



City of Dania Beach

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# **Chapter 4**

## **SANITARY SEWER, SOLID WASTE, DRAINAGE, POTABLE WATER, NATURAL GROUNDWATER AQUIFER RECHARGE**

Adopted by the Dania Beach City Commission

Revised December 2014

**SANITARY SEWER, SOLID WASTE, DRAINAGE, POTABLE WATER,  
NATURAL GROUNDWATER AQUIFER RECHARGE**

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## **I. SANITARY SEWER SUB-ELEMENT**

### **A. Introduction**

The City of Dania Beach Charter establish Department of Public Services that includes Public Works and Utilities whose responsibility is to oversee the operation, maintenance and construction of the City wastewater system. The area west of Ravenswood Road is served by Broward County Utilities. Dania Beach originally operated its own wastewater treatment facility but it was abandoned in 1974 and the City entered into a large user agreement with the City of Hollywood to provide for wastewater treatment. The City presently operates and maintains its own sanitary sewage collection system and sewage lift stations.

### **B. Existing Conditions**

The City sewage collection and transmission system consists of approximately fifty (50) miles of gravity sewer lines ranging from eight (8) inches in diameter to twenty-four (24) inches in diameter. There are sixteen (16) sewage pump stations and approximately six (6) miles of sewage force mains with diameters of up to eighteen (18) inches.

Approximately ninety (90) percent of the City is served by the sanitary sewer system. The area served by septic tanks in the City of Dania Beach is known as Melaleuca Gardens which encompasses approximately 102 acres and 367 dwelling units which translates to a density of less than four (4) dwelling units per acre. This density does not exceed the maximum density for septic tanks as specified by State regulations. In addition, the area is fully developed at this time and no additional septic tanks are anticipated.

The Broward County Health Unit is responsible for permitting septic tanks. At this time, representatives of the Broward County Health Unit are not aware of any problems related to the existence of septic tanks in the City. Specifically, no ground water problems linked to the existence of septic tanks are known to exist.

The area served by septic tanks is of a relatively high elevation

and has soils consisting of the Lauderdale-Dania Association. The septic tank area is essentially built out but any future septic tanks would be permitted on a case by case basis by the Broward County Public Health Unit. Septic tanks are permitted if existing sewers are more than 100 feet from a single family residence. The level of service for a septic tank maximum discharge as established by the Broward County Public Health Unit is as follows:

Residential	2,500 gallons/acre/day
Commercial	1,500 gallons/acre/day

With the following utilized as a design criteria for septic tank:

Residential served by potable water	0.0574
gallons/day/s.f.	
Commercial	0.0034 gallons/day/s.f.

The entire area served by septic tanks has potable water service to the vicinity.

As indicated on Map 4, Soils Map, of the Comprehensive Plan Map Atlas, the soils in the area served by septic tanks are the Hallandale-Margate Association. According to the USDA Soil Survey of Broward County, these soils are described as follows:

- Hallandale soils are poorly drained and nearly level. Typically they have a thin surface layer of black fine sand, and subsurface layer of light brownish gray fine sand, and a subsoil of brown and yellowish brown fine sand that has slightly more clay than the subsurface layer. Beneath the subsoil is hard limestone. Depth to hard limestone ranges from 7 to 20 inches but is typically 16 inches.
- Margate soils are poorly drained and nearly level. Typically they have a surface layer of very dark gray fine sand and a subsurface layer of light brownish gray fine sand. The subsoil is brown fine sand that is slightly more clayey than the subsurface layer. It has a layer, about 4 inches thick, of brown fine sandy loam mixed with fragments of limestone. Hard limestone is at a depth of about 32 inches. Depth to hard limestone ranges from 20 to 40 inches.

These soils are poorly suited to cultivate crops. For urban

development, fill material must be added to the surface for building site.

The area west of Ravenswood Road is served by Broward County. The County also entered into an agreement with the City of Hollywood to provide sanitary sewer treatment services in 1974. The County is installing sanitary sewers in all areas currently served by septic tanks as a part of its 20 year plan.

The Broward County 201 facilities plan, as approved by the State, provided for the wastewater from the City of Dania Beach to be treated by the City of Hollywood Wastewater Treatment Facility. The Hollywood plant is located on a 32 acre site in the eastern portion of that City. The plant has a design capacity of forty-eight (48) million gallons per day and currently treats approximately forty-three (43) million gallons per day on an average day. The treatment is secondary and the disposal is via an ocean outfall and injection wells.

The City of Dania Beach utilizes the design flows established by the Broward County Chapter 27, Article V, "Water Resource Management," Broward County Code of Ordinances to assess the adequacy of service and concurrency for potential retail customers.

### **C. Analysis Of Existing System**

The present wastewater and future flows generated by the City of Dania Beach are tabulated as follows:

<b>Table 1 Present Wastewater and Future Flows</b>		
<b>Year</b>	<b>Average</b>	<b>Peak</b>
2015	3.3 MGD	3.8 MGD
2020	3.5 MGD	4.0 MGD
2025	3.8 MGD	4.2 MGD
2030	4.0 MGD	4.4 MGD
2035	4.1 MGD	4.5 MGD

The City of Dania Beach presently contracts with the City of Hollywood for wastewater treatment. The contract, known as a "Large User Agreement", is being updated to the following flows for the City of Dania Beach:

<b>Table 2 Contract Flows – Dania Beach</b>				
<b>Year</b>	<b>Average</b>	<b>Surplus/ Deficit</b>	<b>Peak</b>	<b>Peak Surplus/ Deficit</b>
2015	3.3 MGF	0.0 MGD	3.8 MGD	0.0 MGD
2020	3.5 MGD	0.0 MGD	4.0 MGD	0.0 MGD
2025	3.8 MGD	0.0 MGD	4.2 MGD	0.0 MGD
2030	4.0 MGD	0.0 MGD	4.4 MGD	0.0 MGD
2035	4.1 MGD	0.0 MGD	4.5 MGD	0.0 MGD

The City of Hollywood has prepared design reports for the expansion of the treatment facility from 48.75 million gallons which includes the anticipated flows from Dania Beach.

The sewage lift stations and force main systems were analyzed in 2004 for the ultimate flow projections. Certain deficiencies were identified, such as undersized stretches of force main, undersized master meters and upgrading of pumps. These deficiencies are being addressed by the City and the improvements should be completed within 3-5 years.

The gravity sewer collection system was installed by the City in the early 1960's and the installations are of vitrified clay pipe in organic soil areas. Some settlement has occurred, particularly in the eastern area of the City and infiltration is occurring. Inflow is also occurring due to flooding of streets in extremely low areas. The City performed an Inflow and Infiltration Study in 1984 with repairs being made in 1985 and 2013 that accomplished a reduction in sewer flow of approximately 400,000 gallons per day. Another study should be done, a recommendation will be made to include funding in the FY 2016-2017 Budget.

**D. Economic Assumptions**

The City of Dania Beach has two primary sources of income for wastewater expenditures. The first is rates for use which can be adjusted as needed and the second is unit and acreage charges or connection charges. Connection charges are established in Ordinance 4 1-86 and are based on the estimated flow as determined in the level of service charts. They are collected from all new construction and are utilized only for capital expenditures and not operating.

### **E. Goal, Objectives And Policies**

The goal of the Sanitary Sewer Element will be to provide wastewater customers, both new and existing, within the City of Dania Beach adequate sewerage facilities meeting all local, state and federal criteria.

#### **Objective I**

Continue to contract with the City of Hollywood to provide wastewater treatment.

Policy 1.1 Negotiate a new Large User Agreement with the City of Hollywood to facilitate any additional treatment needs should they arise.

#### **Objective II**

Meet the wastewater service demands of the City of Dania Beach. Policy 2.1 The level of service standard of 300 gallons per day per equivalent residential unit shall be utilized to assess the adequacy of service as well as the standards set forth by the Broward County Department of Planning and Environmental Protection and Ordinance 4 1-86 of the City of Dania Beach as follows:

#### Dwellings:

Each Single Family Unit =1 ERC

#### Condominium:

3 bedroom 300 gpd 1 ERC

1 & 2 bedroom 250 gpd

0.71 ERC

#### Motel/Hotel:



150 gpd per room  
200 gpd per pool  
350 gpd per mgr. apt.

Mobile Home:

100 gpd per space

Office

0.2 gpd per square feet

Retail:

0.1 gpd per square foot

Laundries:

400 gpd per machine

Bar (no food service):

20 gpd per seat

Restaurants:

24 hour - 50 gpd per seat (Including bar)

Less than 24 hours -30 gpd per (Including bar)

Theaters:

5 gpd per seat

Assembly Hall:

2 gpd per seat

Park:

10 gpd per person

Factories:

15 gpd per person per shift

Institutions:

100 gpd per person

Church:

7 gpd per seat

Service Station:

Full Service Station

First Two Bays - 750 gpd

Each Additional Bay - 300 gpd  
Per Fuel Pump - 100 gpd

Self Service Station  
Per Fuel Pump 50 gpd

Elementary School:  
10 gpd per pupil  
5 gpd per shower per pupil  
5 gpd per cafeteria per pupil

High School:  
15 gpd per pupil  
5 gpd per shower per pupil  
5 gpd per cafeteria per pupil

Hospital and Nursing Home:  
200 gpd per bed  
100 gpd per staff

Warehouse:  
0.1 gpd per square foot

Policy 2.1 This City of Dania Beach shall use the information contained in Chapter 27, Article V, "Water Resource Management," Broward County Code of Ordinances to assess the adequacy of service and concurrency for potential retail customers.

Policy 2.2 The City of Dania Beach shall identify sanitary sewer facilities at risk from sea level rise and other climate change related impacts by 2016, and update this assessment every 5 years.

Policy 2.3 The City shall continue with an ongoing infiltration and inflow study to correct leaks in wastewater pipes and make repairs as necessary. The study should be done in 2016.

Policy 2.4

Policy 2.4 The City shall continue to collect impact fees as a mechanism to provide for wastewater capital expenditures related to growth on the system.

Policy 2.5 The City of Dania Beach shall design for additional capacity in accordance with Section Broward County Page 5-5 Proposed WSFWP Amendments to the Comprehensive Plan (Vers1: 07.03.14) 62-600.405, FAC. and consider the impacts of increased coastal flooding, sea level rise, saltwater intrusion, and other potential future climate change impacts, in planning for infrastructure replacement and relocation.

#### Objective III

Provide sanitary sewer for the entire City, including Melaleuca Gardens.

Policy 3.1 The City shall continue coordination with Broward County in the installation process underway to replace the existing septic tanks in the areas west of Ravenswood Road and to expedite timetable for the installation of the sanitary sewers throughout the area.

Policy 3.2 The City shall coordinate with Broward County in the planning process to determine feasibility of replacing the existing septic tanks in Melaleuca Gardens. The City shall have a study done to evaluate feasibility and best option, gravity system versus vacuum system. Also, have a study done to determine turnkey option, including collection, treatment and reuse for the Melaleuca Garden area. Adjacent Broward County land could be utilized to construct necessary facilities.

#### Objective IV

Continue to require the use of sanitary sewer facilities by all new development so as to discourage urban sprawl.

Policy 4.1 The City will discourage urban sprawl by requiring all new development to provide sanitary sewer facilities.

Policy 4.2 To reduce the potential groundwater pollution sources and protect groundwater supplies, the City will discourage urban sprawl by requiring single family residences to hook up to sanitary sewer facilities if they are within 100 feet of a sewer line, in

accordance with Broward County Code of Ordinances Chapter 34, Article II, "Water and Sewers", Article II, "Water and Sewer Connection Ordinance," Broward County Code of Ordinances and Article II 1/2, "Water, Sanitary Sewer and Septic Tank Ordinance."

#### Objective V

The City of Dania Beach shall promote the resiliency of existing and planned sanitary sewer infrastructure or retrofits from the impacts of climate change.

Policy 5.1. The City of Dania Beach shall implement the retrofit of existing and construction of new sanitary sewer facilities and collection systems in coastal areas that are identified as potentially impacted by sea level rise by 2040.

Policy 5.2 The City of Dania Beach shall evaluate the influences of sea level rise on inflow and infiltration of chlorides in treated wastewater and develop economic, environmental, and technically feasible strategies for current and future reuse options.

Policy 5.3 The City of Dania Beach shall coordinate with Broward County and the City of Hollywood, to develop policies and plans that set short-, intermediate- and long-range goals and establish adaptive management implementation strategies for water and wastewater resources under their jurisdiction to address the potential impacts of climate change, and its operational, economic, and environmental effects.

