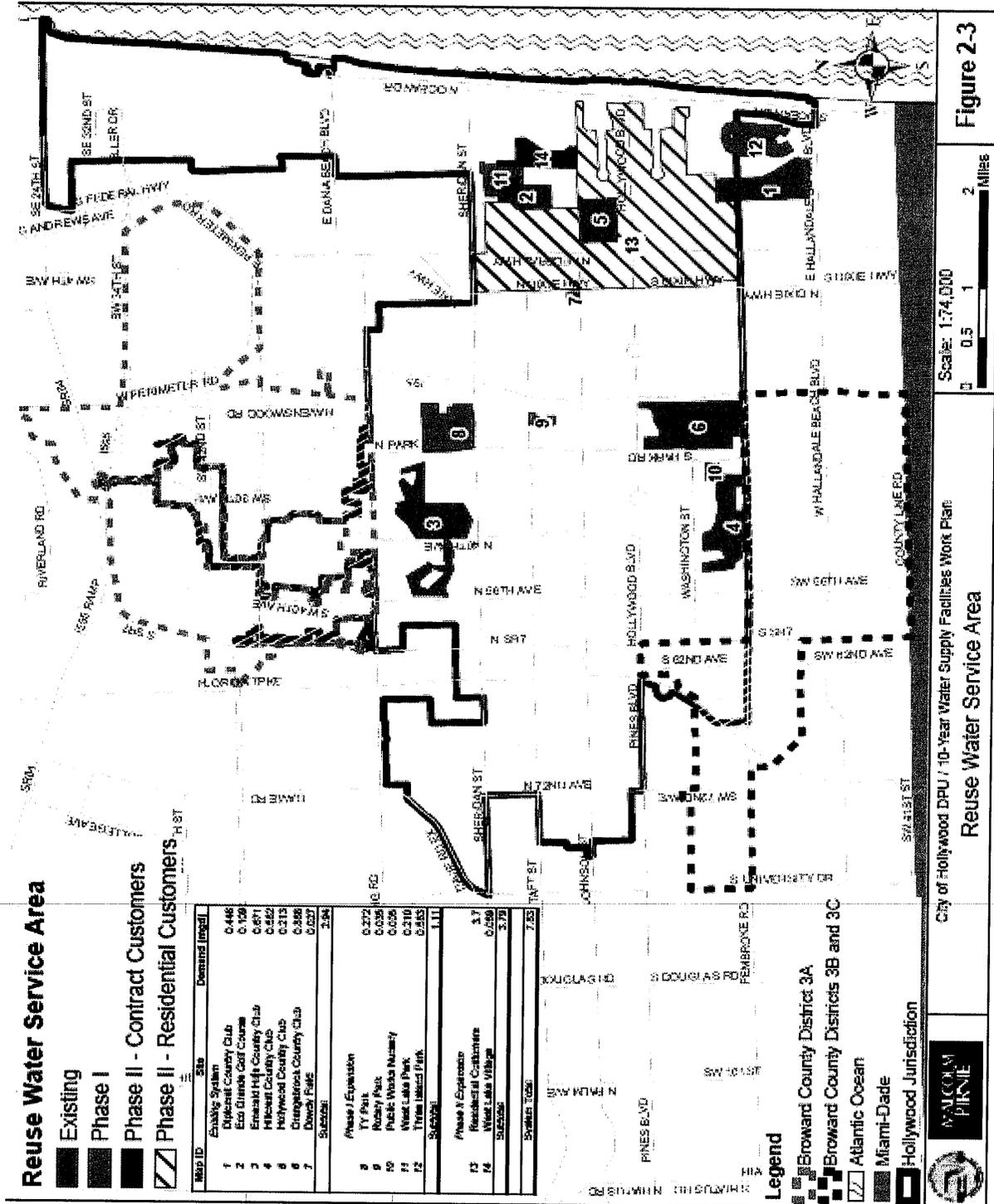


Figure 2-3

ALTERNATIVE WATER SUPPLY SOURCES

Since 2007, the South Florida Water Management District has been imposing Phase III water restrictions on Hallandale Beach. Under those restrictions, the City has experienced a tremendous reduction (13%) in its water consumption levels. According to the City's water billing records, the City had been consuming an average of 167 gallons per capita per day (gpcd). By May 2008, the City's gpcd had reached an average of 146 gallons per capita per day.

Based upon the City's current gallons per capita per day rate, the City will be capable of providing the raw water demand for future projections through 2020 on a maximum day demand (Figure 4) and beyond 2030 on an average day demand (Figure 6) without requiring the implementation of any additional alternative water supply (AWS) projects.

The City has determined that enhancing its water conservation efforts and implementing additional conservation programs will ensure that Hallandale Beach will have the necessary resources to provide water to current and future populations well beyond the required 10-year planning period.

Although it is not necessary at this time for Hallandale Beach to implement any additional AWS projects to meet current and future projections, City staff will continue to research alternative programs for the future.

