CITY OF MIAMI GARDENS

COMPREHENSIVE DEVELOPMENT MASTER PLAN

INFRASTRUCTURE ELEMENT

DATA, INVENTORY AND ANALYSIS

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CHAPTER III – INFRASTRUCTURE ELEMENT

DATA AND ANALYSIS

A. INTRODUCTION

City of Miami Gardens' Infrastructure Element is composed to provide the data, inventory and analysis for the Potable Water Sub-Element, Sanitary Sewer Sub-Element, Stormwater Drainage Sub-Element, Solid Waste Sub-Element and Natural Groundwater Aquifer Recharge Sub-Element for the City. Pursuant to the Growth Management requirements, this section further analyzes the existing and projected future conditions, service demand needs and level of service requirements for the City.

1. Comparison of Impact of New City Plan and Existing County Plan Upon Water, Sewer, Solid Waste and Other Services.

A key question that one might ask is whether the new City plan would place greater or lesser impact upon services, especially potable water, sanitary sewer, solid waste and transportation. At the date of this writing, potable water was considered to be an especially critical issue in Miami Dade County. Since the approaches between the two plans are different, will the City's plan generate more or less development potential? Given that redevelopment is difficult to predict in either plan, a comparison of the development potential for uncommitted vacant land sheds light on this important question. As reflected in the Future Land Use Element's Data and Analysis section, **Table FLU I -10**, parts A and B, reflect calculations of uncommitted vacant land development potential for both the proposed City and the existing County plans. There was negligible difference between the two plans: 70 dwelling units. Therefore, the City of Miami Gardens' new Comprehensive Development Master Plan neither increases nor decreases the impact of development upon urban services in an appreciable manner.

B. SANITARY SEWER

A sanitary sewer is an underground structural system for transporting sewage from houses or industry to treatment plants or disposal systems. In some areas, sanitary sewers are operated separately and independently of storm drains.

1. Sanitary Sewer Existing Conditions and Geographic Service Area

Almost all existing developments in the City are served by central sanitary sewer. There are only a few small pocket of properties currently served by septic tank systems The central sanitary sewer service in the City, including treatment, transmission and pumping facilities, is provided by the Miami-Dade County Water and Sewer Department (WASD) and the City of North Miami Beach. **Map INF III-1** shows the existing sanitary sewer service areas for Miami Gardens. Since the system is owned and maintained by the County's WASD and the North Miami Beach Public Service Department, no sanitary

sewer improvements or projects are programmed or planned by the City in the foreseeable future. The following information provides a general demand and capacity analysis for the two providers with respect to Miami Gardens.

a. Miami-Dade County Water and Sewer Department (WASD)

The County's WASD sanitary sewer service area is divided into three service districts: North, Central and South. Miami Gardens is located on the northwestern boundary of the County's North Service District (See **Exhibit INF III-1**) and is served by the County's North District Wastewater Treatment Plant located at 2575 NE 151 Street, North Miami. The disposal methods utilized at the plant are ocean outfall and deep well injection.

Per WASD, the North District Plant has a design flow capacity of 112.5 million gallons per day (MGD) annually. The twelve-month maximum annual average daily flow into the plant between 2004 and 2005 was 89.85 MGD or 79.86% of the design capacity. Miami-Dade County's permit #FL0032182-001 from Florida Department of Environmental Protection (FDEP), will increase the capacity to 120 MGD. The Central District Plant and South District Plants have a design flow capacity of 143 and 112.5 MGD annually. Since all three Miami-Dade Regional Wastewater Plants serving all three districts are combined in terms of the distribution and collection, the Level-of-Service (LOS) is measured for the entire system. See **Table INF III– 1** for Miami-Dade District Wastewater Plant Flows and Capacities. The WASD regional treatment capacity for year 2000 shows a capacity of 454.8 MGD annually of which Miami Gardens is approximately 2.20% of the system. Year 2005 shows a current treatment capacity of 495.1 MGD annually of which Miami Gardens is approximately 2.14% of the system. Year 2020 shows a projected capacity of 563.1 of which Miami Gardens is approximately 2.24% of the system. See **Table INF III – 2** for Existing and Projected Wastewater Water Demand for the City of Miami Gardens (from Miami-Dade County). As seen through the analysis, Miami Gardens is only a portion of the entire regional waste water system. Therefore City of Miami Gardens' demand and capacity analysis for wastewater treatment will be maintained through Miami-Dade County's 5 year and ten year planning periods.

b. City of North Miami Beach

The City of North Miami Beach utilizes the sanitary sewer treatment from Miami-Dade County WASD. Whereas WASD treats all sewers in the county, North Miami Beach has its own system of pipes and pumps. Since the city does not have a treatment plant, the system is discharged into the county system at various points of connection with slow meters. Approximately half of Miami Gardens is served by each entity. Based upon the county's future capacity of 120 MGD, the final flow capacity of North Miami Beach is expected to be 2 MGD by year 2006. The City of North Miami Beach serves not only City of Miami Gardens, but also

parts of City of Aventura, Sunny Isles Beach and certain portions of unincorporated Miami-Dade County. As such Miami Gardens is a portion of the entire regional waste water system. Therefore Miami Gardens' demand and capacity analysis for wastewater treatment will be maintained through Miami-Dade County's 5 year and ten year planning periods.

2. Current Demand and Levels-of-Service

The City of Miami Gardens is a developed, suburban/urban area that is approaching physical build-out in the near future. The present sanitary sewer system fulfills its demand and provides adequate treatment facility to the residents of the City.

Per the adopted Miami-Dade County Comprehensive Development Master Plan establishes a Level-of-Service (LOS) standard for sanitary sewer as follows:

- "System LOS" – The regional wastewater treatment system shall operate with a treated maximum daily capacity that is no less than 102 percent of the maximum daily flow for the preceding year, and an average daily capacity of 102 percent of the average daily system demand for the preceding five (5) years.

Based on the above County LOS, City of Miami Gardens shall maintain the following LOS for sanitary sewer services:

- "User LOS" – 100 gallons of sewage per capita per day.

A comparison of the projected capacity to the 102 percent of the previous year's average daily flow requirement from year 2000 to year 2020 is presented in **Table INF III-2** for existing and projected wastewater demand for the City of Miami Gardens. According to the best available data, the capacity of the County's wastewater system is expected to exceed the 102 percent requirement through the year 2020.

3. City of Miami Gardens' Sanitary Sewer System Demand Analysis

The "user" portion of the county's adopted level-of-service standard is 100 gallons per capita per day. As seen in **Table INF III-2**, the year 2004 estimated City population of 105,414 (BEBR estimates see Future land Use Element Population Projections), shows a wastewater service demand of approximately 10.5 MGD, or 2.12% of the entire countywide treatment capacity of 495.1 MGD. With respect to the North District wastewater planned capacity of 120 MGD **(See Table INF III-1),** the City's wastewater demand for year 2004 is approximately 8.75%.

Based on data provided by Miami-Dade County, Miami Gardens is accountable for 2.12% of the overall system and 8.75% of the regional capacity. As such, the County's level-of-service standard (which is the same as Miami Gardens' proposed LOS), will be maintained through year 2020 and will provide sanitary sewer service to the City of Miami Gardens through the five (5) and ten (10) year planning periods. As mentioned earlier, the City of North Miami Beach does not have a sanitary sewer treatment plant. That city's system is discharged into the WASD system and service is provided through the county system to the various cities.