### **F. Plan Implementation And Monitoring Procedures**

The City of Dania Beach Community Development Department shall prepare a list of goals, objectives and policies and distribute these to all affected City departments for their implementation. The Community Development Department shall be responsible for monitoring these goals, objectives and policies and determining their compliance with the plan. The Community Development Department will review yearly status reports from the Public Services Department as to the achievements of the

goals, objectives and policies and shall ensure that adequate funding is budgeted to meet the same. The Community Development Department shall immediately notify the City Manager and the City Commission of any unaddressed deficiencies so that they may be addressed.

## **II. DRAINAGE AND NATURAL GROUNDWATER RECHARGE**

### **A. Introduction**

The City of Dania Beach Community Development Department is responsible for assuring proper drainage is installed on all new projects the most recent edition of the Florida Building Code and the Public Services Department is responsible for existing systems and their extensions as per the City Charter and the Code of ordinances. Dania Beach also requires that projects obtain approval from the Broward County Water Management Division which follows the criteria as set forth in the "Grading and Drainage Regulations and Standards" Manual. The City also requires adherence to the "South Florida Water Management District Basis of Review" and the rules and regulations of the Broward County Environmental Protection and Growth Management Department. Any dredge and fill projects within the City require prior review of the U.S. Army Corps of Engineers and the State of Florida Department of Environmental Regulation.

Due to the nature of the geography of the City and its drainage patterns it was chosen to combine the drainage element and the natural groundwater recharge into one element.

### **B. Existing Conditions**

The primary drainage system of the City of Dania Beach, as well as Broward County, is controlled by the canal and pump system of the South Florida Water Management District (SFWMD). The SFWMD maintains a canal and pump systems and controls discharge based on the capacity of the system to remove storm water. Drainage systems primarily consist of storm sewers, exfiltration trench systems and onsite retention/detention systems. Retention/detention systems consists of Wet which retains or detains storm water in lakes and Dry which retains or detains storm water in areas that are normally dry. Both of these

methods provide for storm water storage and aquifer recharge, however, dry retention systems provide for the added benefit of improving water quality due to the filtration action of the soils.

Dania Beach is underlain by two aquifers, the Floridian and the Biscayne. The Floridian is confined and approximately 1,000 feet below the surface and is quite high in chlorides. The Biscayne Aquifer is essentially on the surface as is approximately 200 feet in depth. The Biscayne Aquifer is the primary source of drinking water.

The western portion of Broward County through the 790 square mile conservation area is the primary aquifer recharge area. These areas are maintained by the South Florida Water District. Other aquifer recharge occurs through rainfall, exfiltration trench systems and onsite retention/detention areas.

The southeast area of the City is quite low in elevation, having an average elevation of 4.0 to + 5.0 N.G.V.D. Drainage is currently inadequate and the City is in the process of constructing three new pumping stations and associated piping to alleviate flooding in the area.

The City adheres to the minimum standards of Broward County and the South Florida Water Management District and establishes the following levels of service.

Road Protection

Residential and primary streets crown elevation meet the minimum elevations as published on the Broward County 10 year Flood Criteria Map.

Buildings

The lowest floor elevation shall not be lower than the elevation published on the Broward County 100 year flood elevation map plus 12 inches and 18 inches above the adjacent crown of road for residential and 6 inches above the adjacent crown of road for commercial/industrial.

Storm Sewers

Shall be designed using the Florida Department of Transportation Zone 10 rainfall curves.

Flood Plain Routing

Modified SCS routing method as established by the SFWMD  
"Basis of Review".

Best Management Practice

Efforts shall be utilized to use best management practice  
to reduce pollutants entering the groundwater.

**C. Analysis Of Existing System**

Except for the southeast section and certain sections in the SW  
section west of Ravenswood Road, the drainage system of the  
City functions adequately and is able to meet the area wide level  
of service expectations.

The review process of new developments ensures that SFWMD,  
Broward County and City drainage and recharge criteria are  
met. This review is conducted based on the following criteria:

- Public road elevation: 10 year, one-day storm event.
- Floor elevation: 100 year. Three day-storm event.

The following level of service standards are utilized by the City:

Road Protection

Residential and primary streets crown elevations meet the  
minimum elevations as published on the Broward County  
10 year Flood Criteria Map.

Buildings

The lowest floor elevation shall not be lower than the  
elevation published on the Broward County 100 year flood  
elevation map plus 12 inches and 18 inches above the  
adjacent crown of road for residential and 6 inches above  
the adjacent crown of road for commercial/industrial.

Storm Sewers

Shall be designed using the Florida Department of  
Transportation Zone 10 rainfall curves.

Flood Plain Routing

Modified SCS routing method as established by the SFWMD  
"Basis of Review".

Best Management Practice

Efforts shall be utilized to use best management practice to reduce pollutants entering the groundwater.

Water quality is improved in the City through the encouragement of the use of pervious pavers, pervious driveways, grassed swales and water detention/retention systems. The ratio of pervious area to impervious area is also utilized to encourage water quality.

#### **D. Economic Assumptions**

The indicated drainage improvements and system maintenance will be financed through general fund revenues, special assessments and developer contributions.

#### **E. Goal, Objectives And Policies**

Provide for storm water protection for the residents of the City of Dania Beach that assures flooding protection while encouraging water quality and aquifer recharge.

##### **Objective I Ensure flood protection.**

Policy 1.1 The following design storms are established for drainage facility capacity:

- Public road elevation: 10 year, one-day storm event.
- Floor elevation: 100 year. Three day-storm event.

Policy 1.2 Adopt the level of service standards as established by Broward County and the South Florida Water Management District as follows:

##### Road Protection

Residential and primary streets crown elevation meet the minimum elevations as published on the Broward County 10 year Flood Criteria Map.

##### Buildings

The lowest floor elevation shall not be lower than the elevation published on the Broward County 100 year



flood elevation map plus 12 inches and 18 inches above the adjacent crown of road for residential and 6 inches above the adjacent crown of road for commercial/industrial.

Storm Sewers

Shall be designed using the Florida Department of Transportation Zone 10 rainfall curves.

Flood Plain Routing

Modified SCS routing method as established by the SFWMD "Basis of Review".

Best Management Practice

Efforts shall be utilized to use best management practice to reduce pollutants entering the groundwater.

Policy 1.3 Work with Broward County and the SFWMD to encourage proper discharges and drainage practice.

Policy 1.4 The City adopts the surface water standards of Chapter 27 Pollution Control of the Broward County Code of Ordinances (27-195) as the standards for stormwater discharge in the City. These standards are consistent with Chapter 17-25 F.A.C. standards for water quality.

**Objective II**

**Encourage use of Best Management Practice for all drainage systems.**

Policy 2.1 Follow the regulations of Broward County and SFWMD to encourage Best Management Practice.

**Objective III**

**Continue to implement drainage improvements in the southeast area of the city.**

Policy 3.1 Provide for necessary funds for southeast drainage improvements through the general fund, special assessments or developer contributions.

- Policy 3.2 The City of Dania Beach shall work with Broward County to identify areas of the City vulnerable to sea level rise, tidal flooding, and other impacts of climate change, and improve available information needed to make informed decisions regarding adaptation strategies, including infrastructure improvements, modifications, and management strategies
- Policy 3.3 The City of Dania Beach shall work with Broward County to review and update the Priority Planning Area maps to reflect areas at increased risk of flooding based on updated 50 year sea level rise projections, commencing in 2016.
- Policy 3.4 The City of Dania Beach shall work with Broward County to update wet season groundwater elevation maps to reflect impacts of 2 feet of sea level rise for planning and regulatory purposes by 2016.

**Objective V**  
**Work with Broward County and SFWMD to implement drainage rules and criteria.**

- Policy 4.1 Establish staff communication and encourage utilization of Broward County and SFWMD criteria.

**Objective V**  
**Maximize water management systems, rules and regulations to discourage urban sprawl.**

- Policy 5.1 The City Community Development Department will ensure that water management criteria are utilized that discourage urban sprawl.
- Policy 5.2 The City of Dania Beach shall work with Broward County and partner agencies, to adapt the built environment to the impacts of climate change through planning and development practices that reduce impervious area run-off and improve upon the capture, treatment and use of rainwater for aquifer recharge, and as an alternative water supply.
- Policy 5.3 The City of Dania Beach shall continue to maximize

the use of stormwater management system facilities so as to encourage compact urban growth patterns.

**Objective VI**

**The City shall try to discourage the further spread of salt water intrusion.**

Policy 6.1 The City shall work with Broward County and SFWMD to ensure aquifer recharge.

**F. Implementation Procedures**

The Community Department shall monitor the goals, objectives and policies continuously to assure their accomplishment. A yearly report shall be published to measure the achievements attained and to identify deficiencies. Adequate measures will be taken to assure in correction of identified deficiencies.

## **IV. POTABLE WATER SUB-ELEMENT (WATER SUPPLY PLAN)**

### **A. Introduction**

The water supply projects proposed in the water supply plans for Public Water Supply utilities are useful to local governments in the preparation of their Water Supply Facilities Work Plans. As of June 2012, 90 percent of all local governments within the SFWMD have developed and formally submitted their Water Supply Facilities Work Plans, many with the technical assistance of the SFWMD.

Since the previous water supply plan updates, the national economic downturn has slowed residential and commercial development, and in turn, overall population growth, leading to a reduced rate of increase in future urban water demands. Although population growth has been slower than previously projected, the growth is such that additional water supplies over the 20-year planning horizon will likely be required in many areas. This reinforces the need for local governments to develop alternative water sources to ensure adequate future water supplies. In central Florida, future projections indicate that groundwater availability is insufficient to meet the region's growing demand.

Recent drought conditions and water shortages have emphasized the need for efficient water use. South Florida experienced severe drought conditions between 2006 and 2009. In response to these dry conditions, water levels in many groundwater monitor wells in south Florida were at the lowest 10th percentile in history. The SFWMD issued water shortage orders in various basins placing water users, including public water suppliers, under water restrictions to reduce demand and stretch remaining water supplies. After this historic water shortage, the SFWMD evaluated the water savings that resulted from phased water restrictions. A marked decrease in both indoor and outdoor water use occurred in response to water shortage restrictions, even though the restrictions mainly addressed outdoor uses. Consumer behavior changed with each subsequent water shortage order to follow the modified restrictions. The effectiveness of water shortage rules increased when messaging and enforcement were consistent on both regional and local levels. These results suggest that a consistent culture of water

conservation, efficiency, and water conserving technology is key to maximizing water savings and effecting long term change. Water conservation continues to be an effective way to maximize existing water supplies, and to further its efforts, the District developed its Comprehensive Water Conservation Program.

In addition, the SFWMD established an Interdepartmental Climate Change Group to better understand climate change and provide a high-level foundation for future discussions about water management planning and operations. The group's initial mission was to review scientific literature and prepare a climate change white paper to guide water management decisions. Long-term data show increasing temperatures and a corresponding sea level rise. The Florida Oceans and Coastal Council believes the area from Miami to Palm Beach, located within the Lower East Coast (LEC) Planning Area, to be particularly vulnerable to saltwater intrusion into freshwater supplies. Monitoring and detailed analysis are needed to identify the impact of potential sea level rise on utility wellfields at risk of saltwater intrusion.

In both Broward and Miami-Dade counties in the LEC Planning Area have initiated studies to help with this determination. Monitoring and studies are also needed for areas at risk within the Lower West Coast Planning Area. Temperatures are anticipated to continue increasing at a rate of about 0.4°F per decade. This change will likely foster an increase in evapotranspiration (ET). Surface water storage from lakes, reservoirs, ponds, rivers, and canals will have higher evaporation losses than current ET levels. Water demands for most water use categories can be expected to rise as temperatures increase. Projections for effects on average annual rainfall are varied. Some models predict a wetter south Florida and some predict a drier climate, increasing or decreasing by as much as 20 percent. A rainfall decrease will increase the demand for water, lower groundwater levels, and increase the risk of saltwater intrusion. An increase in rainfall could mean more water will be available for storage with higher groundwater and surface water levels. Changes in rainfall timing, intensity, and frequency will also affect water supply. Longer periods of dry weather could cause more frequent droughts and increased water demand.