Figure 4-Avg Day Raw Water Demand

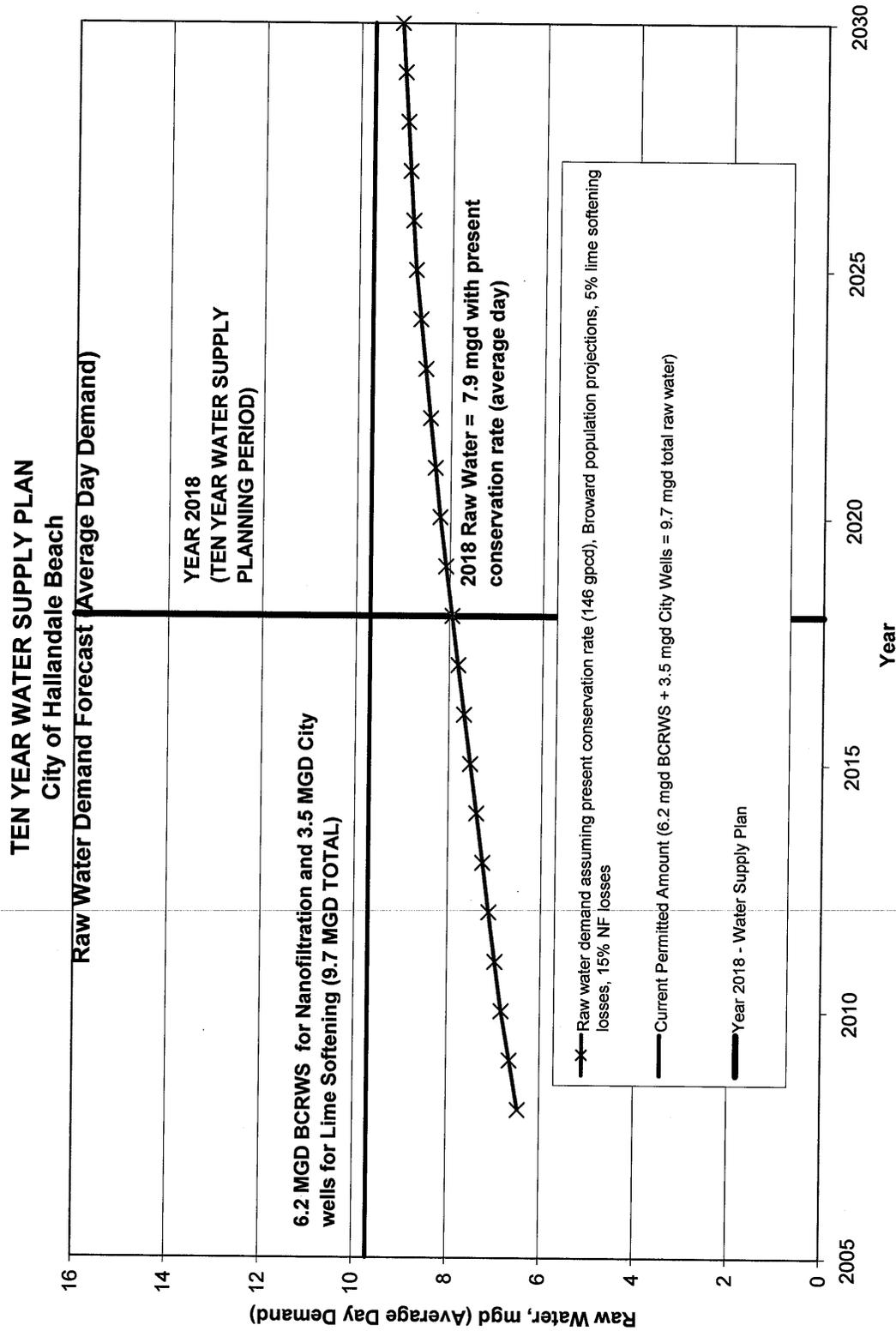


Figure 5- Avg Day Finished Water Demand

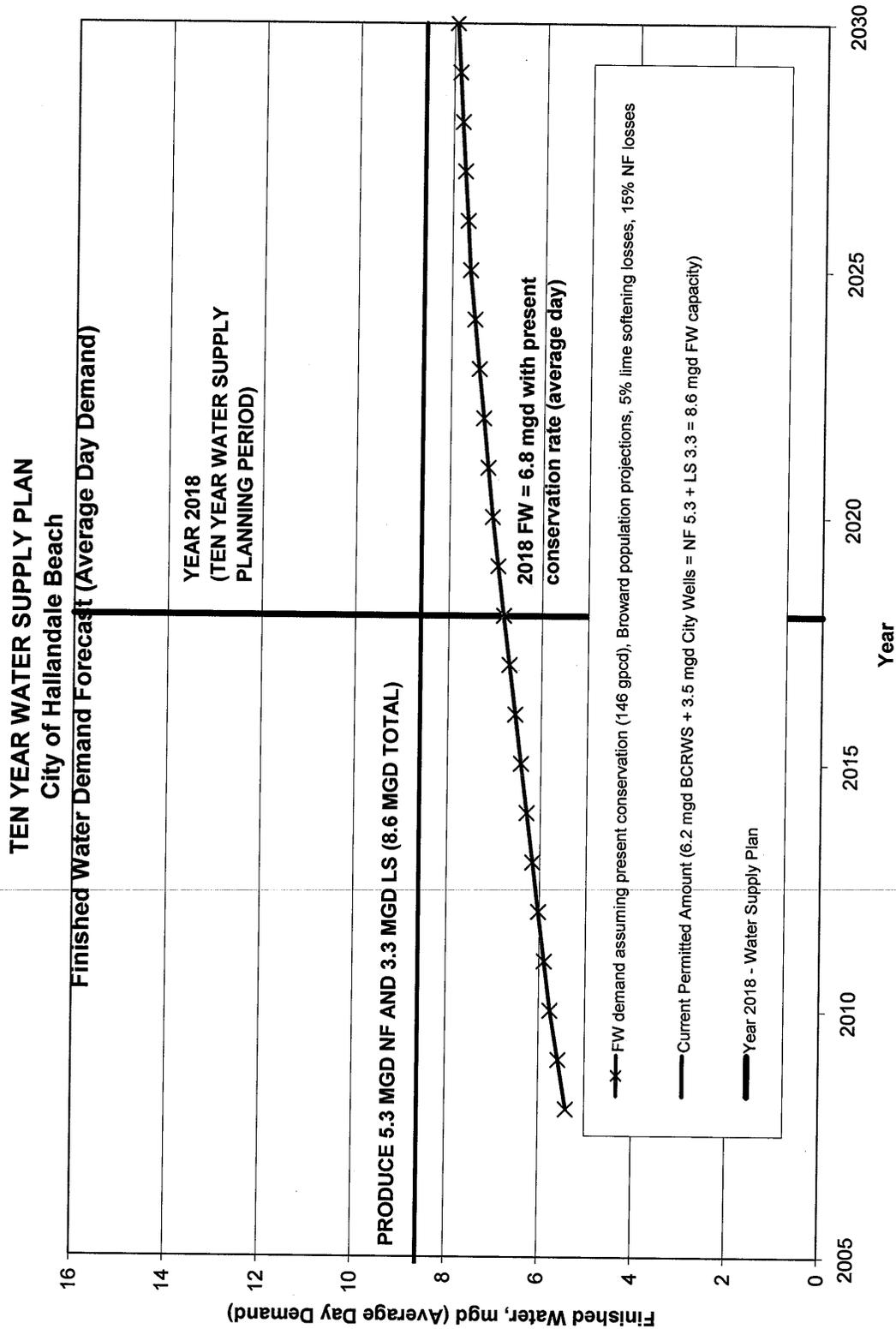