4. Future Projects, Programs and Policy Issues

Since the entire sanitary sewer/wastewater system serving Miami Gardens is owned and maintained by Miami-Dade County and the City of North Miami Beach, no sanitary sewer improvements or projects are planned by the City of Miami Gardens in the near future. All development in Miami Gardens pays sewer impact fees to insure that the developments' proportionate share of infrastructure is paid for.

The City's sanitary sewer sub-element's goals, objectives and policies will address the need to coordinate with Miami-Dade County and the City of North Miami Beach to ensure efficient provision of wastewater treatment for existing and future development within the City of Miami Gardens.

C. SOLID WASTE

As defined under the EPA Resource Conservation and Recovery Act (RCRA), solid waste is any solid, semi-solid, liquid, or contained gaseous materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities. Solid waste includes garbage, construction debris, commercial refuse, sludge from water supply or waste treatment plants, or air pollution control facilities, and other discarded materials. Solid Waste Management Facility is defined as any disposal or resource recovery system; any system, program, or facility for resource conservation; any facility for the treatment of solid wastes.

1. Solid Waste Existing Conditions and Geographic Service Area

The City of Miami Gardens is located in the northwestern section of Miami-Dade county and is served by the Miami-Dade County Department of Solid Waste Management (DSWM). **Map INF III - 5** Solid Waste Locations and Service Area Boundaries, shows the existing solid waste service area for Miami Gardens. The Miami-Dade Department of Solid Waste Management provides residential garbage, trash and recycling collection service to the City of Miami Gardens.

a. Collection

The County's DSWM uses an automated collection system for garbage collection. The system requires a special vehicle and cart. The vehicle is equipped with a lifting mechanism that reaches out to the EZ Go Waste Cart, lifts, empties the contents and returns the cart to its original position. The driver controls the entire process from the cab of the vehicle and does not leave the vehicle. After the collection, the resident is responsible for returning the EZ Go Waste Cart to its storage place. There are 41 routes serving the Miami Gardens area that utilize 24 trucks. Out of a total of 41 routes, 24 routes operate on Mondays and Thursdays and 17 routes operate and on Tuesdays and Fridays.

b. Transfer

The County operates three regional transfer stations (see **Table INF III - 4** for location and hours of operation):

- The Northeast Transfer Station;
- The West Transfer Station;
- The Central Transfer Station.

At these facilities, DSWM has ongoing transfer operations for the transport of waste and waste derived by-products, such as yard trash and tires. The closest transfer station for the City of Miami Gardens is the Northeast Transfer Station. Waste is received at these transfer stations and sites from County operations, municipal and licensed private haulers. All solid waste from both residential and non-residential properties is processed at either a transfer station or a landfill. At both facilities, four steps are taken to dispose of the waste:

1) Burn

2) Bury

3) Refuge for fuel, and

4) Recycle

The County's DSWM also maintains disposal service contracts with two private disposal facilities in Broward County: Waste Management (up to 500,000 tons per year for 20 years) and Wheelabrator (up to 100,000 tons per year for 7 years). These supplemental facilities allow for waste delivery and more flexibility and allow the County to maintain capacity and meet concurrency requirements.

The Norwood Trash Recycling Center is identified on **Map INF III – 4** Public Facilities, because it services the residents of Miami Gardens and is located within the City's limits. The two landfills namely Golden Glades and North Dade Landfills as well as the Home Chemical Recycling Center serve the residents of Miami Gardens as well, but are located outside of the city's limits and therefore are not shown on the Public Facilities map.

- Norwood Trash Recycling Center at 19901 NW 7th Avenue (within City limits).
- Golden Glades Landfill at 140 NW 160th Street (outside City limits);
- North Dade Landfill at 21500 NW 47th Avenue (outside City limits);
- Home Chemical recycling Center at 8331 NW 58th Street (outside City limits).

c. Disposal

The DSWM owns and operates four (4) major disposal facilities (see **Table INF III - 3**). The following are the locations where solid waste collected by private haulers and Miami-Dade County is disposed of at:

- North Dade Landfill;
- Resources Recovery Facility (operated through an agreement with Montenay-Dade, Ltd.);
- South Dade Landfill and
- Ash Landfill.

The City's solid waste is taken to the North Dade Landfill, which is located on a 268-acre site near the Broward County line. Approximately 246,290 tons of trash is projected to be disposed of at this site during FY 2005-2006. Any other waste that cannot be processed at this location is taken to the County's Resource Recovery Facility (RRF) or to the South Dade Landfill, where it is finally processed or burned for fuel at the Ash Landfill.

The RRF is projected to receive about 1.2 million tons of waste in FY 2005-2006. This facility includes a waste processing plant, an electrical generating facility, ash disposal cells and related support structures to handle garbage and trash and to recover usable energy and materials for recycling. Incoming waste is separated on the basis of combustibility and then shredded. The combustible fraction is burned to generate high-pressure, super-heated steam that drives turbine generators for the production of electricity. About 111,000 tons of recyclable material is currently being recovered from this facility annually.

d. Recycling/Home Chemical Program

Miami-Dade County's waste reduction and recycling programs have been designed to reduce waste generation and maximize recyclable material recovery. The Department of Solid Waste Management administers one of the nation's largest residential curbside recycling programs and serves nearly 320,000 homes. The program accepts newspaper, corrugated cardboard, aluminum, ferrous metals, glass containers, aseptic packages, plastic, household batteries and telephone books. In addition to the unincorporated area of Miami-Dade County collection is provided to single-family homes, duplexes, triplexes and some cluster homes. Residents of multi-family housing units have had a different recycling system since 1992; such establishments are required by County ordinance to provide for a recycling program. Requesting recycling bins for participating homes is now as easy as going online. In keeping with technology and with more and more electronic items being thrown away every day, the Solid Waste Management Department has a program to collect and recycle used electronic equipment from Miami-Dade residents. Items accepted for recycling include computer monitors and televisions; personal computers, keyboards, hard drives and printers; VCRs,

audio and video equipment and communication equipment such as cellular telephones and hand held radios.

The Department also offers a permanent Home Chemical Collection program that accepts oil-based paints, pesticides, solvents, pool chemicals and other household items. The designated centers also accept latex paints that are still in liquid form; however, it is recommended that new paints or latex paint that is still in good condition be donated to neighbors or community groups. The centers are available to non-commercial residents only.

2. Current Demand and Levels-of-Service

Per Florida Department if Environmental Protection (FDEP), Miami-Dade County per capita waste generation is 9.4 pounds per day. The County is estimating that about 1.61 million tons of solid waste will be generated each year for the next 5 years in Miami-Dade County. The County's level-of-service standard is to maintain solid waste disposal capacity sufficient enough to accommodate waste flows to the system through long-term interlocal agreements or contracts along with anticipated non-committed waste flows for a period of five (5) years. Per DSWM, the maximum capacity at the South Miami-Dade Landfill is 20.3 million tons; the maximum capacity at the North Miami-Dade Landfill is 12 million tons; and the maximum capacity of for the Ashfill Landfill facility is 6.25 million tons. With a maximum capacity of 38.55 million tons between the three (3) landfills, Miami-Dade County projects remaining solid waste capacity to be well in excess of the five year standard. Please see **Table INF III – 5** for the solid waste generation and capacity figures for Miami-Dade County.