As a result, the regional limitations in water supply can affect utilities by decreasing withdrawals from both the Surficial Aquifer

System and surface water from Lake Okeechobee. As noted in the LEC plan, water conservation continues to be relied upon, although the City notes that reliance only on per capita use and a means to potentially delay or perhaps avoid adding capacity penalizes communities with growing economic bases, like Dania Beach. The LEC suggested that use of reclaimed water continues to be an important alternative source in the region and helps to meet requirements of the 2008 Leah G. Schad Ocean Outfall Program, but the application to the City of Dania Beach is limited.

### Summary of Water Supply Plan (SFWMD)

The South Florida Water management District approved its 2011-2014 Water Supply Plan update in September 2013. All utilities are required to update their plans within 18 months of that date. The intent to the District's water supply plan is to coordinate with local utilities to identify future water supplies. The need to plan for water supply needs has been an issue for many years. The first coordinated efforts began with the model water code approve as the Florida Water Resources Development Act of 1972 and subsequence establishment of the water management district.

In this latest plan the District raises water source options and water conservation. This chapter outlines a number of water supply sources, along with some related costs, including:

1. Groundwater Sources - Water withdrawn from beneath the surface of the ground, primarily from the surficial aquifer system (SAS), intermediate aquifer system (IAS), and Floridan aquifer system (FAS).
2. Surface Water - Lakes, rivers, and canals are surface water bodies used to supplement water supply.
3. Seawater - Sources of desalinated water in south Florida are the Atlantic Ocean and Gulf of Mexico.
4. Reclaimed Water - Water reused after receiving at least secondary treatment and basic disinfection, flowing out of a domestic wastewater treatment facility.
5. Storage Solutions - Three major types of potential storage options in the SFWMD are Aquifer Storage and Recovery (ASR), regional and local retention, and reservoirs.

6. Utility Interconnects - Public Water Supply interconnection of treated or raw water distribution system as a means to address shortfalls.

The City of Dania Beach has considered all of these options as included in more detail herein. Quickly the results are:

1. Groundwater Sources – the City relies of water from its wells and the County’s wells drilled into the Biscayne aquifer, a surficial aquifer system (SAS). The intermediate aquifer system (IAS) is not available. The Floridan aquifer system (FAS) would require a deep injection well for concentrate and as a result does not make economic sense.
2. Surface Water – The City has no lakes, rivers, and canals are surface water bodies used to supplement water supply. One City option for water supply is an infiltration gallery that could pull water from a rock pit.
3. Seawater – The City is not in a location to take advantage of this option and the energy and concentrate disposal costs are prohibitive.
4. Reclaimed Water – The City does not operate a wastewater treatment facility. The City has discussed reclaimed water with Hollywood, and has installed piping in the event Hollywood extends pipelines to the City limits. However Hollywood has limited freshwater supplies
5. Storage Solutions – The City has remained a partner of the C51 reservoir. There are no other reservoir options. The City has limited means for retention locally. ASR does not appear to have a very successful track record in much of southeast Florida (Boynton Beach being the biggest success) and the scale of the operation required would make the City a bigger water user than it is now.
6. Utility Interconnects – The City has interconnects.

More details on the issues that City is pursuing are found in the following pages.

Withdrawal of raw water from the aquifer is governed by the South Florida Water Management District. The Broward County Public Health Unit is charged with the responsibility of approving distribution systems and overseeing the operation of treatment facilities. The Broward County Environmental Protection and

Growth Management Department is responsible for implementing wellfield protection protocols to protect wellfields throughout the county.

## **B. Existing Conditions City Water System**

The Charter of the City of Dania Beach provides for a Public Services Department, which includes Public Works and Utilities which is responsible for the potable water treatment system and distribution system. The department's task is to assure the residents of the City with a safe, quality drinking water to half of the current corporate limits, east of Ravenswood Road. The areas west of Ravenswood Road are served by Broward County.

The City's initial wells were installed near the current water plant along the Florida East Coast railroad. Use of these wells has been discontinued due to high levels of chlorides in the water, and the wells were abandoned in 2007. In 1985, two new wells were installed (referenced as Wells G and H) on the west side of the City near Ravenswood Road west. Well "G" is currently in use. Well "H" was converted to a monitoring well in 2010. These wells were restricted due to saltwater intrusion although it appears that the chloride content of the raw water is diminishing slightly with time and responds to rainfall. The City continues to test for salt water intrusion monthly basis in both the production well and adjacent monitoring wells.

The capacity of the two 65-foot deep wells was 2100 gpm each. The wells were rehabilitated in 2003 (H) and 2005 (G), which reduced capacity to 1400 gpm in each. Since then, Well H has been converted to a monitoring well. Well G remains at 1400 gpm, but normally operated at 700 gpm or less. The City's hydrogeological consultant suggested that the City might be able to recapture firm capacity by drilling a third well southwest of the existing wells on Stirling Road. Investigation was initiated during the 2007 budget to find more water, but suitable water quality was not found to the north or west. As a result the City reconsidered its options to increase raw water from the County, altered current withdrawal practices and is considering infiltration or horizontal wells.

The City has installed a new, shallower well at the site of Well G (nomenclature Well "I") in 2011. The new shallower well will reduce the potential for saltwater intrusion. Well "I" has an open



hole 40-61 ft below land surface. It's maximum withdrawal rate is 700 gpm, but is normally run at half that due to screening. The City has done some preliminary modeling of its wells, which it is sharing with the County.

The County commissioned a study for the implementation of a regional wellfield facility in the late 1980s. This report indicated that the Dania Beach wells were at their peak capacity and that a regional wellfield would provide the long-term permanent solution. The Broward County raw water agreement was executed in June 1990 between the City of Dania Beach and the County. An addendum was issued in 1994 because no water had been delivered by that date. See Appendix A: Broward County Raw Water Agreements. The concept was to permit several eastern communities, Dania Beach, Hallandale and Hollywood among them, to draw raw water from a new western wellfield to replace lost capacity in the eastern wellfields. The agreement has the following provisions:

- Defined the service area – limiting Dania Beach to the then-City limits.
- Created a Large User Advisory Board that was to meet regularly
- Determined that the County would construct the wellfield and all appurtenances
- Defined a rate methodology for the raw water
- Defined meter locations, readings, meter inaccuracies and a dispute resolution
- Requires a 10% renewal surcharge for wellfield maintenance
- Reserves certain flows for each user

The County used Certificates of Participation, paid off via General Fund revenues, to construct the regional 21 MGD wellfield. The wellfield came on line in 1994 with an installed capacity of 21 MGD. The South Florida Water Management District permitted the wellfield at 14.9 MGD average daily flow and 21 MGD maximum daily flow. The City's agreement with Broward County permits it to withdraw up to 1.12 MGD of raw water from the southern regional wellfield (Brian Piccolo Park (BPP) wellfield). The intent has been for the wellfield to be incrementally increased in flow until fully allocated. The City has planned on the BPP supply as its long-term raw water solution which is a situation that may be changing due to the SFWMD's rules.

The City has a lime softening treatment plant with a nominal capacity of three (3) million gallons per day and a nanofiltration plant completed in 2011 with a nominal capacity of two (2) million gallons per day. The water treatment plant is supplied with raw water via a sixteen (16) inch diameter raw water line.

The lime softening water treatment plant was built in two phases in 1952 and 1964, and was renovated in 1991 and 2013. The filter rehab is expected to be completed in 2015. The plant operates well and is in good condition except for the filters. It is expected that the plant will operate satisfactorily for approximately twenty years without major replacements. The City of Dania Beach Water Treatment Plant has the following characteristics for 2014:

Average Daily flow	2.3 million gallons / day
Peak flow	2.8 million gallons / day
Design flow (ADF)	5.05 million gallons / day
Estimated Remaining Life	20 years

The City has 384,000 gallons of storage in its clear wells. A new 2 million gallon ground storage tank was completed September 2008. The plant operates twenty-four hours per day.

The City's base water usage is expected to grow minimally over the near term as there are few areas the City can extend service to that are not already served. Hence any increase flows will be generated in the current service area as a result of commercial development.

However, the City is poised for major redevelopment in subsequent years as a result of the City's Regional Activity Center (RAC) district and Community Redevelopment Agency (CRA) . Currently developers are interested in a series of properties in the corridor and development could come on line after 2016. The RAC will permit 4,300 new units in the City, most of which will be along Dania Beach Blvd and US 1 (City service area). The support documentation for the current water use permit and prior comprehensive plan amendments contained detailed data on how these units are expected to come on line. The 2008 economic downturn has delayed the start data. For the purposes of this plan update, the prior demands have been

shifted forward 5 years. Noticeable increases in the number of units is now expected to start coming on line by 2020 (as opposed to 2015, and at a slightly lesser pace. The water use of these units (residential plus commercial) is expected to average 250 gallons per day per unit as a result of the construction being primarily multi-family with limited irrigatable area. Between now and 2030, the City's water usage is expected to increase by 0.85 MGD as a result of the RAC. This has been included in the population projections for the City's current and expanded RAC.

There are two issues regarding water supplies for the future growth in the City as a result of the RAC. The first is the quantity of water available for treatment. Because people in urbanized South Florida use groundwater supplies that are replenished directly by summer rainfall, the quantity of water available is finite and the quality must be protected for the end users - the public and the ecosystem.

The South Florida Water Management District issues water use permits based upon availability of the resource. These withdrawals limit both annual average and maximum daily withdrawals from the aquifer by the utility.

The City's current water use permit No. 06-00187-W allows for 1.1 MGD to be withdrawn from the City's two wells (G and H) as a result of restrictions imposed by the South Florida Water Management District under their water resource availability rule approved in 2007. This necessitates the City obtaining additional water from the County since its prior permit was 2 MGD.

The City purchases raw water from Broward County. The allocation was 1.12 MGD. Broward County has committed to an additional 0.6 MGD through 2015, which provides the City with a total of 1.72 MGD of raw water. Thereafter the City will provide a total of 2.52 MGD (see letter from Ms. Bertha Henry dated August 13, 2010 located at the end of this document). Between the City and County supplies, the total raw water supply will be 3.62 MGD through 2012. With the additional flows agreed to in Ms. Henry's letter, the City will be able to meet its short term needs as well as its 2030 demands.

The City is participating in Broward County's modeling efforts of southeast Broward County (\$43,000 allocated in 2010), so extending the model to details of the City's wells will be

straightforward. Incorporated into the model will be an evaluation of safe yield and the potential for skimming water off the top of the aquifer for future use in modeling a horizontal well. The results of that effort are incomplete.

As the City reads the Regional Water Availability Rule, the intent is to limit water demands on the Everglades recharge area for the Biscayne aquifer. This impacts the County water supply. The rule permits utilities to harvest local water that is rainfall driven as long as the withdrawals do not impact the regional conditions and all other permitting requirements are met (pollution, impact on wetlands or other users). The City is among the limited number of utilities that is positioned to take advantage of direct rainfall harvesting. The City is located east of the salinity structures and as a result all shallow groundwater is rainfall.

The City will investigate additional water supplied based on the concepts of a Ranney<sup>®</sup> or horizontal collector well. Such wells comprise a central concrete caisson – typically 16 feet in diameter – excavated to a target depth as which well screens project laterally outward in a radial pattern. In a practice referred to as riverbank filtration, the wells are designed to induce infiltration from a nearby surface water sources, combining the desirable features of groundwater and surface water supplies (see Figure 1).

The concept for the radial collector well was originally used for development of oil using first a horizontally-drilled borehole into an oil-producing formation, followed by development of a vertical shaft with multiple horizontal boreholes drilled out laterally into the oil shales. The inventor, a petroleum engineer named Leo Ranney, first drilled horizontally for oil in the early 1920s in Texas, then later in Ohio and Pennsylvania. The theory is that a horizontal borehole could expose more of the oil producing formation, and thus develop higher quantities of oil for a given well site. As oil prices in the United States dropped in the 1930s, Mr. Ranney applied this concept to developing water supplies from alluvial aquifers.

The first Ranney<sup>®</sup> water collector well was constructed for the London Water Board in London, England in about 1933. Mr. Ranney then took this technology to Europe before returning to the United States in 1936 and installing the first water collector

well in the country in Canton, Ohio. Since then hundreds of Ranney® collector wells have been constructed all over the world. These high-capacity wells offer an alternative to fields with many vertical wells. USEPA even denotes their place in surface water filtration section of the Long-Term II Surface Water treatment rule.