Figure 6- Max Day Raw Water Demand

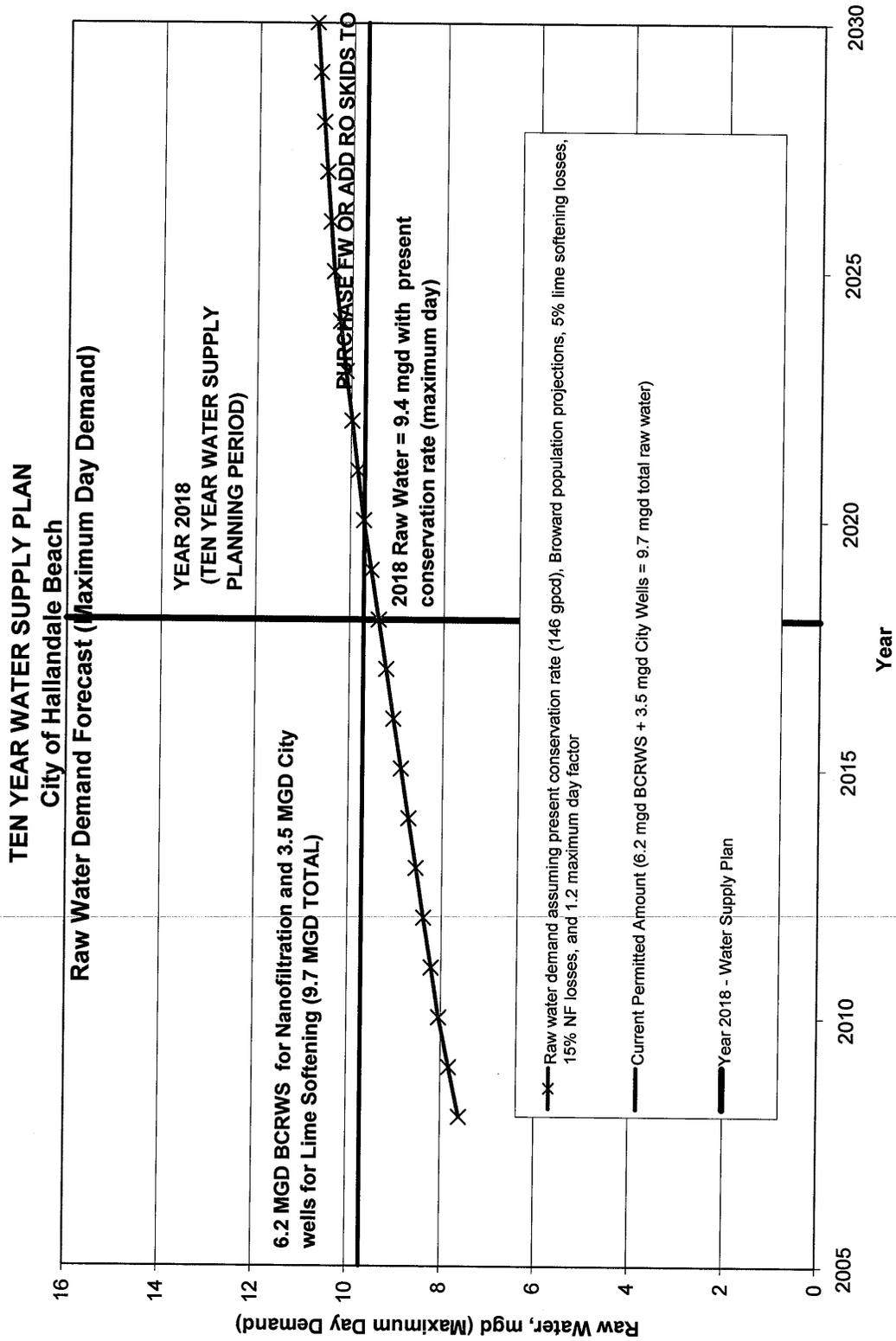
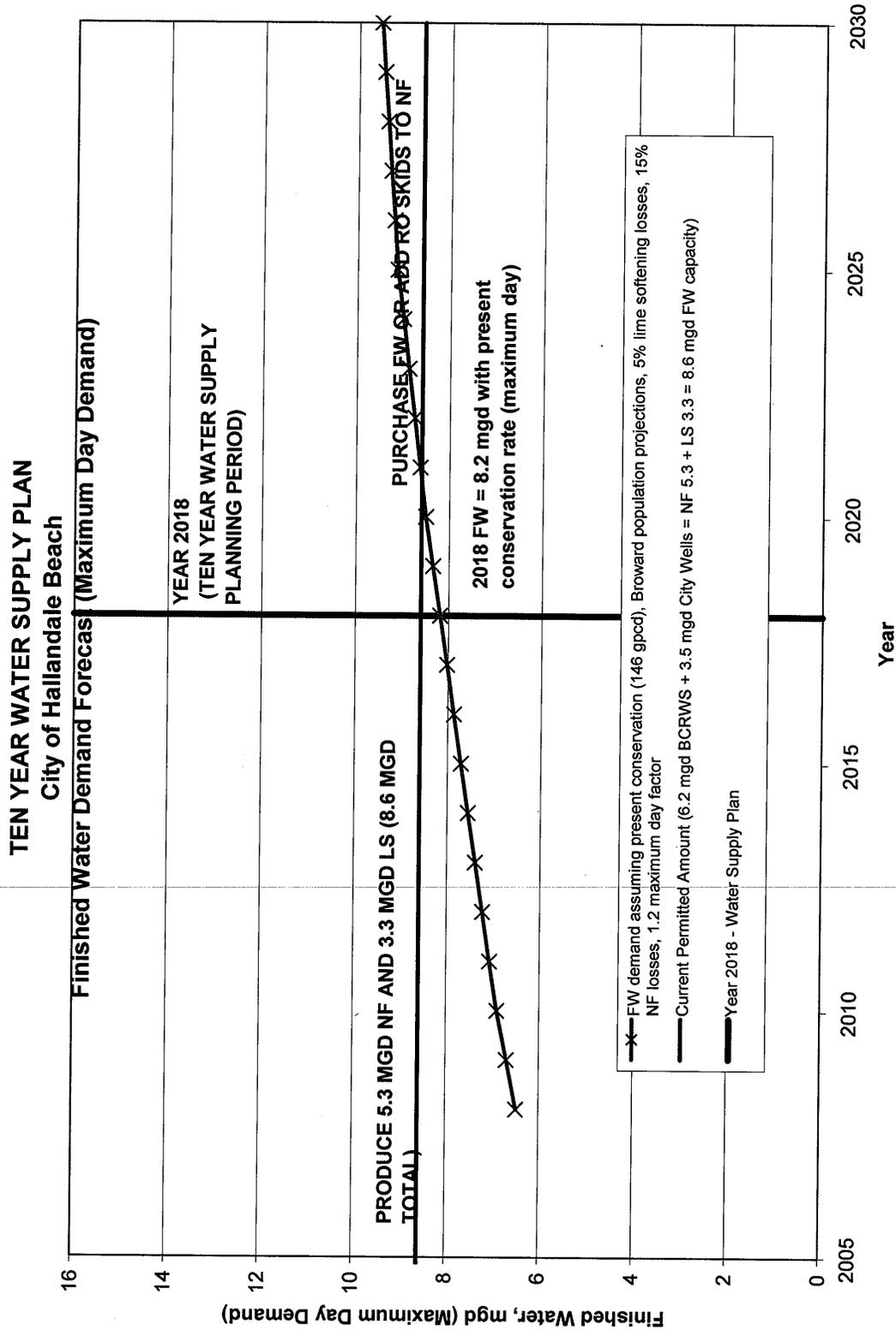