3. Solid Waste System Analysis

The County estimates that current landfill capacity will be sufficient to meet the demand with the actual capacity not being reached until year 2016. The figures presented in **Table INF III-5** are based upon the demand generated by municipalities and private haulers who work through interlocal agreements in accordance with the level of service standard set forth by the County and applicable federal, state and local permits.

Table INF III – 6, shows the projected demand for the City of Miami Gardens. Based on the data provided by Miami-Dade County, Miami Gardens is accountable for only a portion of the overall system. As such, the County's level-of-service standard will be maintained through year 2016 and will provide sanitary sewer service to the City of Miami Gardens through the five (5) and ten (10) year planning periods.

4. Future Projects, Programs and Policy Issues

Level of service for solid waste issues will be maintained within the City of Miami Gardens pursuant to Miami-Dade County regulatory requirements. Since the entire system is owned and operated by the County, no solid waste facilities or improvements are planned by the City of Miami Gardens in the foreseeable future. All development in Miami Gardens pays solid waste impact fees to insure that the developments' proportionate share of infrastructure is paid for. The City will continue to coordinate with

Miami-Dade County and applicable regional agencies to comply with regulations and furthermore educate its residents and businesses for active participation in waste recycling and reuse programs.

D. DRAINAGE

A drainage facility is a constructed or engineered feature that collects, conveys, stores or treats surface and storm water runoff. Drainage facilities generally include but are not limited to pipelines, canals, ditches, gutters, lakes, swales, inlets, catch basins, culverts, water quality treatment facilities, and other drainage structures.

1. Existing conditions and Geographic Service Area

a. Existing conditions

The City of Miami Gardens is in the process of developing a Stormwater Drainage Master Plan that will evaluate and implement the City's long-term needs. The City of Miami Gardens Watershed Planning Project is partially funded by the 2004 Florida Legislature General Appropriation Act funds from the Florida Department of Environmental Protection (FDEP) to support the development of South Florida Flood Mitigation in Miami-Dade County through Special Appropriation SA2064A. These funds are administered through the South Florida Water Management District and dispersed and managed at the local level.

A detailed inventory of the existing stormwater system, conducted as part of the master plan, showed a general deficiency of the following nature:

- Lack of stormwater facilities
- Hydraulically inadequate stormwater facilities
- Low lying structures
- Inadequate maintenance of stormwater system

Please see **Map INF III–2** for City of Miami Gardens Stormwater Infrastructure Inventory.

b. Geographic service area

The City is generally located within the C-8 and C-9 drainage basins (SFWMD data). Per City of Miami Gardens Stormwater Master Plan, the City's geographic service area of 20 square miles has been delineated into a total of 117 sub-basins. The initial sub-basins were identified using the topography, the stormwater system information from Miami-Dade county DERM and regional land use classifications. The final sub-basin identification was carried out based on drainage patterns from topography, major culverts, field reconnaissance, stormwater system, infrastructure maps, major roadway alignments and crown

elevations, surface water features and canal-right-of-ways. Detailed analysis will be performed to help define and predict storm runoff flows and volumes.

c. Types of Land Uses Served

The Future Land Use Element describes the existing and proposed land uses for the City of Miami Gardens. At this time the City goal is to improve the existing stormwater deficiencies and implement an efficient stormwater management system.

2. Drainage System Analysis

The City of Miami Gardens shall maintain a level of service standard, for new and existing development, based on the following stormwater quantity and quality criteria:

- Design storm based on 24-hour minimum.

Facility	Design Storm (Years)
Bridges	50
Canals, ditches, or culverts for drainage external to developments	25
Crossdrains, storm sewers	10
Roadside swales for drainage internal to the development	10
Detention Basins	25
Retention Basins (no positive outfall)	100

- Pollution abatement shall be accomplished by requiring stormwater management systems to retain or detain with filtration, the first one-half inch of run-off from developed sites, or the run-off generated from the first inch of rainfall on developed sites, whichever is greater.
- The City of Miami Gardens shall require a retention/detention system that limits peak discharge of a developed site to the discharge from the site in an undeveloped condition during a 24-hour/25-year frequency storm event.
- The City of Miami Gardens shall require, prior to development approval, that projects receive appropriate permits from State agencies to comply with the rules and regulations for stormwater facility design, performance and discharge.
- Discharged stormwater run-off shall not degrade receiving surface water bodies below the minimum conditions as established by State water quality standards (17-302 and 17-40.420, Florida Administrative Code).

The above level-of-service standards have been incorporated into the Stormwater Master Plan goals, objectives and policies and are also being adopted as part of this CDMP.

3. Future Projects, Programs and Policy Issues

The Stormwater Drainage Master Plan will include specific goals, objectives, policies and analysis for retrofitting the City's future stormwater drainage and groundwater aquifer recharge needs to meet state standards. This master plan will allow the City to create a citywide stormwater utility system as part of assuming responsibility for stormwater management from Miami-Dade County (summer 2006). Key elements of the master plan will include goal setting, inventory of existing facilities and condition, problem identification, assessment of flooding conditions, water quality, ecological considerations, development of prioritized solutions, and public participation.

The Stormwater Master Plan will provide the basis for updating the Capital Improvements Schedule provided in the Capital Improvement Element of CDMP. As such, the City anticipates a range of as-yet unknown stormwater improvements that are reflected as a generalized project in the Schedule of Capital Improvements.

E. POTABE WATER

This sub-element describes the current local as well as the regional potable water system facilities serving the City. "Potable water" means water that is free of pathogenic bacteria. "Potable water system" means the equipment used on a conveyance for handling, treating, storing and distributing potable water; and is generally described as a system of structures designed to collect, treat, or distribute potable water and includes potable water wells, treatment plants, reservoirs and distribution mains.

1. Existing Potable Water Conditions and Geographic Service Area

Potable water treatment, transmission and pumping facilities serving the City of Miami Gardens are provided by Miami-Dade County Water and Sewer Department (WASD), the City of North Miami Beach Public Service Department and the City of Opa-Locka. See **Map INF III-3** for the existing potable water service areas in Miami Gardens.

a. Miami-Dade County Water and Sewer Department (WASD)

The City of Miami Gardens receives water service from Miami-Dade County primarily through the Hialeah-Preston Water Treatment Plant. WASD is primarily responsible for maintaining the distribution and operating the facilities that serve City of Miami Gardens. The City is located in the County's north regional water service area. The potable water system collectively serves all residential and non-residential land uses in Miami Gardens, including approximately 105,414 persons (BEBR 2004 estimate) or 30,000 housing units.

The Biscayne Aquifer is the source of potable water in Miami-Dade County with approximate 347 million gallons per day (MGD) withdrawn from the aquifer to meet the demands of the entire County. Based on year 2005 data from Miami-Dade County, **Table INF III–7** shows that the Hialeah-Preston Plant has a capacity of 225 MGD through the year 2016.

b. City of North Miami Beach

The City of Miami Gardens also receives water service from City of North Miami Beach from the Norwood Water Treatment Plant, located at 19150 NW 8th Avenue within Miami Gardens. Based on year 2000 data, the North Miami Beach treatment system at the Norwood Treatment Plant has a permitted annual daily capacity of 15 MGD. The facility is undergoing expansion plans to increase its capacity to 32 MGD through year 2006.