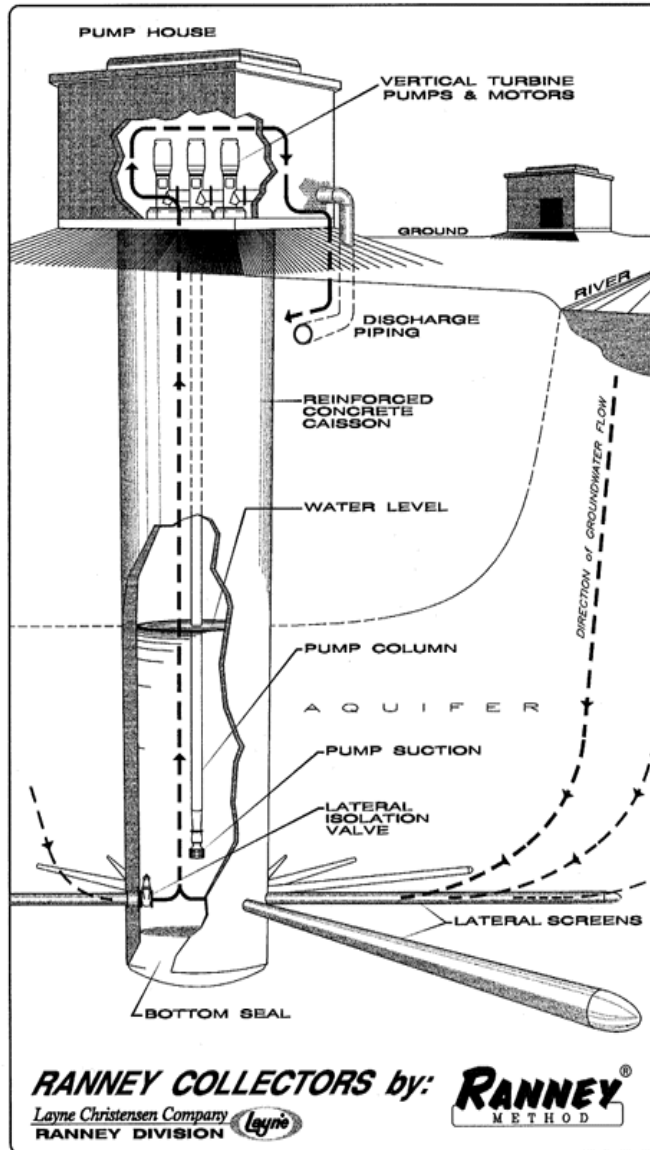


Figure 1 Ranney Collector Well

The concept is similar to skimming efforts that used by island communities to skim freshwater from thin lenses above saltwater interfaces. The technology is ripe for investigation in Florida, but currently no such wells have been installed because

vertical wells are so productive and until recently, saltwater intrusion has not been the driving issue.

In the past, Ranney® wells have been categorized by some state agencies as surface water sources because of their proximity to rivers and reliance on induced infiltration. Municipal water supplies that use Ranney® wells designated as ground-water under the direct influence of surface water must decommission the wells, or upgrade treatment facilities and operator certifications to meet surface water treatment requirements. In most cases, upgrading a well presents operational and/or financial limitations the purveyor cannot overcome. The Surface Water Treatment Rule has a specific section dedicated to Ranney® wells.

The City is in discussions with the Layne, who acquired the Ranney Collector Well group to evaluate the ability of a Ranney® well to skim water off of the sands above the Biscayne aquifer, while creating minimal drawdown that will prevent saltwater intrusion and upconing (which is an issue for the City), and shallow enough that the Biscayne Aquifer/Everglades is not affected. Comparing Figures 2 and 3 and the potential drawdown. The horizontal configuration has an ancillary benefit of reducing the potential for upconing of saltwater by lessening drawdown effects. Ongoing research at FAU will provide preliminary modeling results.

The City has discussed with the SFWMD a plan to test the wells in situ to determine pumping parameters. The City initiated the Ranney® well investigation in 2010 expects to move toward a test program by 2025 which will provide sufficient time to evaluate the ultimate potential capacity of such a system. The City expects that testing the concept will involve up to 2-3 years of effort and involve modification to the water use permit. The modification will include a plan, drawing, modeling and utilization of the raw water. The Broward County Public Health Unit has been asked how this water will be classified during testing to that it can be used in the treatment process and is partially driven by regulatory issues. The concept is expected to be fully tested by 2030 so that it can be utilized at such point as additional demands are needed.

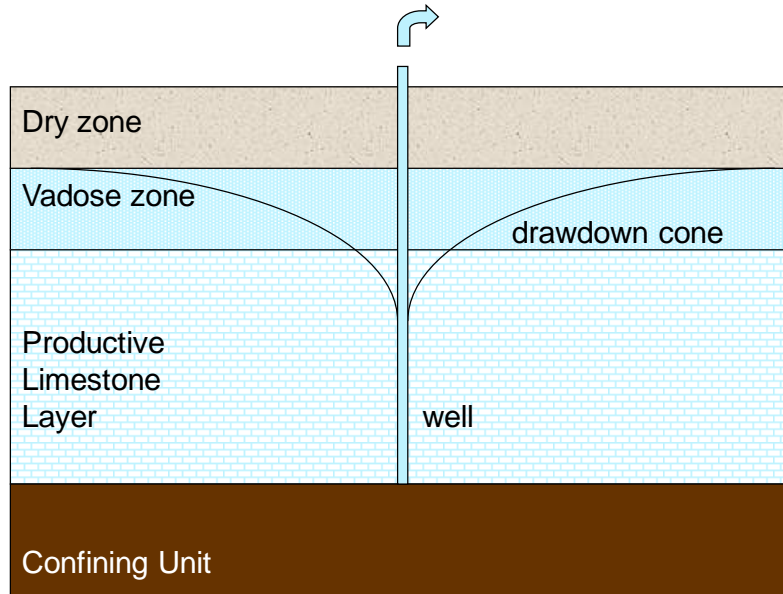


Figure 2 – Normal drawdown for vertical well

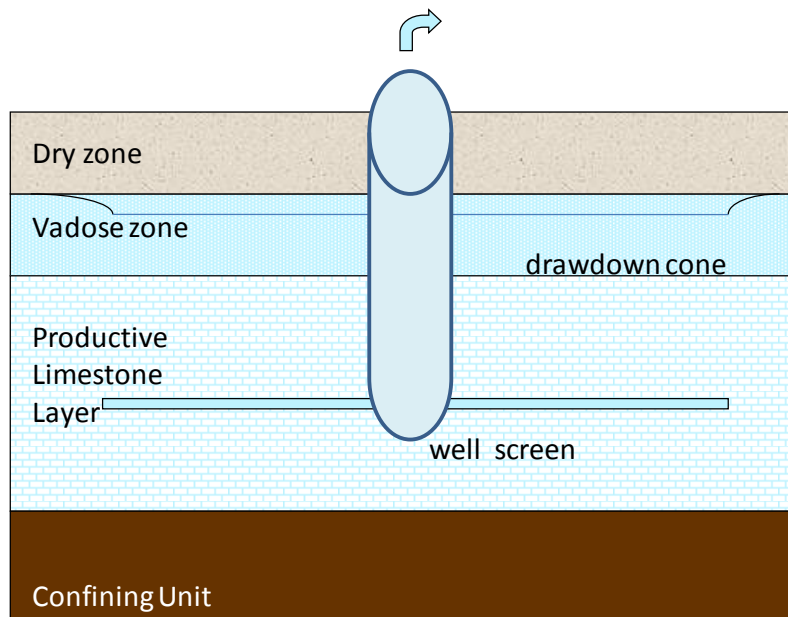


Figure 3 – much smaller drawdown with horizontal wells

Water supplies beyond those deliverable by a horizontal collector well would require the City to consider acquisition of more raw water from the Brian Piccolo sources is available, potable water from Hollywood, or participate in a yet-to-be-identified regional

solution such as the C-51 reservoir project.

The City has an existing, recently updated emergency agreement with the City of Hollywood for potable water. The C-51 reservoir project might provide recharge to the Brian Piccolo wellfield, which would potentially increase available water supplies from the County beyond 2030. The funding and operation of the C51 reservoir are many years away and there remains uncertainty with the project. However, the City wants to secure multiple water supply opportunities to secure its water supply future.

The City and County have created a Community Redevelopment Area (CRA) that covers eastern half of the City. The CRA plan calls for adding 1.3 million square feet of retail and office space plus 4,300 mixed use units over the coming 20 years with much of the commercial activity in the next 10 years. Table 5 summarizes how these units are expected to come on line. Note Table 5 updates the original projections submitted for the comprehensive plan amendments in 2010, the water use permit issued in 2012 (No. 06-00187-W) and the Stipulated Settlement Agreement between the City and DCA, authorized by Resolution #2010-0174, and Remedial Comprehensive Plan Amendment #10-R1, adopted by the City with Ordinance #2010-022 because the economic downturn delayed redevelopment of any type for about 10 years. The updated Table 5 uses population increases in the City that track the latest data for TAZ zones from Broward County, plus the CRA units overlain upon them, based on the prior documents. The unit numbers are a decrease from 2012 because of delays in the redevelopment.

It should be noted that a major portion of the commercial redevelopment is expected to come on line by 2020 as a result of a new 100 ac development that will replace the old Boomer's which was closed 1/25/2015). This development may include 1 million of those square feet of commercial space. In addition residential, mixed use and hotel properties will be included. The City's per capita water use will increase because more water use is non-residential.

The current policy calls for 300 gpd/single family unit or ERC although the actual value is more like 250 gpd/ERC. This value is used in Table 5 (see Table 5a at end of the element for more details). For new CRA units, the gpd/ERC has been revised downward to 200 gpd/ERC due to the new plumbing standards the City has adopted as a water conservation measure (see also Table 5A), The new mixed use condos are expected to average 2 people per unit, which is in keeping with the current per unit population in the City.



The commercial property creates a bigger issue as it is poised to add over 0.5 MGD of flow by 2030. Commercial use is included in per capita use, but because the commercial use may not be related to residences (visitors and economic growth), the per capita use may be driven upward as a result, especially since it will likely precede the bulk of the residential development.

The estimated flow estimates are based on the usage estimates from the comprehensive plan below, taken from the Department of Health. However, commercial property is notorious for using less water as usage patterns settle. The City has in place the water conservation ordinances and polices recommended by the District, including low flow fixture requirements. Irrigation will not use potable water (wells are more likely). Hence the City anticipates that an overall commercial estimates are high, but are currently in keeping with and the Stipulated Settlement Agreement between the City and DCA, authorized by Resolution #2010-0174, and Remedial Comprehensive Plan Amendment #10-R1, adopted by the City with Ordinance #2010-022. The City will look to adopt a LOS for commercial property of 0.25 g/sf or commercial building space based on results of the current planned development.

Unaccounted for water use was 5% in 2014.

**Table 5  
 Current and Potential Water Supplies**

Year	Population	Finished Water Per Capita Usage (GPD)	Total Finished Water Demands (MGD)	Total Raw Water Demands (MGD)	Raw Water ADF (MGD) (City)	Raw Water (ADF) (MGD) (County)	Additional Raw Water (ADF) (MGD) (County)	Total County Water Supplies (MGD)	Total Water Supplies (MGD)
2015	17615	132.4	2.33	2.47	1.10	1.12	0.25	1.37	2.47
2016	17811	132.8	2.37	2.51	1.10	1.12	0.29	1.41	2.51
2017	18007	134.5	2.42	2.57	1.10	1.12	0.35	1.47	2.57
2018	18296	134.7	2.47	2.61	1.10	1.12	0.39	1.51	2.61
2019	18487	136.0	2.51	2.66	1.10	1.12	0.44	1.56	2.66
2020	18775	140.3	2.63	2.79	1.10	1.12	0.57	1.69	2.79
2025	20114	145.5	2.93	3.10	1.10	1.12	0.88	2.00	3.10
2030	22022	144.0	3.17	3.36	1.10	1.12	1.14	2.26	3.36

Based on Table 6, the City has no issues with water supplies until after 2030. These projections include an assumption of significant downtown growth occurring. If this growth does not occur, the water supply issue will be delayed beyond 2030. 2030 is also a point when the City starts to evaluate treatment needs and regulatory requirements of its existing lime softening system.

The City of Dania Beach follows the standards established by the Broward County Public Health Unit and the City to determine the adequacy of potable water services.