Figure 7-Max Day Finished Water Demand



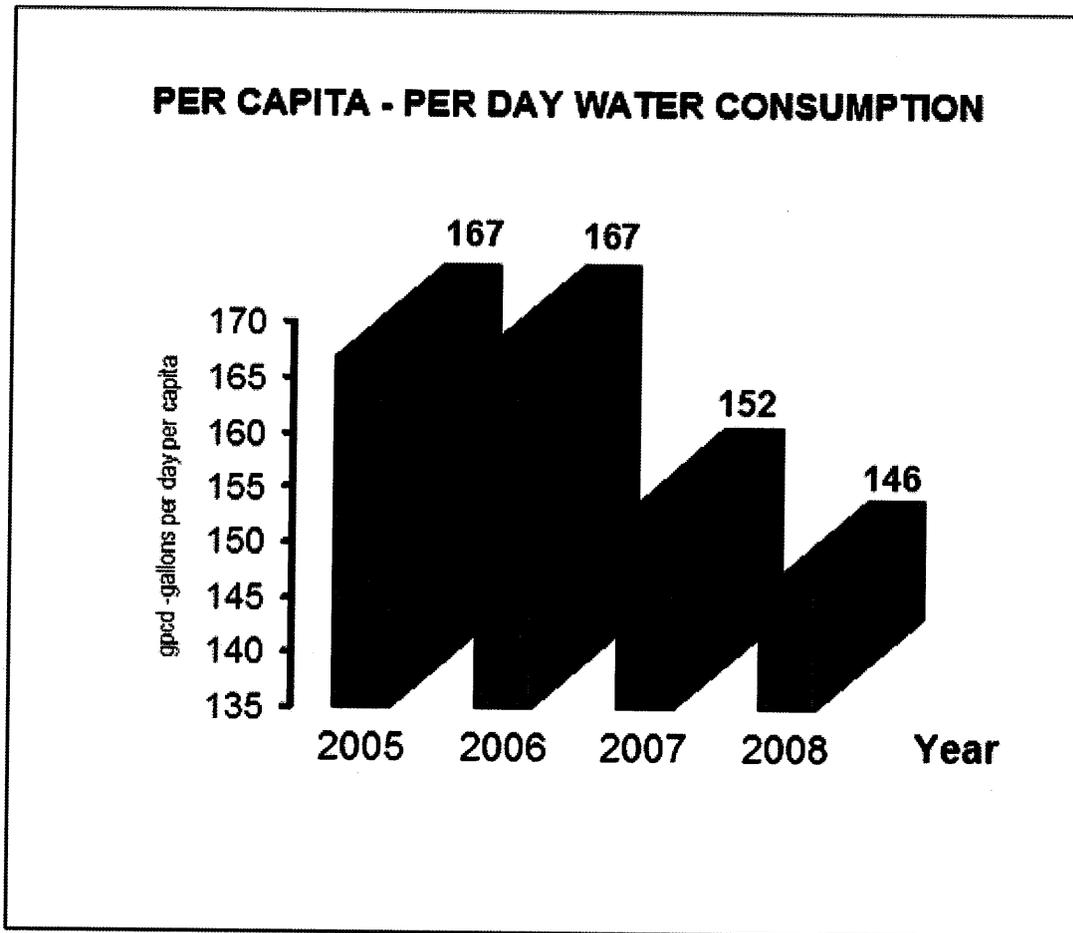
The City is investigating the following alternative water supply methods in an effort to maximize water consumption efficiency:

- 1) Additional water conservation programs to reduce future demand
- 2) Preserve the life of City wells by monitoring salinity encroachment and implementing strategic improvements
- 3) Alternate water suppliers (Cities of Hollywood and North Miami Beach) to meet future demands
- 4) Relocation of City's wells to the west, to extend the life of the wells
- 5) Aquifer Storage and Recovery
- 6) Reuse/Recharge Project
- 7) L-8 Reservoir Project to provide an increased Biscayne Aquifer allowance

Water Conservation

The South Florida Water Management District imposed water restrictions in 2007. Hallandale Beach was subject to those restrictions and as a result experienced a 13% decrease in the amount of Finished Water Demand for 2007/2008. Based on the amount of water saved as a result of the restrictions, the City will be able to provide the necessary water to meet future demands simply by continuing its current water conservation measures.

Figure 8- Historic Water Consumption 12-Month Average



Source: Hallandale Beach Finance Department, Water Billing Rates

Hallandale Beach has been pursuing water conservation measures for many years. The City currently has several water conservation programs already in place that have been effective in lowering water consumption rates. Listed below are the City's current and future conservation programs:

1. The City has adopted an Irrigation Ordinance, City Ordinance 2007-04, Chapter 30 / Section 30-49, enforcing the South Florida Water Management District's (SFWMD) Phase I guidelines, which restricts the watering of landscaping to two days a week. The City has been following Phase III restrictions since 2007 which permits the watering of landscaping only once a week. The City will amend its Irrigation Ordinance to maintain the Phase III restrictions by December 2008.
2. City Resolution 87-14 outlining the use of Xeriscape (not requiring additional irrigation) plants and landscaping design details to promote and expand its

use according to recommended landscaping planting guidelines intended to reduce or eliminate the need for supplemental irrigation.

3. The City has endorsed and proactively promoted Broward County's NatureScape Irrigation Program and concept, implementing environmentally sound landscaping practices to reduce the irrigation demands. To date the application of these irrigation best practices through NatureScape have generated water savings of close to 10 million gallons / year (every year) or the equivalent economic savings of \$13,500 per year (every year) by applying the program recommendations to the City facilities and parks.

Table 8- NatureScape Savings

<u>City Location</u>	<u>Savings</u> (gal/year)	<u>Savings</u> (\$/year)
City Hall	824,460	\$1,607.70
Hallandale Beach Cemetery (South)	3,436,389	N/A
Hallandale Beach Cemetery (North)	1,525,680	\$2,975.08
Cultural Center	556,920	\$1,085.99
Bluesten Park	3,555,786	\$7,644.94
Bluesten	71,308	\$153.31
Community Center	N/A	\$0.00
Foster Park	15,600	\$33.54
	9,986,143	\$13,500.56

Hallandale Beach is currently working with Broward County to register as a NatureScape City and through the National Wildlife Federation (NWF) to become a Certified Community Wildlife Habitat.

4. The City adopted a Rain Sensor Device Ordinance, whereby the City requires any person applying for an irrigation system permit to install, operate and maintain rain sensor devices or to provide for automatic switching mechanisms that will stop the irrigation system with the occurrence of adequate rainfall.