The North Miami Beach facility not only serves the City of Miami Gardens, but also serves the population of North Miami Beach, Sunny Isles Beach and portions of Miami-Dade County. Currently, it provides water service at a rate of 130 gallons per capita per day. Based on this level-of-service and the Norwood Treatment Plant facility expansion, it is reasonable to assume that Miami Gardens population will continue to receive part of the water service facility from North Miami Beach through the five (5) and ten (10) year planning horizons. See **Table INF III – 8** Existing and Projected Potable Water Demand for the City of Miami Gardens (from North Miami Beach) for detailed analysis.

c. City of Opa-Locka

The City of Opa-Locka is the third entity that provides water service to City of Miami Gardens. The total storage capacity of that system is 1.7 MGD (City of Opa-Locka Comprehensive Plan). It should be noted that, although the City of Opa-Locka owns and operates the facilities for the distribution of water, Miami-Dade County supplies the water commodity.

A small portion of Miami Gardens north of the south corporate limits at NW 151st Street is served through the City of Opa-Locka. Per the Opa-Locka's Comprehensive Plan, approximately 1,237 customers outside the municipal jurisdiction are served through the system.

In summary, Miami Gardens is accountable for a minor portion of the City of Opa-Locka's distribution capacity. As such the county's level-of-service standard and demand analysis will be more appropriate for the City of Miami Gardens through the five (5) and ten (10) year planning periods.

2. Current Level-of-Service Standard

The adopted Miami-Dade County Comprehensive Development Master Plan allows for the following level of services:

- Regional Treatment: The regional treatment system shall operate with a rated capacity that is no less than 2 percent above the maximum daily flow for the preceding year.
- Water Quality: Water quality shall meet all federal, state, and county primary standards for potable water.

- Countywide Storage Capacity: Storage capacity for finished water shall equal no less than 15 percent of the countywide average daily demand.

Based on year 2005 data, the countywide WASD system has a permitted annual average daily withdrawal capacity of 413.2 mgd and the maximum daily demand is 413.4 mgd. The Hialeah-Preston Treatment Plant has a permitted annual average daily withdrawal capacity of 199.19 mgd and a maximum annual daily permitted withdrawal capacity of 225 mgd. Per Miami-Dade Water and Sewer Department (WASD), the Hialeah-Preston Plant that provides potable water service to City of Miami Gardens has an estimated current level of service of 155 mgd per capita. See **Table INF III-7** for Demand Analysis (WASD).

Water is delivered to users at a pressure no less than 20 pounds per square inch (psi) and no greater than 100 psi. Since all potable water facilities are provided through WASD (including the North Miami Beach Plant), Miami Gardens will adopt the LOS standards of 155 mgd per capita consistent with WASD level of service standards.

The minimum fire flows are described in **Table INF III - 9**. These fire flows are maintained by Miami-Dade WASD and are based on the following land uses: Single Family Residential/ Estate, Single Family, Duplex, and Residential on minimum lots of 7,500 square feet, Multifamily Residential; Semiprofessional Offices, Hospitals; Schools, Business and Industry.

3. Miami Gardens' Potable Water System Demand Analysis

Table INF III - 7 provides a detailed demand calculation for Miami Gardens' population based on an estimated level-of-service of 155 mgd per capita. Based on the current population growth of Miami Gardens, the average demand for year 2005 is about 16.33% (154.87 MGD) of the Miami-Dade systemwide average demand for that year. As such, the WASD demand projections show the level-of-service standards being met through the five (5) and ten (10) year planning periods and will continue to serve Miami Gardens through year 2016.

4. Future Projects, Programs and Policies

It is clear from the above analysis that the potable LOS will be maintained in Miami Gardens during the five (5) and ten (10) year planning periods. Since the system is maintained and distributed by Miami-Dade WASD, no potable water improvements are foreseen or planned by the City in the future. However, the City depends upon the County system to receive these facilities and services. All development in Miami Gardens pays potable water impact fees to insure that the developments' proportionate share of infrastructure is paid for.

The City shall incorporate specific goals, objectives and policies that emphasize the need to work closely with Miami-Dade County WASD, City of North Miami Beach, City of Opa-Locka and all related agencies to ensure efficient provision of potable water for all existing and future development in the City.

F. NATURAL GROUNGWATER AQUIFER RECHARGE AREAS

1. Identification of Prime Recharge Areas

South Florida Water Management District (SFWMD) has not identified any areas within the City of Miami Gardens as a prime groundwater recharge areas for the Biscayne aquifer. See **Exhibit INF III - 2** for further details.

2. Major Natural Drainage Features

Major natural drainage features are generally defined as the naturally occurring features of an area that accommodates the flow of stormwater, such as streams, rivers, lakes and wetlands. The City of Miami Gardens has no natural drainage features of this kind.

Table INF III - 1: Miami-Dade Wastewater Plant Flows and Capacities

Treatment Plant	12-Month Average Flow (MGD)	Average Flow Design Capacity- Permitted (MGD)	Planned Capacity (MGD)
North District	89.85	112.5	120.0
Central District	114.00	143.0	143.0
South District	90.90	112.5	131.3
Total	**294.75**	**368**	**394.3**

Source: Miami-Dade Water and Sewer Department, 2005

Table INF III - 2: Existing and Projected Wastewater Water Demand For The City of Miami Gardens (From Miami Dade County WASD)

Year	Miami-Dade - WASD Treatment Capacity (MGD)	102% of Previous Year's AVG. Daily Flow (MGD)	Miami Gardens POPULATION Served	Gallons/ Capita/ Day	Miami Gardens Average Demand (MGD)	MIAMI GARDENS% OF WASD CAPACITY	Miami-Dade North District Capacity (MGD)*	MIAMI GARDENS% OF NORTH DISTRICT CAPACITY
2000	454.8	399.1	100,809	100	10.08	2.22	112.5	8.96
2004	495.1	451.6	105,414	100	10.54	2.13	112.5	9.37
2005	495.1	451.6	105,457	100	10.55	2.13	112.5	9.37
2010	520.1	487.4	110,751	100	11.08	2.13	120.0	9.23
2011(1)	520.1	487.4	111,103	100	11.11	2.14	120.0	9.26
2015	563.1	517.3	112,246	100	11.22	1.99	120.0	9.35
2016(2)	563.1	517.3	112,389	100	11.24	2.00	120.0	9.37
2020	563.1	547.7	112,713	100	11.27	2.00	120.0	9.39

Sources: *Miami Dade Water and Sewer Department, 2005; Miami Gardens Planning and Zoning Department, 2005
(1) 2011: Short Range Planning Timeframe;
(2) 2016: Long Range Planning Timeframe

Table INF III - 3: Miami Dade Solid Waste Landfills and Facilities

FACILITY	ADDRESS	DAYS AND HOURS	MATERIALS ACCEPTED
North Dade Landfill	21500 NW 47 Ave.	7 days a week, 7 a.m.-5 p.m.	Trash, yard trash, off-road tires (tires 48" in diameter or larger), construction and demolition debris
South Dade Landfill	24000 SW 97 Ave.	7 days a week, 7 a.m.-5 p.m.	Garbage, trash, yard trash, off-road and automobile tires, construction and demolition debris, and dead animals. Asbestos is also accepted but you must obtain authorization form the Miami-Dade Department of Environmental Resources Management (372-6925) and make arrangements for the disposal of the material with the facility (258-2830) 24 hours in advance.
Ash Landfill	6990 NW 97 Ave.	This facility is not open to public.	No materials accepted except for residue after the waste has been buried at RRF.
Resources Recovery Facility (RRF)	6990 NW 97 Ave.	Mon-Fri. 4 a.m.-6 p.m. Sat. 7 a.m.-5 p.m.	Garbage, trash and tires

Source: Miami-Dade County Solid Waste Department.