1. Dwellings:  
Each Single Family Unit = 1 ERC
2. Condominium:  
3 bedroom 300 gpd 1 ERC  
1&2 bedroom 250 gpd 0.71 ERC
3. Motel/Hotel:  
150 gpd per room/200 gpd per pool  
350 gpd per mgr. apt.
4. Mobile Home:  
100 gpd per space
5. Office  
0.2 gpd per square feet
6. Retail:  
0.1 gpd per square foot
7. Laundries:  
400 gpd per machine
8. Bar (no food service):  
20 gpd per seat
9. Restaurants:  
24 hour - 50 gpd per seat (Including bar)  
Less than 24 hours -30 gpd per seat (Including bar)

10. Theaters:  
5 gpd per seat
11. Assembly Hall:  
2 gpd per seat
12. Park  
10 gpd per person
13. Factories:  
15 gpd per person per shift
14. Institutions:  
100 gpd per person
15. Church:  
7 gpd per seat
16. Service Station:  
Full Service Station  
    First Two Bays - 750 gpd  
    Each Additional Bay - 300 gpd  
    Per Fuel Pump - 100 gpd  
  
Self Service Station  
    Per Fuel Pump 50 gpd
17. Elementary School:  
10 gpd per pupil  
5 gpd per shower per pupil  
5 gpd per cafeteria per pupil
18. High School:  
15 gpd per pupil  
5 gpd per shower per pupil  
5 gpd per cafeteria per pupil
19. Hospital and Nursing Home:  
200 gpd per bed  
100 gpd per staff
20. Warehouse:  
0.1 gpd per square foot

### **C. Existing Conditions County Water System**

The City of Dania Beach does not control the water system in the western part of the City. This service area is known as the Broward County 3A service area. The area is served by Broward County. The area was annexed into Dania Beach and Hollywood in the early 1990s.

Broward County operates three service districts know as Districts 1, 2 and 3. All three operating Districts are managed financially as one utility; with one set of rates, fees and charges. Operating and general maintenance costs are recovered through service charges, connection charges, and miscellaneous fees and charges. Capital costs for system development, large maintenance project and renewal and replacement projects are funded through net revenues, bond proceeds, developer contributions, contributions from other municipalities and capital recovery charges. User charges and fees are established by BCWWS and approved by the Board of County Commissioners. The Board has specific legal authority to fix charges and collect rates, fees and charges from its customers and to acquire, construct, finance and operate the Utility.

District 3 service contains portions of the cities of Dania Beach, Davie, Fort Lauderdale, Miramar, West Park, Pembroke Park, Pembroke Pines and Hollywood; and provides water to the Fort Lauderdale-Hollywood International Airport. BCWWS\_has the responsibility to determine if it can adequately serve existing and potential customers.

BCWWS Land Development Standards contain\_the methodology currently used to determine if the level of service standard can be met. BCWWS changes the methodology administratively from time to time as new information becomes available.

District 3 does not have raw water supply facilities. The County has entered into an agreement with the City of Hollywood whereby the City provides treated water to this district. The City of Hollywood is responsible for ensuring adequate raw water supply and treatment facilities. The City's existing CUP (Permit No. 06-00038-W) was issued by SFWMD on April 9, 2008 and expires April 9, 2028. The permit contains sufficient allocation to

meet demands through the year 2028. BCWWS coordinated closely with the City during its CUP renewal process to ensure that future demands for District 3 were adequately addressed.

The City of Hollywood has a 37.5 MGD facility. The City of Hollywood treats Biscayne water from their new wells, the County's Brian Piccolo wells and their own Floridan wells. The Floridan wells are considered an alternative water supply and are not affected by the water use permit restrictions. As a result, the City of Hollywood is pursuing additional Floridan water supplies to meet the demands of their customers, including their obligations to serve the 3A service area. The City expects to be fully compliant with water use needs for the 2025 horizon in the next 10 years (see Table 5.3 of the City of Hollywood's approved water supply plan which shows additional Floridan wells as their water supply solution). At present the South Florida Water Management District is reviewing their water use permit application as well. The existing water supply agreement between the City of Hollywood and County for customers within the City of Dania Beach (but served by the County) indicates that the City must make the plans and provisions to secure the 3A demands. The City of Hollywood is planning to address the future demands with Floridan wells which are being drilled at this time. This area of the City is served through the Broward County 3A facilities by the City of Hollywood. Agreements are attached as Appendix B: Hollywood Water Supply Agreements, and reflect the service that the City of Hollywood provides to Dania Beach.

The City of Hollywood's Water supply Plan was adopted by Ordinance # 0-2008-27 on November 5, 2008 and the plan was found in compliance by FDCA on January 2, 2009.

The City of Dania Beach hereby adopts by reference the Water Supply Facilities Work Plan dated January 13, 2015 by Broward County and approved February 26, 2015 by the Department of Economic Opportunity. That Work Plan addressed issues that pertain to water supply facilities and requirements needed to serve the current and future development within their service area. Broward County reviews and updates its plan every 5 years or within 18 months of updates by the District, whichever comes first. Any change affecting the Work Plan will be included in the annual Capital Improvements Plan update to ensure consistency between the Potable Water Sub-element and the Capital Improvement Plan.

From the County's adopted water supply plan, the following is proposed at this time (Broward County, 2008)

Table 6  
District 3A Projected Population and Finished Water Demand Potential  
2015 - 2040

<u>Year</u>	<u>Projected Population*</u>	<u>Finished Water Demand Potential (Average Day in MGD)</u>	<u>Finished Water Demand Potential (Max. Day in MGD) **</u>	<u>Overall Per Capita Demand (GPD)</u>
<u>2015</u>	<u>16,298</u>	<u>3.21</u>	<u>4.49</u>	<u>197</u>
<u>2020</u>	<u>17,014</u>	<u>3.3</u>	<u>4.69</u>	<u>197</u>
<u>2025</u>	<u>17,442</u>	<u>3.4</u>	<u>4.81</u>	<u>197</u>
<u>2030</u>	<u>17,962</u>	<u>3.53</u>	<u>4.95</u>	<u>197</u>

<u>Year</u>	<u>Projected Population*</u>	<u>Finished Water Demand Potential (Average Day in MGD)</u>	<u>Finished Water Demand Potential (Max. Day in MGD) **</u>	<u>Overall Per Capita Demand (GPD)</u>
<u>2015</u>	<u>16,298</u>	<u>3.231</u>	<u>4.49</u>	<u>197</u>
<u>2020</u>	<del>16,960</del> <u>17,014</u>	<del>3.345</del> <u>3.4</u>	<u>4.69</u>	<u>197</u>
<u>2025</u>	<del>17,451</del> <u>17,442</u>	<del>3.443</del> <u>3.4</u>	<del>4.781</del> <u>4.81</u>	<u>197</u>
<u>2030</u>	<del>17,9623</del> <u>17,962</u>	<del>3.543</del> <u>3.53</u>	<del>4.895</del> <u>4.95</u>	<u>197</u>

\* Based on 2014 BCPRD TAZ estimate translation to UAZ populations

\*\* Based on a maximum day to average day ratio of 1.37

**D. Analysis of Existing Conditions**

The following chart gives the demands for the City of Dania Beach:

Table 7 Dania Beach Water Demand v. Supply						
	City Service Area Demand vs Supply			County Service Area Demand vs Supply		
Year	Population	Avg Flow MGD	Total Water Supply Available	Population	Avg Flow MGD	Total Water Supply Available from Hollywood
2015	17615	2.33	2.47	16,298	3.21	4.49
2020	18775	2.63	2.79	17,014	3.3	4.69
2025	20114	2.93	3.10	17,442	3.4	4.81
2030	22022	3.17	3.36	17,962	3.53	4.95

\*Note County service area flow projections per capita are substantially higher than the City service area as a result of the County providing service estimated to exceed 1.5 MGD to the Fort Lauderdale-Hollywood International Airport and ancillary commercial and industrial complexes associated with the airport.

### E. Water Distribution

The City of Dania Beach's water distribution system consists of approximately sixty (60) miles of pipe with diameters varying from six (6) inches in diameter to twenty (20) inches in diameter. The distribution system of the City has been analyzed by hydraulic analysis and three areas of the City were determined to have weakness, the extreme southeast area, the area north of the Dania Cut-Off Canal known as Melalucca Gardens and the area north and south of the Dania Cut-Off Canal in the extreme eastern part of the City. This analysis was performed both for present demands and build out demands utilizing an average per capita consumption of 100 gallons per day; a maximum day factor of 1.6 and a peak hour factor of 3.2. Fire flow was established at 1,500 gallons per minute. The distribution system weaknesses in the extreme southeast area of the City have already been corrected.

The District 3A transmission and distribution system contains approximately 94 miles of pipe. The capacity of the system to handle existing and projected demands was determined by BCWWS using water distribution system hydraulic modeling. To correct identified deficiencies, BCWWS is implemented a major



water system rebuilding effort in District 3A, which included rebuilding substantial portions of the water and wastewater systems and providing wastewater service to those on septic tanks. The projects are anticipated to be completed by the year 2013 at an estimated cost of \$50 million. BCWWS maintains water system interconnections with the systems of the Cities of Fort Lauderdale, Hollywood and Dania Beach. These interconnects are used for emergency purposes.

## **F. Future Water Supplies**

The City does not need additional water supplies until 2030. However that does not mean it will not work toward future water supply solutions. The City will implement the following to secure additional water:

- Groundwater Sources – the City relies of water from its wells and the County’s wells drilled into the Biscayne aquifer, a surficial aquifer system (SAS). The intermediate aquifer system (IAS) is not available. The Floridan aquifer system (FAS) would require a deep injection well for concentrate and as a result does not make economic sense.
- Investigate additional well locations in the City’s current wellfield. This will require drilling of test wells, additional monitoring wells (completed 2007) and modeling of proposed locations to determine if additional raw water is available in Dania Beach. IThis investigation was complete in 2011.
- 
- The City is among the limited number of utilities that is positioned to take advantage of direct rainfall harvesting. The City is located east of the salinity structures and as a result all shallow groundwater is rainfall. As a result the City has begun investigation of the installation of a horizontal collector well that would harvest direct rainfall. The City plans to complete the horizontal collector well investigation and modeling by 2025 which will provide sufficient time to evaluate the ultimate potential capacity of such a system. Assuming direct rainfall harvesting is demonstrated with the horizontal collector well concept, the City will proceed with permitting and construction by 2030. At this time the City continues to monitor potential efforts in southeast Florida regarding horizontal collectors.

Whether the horizontal collector well is successful or not, the City will participate with the County of efforts to recharge the County wellfield on a utilization basis. This may include additional wells, storm water recharge, the C-51 reservoir and/or reuse recharge. As a result, the City is in the process of working with Broward County and internally on creative solutions to resolve any future shortfalls. Alternative water sources are to be pursued, but the City has no ability to pursue desalination or reuse (no injection well and no wastewater treatment plant).

- Assuming direct rainfall harvesting is demonstrated with the Ranney Well concept, the City will proceed with permitting and construction by 2030. The horizontal well concept is direct rain harvesting as it is shallow (above the Biscayne aquifer). In addition the concept could be applied to the rock pits along I-95 as a surficial supply (subject to riverbank filtration rules under the LT2 surface water rules).
- Participate in the southeast Broward County modeling project with the County that should be completed by 2015. The intent of this modeling is to determine that safe yield of the County wellfield and potential supplies in Dania and other cities.
- Participate with the County on efforts to recharge the County wellfield on a utilization basis. This may include additional wells, storm water recharge or reuse recharge. At this time the appropriate solution cannot be determined, since the solution is within the County's purview. While the City does not need additional water supplies until 2030. As a result, the City is in the process of working with Broward County and internally on creative solutions to resolve any future shortfalls. Alternative water sources are to be pursued, but the City has no ability to pursue desalination or reuse (no injection well and no wastewater treatment plant).
- The City has neither effluent nor a wastewater treatment plant to address the water supply issue. However the City has installed pipelines that can be converted to reclaimed water if lines are extended by the City by Hollywood. The City has discussed the potential to irrigate two cemeteries,

the US 1 median, linear park and potentially Frost Park. The total reclaimed water use is under 0.2 MGD. The current pipes are over 2 miles away so the cost of this option is not appealing to the City. Also note that the City's residents rely on irrigation wells versus potable water so reclaimed water use will have limited impact of the City's potable water use.