In fiscal year 2007/2008, the City obtained a matching grant from the SFWMD's Water Savings Initiative Programs (WaterSIP) to retrofit sprinkler systems with rain sensors able to suppress unnecessary watering when rain have satisfied the irrigation needs. This free rain sensor retrofit program is a direct incentive for all residents and businesses wishing to install approved rain sensor devices in their irrigation systems. When fully implemented, this program has the potential to conserve around 11.5 million gallons of water yearly.

5. The City adopted an Ultra-Low-Volume Plumbing Fixture Ordinance - City Ordinance Chapter 8, Article 1, Section 8-1, recognizing the Florida Building Code as the enforceable Building Code for the City and codifying the Building Code requirements for ultra-low-volume plumbing fixtures on all new construction.

The City recently applied for a \$50,000 matching grant under the SFWMD's WaterSIP for fiscal year 2009 to further water savings in areas where most opportunities exists, such as toilet flushing retrofits for selective volumes flushing by planning to retrofit 1,000 condominium unit toilets with the potential to save 10-million gallons of water per year. As part of this grant proposal, the City also plans to establish a water reuse infrastructure system for the City facilities, parks and street medians. The water reuse system is anticipated to save between 10,000-25,000 gallons of water per day.

6. The City of Hallandale Beach maintains a utilities (water / sewer) rate structure supporting economic incentives for water conservation. The basis for this financial inducement is to reward lower water users (2,000 gallons or less) with a lower utility rate and incrementally raise the per unit cost for larger users (above 25,000 gallons).
7. The City's Public Works Department maintains a Water Utility Leak Detection Program, whereby all water meters are replaced on a 5-year schedule and the large meters are checked and calibrated for accuracy annually.

In addition, Public Works also maintains a Water Distribution System Leakage Programs, whereby the monthly reports for the water piping distribution system are examined to compare the water pumped vs. the water billed and identify any excessive unaccounted volumes. Historically, the City's water distribution system has unaccounted water losses averaging less than 4%, considerably less than the 10% the South Florida Water Management District allows for coastal communities.

8. The City has maintained a continuous water conservation informational program for its residents, whereby the City periodically issues water conservation messages through newsletters, such as Hallandale Happenings, the annual Water Quality Report, and other means available to convey the need and importance of water conservation.
9. The City has been working to reduce the amount of Inflow and Infiltration (I/I) for over two decades. Though not often highlighted as a means of water conservation, implementation of a strong I/I program also conserves water. Each day hundreds of thousands of gallons of water in the aquifer are lost to wastewater system inflow and infiltration. A strong I/I program can have a dramatic impact on the amount of water saved and the City continues to improve this program to maximize the amount of water conservation.

Alternative Suppliers

The City of Hallandale Beach has recently been in contact with the City of Hollywood to discuss the possibility of expanding the reuse water system operated by Hollywood's wastewater treatment facility by supplying the City of Hallandale Beach with 800,000 gallons per day (gpd) of reuse water. Hollywood currently provides approximately 225,000 gpd of reuse water to Hallandale Beach for the irrigation of the Diplomat Golf Course which is located in both cities. Hollywood has included the reuse expansion plans in its Water Supply Plan. Under Phase 1 expansion (Figure 3), Hollywood is expected to provide over 500,000 gallons per day of reuse water for Scavo Park (Three Islands Park), located in the north eastern portion of Hallandale Beach.

In addition to the reuse water provided by Hollywood, Hallandale Beach would also like to pursue a possible water agreement with the City of North Miami Beach. The City has had discussions with NMB regarding the possibility of providing some water to the City on a permanent basis; however, at this time no final agreements have been reached.

Aquifer Storage and Recovery

Although there are no current plans to pursue this technology, the City will be researching this process in the future.

Reuse/Recharge Project

The updated 2005-2006 Lower East Coast Water Supply Plan has identified Alternative Water Resource (AWS) options for each public water supply utility. Each utility is to choose an AWS project, or several, to plan for the future needs of its service area. The Cities of Hallandale Beach, Dania Beach and Hollywood and Florida Power & Light all draw water from the Broward County South Regional Wellfield (Piccolo Wellfield). The LEC Plan has recommended a highly treated reuse/recharge project for the Piccolo Wellfield which would require the cooperation of those who receive water from it. This project would provide recharge in sufficient quantities to allow for an increase in groundwater withdrawal.

L-8 Reservoir Project

The Western L-8 Reservoir Project is a potential means of AWS that several municipalities in Southeast Florida are investigating, including Hallandale Beach. The basis for the project involves the construction of a large reservoir in Palm Beach County to divert flow from the C-51 Canal which would ordinarily be lost to tide. Water stored in the reservoir would be used to offset the need for water deliveries from the water conservation areas, or the regional system, thereby

allowing for increased recharge of surficial aquifers. It is anticipated that participating utilities would be granted access to a greater water allowance from the Biscayne Aquifer due to lessened demands from the regional system

Water Supply Capital Improvements

Table 9 below outlines the anticipated capital improvement projects the City will undertake to enhance its water conservation program. Although the City's projections indicate the current water conservation program is sufficient to meet all projected water demands beyond the 10-year planning period, the City has incorporated additional conservation programs into the Capital Improvements Schedule in an effort to further reduce water consumption throughout the City.

Table 9- Water Supply Capital Improvement Projects

* Water Supply CIP's	FY2008	FY2009	FY2010	FY2011	FY2012
1. Water Reuse Study, Design and construction	\$100,000	\$100,000	\$100,000	\$78,000	\$78,000
2. SFWMD – WaterSIP Grant	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
3. Water Conservation Incentive Programs	\$30,000	\$30,000	\$30,000	\$50,000	\$50,000
4. Conservation Promotional Material	\$10,000	\$10,000	\$13,000	\$15,000	\$15,000
5. Water-Wise Fifth Grade Conservation Material	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000
6. NatureScope Certification	\$3,000	\$3,000	0	0	0
TOTAL	\$200,000	\$200,000.00	\$200,000.00	\$200,000.00	\$200,000.00
OVERALL 5-YEAR CIP TOTAL= \$1,000,000					

* Project Description

1. Water Reuse Study, Design, and Construction

Fund the Study, Design-Engineering and Initial Construction (Phase 1 of 3) of Water Reuse System to Encompass Rain Harvesting, Storm Water and/or Water Plant Concentrate (Reject Water) for All City Facilities and Street Medians

2. SFWMD – WaterSIP Grant

[Grant to Be Announced by Mid August 2008]

Commitment to match South Florida Water Management District grant to be used for:

1. Water Re-Use for City Facilities (Buildings / Medians)... Install Infrastructure
2. High Density-High Water Use / Circa 1970s Condominium Toilets... Retrofit Toilet (Use Bldgs Maintenance Crew)

3. Water Conservation Incentive Programs

Program to Encompass Rebates and Incentives Such as Water-Wise Rebate / Incentive, Ultra Low Flow Toilet Exchange, Plumbing Retrofits / Exchanges (Residential & Commercial), and Other Special Opportunity Incentive

4. Conservation Promotional Material

City Sponsored / Funded Water Conservation Literature and Small Value Conservation Promotional Materials Such As: Showerheads, Dye Tablets, Faucet Aerators, Conservation Kits, Etc.