Table INF III - 4: Miami Dade Solid Waste Transfer Stations

FACILITY	ADDRESS	DAYS AND HOURS	MATERIAL ACCEPTED
Northeast Transfer Station	18701 NE 6 Ave.	Mon.-Sat. 7 a.m.-5 p.m.	Garbage and trash
Central Transfer Station	1150 NW 20 St.	Mon.-Sat. 7 a.m.-5 p.m.	Garbage and trash
West Transfer Station	2900 SW 72 Ave.	Mon.-Sat. 7 a.m.-5 p.m.	Garbage and trash

Source: Miami-Dade County Solid Waste Department.

Table INF III - 5: Solid Waste Generation, 2000-2015 (Miami-Dade County)

Year	Countywide Generation*	Amount to Landfill	Amount to Ashfill	Total Capacity*	Remaining Capacity*
2000	1,610,000	1,447,000	163,000	4,458,000	2,848,000
2005	1,610,000	1,447,000	163,000	3,643,000	2,033,000
2010	1,610,000	1,447,000	163,000	2,828,000	1,218,000
2011◙ (1)	1610000◙	1447000◙	163000◙	2828000◙	1218000◙
2015	1,610,000	1,447,000	163,000	2,013,000	403,000
2016◙ (2)	1610000◙	1447000◙	163000◙	2013000◙	403000◙

Source: Miami-Dade County Department of Solid Waste Management (MDSWM), 2005
*Figures are in tons per year
◙ Figures assumed to be constant as previous year. No information available from MDSWM.
(1) 2011: Short Range Planning Timeframe.
(2) 2016: Long Range Planning Timeframe.

Table INF III - 6: Existing and Projected Solid Waste Demand for the City of Miami Gardens (From Miami-Dade County)

YEAR	MIAMI GARDENS POPULATION SERVED	MIAMI GARDENS RESIDENTIAL UNITS	TONS/ CAPITA/DAY	MIAMI GARDENS AVERAGE DEMAND	MIAMI GARDENS AS % OF COUNTY	MIAMI-DADE TOTALCAPACITY* (TONS)
2000	100,809	30,988	9.4	291,287	6.53	4,458,000
2005	105,457	32,417	9.4	304,723	8.36	3,643,000
2010	110,751	34,045	9.4	320,021	11.32	2,828,000
2011◙ (1)	111,103	34,153	9.4	321,038	11.35	2,828,000
2015	112,246	34,504	9.4	324,341	16.11	2,013,000
2016◙ (2)	112,389	34,548	9.4	324,754	16.13	2,013,000

Source: Miami-Dade County Department of Solid Waste Management, 2005, Miami Gardens Housing Element.

*Figures are in tons per year

◙ Figures assumed to be constant as previous year. No information available from MDSWM.

(1) 2011: Short Range Planning Timeframe.

(2) 2016: Long Range Planning Timeframe.

Table INF III - 7: City of Miami Gardens Finished Potable Water Demand Analysis (From Miami-Dade County WASD)

YEAR	MIAMI GARDENS POPULATION SERVED	GALLONS/ CAPITA/DAY	MIAMI GARDENS AVERAGE DEMAND (MGD)	MIAMI-DADE COUNTY WASD SYSTEMWIDE AVERAGE DEMAND (MGD) *	MIAMI GARDENS DEMAND AS % OF COUNTY	MIAMI-DADE HIALEAH-PRESTON PLANT CAPACITY (MGD)*
2000	100,809	166.26	16.76	340.00	4.93	454.77
2004	105,414	156.80	16.53	339.60	4.87	454.77
2005	105,457	154.87	16.33	340.10	4.80	454.77
2010	110,751	155	17.17	356.32	4.82	454.77
2011(1)	111103	155	17.22	360.91	4.77	454.77
2015	112,246	155	17.40	379.42	4.55	479.97
2016 (2)	112,389	155	17.42	383.22	4.55	479.97
2020	112,713	155	17.47	398.45	4.38	479.97

Sources: *Miami Dade Water and Sewer Department 2005, Miami Gardens Planning and Zoning Department 2005.
(1) 2011: Short Range Planning Timeframe.
(2) 2016: Long Range Planning Timeframe.

Table INF III - 8: Existing and Projected Potable Water Demand for the City of Miami Gardens (From North Miami Beach)

YEAR	MIAMI GARDENS POPULATION	POPULATION SERVED	MIAMI GARDENS PERCENTAGE	GALLONS /CAPITA/ DAY	AVERAGE DEMAND (MGD)
2000	100,809	181,088	56%	130	13.11
2010	110,751	170,082	65%	130	14.40
2011◙ (1)	111,103	170,082	65%	130	14.44
2015	112,246	177,367	63%	130	14.59
2016◙ (2)	112,389	177,367	63%	130	14.61
2020	112,713	180,148	63%	130	14.65

Sources: North Miami Beach Public Service Department, 2005
Miami Gardens Planning and Zoning Department, 2005
◙ Figures assumed to be constant as previous year.
(1) 2011: Short Range Planning Timeframe.
(2) 2016: Long Range Planning Timeframe.

** The above table is City of North Miami Beach water demand projection for water service area in total, including City of North Miami Beach, Sunny Isles, part of City of Miami Gardens, and portion of Unincorporated Miami-Dade County. These projections are for total service area not only for the City of Miami Gardens.

Table INF III - 9: Minimum Fire Flow LOS

LAND USE	MINIMUM FIRE FLOW (GAL/MIN)
Single Family Residential/Estate	500
Single Family, Duplex, and Residential on minimum lots of 7,500 square feet	750
Multifamily Residential; Semiprofessional Offices	1,500
Hospitals; Schools	2,000
Business: Industry	3,000

Sources: Miami-Dade County Adopted 2003 Evaluation and Appraisal Report, Water, Sewer and Solid Waste Element