- The City will remain involved in the C-51 project. This is a multi-jurisdictional project that is expected to provide long-term benefits by recharging canal systems in the western part of the County, including the County wellfield. The ongoing efforts remain in the planning stages. The City does not anticipate needing this water, but remains involved as a backup to other options with the County and the horizontal collector.
- ASR does not appear to have a very successful track record in much of southeast Florida (Boynton Beach being the biggest success). The typical ASR well injects 1 MGD. That is 50% of the City's current output. The recovery in southeast Florida is poor 20-40%. This would mean the City is a net user of water due to water losses. This is not in keeping with water supply goals. ASR is not of a scale that makes sense for the City.
- If the above options fail, secure additional water from Hollywood to meet future demands. An amendment to the existing agreement would be needed. The City also has in place four (4) interconnects with adjacent utilities as follows:

City of Hollywood	2- 6 inches
	1 - 8 inches
Broward County	1 - 12 inches

## **G. Future Water Quality**

From a water quality perspective there are no needs for the City. The nanofiltration and lime softening facilities can treat up to 5 MGD, well beyond what the City has need for at this time. No upgrades are planned.

At the time, the hybrid option was the least costly and was therefore the recommended option. More recent evaluations have indicated that the difference between the options continues to widen, and that the hybrid offers the most advantages to the City. The plant can be expanded to 3 MGD with minor modifications. The nanofiltration plant will be able to treat Brian Piccolo water without issue for the foreseeable future.

**H. Economic Assumptions**

The City of Dania Beach’s primary sources of revenue for the potable water system is through rates charges to users and connection charges on unit and acreage charges as set forth in Ordinance 41-86 of the City, which are charges to new users. Other capital expenditures will utilize bond issues supported by utility revenues or low interest bank loans. The City upgraded its impact fee ordinance and policies in 2007. No level of service improvements are needed until 2030.

**I. Goals, Objectives and Policies**

Provide to the users of the City of Dania Beach a safe reliable and adequate potable water system.

**Objective I**

**Meet the service demands of the City as follows:**

<b>Table 8 Dania Beach Water Demand v. Supply</b>						
	<b>City Service Area Demand vs Supply</b>			<b>County Service Area Demand vs Supply</b>		
<b>Year</b>	<b>Population</b>	<b>Avg Flow MGD</b>	<b>Total Water Supply Available</b>	<b>Population</b>	<b>Avg Flow MGD</b>	<b>Total Water Supply Available from Hollywood</b>
2015	17615	2.33	2.47	16,384,298	3.231	4.49
2020	18775	2.63	2.79	16,960,170,14	3.345	4.569
2025	20114	2.93	3.10	17,451,42	3.443	4.781
2030	22022	3.17	3.36	17,9623	3.543	4.895

\*Note County service area flow projections per capita are substantially higher than the City service area as a result of the County providing service estimated to exceed 1.5 MGD to the Fort Lauderdale-Hollywood International Airport and ancillary commercial and industrial complexes associated with the airport.

Policy 1.1

Augment the potable water distribution system to provide fire protection of 3,000 gallons per minute with 20 psi residual pressure

Policy 1.2

Adopt as the level of service standard the following design flows as established in Ordinance 4146:

1. Dwellings:  
Each Single Family Unit = 1 ERC
2. Condominium:  
3 bedroom 300 gpd 1 ERC  
1&2 bedroom 250 gpd 0.71 ERC
3. Motel/Hotel:  
150 gpd per room/200 gpd per pool  
350 gpd per mgr. apt.
4. Mobile Home:  
100 gpd per space
5. Office  
0.2 gpd per square feet
6. Retail:  
0.1 gpd per square foot
7. Laundries:  
400 gpd per machine
8. Bar (no food service):  
20 gpd per seat
9. Restaurants:  
24 hour - 50 gpd per seat (Including bar)  
Less than 24 hours -30 gpd per seat (Including bar)
10. Theaters:  
5 gpd per seat
11. Assembly Hall:  
2 gpd per seat

12. Park

10 gpd per person

13. Factories:

15 gpd per person per shift

14. Institutions:

100 gpd per person

15. Church:

7 gpd per seat

16. Service Station:

Full Service Station

First Two Bays - 750 gpd

Each Additional Bay - 300 gpd

Per Fuel Pump - 100 gpd

Self Service Station

Per Fuel Pump 50 gpd

17. Elementary School:

10 gpd per pupil

5 gpd per shower per pupil

5 gpd per cafeteria per pupil

18. High School:

15 gpd per pupil

5 gpd per shower per pupil

5 gpd per cafeteria per pupil

19. Hospital and Nursing Home:

200 gpd per bed

100 gpd per staff

20. Warehouse:

0.1 gpd per square foot

Note the city has adopted a plumbing fixtures ordinance that restricts all new and replacement fixtures to meeting EPA's WaterSense initiative goals (1.2 g/flush, 0.5 gpf urinals and 1.5 gpm faucets).

Policy 1. 4 Maintain interlocal agreement and interconnects to

accommodate future water demands at the adopted level of service.

Policy 1.5 Prior to approval to any building permit of development, the City will consult with the appropriate water supplier to determine whether adequate water supplies to serve the new development will be available no later than the anticipated date of the certificate of occupancy.

### **Objective II**

#### **Maintain the treatment distribution and storage facilities.**

Policy 2.1 Examine rates necessary to support bond issues for the necessary improvements.

Policy 2.2 Continue to utilize the impact fees as indicated in Ordinance 41-86 for new capital expenditures.

### **Objective III**

#### **The City shall discourage urban sprawl by requiring connection to potable water system within 1/4 mile of a subdivision or within 100 feet of a residence**

Policy 3.1 New users shall be required to participate in the necessary expansion of the potable water system and existing, unconnected areas, shall be required to make the necessary connections.

### **Objective IV**

#### **Explore additional fresh raw water supplies**

Policy 4.1 The City will utilize its existing agreement with Broward County to provide traditional water sources that will be required within the 10 year planning horizon.

Policy 4.2 Investigate additional well location in the City's current wellfield. This will require drilling of test wells, additional monitoring wells (completed 2007) and modeling of proposed locations to determine if additional raw water is available in Dania Beach.

- Policy 4.3 Investigate horizontal collector well. The City shall continue to evaluate the ability of horizontal wells to skim water off of the sands above the Biscayne aquifer, while creating minimal drawdown that will prevent saltwater intrusion and upconing, and shallow enough that the Biscayne aquifer/Everglades is not affected. While this solution may be tantamount to a surface system with regard to treatment, the extensive loss of water to tide would be only partially curtained as a result of the proposed horizontal well project. A protocol for development for this type of supply will result from ongoing modeling and investigations funded in 2008-2011. Pursue by 2025 if found to be viable for on-line service by 2030.
- Policy 4.4 Participate with the County of efforts to recharge the County wellfield on a utilization basis. This may include additional wells, storm water recharge or reuse recharge.
- Policy 4.5 By 2025, develop preliminary model of horizontal collector well and by 2025 test well for production to identify a water sources and infrastructure to meet water demands beyond 2030.
- Policy 4.6 Continue to participate in the Southeast Broward County Regional Groundwater Model scheduled for completion in 2015.
- Policy 4.7 Continue to coordinate with the SFWMD's Lower East Coast Regional Water Supply Plan.
- Policy 4.8 The City shall update its comprehensive plan and work plan within 18 months of LEC Water Supply Plan updates as approved by SFWMD.
- Policy 4.9 Potable water facilities shall be designed, constructed, maintained and operated in such a manner as to protect the functions of natural groundwater recharge areas and natural drainage features and not exacerbate saltwater intrusion. without inducing the inland movement or upwelling of saline water into Underground Sources of Drinking Water (USDW) as defined in Chapter 62-528, FAC, and SFWMD



Basis of Review for Water Use as referenced in  
Chapter 40E-2, FAC

- Policy 4.10 The City of Dania Beach will protect existing wellfields, surface or subsurface storage facilities, control structures, water and wastewater treatment plants and transmission infrastructure from increased coastal flooding, sea level rise, saltwater intrusion, and other potential future climate change impacts, and plan for infrastructure replacement and relocation as needed to maintain the current level of service to customers
- Policy 4.11 The City of Dania Beach will collaborate with local, regional, state and federal partner agencies on potential impacts of climate change on the region's water resources and support the development of local integrated models and continuous data collection, to help predict and track the impacts of sea level rise on groundwater levels, saltwater intrusion, and drainage infrastructure.
- Policy 4.12 The City of Dania Beach will collaborate with local, regional, state and federal partner agencies study whether to build, modify or relocate water, wastewater and stormwater transmission infrastructure to allow for strategic retreat from areas at risk to sea level rise.
- Policy 4.13 The City of Dania Beach hereby adopts by reference the Water Supply Facilities Work Plan dated January 13, 2015 by Broward County and approved February 26, 2015 by the Department of Economic Opportunity.

**Objective V**

**The City shall implement water conservation**

- Policy 5.1 Maintain an accurate database of water consumption to reduce municipal water waste – all services in the City are metered, including all irrigation services.
- Policy 5.2 The City will enforce its ordinance to require all new and remodeled buildings to use plumbing fixtures in accordance with USEPA's WaterSense conservation program.
- Policy 5.3 The City will enforce its Florida Friendly landscaping

ordinance. The City's landscaping regulations address the planting of native and site adaptive exotic species that are suited to the normal hydrological cycle of South Florida and support the xeriscape concept.

- Policy 5.4 The City will continue its public information and education programs. The City has SFWMD brochures on water conservation and Florida Friendly Landscaping available for the public (on display).
- Policy 5.5 The City will continue its water conservation rate structure that penalizes residents using in excess of 10,000 gallons per month. The typical single family or 150 gpd/ERU. The average single family home uses 70 gpcd.
- Policy 5.6 The City requires the installation of low flow plumbing fixtures in accordance with the Florida Building Code.
- Policy 5.7 The City will provide educational literature for the public.
- Policy 5.8 The City will enforce its Land Development Code to provide for the use of rain sensors for new and retrofit of irrigation systems.
- Policy 5.9 The City will continue its a program to recalibrate large meters every two years and plant meters annually. The City changes out a number of older meters each year, depending on the age (prior change outs were not recorded).
- Policy 5.10 The City will participate with Broward County on toilet change outs. The City did 46 in 2014.

#### **Objective VI**

**To support the on-going and quantifiable communication program ensuring public water supply facilities and services, at the adopted level of service, are planned for and available concurrent with development.**

- Policy 6.1 Ensure and identify the consistency of local level of service standards by annually contacting all service providers to obtain current information, including: populations, level of services, service areas, and water supply facilities, and evaluate if future modification to either the service agreement or level of service standards should be include in subsequent Comprehensive Plan Amendments.
- Policy 6.2 Ensure and identify the consistency of local level of service standards by annually contacting all local governments in which water service is provided and provide current information, including: populations, level of services, service areas, and water supply facilities, and evaluate if future modification to either the service agreement or level of service standards should be include in subsequent Comprehensive Plan Amendments.
- Policy 6.3 Negotiate or renew interlocal agreements with water supply providers, or with local governments in which water is supplied, ensuring contractual agreement of the adopted level of service standards, service area, populations and time periods for service provided.
- Policy 6.4 In areas served or to be served where no interlocal agreements exist, provide a written summary of the adopted level of service standards, service area, populations and time periods for services to be provided and verify agreement with all providers or local governments to be served.
- Policy 6.5 With respect to adjacent jurisdictional Comprehensive Plans that are service providers to the City, review the level of service standards subsequently adopted in those amendments.
- Policy 6.7 Review the level of service standards adopted or amended by all adjacent local governments that are service providers to the County or receive water from the County.
- Policy 6.8 The City shall update its comprehensive plan and work plan within 18 months of LEC Water Supply

Plan updates as approved by SFWMD.

**J. Plan Implementation And Monitoring Procedures**

The City of Dania Beach Community Development Department shall prepare a list of goals, objectives and policies and distribute these to all affected City departments for their implementation. The Community Development Department shall be responsible for monitoring these goals, objectives and policies and determining their compliance with the plan. The Community Development Department will review yearly status reports from the Utilities and Public Works Department as to the achievements of the goals, objectives and policies and shall ensure that adequate funding is budgeted to meet the same. The Community Development Department shall immediately notify the City Manager and the City Commission of any unaddressed deficiencies so that they may be corrected

**K. 10 year Capital Plan**

The below table reflects improvements for water quality not water supply. No water supply improvements are needed within this time frame. As noted previously, the City has adequate water supply until 2030.