5. Water-Wise Fifth Grade Conservation Material

Fifth-Grade Math and Science Curriculum-Based Water Conservation Educational Classroom Material with Water Savings Kit for Home Retrofits as Homework / Report
-Target: Hallandale Elementary 185 Students & Teachers

6. NatureScape Certification

Registration for NatureScape and Certification
-Satisfy and Provide Requirements for Official Registration
-Continue Process towards Certification by Satisfying and Providing Official Certification Requirements and Provide Support for Team Volunteers

Goals, Objectives, and Policies

Future Land Use Element

GOAL: To provide a coordinated and compatible mix of land uses which encourages a high quality of life meeting the social, economic and physical needs of the present and future population of Hallandale Beach, while insuring reasonable environmental protection and timely and efficient provision of services.

OBJECTIVE 1.1: Levels of Service: The City shall continue to condition approval of development applications upon maintaining the provision of services at the Levels of Service (LOS) which meet or exceed levels specified in this Comprehensive Plan.

POLICY 1.1.1: The City shall maintain, within the Comprehensive Plan Elements, Level of Service standards for City facilities which will meet the existing and future needs of Hallandale Beach population and the standards established by Chapter 163 F.S., and 9J-5.

POLICY 1.1.2: Any development order or permit shall be approved only when adequate public services and facilities are in place, or will be provided to support the development at Levels of Service adopted by this Plan.

The necessary facilities and services shall be available concurrent with the impacts of development or through any of the following situations:

- A. The necessary facilities are in place at the time a development order or permit is issued, or a development order or permit is issued subject to the condition that the necessary facilities will be in place when the impacts of the development occur.
- B. The necessary facilities are under construction at the time a development order or permit is issued.
- C. The necessary facilities are the subject of a binding contract executed for the construction of those necessary facilities at the time development order or permit is issued.
- D. The necessary facilities have been included in the annual City budget and capital improvements program at the time development order or permit is issued although the facilities are not yet the subject of a binding contract for their construction.
- E. The necessary facilities are committed facilities at the time a development order or permit is issued.
- F. The Hallandale Beach City Commission assures the necessary facilities will be in place within a reasonable period of time consistent with the requirements of Chapter 163. At a minimum, the necessary facilities are to be included within a financially feasible capital improvements element which is determined by the Florida Department of Community Affairs to be in compliance with Rule 9J-5 of the Florida Administrative Code and supported by all necessary implementing land use development regulations and a monitoring system for provision of the necessary facilities.

POLICY 1.1.6: The City of Hallandale Beach will provide sanitary sewer, solid waste, drainage and potable water facilities and services to correct deficiencies and to meet existing and project demands identified in this Plan and in the 10-year Water Supply Facilities Work Plan.

OBJECTIVE 1.6: Industrial Land Use: Maintain at least 2 light-industrial or business/industrial land use categories and corresponding zoning districts,

covering at least 2 percent (50 acres) of the City land area, to provide for non-polluting, innocuous light manufacturing, high-technology, and related research and development uses.

OBJECTIVE 1.8: Historic and Natural Resources: Ensure that no development adversely impacts historic resources, pollutes the aquifer, surface water bodies or air, contributes to beach erosion or tree removal in excess of tree replacement, disturbs migratory aquatic wildlife, or harms beach vegetation in excess of permitted and acceptable levels, as determined by the City, water management and environmental monitoring and permitting agencies. This objective will be achieved if there is no degradation of these resources attributed to specific development or development within the City, in general.

POLICY 1.8.1: The City shall protect, by regulation, acquisition and/or restoration, existing natural areas.

POLICY 1.8.8: The City of Hallandale Beach shall continue to evaluate development proposals with respect to pervious area requirements specified in the Land Development Code.

POLICY 1.8.9: The City shall continue to discourage developments which may handle, generate or store hazardous material from locating within a wellfield cone of influence.

POLICY 1.8.10: The City shall protect the ground water aquifer within the cone of influence in conjunction with its agreements with Broward County Water Resources Management Division and the Broward County Wellfield Protection Ordinance and through the enforcement of the policies set forth in the "Infrastructure" Element of this Comprehensive Plan, and the regulations of the South Florida Water Management District (SFWMD).

POLICY 1.8.11: The City shall continue to protect its natural resources and maintain its environmental quality through the provision of land use regulations which are consistent with the policies of this Comprehensive Plan.

POLICY 1.10.2: The City shall continue to ensure that the provisions of the Hallandale Beach Zoning and Land Development code include all necessary site plan requirements to further the intent of this Comprehensive Plan. These requirements shall include but not be limited to adequate drainage and stormwater management, landscaping and open space requirements, signage regulations, subdivision regulations, safe and convenient on-site traffic flow, vehicle parking and consistency of land uses with Plan designations.

POLICY 1.10.5: The City shall continue to require adequate pervious areas to improve aquifer recharge.

POLICY 1.12.1: The City shall determine the status and capabilities of existing and proposed facilities (including water, wastewater, solid waste, traffic, stormwater, and recreation/open space) to accommodate current, new, and redevelopment demands, and any projects necessary to maintain adopted levels of service. These projects will be added to the five-year Capital Improvements Plan.

Utilities Element

GOAL 2: The City of Hallandale Beach will provide sanitary sewer, solid waste, stormwater management and potable water facilities and services to correct deficiencies and to meet existing and projected demands identified in this Plan.

OBJECTIVE 2.1: Existing deficiencies will be corrected by undertaking the following projects by the year 2018:

- a. Installation of a relief force main in the SE area.
- b. The sanitary sewer collection system will be rehabilitated to mitigate infiltration/inflow (I/I) in this area.
- c. Replacement/upgrade of Intracoastal force main crossing.

POLICY 2.1.1: Projects shall be undertaken in accordance with the schedule provided in the Capital Improvements Element of this Plan.

POLICY 2.1.2: Projects needed to correct existing deficiencies shall be given priority in the annual work programs of the City Departments.

POLICY 2.1.3: Permits will not be issued for new developments which would result in an increase in demand that would exceed the ability of the City to provide the level of service adopted for the facility.

OBJECTIVE 2.2: Project demands through the year 2018 will be met by undertaking the following projects:

- a. Sanitary Sewer Projects
 1. Provide rehabilitation for two collection system lift stations per year.
 2. Locate and eliminate major sources of I/I in sewer system to prevent increase over present unmetered sewer flow to Hollywood Regional Treatment Plant (R.T.P.)