Exhibit INF III - 1: Miami Dade County North Regional District for Wastewater

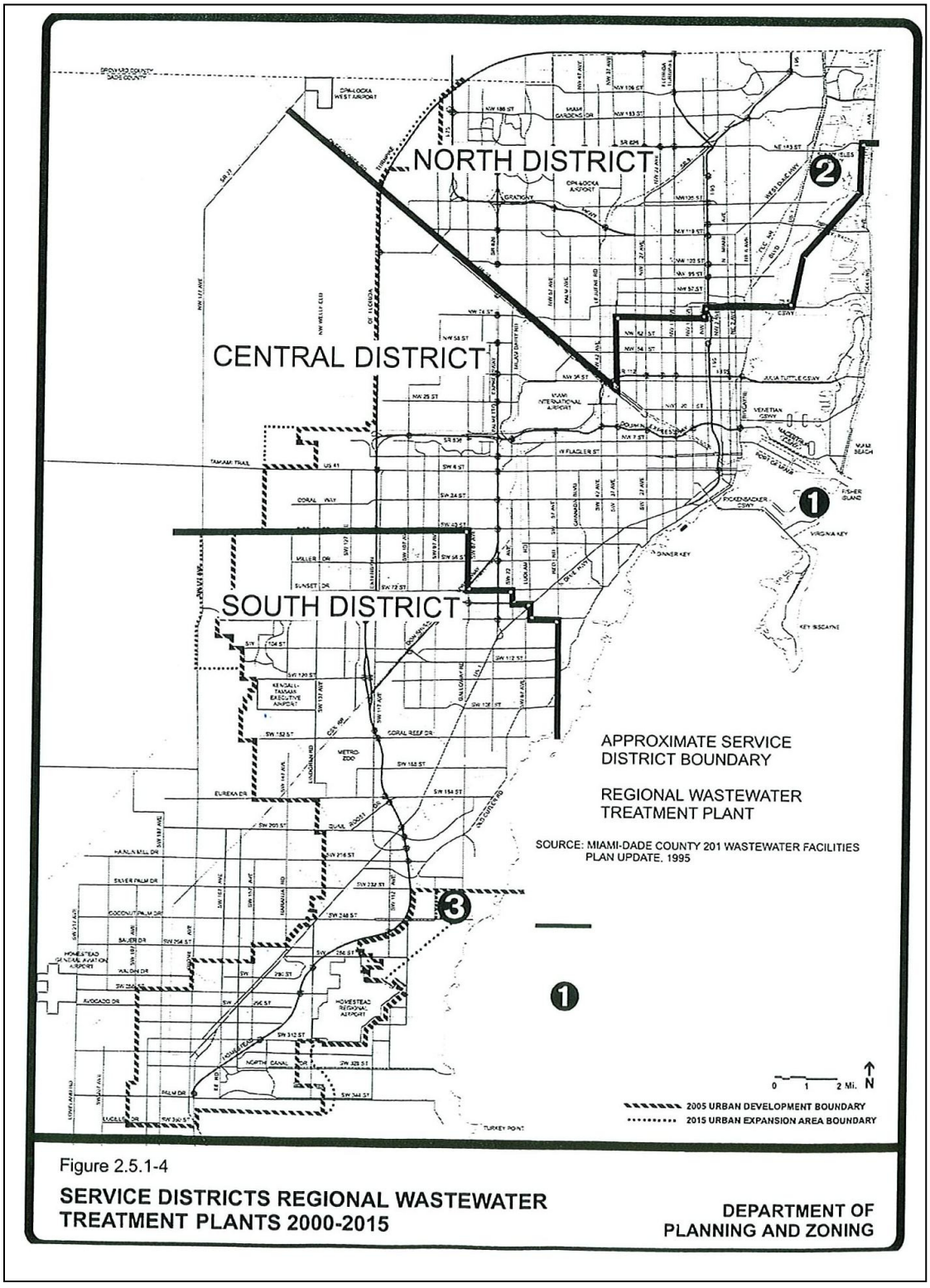
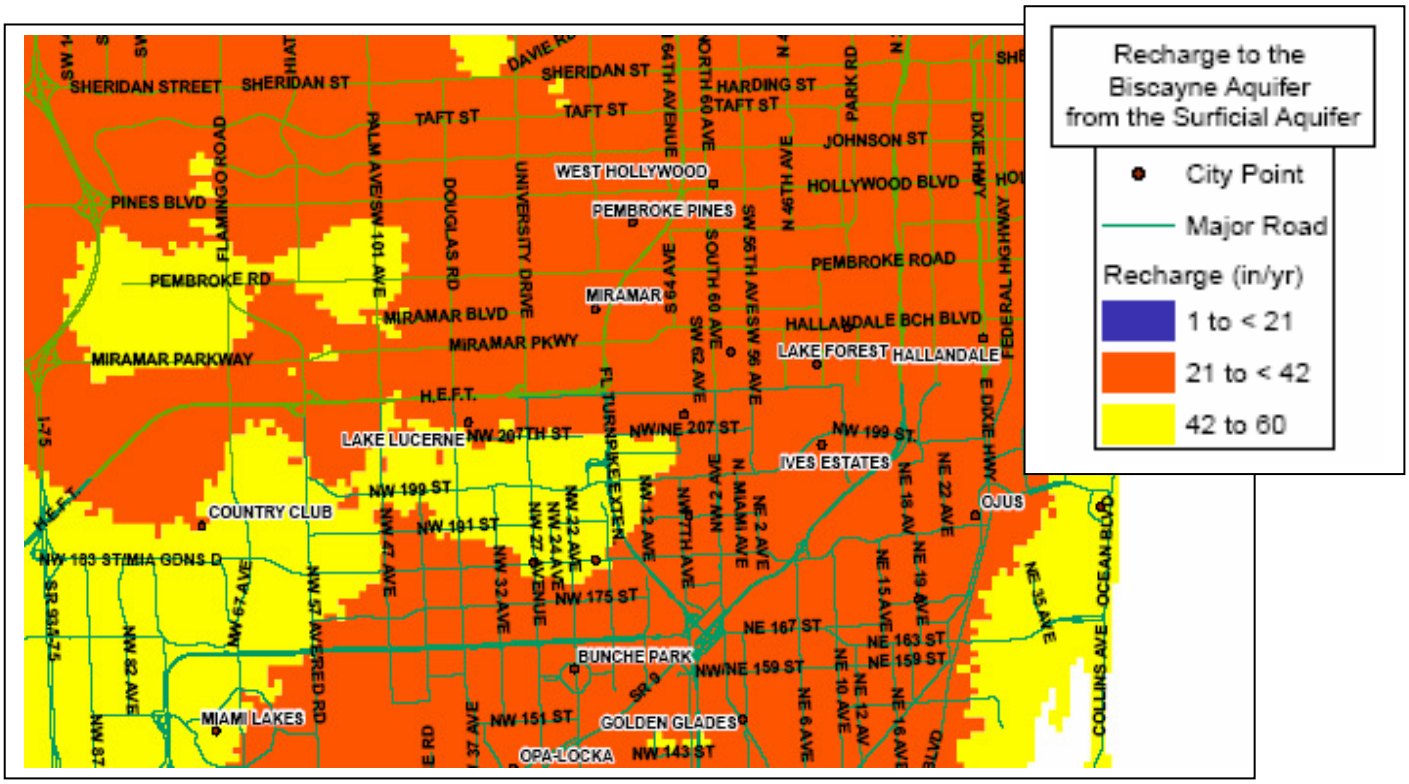
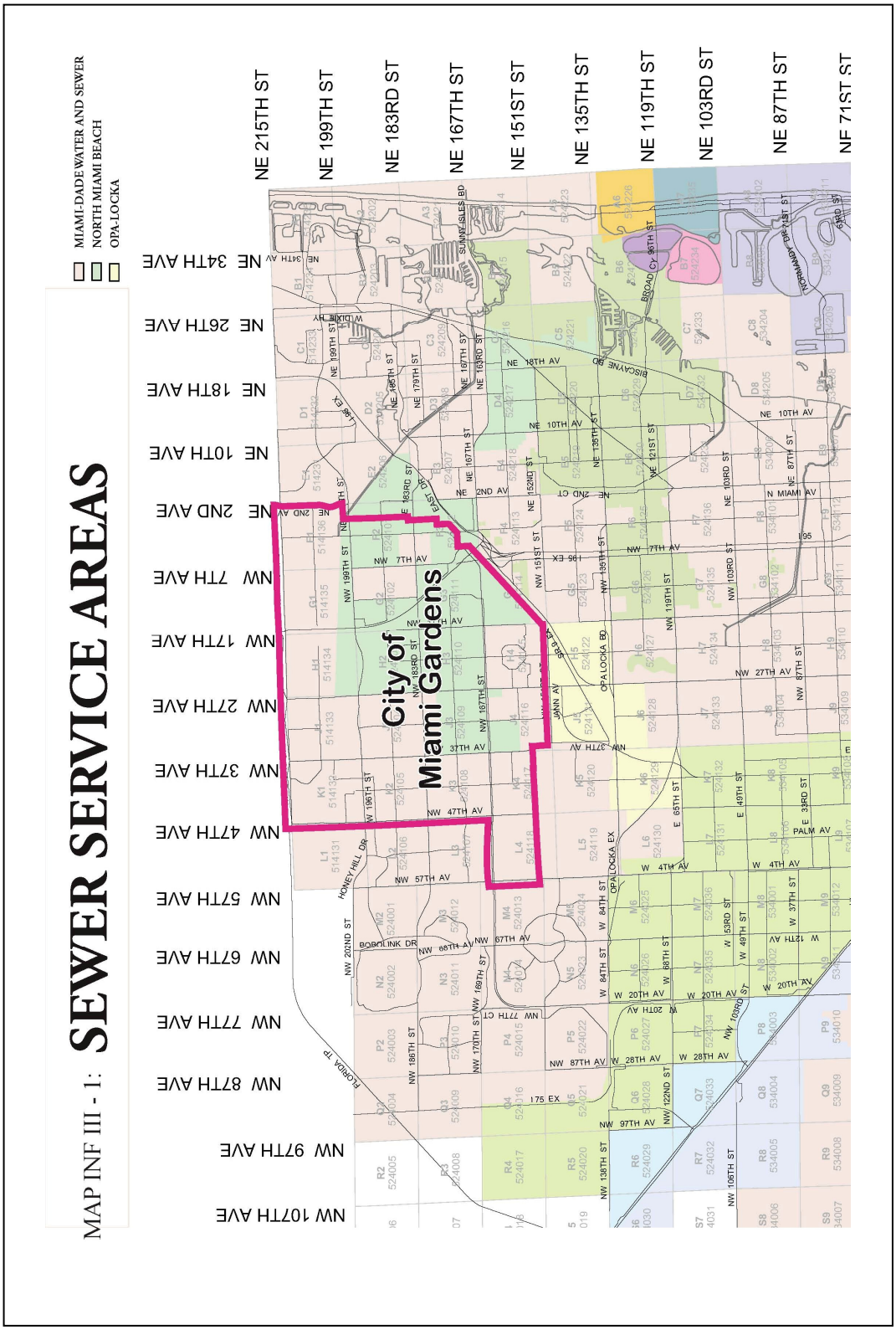