<b>Table 9 – Water Quality Improvements</b>					
<b>Department</b>	<b>Projects</b>	<b>FY 2014</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY</b>
Water Utilities	Water Plant Upgrade				
	Chlorine Upgrades		250,000		
	Filter Repairs		700,000		
	Construction of Horiz Test well		50,000		
<b>TOTOL</b>			<b>1,000,000</b>		

## L. Water Conservation

The City of Dania Beach approved a formal water conservation program in August 2010. The water conservation plan included requirements for Florida Friendly plants, rain sensors on irrigation systems, exclusions for irrigation systems where Florida Friendly plants are used, WaterSense plumbing fixtures and evaluation of water conservation solutions.

The City has data on residential use – divided into single family residential use, multi-family residential use and other metered users – includes all uses (commercial, industrial) other than residential accounted for by meter as shown below (from 2010).

User Group	accounts	Units	Usage/ERC	Usage/mo
Single Family	3539	3539	158	4787
Multi-Family	322	4166	134	134
Other (commercial, industrial)	596	unk	979	2270
Sprinklers	70	70	200	6000

The above shows that the average single family home uses under 4800 g/mo in 2010. With approximately 2.24 people per household for single family and 2 per multi-family, this means the average resident is using 70 gpcd of water, which is the minimum water user per person that can be achieved without changes to indoor plumbing according to Vickers, (2001).

It should be noted that very few customers connected to the potable water system use same of irrigation. Virtually all irrigation in the City is via small private wells. Despite this fact, the City has seen a decrease in irrigation water use (to under 65 gpcd) since the ordinance went into effect.

The City used the EZ Guide v 1 to evaluate water savings ideas. As with Broward County, the EZ Guide information indicates only two significant areas to achieve water saving – irrigation and toilets – because water use is within expectations of a mixed residential/commercial community. Toilet retrofits become the next alterative. Given new construction and revisions to plumbing

systems will need to meet the revised plumbing standards, it is expected that many toilets will have been replaced by 2030.

The EZ Guide was prepared for Dania Beach. There were no options that were cost effective. No residential units are candidates for significant improvements without indoor toilet changes. The City is well below other users on per capita use. SF and MF homes are particularly good. Cost is a major concern to the City. Invasive retrofits have long payoffs and little public support. This is the same issue as the County. To address this, the City adopted ULF toilet ordinances for all new and retrofit toilets. Hence without actually going in from an active perspective, the City will achieve this goal voluntarily. The City anticipates looking at this in 2030 when water supply issue may become more critical. The irrigation uses are being addressed with the ordinance changes noted above.

The City implements these measures in the following manner:

- 1) Develop/maintain an accurate database of water consumption to reduce municipal water waste – all services in the City are metered, including all irrigation services. The City also recalibrates large meters every two years and plant meters annually. The City changes out a number of older meters each year, depending on the age (prior change-outs were not recorded).
- 2) A retrofit program – is not pursued in the City at this time since unaccounted-for water is below 15%. However, remodeling of buildings requires that new fixtures meet the Florida Building Code – Plumbing requirements which require low flow fixtures. Therefore, while the City does not have an active retrofit program (or the funds and personnel to implement same), the building code is accomplishing this purpose.
- 3) Adopted WaterSense plumbing fixture ordinance requiring low flow plumbing fixtures. As the majority of homeowners in Dania Beach use wells for irrigation, not potable water the benefits to the utility from a water savings potential from xeriscaping, rain sensors and landscaping is minimal and the City has limited capability to impose restrictions on well use. A water conservation policy is in the process of being developed at this time for

landscaping and the promotion of xeriscaping. The policies may help with these issues.

- 4) Public information and education programs – the City has District brochures on water conservation and xeriscaping available for the public (on display).
- 5) Water conservation rate structure – The City has long had in place, a water conservation rate structure that penalized residents using in excess of 10,000 gallons per month. The typical single family use in Dania Beach is less than 8,000 gallons per month, or 150 gpd/ERU.

In addition the City has looked at three other issues associated with water conservation – leak detection, reclaimed water and ASR. Both were rejected as discussed in the following paragraphs.

The City's unaccounted for water varies from 4 to 9 percent depending on meter replacement (2014 was less than 4%). The City regularly tracks water use. Leak detection does not meet the leakage threshold. All leaks come to the surface readily so they are easily found. Slow meters are another issue that the City watches continually (See water conservation plan for more details).

Effluent reuse is of substantial benefit to the area for a number of reasons, the most important of which is the reduction of competing water withdrawals from the surficial aquifer system by the application of the reclaimed water. The drainage system has lowered the water table, causing saltwater intrusion to occur. Carefully designed applications of effluent to critical areas of the surficial aquifer could protect and maintain freshwater sources. However, the City must rely on the City of Hollywood for reclaimed water, as the City has no treatment plant of its own. To date, the City of Hollywood has not had facilities or water quantity to extend reclaimed water to the City of Dania Beach. This situation could change if the City of Hollywood extends reclaimed water to Port Everglades.

ASR Wells are a water supply management option some utilities have pursued in south Florida. Unfortunately there is only one successfully operated ASR well in Southeast Florida – Boynton Beach. The water required to supply and ASR well would be a minimum of 1-2 MGD, which is a sizeable portion of the City's

demands. Investment in additional water treatment plant capacity and a well for this purpose does not seem reasonable.

Table 10 outlines the Status of the City’s conservation efforts.

Requirements	Completed (Yes/No)	If Yes, Compl date	If no, antic start date	Antic Compl date	Annual budget allocation (if applicable)
Adoption of irrigation hours ordinance	yes	2005	n/a	n/a	n/a
Adoption of Florida Friendly-based landscape ordinance	yes	2010	n/a	n/a	n/a
Adoption of ultralow volume fixtures ordinance	yes	2010	n/a	n/a	n/a
Adoption of automatic landscape irrigation systems interrupter (rain or soil moisture sensor) ordinance	yes	2010	n/a	n/a	n/a
Adoption of Water conservation based rate structure	yes	Many years ago	n/a	n/a	n/a
Implementation of a Water conservation education program	yes	Many years ago	n/a	n/a	n/a
Implementation of leak detection and repair program (if > 10% unaccounted-for water loss)	No	not applicable	n/a	n/a	n/a
An analysis of reclaimed water feasibility.	No	Talked to Hollywood about issue. City has not wastewater treatment plant	n/a	n/a	not applicable



The City has completed all required water conservation measures and more as a result of its 2010 water conservation plan. The City currently participates with Broward County in its SIP program to replace toilets. 346 were changed out in 2014. The measures appear to have made minor reductions in per capital water use. No changes are needed at this time.

Attachments



**BERTHA W. HENRY**, County Administrator  
115 S. Andrews Avenue, Room 409 • Fort Lauderdale, Florida 33301 • 954-357-7362 • FAX 954-357-7360

August 13, 2010

Mr. Robert Baldwin, City Manager  
City of Dania Beach  
100 W. Dania Beach Blvd.  
Dania Beach, FL 33004

Dear Bob:

I have reviewed your letter related to raw water capacity for the City dated August 2, 2010, which has been evaluated by the County's water and wastewater staff. First, I would like to thank you for participating as one of our large raw water customers from the Southern Regional Wellfield. We have reviewed your request for both long term and short term needs, and can assure you that Broward County will be able to provide the necessary amounts to meet all existing and projected demands in the City's service area.

Our staff has reviewed the City's future demands with representatives of the City, your consultants, and the South Florida Water Management District, and reached a consensus that the City needs a total of 2.52 mgd of raw water from the County's regional wellfield in order to supply the future needs. This includes the change in the comprehensive plan's future land use map currently under review by the Planning Council. By copy of this letter, the Planning Council will be informed of our intent.

In the short-term (thru 2015), we will meet the 0.6 mgd additional demand, and we will also be able to supply the raw water to supplement the City's wellfield and to meet the City's long-term needs (thru 2030). In your letter, you expressed the need for 1.83 mgd in addition to the existing base flow of 1.12 mgd from the County's wellfield for a total of 2.95 mgd.

If this is consistent with your understanding, I await a firm commitment from Dania Beach to utilize this excess capacity by 2015, as requests by other customers will be governed accordingly.

Please feel free to contact me, or our Water and Wastewater Services Director, Alan Garcia at (954) 831-0704 if you have any further questions.

Sincerely,

  
Bertha W. Henry  
County Administrator

cc: Broward County Board of County Commissioners  
Henry Sniezek, Executive Director, Planning Council  
Tom Hutka, Director, Public Works Department  
Alan Garcia, Director, Water & Wastewater Services  
Robert J. Daniels, Director, Community Development, City of Dania Beach  
Carol Wehle, Executive Director, South Florida Water Management District

Broward County Board of County Commissioners  
Sue Gunzburger • Kristin D. Jacobs • Albert C. Jones • Ken Keechl • Ilene Lieberman • Stacy Ritter • John E. Rodstrom, Jr. • Lois Wexler