3. Replace existing 16" Intracoastal force main crossing with new 24" force main.
4. Collaboration with other large users for use of existing wastewater treatment plant capacity.

b. Solid Waste Projects

1. Removal of vegetative waste from garbage waste disposal.
2. Replacement of manual garbage trucks with automated trucks.

c. Stormwater Management Projects

1. Meet monitoring and removal of contaminants from surface water discharges to National Pollutant Discharge Elimination System (NPDES) Stormwater Permit requirements.
2. Evaluate major storm (hurricane) related drainage problems to ascertain needs to mitigate flood damages.
3. Perform vegetative trimming and dredging in drainage canals.
4. Install large diameter, Class 5, drainage wells in Eastern areas of the City subject to flash flooding.

d. Potable Water Projects

1. Install major water distribution mains in Golden Isles area and across the Intracoastal Waterway to improve pressure, increase capacity and improve looping.
2. Pursue new treated water interconnections with neighboring utilities, especially Hollywood.
3. Continue to upgrade distribution system by improved looping, adding fire hydrants, and upgrading water main sizes where appropriate.
4. Coordinate with North Miami Beach for future purchase of potable water as may be required.

OBJECTIVE 2.3: Project demands for the period 2008 through 2018 will be met by undertaking the following projects:

a. Sanitary Sewer Projects

1. Ongoing maintenance rehabilitation of sewer lines to reduce I/I.

- b. Solid Waste Projects
 - 1. Removal of vegetative waste and recyclables from garbage waste stream.
- c. Stormwater Management Projects
 - 1. Ongoing installation of drainage facilities to comply with adopted policies.
- d. Potable Water Projects
 - 1. Interconnect(s) with neighboring jurisdictions.
 - 2. Implementation of distribution improvements to accommodate growth.
 - 3. Implementation of additional water conservation projects to meet future water supply needs.
 - 4. Replacement of aging infrastructure as required.

POLICY 3.1.3: New development shall provide water storage capacity equal to that which existed under predevelopment conditions consistent with the water management regulations and plans of the South Florida Water Management District, and the Broward County Environmental Protection Department.

GOAL 4: Quality potable water will be provided to meet existing and future needs of the City of Hallandale Beach during both normal and emergency situations.

OBJECTIVE 4.1: The City will continue to provide sufficient quality treated water to serve present and future citizen needs.

POLICY 4.1.1: City shall adopt the 10-Year Water Supply Facilities Work Plan to increase the coordination between land use and water supply planning within 18 months of the adoption of the regional water supply plan, as required by the Chapter 163, Florida Statutes (see exhibit 5-1).

POLICY 4.1.2: Planning for additional capacity and/or a reduction in per capita demand shall be included in the 10-Year Water Supply Facilities Work Plan as required in Chapter 163 of Florida Statutes to increase the coordination of local land use and future water supply planning.

POLICY 4.1.3: City will provide the necessary capital funds to upgrade the water plant to meet all needs.

OBJECTIVE 4.2: City will work towards a water system that meets its needs under emergency situations.

POLICY 4.2.1: The City will secure any needed water main interconnections with neighboring utilities to provide emergency service.

POLICY 4.2.2: City will continue to improve looping and upgrading of water distribution system.

OBJECTIVE 4.3: City of Hallandale Beach will follow a course of action which assures a long term water supply for the present and future development of the City.

POLICY 4.3.1: Maintain a long-term agreement with Broward County for long-term water supply.

POLICY 4.3.2: The City will negotiate with Hollywood to procure interconnects as a backup system to the system.

POLICY 4.3.3: The City will study the possibility of the cost effective use of sewage effluent for City irrigation needs.

POLICY 4.3.4: The City shall establish landscaping guidelines which require planting materials which are low water users.

POLICY 4.3.5: The City shall study the viability of using grey water on public areas, golf courses, race tracks and other large irrigation areas.

POLICY 4.3.6: The City will work in conjunction with the South Florida Water Management District to coordinate the monitoring of the saltwater front along the Southeast Broward County coast.

POLICY 4.3.7: The City will develop and implement a program to curtail excess water use during excessively dry periods. In addition, the City will implement a plan to promote the use of water-efficient appliances and continue to coordinate efforts for water resource conservation with the SFWMD.

POLICY 4.3.8: The City will work with private parties, SFWMD, FDEP, City of Hollywood, and Broward County in evaluating and implementing a wastewater reuse program within Hallandale Beach.

GOAL 5: The City shall enforce preservation of existing pervious areas and conversion of unnecessary impervious areas to pervious areas to increase groundwater aquifer recharge.

OBJECTIVE 5.1: The City shall continue to encourage aquifer recharge opportunities through enforcement of minimum pervious area requirements of the Hallandale Beach Zoning and Land Development Code at time of development review.

POLICY 5.1.1: At time of development review, the City shall require on-site, stormwater detention such that past development runoff rates and quantities do not change from predevelopment values. Detention methods will provide a direct means of aquifer recharge. All aspects of stormwater management will include the use of Best Management Practices (BMP's).

Conservation Element

GOAL 1: The City shall provide and maintain an adequate quantity and quality supply of water for use while minimizing affects on the natural system.

OBJECTIVE 1.1: The City shall continue to provide safe quality potable water for residential, commercial and industrial uses within the City at a level of service standard of 175 gallons per capita per day.

POLICY 1.1.1: The City, in order to provide safe potable water, shall continue working with other public agencies, such as the Department of Environmental Protection, South Florida Water Management District, and Broward County Health Department, to meet primary and secondary water quality standards mandated by Florida Water Statutes.

POLICY 1.1.2: The City shall continue to encourage installation of water saving devices in new buildings or, where possible, retrofit existing structures for water conservation.

POLICY 1.1.3: The City shall continue and expand its water conservation practices to maintain a low per capita consumption of potable water by implementing the capital improvement projects identified in the 10-year Water Supply Facilities Plan.

OBJECTIVE 1.2: The City shall encourage the use of grey water throughout the community.

POLICY 1.2.1: The City shall implement adopted landscaping requirements in accord with the South Florida Water Management District model regulations, which encourages planting materials which are low water users.

OBJECTIVE 1.3: The City shall protect the ground water aquifer within the cone of influence in conjunction with its agreements with Broward County Water Resources Management Division and the Broward County Wellfield Protection

Ordinance.

POLICY 1.3.2: The City shall require proper water treatment and drainage for all new development, redevelopment areas, and major renovation projects.

OBJECTIVE 1.4: Development of Alternative Water Supplies

POLICY 1.4.1: The City shall continue to explore the development of alternative water supply projects to maintain low per capita water consumption levels.

POLICY 1.4.2: The City shall utilize alternative water supply sources, if feasible, when improving or expanding the City's water system.

Capital Improvements Element

GOAL 1: The City of Hallandale Beach shall plan and manage its fiscal responsibilities to ensure the timely and efficient provision of capital projects that adequately serve its existing and projected needs.