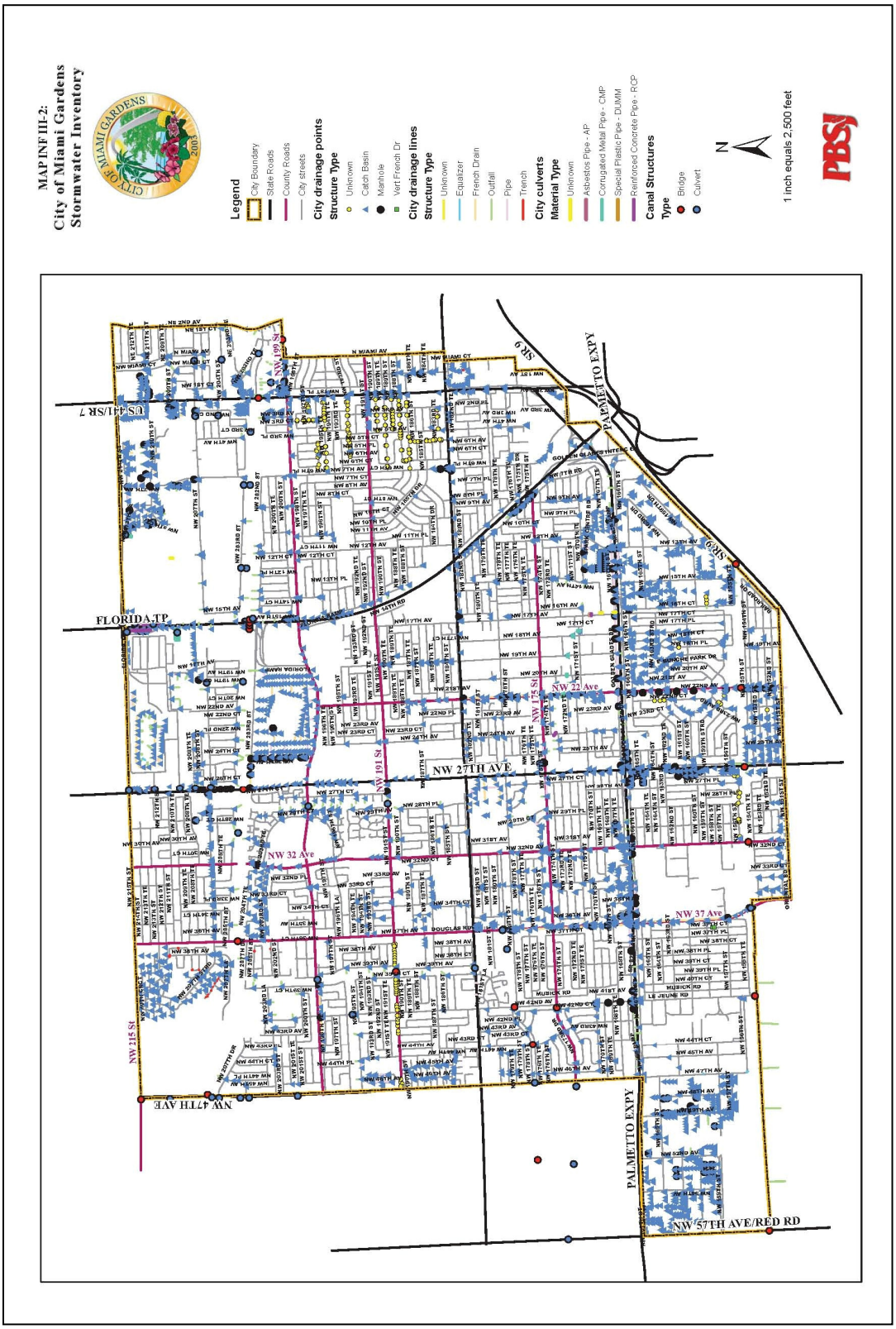
Exhibit INF III - 2: Aquifer Recharge Areas