Figure 1 - Water Service Area

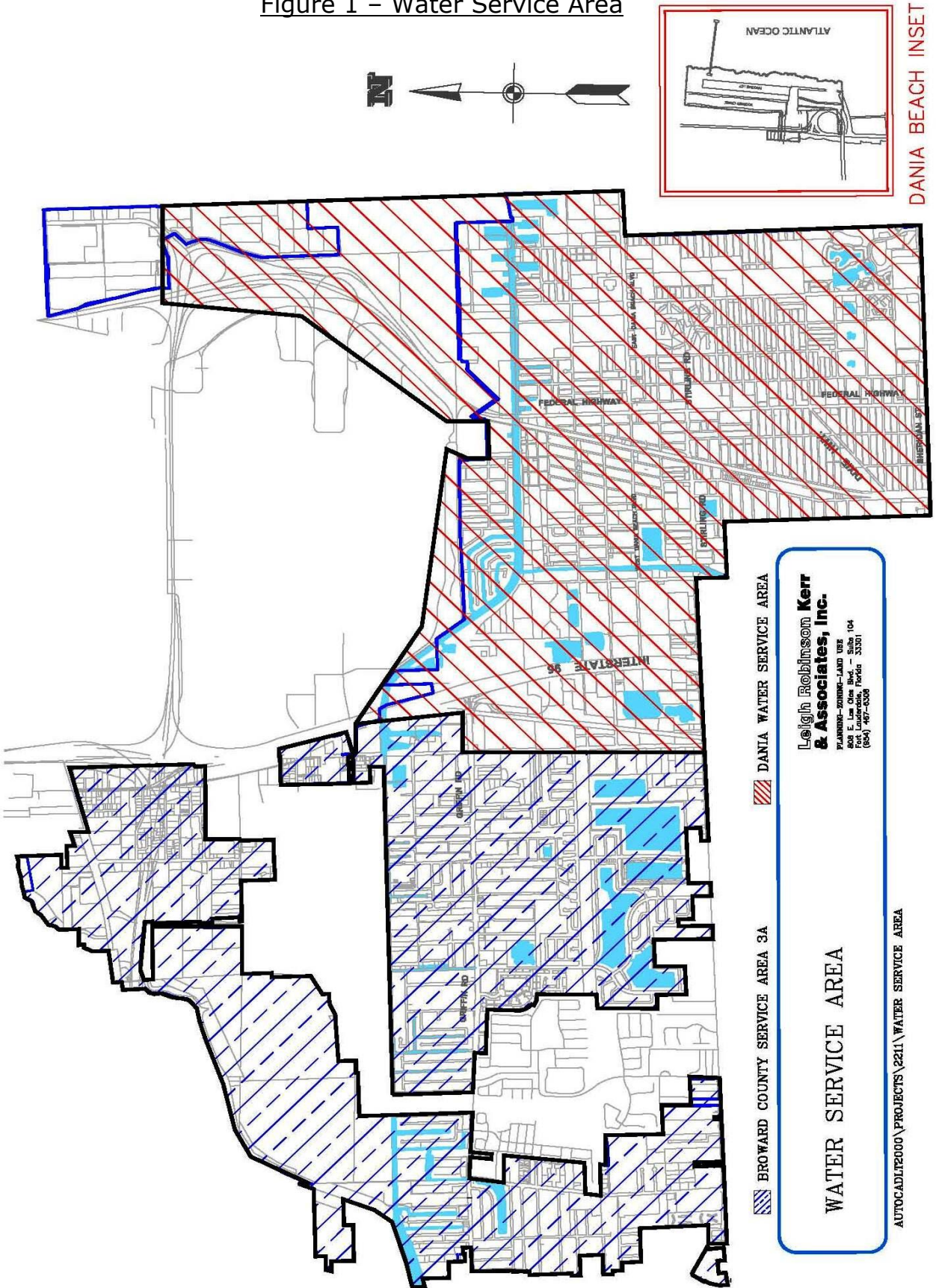
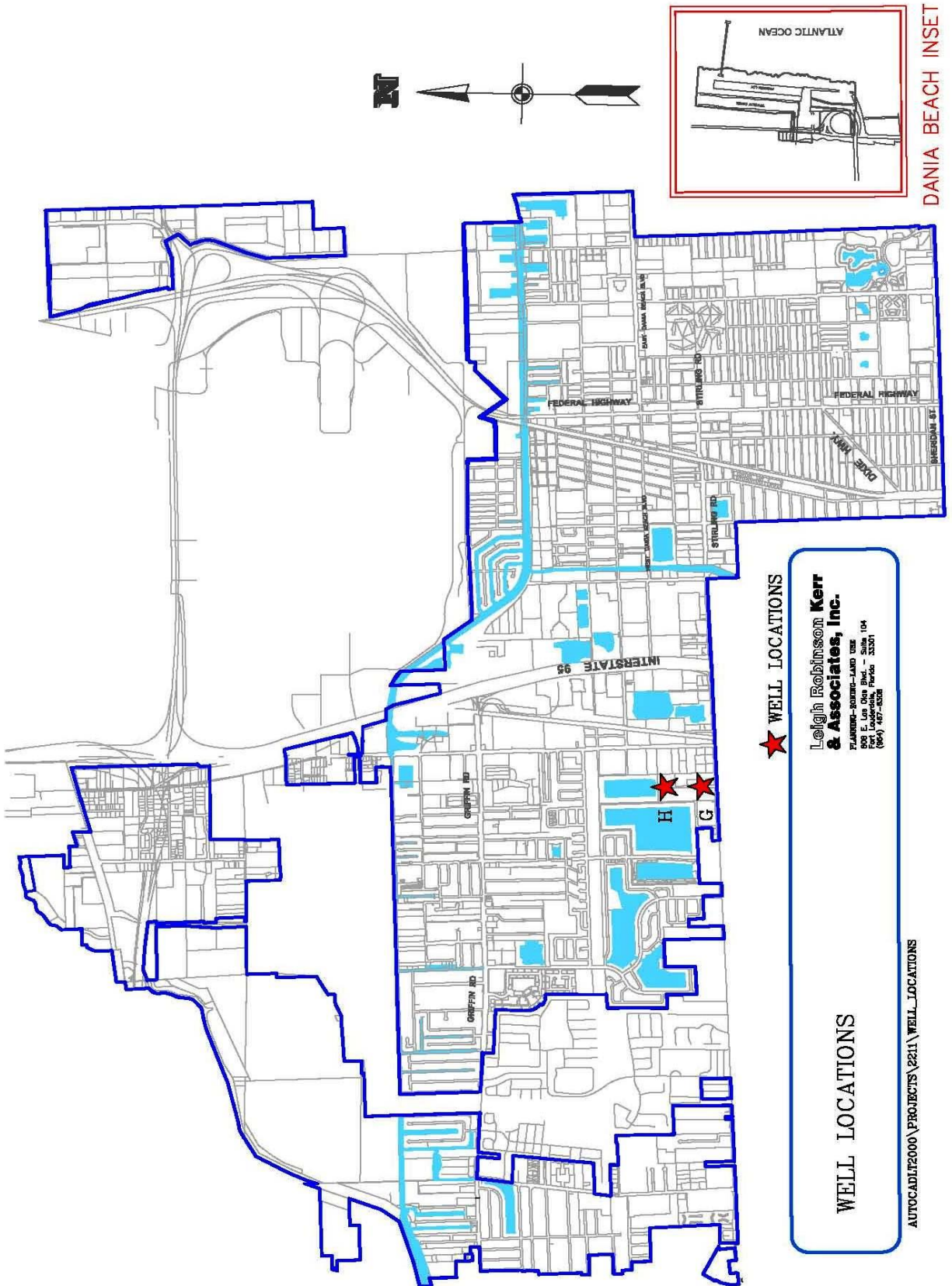


Figure 2 – Well Locations





City of Dania Beach  
Department of Public Services

100 West Dania Beach Blvd · Dania Beach, FL 33004 · (954) 924-3741 · (954) - 923-1109 (Fax)

August 12, 2010

Mr. John Crouse  
Water Resource Director  
Broward County Water and Wastewater Services  
2555 W Copans Rd  
Pompano Beach, FL 33069

RE: Large User Raw Water Agreement between Broward County and the City of Dania (Beach):  
Update of Dania Beach Water Supply Needs from the South Regional Wellfield (SRW)

Dear Mr. Crouse:

This is a follow-up to our recent discussion and the SRW Large Users meeting on July 16, 2010 concerning the portion of the City's demand projections that need to be supplied by the County from the South Regional Wellfield (SRW). We understand that for the renewal of the SRW consumptive use permit, that the quantity of water delivered to the City (both average and peak day) and the duration of the water service needs to be identified.

The City's raw water demand projections through and sources through 2030 are being submitted according to the existing agreement, ("Large User Raw Water Agreement between Broward County and the City of Dania (Beach)", Section 3.5.)

Our projected demands are as follows, with our associated requested from the County.

Year	Accounts	Units	Finished Water Per Capita Usage GPD	Population	Raw ADF MGD	City MGD	SRW at BPP MGD	Maximum Daily MGD
2010	4693	7993	139	16568	2.43	1.1	1.33	5.8
2011	4697	7997	139	17,265	2.49	1.1	1.39	5.8
2012	4702	8002	139	17,962	2.67	1.1	1.57	5.8
2013	4707	8007	139	18,660	2.74	1.1	1.64	5.8
2014	4712	8012	139	19,357	2.80	1.1	1.70	5.8



City of Dania Beach  
Department of Public Services

100 West Dania Beach Blvd · Dania Beach, FL 33004 · (954) 924-3741 · (954) - 923-1109 (Fax)

2015	n/a	9666	139	20,054	2.92	1.1	1.82	5.8
2020	n/a	11356	139	22,869	3.36	1.1	2.26	5.8
2025	n/a	12096	139	22,869	3.53	1.1	2.43	5.8
2030	n/a	12436	139	24,801	3.62	1.1	2.52	5.8

The City is requesting that the 0.7 MGD portion of our wellfield's base condition allocation (not currently allowed by SFWMD) be shifted to the South Regional Wellfield (SRW) located at Brian Piccolo Park. We understand that based upon the County's estimation this will provide an additional 0.37 MGD to the SRW CUP allocation for use by the City. At some time in the future, the City may desire to shift this allocation and the associated demand to a future City well at another location.

In the advent of a loss of our current coastal wells because of saltwater intrusion we request that a contingency plan be included in your permit that would include a contingency allocation of 1.1 MGD for the SRW. This provision will provide assurance that the City will be able to meet the total water demands until the new wellfield is placed in service. After the new wellfield is in place, we would like to continue a contingency plan with the County to provide or receive water during emergency situations under provisions of SFWMD regulations.

Should you have any questions, please let me know.

Sincerely,

A handwritten signature in blue ink that reads "Dominic F. Orlando".

Dominic F. Orlando, P.E.  
Director of Public Services

cc: Fran Henderson  
Robert Baldwin  
Bob Daniels  
Fred Bloetscher

TABLE 5a Projected Increase in Water Supply Demands 2010-2030 (updated from water use permit data and Stipulated Settlement Agreement between the City and DCA, authorized by Resolution #2010-0174, and Remedial Comprehensive Plan Amendment #10-R1, adopted by the City with Ordinance #2010-022)

Year	Accounts	Units	Usage	Existing Users + SF growth (MGD)	Annual Added CRA Units	Projected Actual CRA MF Use/unit	Annual CRA MF Addition (MGD)	Total Added CRA Units	Cumulative CRA MF units added	Identified Possible CRA Commercial Adds (sf)	Projected Unknown Commercial est. Prof Adds (sf)	Annual CRA Commercial Water Added ***** (MGD)	Annual CRA Comm+MF Additions (MGD)	Cum.CRA Additions total Comm + MF (MGD)	Avg. ADF/ CRA unit (MGD)	Rev Calc CRA Proj Fin Water ADF (MGD)	MDF (MGD)	Svc. Area Popul.	Pop/Unit	Water Lost During Treatment	Raw Water Needs (MGD)	gpcd
	*		per Unit**					***	Use													
2010	4693	9201	250	2.30	0	250	0.00	0	0.00	0	0	0	0.00	0.00	n/a	2.30	2.76	16767	2	0.13	2.4	137.2
2011	4697	9204	250	2.30	0	250	0.00	0	0.00	0	0	0	0.00	0.00	n/a	2.30	2.76	17488	1.9	0.13	2.4	131.6
2012	4702	9208	250	2.30	0	250	0.00	0	0.00	0	0	0	0.00	0.00	n/a	2.30	2.76	17495	1.9	0.13	2.4	131.6
2013	4707	9212	250	2.30	0	250	0.00	0	0.00	0	0	0	0.00	0.00	n/a	2.30	2.76	17503	1.9	0.13	2.4	131.6
2014	4712	9216	250	2.30	0	250	0.00	0	0.00	0	0	0	0.00	0.00	n/a	2.30	2.76	17510	1.9	0.13	2.4	131.6
2015	4716	9220	250	2.31	100	200	0.02	100	0.02	65,400		0.008	0.028	0.028	280	2.33	2.80	17615	1.89	0.13	2.5	132.4
2016	4721	9224	250	2.31	100	200	0.02	200	0.04	47,422		0.012	0.032	0.060	300	2.37	2.84	17811	1.89	0.13	2.5	132.8
2017	4726	9228	250	2.31	150	200	0.03	350	0.07	84,000		0.024	0.054	0.114	326	2.42	2.91	18007	1.88	0.13	2.6	134.5
2018	4730	9232	250	2.31	150	200	0.03	500	0.10	76,350		0.013	0.043	0.157	314	2.47	2.96	18296	1.88	0.13	2.6	134.7
2019	4735	9236	250	2.31	150	200	0.03	650	0.13	88,000		0.0176	0.048	0.205	315	2.51	3.02	18487	1.87	0.13	2.6	136.0
2020	4740	9240	250	2.31	150	200	0.03	800	0.16	260000		0.09	0.120	0.325	406	2.63	3.16	18775	1.87	0.13	2.8	140.3
2021	4745	9245	250	2.31	150	200	0.03	950	0.19	160,000		0.08	0.110	0.435	457	2.75	3.30	18963	1.86	0.13	2.9	144.8
2022	4749	9250	250	2.31	150	200	0.03	1100	0.22		80,000	0.016	0.046	0.481	437	2.79	3.35	19251	1.86	0.13	2.9	145.1
2023	4754	9255	250	2.31	150	200	0.03	1250	0.25		80,000	0.016	0.046	0.527	421	2.84	3.41	19539	1.86	0.13	3.0	145.4
2024	4759	9260	250	2.32	150	200	0.03	1400	0.28		50,000	0.012	0.042	0.569	406	2.88	3.46	19828	1.86	0.13	3.0	145.4
2025	4764	9265	250	2.32	150	200	0.03	1550	0.31		50,000	0.012	0.042	0.611	394	2.93	3.51	20114	1.86	0.13	3.1	145.5
2026	4769	9270	250	2.32	200	200	0.04	1750	0.35		50,000	0.012	0.052	0.663	379	2.98	3.58	20497	1.86	0.13	3.1	145.4
2027	4774	9275	250	2.32	200	200	0.04	1950	0.39		50,000	0.012	0.052	0.715	366	3.03	3.64	20879	1.86	0.13	3.2	145.3
2028	4779	9280	250	2.32	200	200	0.04	2150	0.43		20,000	0.005	0.045	0.760	353	3.08	3.70	21260	1.86	0.13	3.2	144.9
2029	4784	9285	250	2.32	200	200	0.04	2350	0.47		20,000	0.005	0.045	0.805	342	3.13	3.75	21641	1.86	0.13	3.3	144.4
2030	4789	9290	250	2.32	200	200	0.04	2550	0.51		20,000	0.005	0.045	0.850	333	3.17	3.81	22022	1.86	0.13	3.3	144.0
2031	4794	9295	250	2.32	200	200	0.04	2750	0.55		20,000	0.005	0.045	0.895	325	3.22	3.86	22404	1.86	0.13	3.3	143.7