OBJECTIVE 1.1: A five year schedule of Capital improvements will be maintained. The schedule will be oriented toward implementation of concurrency requirements of Chapter 163.F.S. that require public facilities and services be available, at levels of service consistent with those adopted in the Comprehensive Plan, when the impacts of development occur.

POLICY 1.1.1: The City will annually adopt a budget that contains funding for Capital improvements from the 5 year schedule of improvements.

POLICY 1.1.2: The City shall determine the status and capabilities of existing and proposed facilities (including water, wastewater, solid waste, traffic, stormwater, and recreation/open space) to accommodate current, new, and redevelopment demands. Required improvements will be added to the 5-year Capital Improvements Plan.

POLICY 1.1.3: The Capital Improvements Plan shall be updated annually to include those projects identified in the first five years of the Water Supply Facilities Work Plan to ensure the potable water Level of Service standard is maintained.

POLICY 1.1.4: Capital improvements needs for each individual element of the Comprehensive Plan will be aggregated and listed within the Capital Improvements Element (see Table 9-1). Prioritization of capital improvements projects will be based on their relative importance to achievement of the goals and objectives and implementation of the policies of the Comprehensive Plan. In

particular, projects involving public safety and health issues will be of a higher priority than other projects. The five year Schedule of Improvements will include funding for capital improvements which do not exceed the City's financial capacity to support such expenditures. Funding priorities will be reflected in the annual Five Year Schedule of Improvements through the year in which they appear in the Schedule.

POLICY 1.1.5: Prioritization of funding improvements shall include consideration of eliminating public hazards.

POLICY 1.1.6: Prioritization of funding improvements shall involve coordination with the comprehensive plans of adjacent incorporated communities, in addition to those of the County, Regional Planning Council, State, the Florida Department of Transportation, the South Florida Water Management District, and any other state agencies that provide public facilities in Hallandale Beach.

POLICY 1.1.7: The City of Hallandale Beach will manage its long-term debt in such a manner that the ratio of the debt service millage to the City millage does not exceed 30 percent.

POLICY 1.1.8: Prioritization of capital improvements projects will consider the policies of the other comprehensive plan elements.

OBJECTIVE 1.2: Construction, improvement, or replacement of public facilities shall be provided at a level that maintains Level of Service standards as adopted in the Comprehensive Plan. Facilities necessary to maintain level of service will be included annually in the five-year Capital Improvement Plan.

POLICY 1.2.1: The Development Services Department shall evaluate impacts resulting from new developments to ensure that adequate facilities are either in place or planned so that Level of Service standards are not reduced.

POLICY 1.2.2: Land use decisions that impact the provision of public services or facilities shall be based upon the City's capability to maintain adequate service levels as described in the elements of the Comprehensive Plan.

POLICY 1.2.3: The City shall provide public facilities and services to serve developments for which development orders were issued prior to adoption of the City's Comprehensive Plan. The ability of facilities to serve new development at levels of service at or above adopted levels shall be established prior to issuance of a development order or permit.

POLICY 1.2.4: The City shall ensure that developments that benefit from the extension or provision of services or facilities shall share a cost of the extension of such service or facility, or make contributions to the City to offset the cost of that service or facility.

POLICY 1.2.5: The assessment of needed capital improvements shall be based on the Level of Service standards adopted in the Transportation, Sanitary Sewer, Solid Waste, Stormwater Management, Potable Water, and Natural Groundwater Aquifer Recharge, and Recreation and Open Space Elements of the Comprehensive Plan. These Level of Service standards include:

Transportation	Level of Service "D" for all arterial, collector and local streets, consistent with the adopted Broward County Standard for Urban Streets.
Sanitary Sewer	Collection and treatment capacity of 190 gallons per capita per day.
Stormwater Management	New Development: Design storm - five year frequency; one hour duration; 3.3 total inches. Existing Development: To meet applicable Florida Building Code drainage standards.
Solid Waste	Ability to collect and dispose of 5.65 pounds of solid waste per person per day, which includes nonresidential waste.
Potable Water	Maximum day water consumption rate: 175 gallons per capita per day.
Recreation/Open Space	Park Area Ratio - 3.00 acres of park and open space per 1,000 residents.

POLICY 1.4.1: In order to adequately maintain adopted Level of Service standards, the City shall maintain an effective and appropriate schedule of user charges, such as the water impact fee included in the City Ordinances, and shall employ other appropriate means to properly collect necessary funds.

Intergovernmental Coordination Element

GOAL 1: To maintain and/or improve existing mechanisms and to establish new ones as required to ensure coordination and cooperation between the City of Hallandale Beach and other units of local, County, Regional, State, and Federal governments regarding planning and development matters.

OBJECTIVE 1.1: The City shall use existing and establish new procedures as needed to ensure consistency and coordination between the City Comprehensive

Plan, the State of Florida Comprehensive Plan, the Regional Plan for South Florida, plans of adjacent municipalities, and plans of other units of local government which provide services within the City, but do not have regulatory authority.

POLICY 1.1.1: The City shall continue to use the Broward County Planning Agency (BCPA) as a means to ensure consistency and coordination with the Broward County Land Use Plan, the State of Florida Comprehensive Plan, the Regional Plan for South Florida and the Comprehensive Plans of adjacent municipalities.

POLICY 1.1.2: The City shall continue to use the resources of Broward County Planning Council (BCPC) to provide for consistency and coordination between the City's circulation plan and those of local, county, region and state units of government.

POLICY 1.1.3: The City shall continue to coordinate and cooperate with the Broward County Planning Council, South Florida Regional Planning Council, South Florida Water Management District, Florida Department of Community Affairs, Florida Department of Transportation and other Federal, State, Regional agencies through formal and informal means to carry out the goals, objectives and policies of the Comprehensive plan.

OBJECTIVE 1.2: Use existing and establish new procedures as needed to ensure consistency, coordination and maintenance of levels of service established in the City's Comprehensive Plan with those of the County, Region and State, as well as, those of adjacent local governments having operations and maintenance responsibility for such facilities.

POLICY 1.2.1: The City shall continue to use the Broward County Metropolitan Planning Organization, South Florida Regional Planning Council and the Florida Department of Transportation to facilitate the planning, funding and scheduling of those improvements identified in the Traffic Circulation Element, Utilities Element and Recreation Element of the plan.

POLICY 1.2.5: The City will continue to ensure that the highest standards and adopted levels of service for recreational and open space needs, as indicated in the plan, are maintained.

POLICY 1.2.6: The City has adopted a 10-Year Water Supply Facilities Work Plan and will update it, as required, in coordination with:

- The most current Lower East Coast Water Supply Plan provided by the South Florida Water Management District,
- Broward County Water and Wastewater Services, and
- Any municipality with which the City has a water agreement.