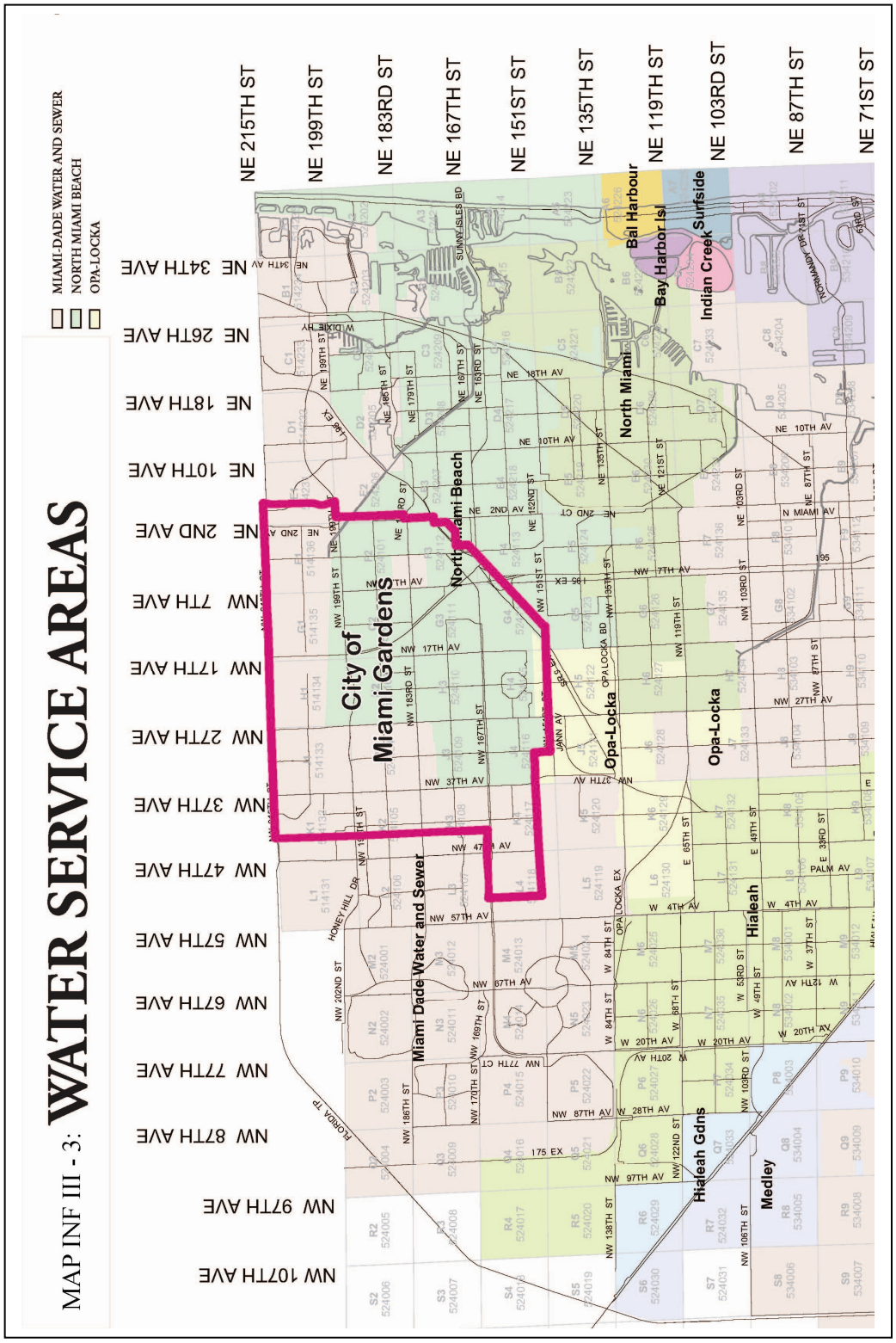
Map INF III - 1: City of North Miami Beach / Miami-Dade W.A.S.D Sewer Services Area Exchange



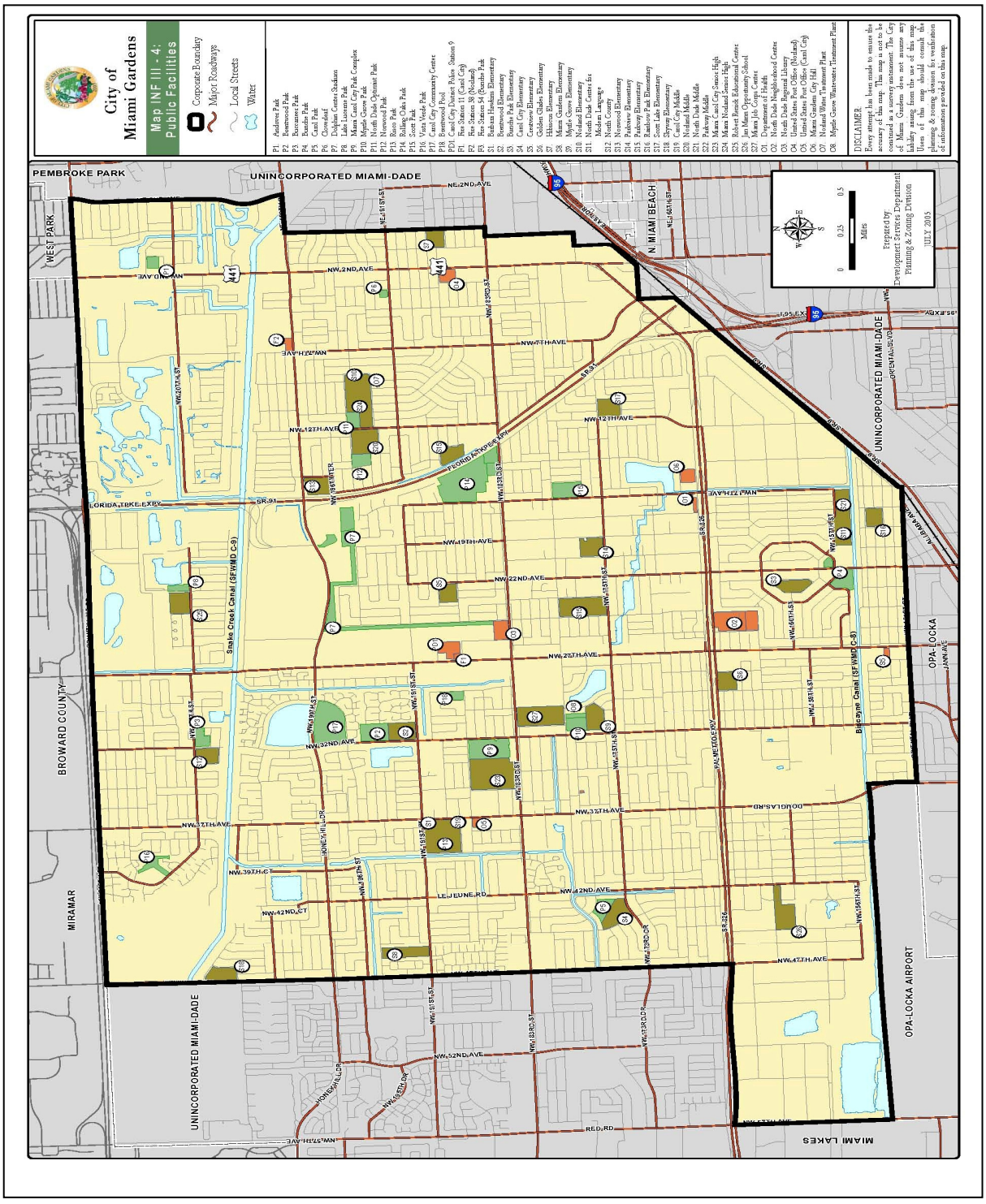
Map INF III - 2: City of Miami Gardens Stormwater Infrastructure Inventory



Map INF III - 3: City of North Miami Beach / Miami-Dade W.A.S.D Water Services Area Exchange



Map INF III - 4: City of Miami Gardens Public Facilities Map



Map INF III - 5: Miami Dade County Solid Waste Geographic Service Area

MAP INF III - 5:
Solid Waste Locations and Service Area Boundaries