Potable Water and Wastewater Data and Analysis Report

Public and Private Potable Water Facilities

Service Area

The City of Gainesville, through Gainesville Regional Utilities (GRU), is the supplier of potable water for all areas within city limits. There are currently no private potable water systems in the city. Both Tachachale Community of Excellence (formerly Sunland Training Center) and St. Michael's Child Care Center have been hooked to the City's centralized system. Tachachale was hooked to the City's centralized water system in 1998 because significant quantities of pollution (benzene and other toxic chemicals) were found in their water wells. The water plant at Tachachale has been placed on inactive status according to the Florida Department of Environmental Protection. Tachachale is billed for 123,288 gallons per day, which is well within the limits of the Murphree Plant's capacity. The City's Murphree Water Plant also provides water to urban fringe areas surrounding the city. Map 1 illustrates the service area for the Murphree Water Plant.

Proportional Capacity

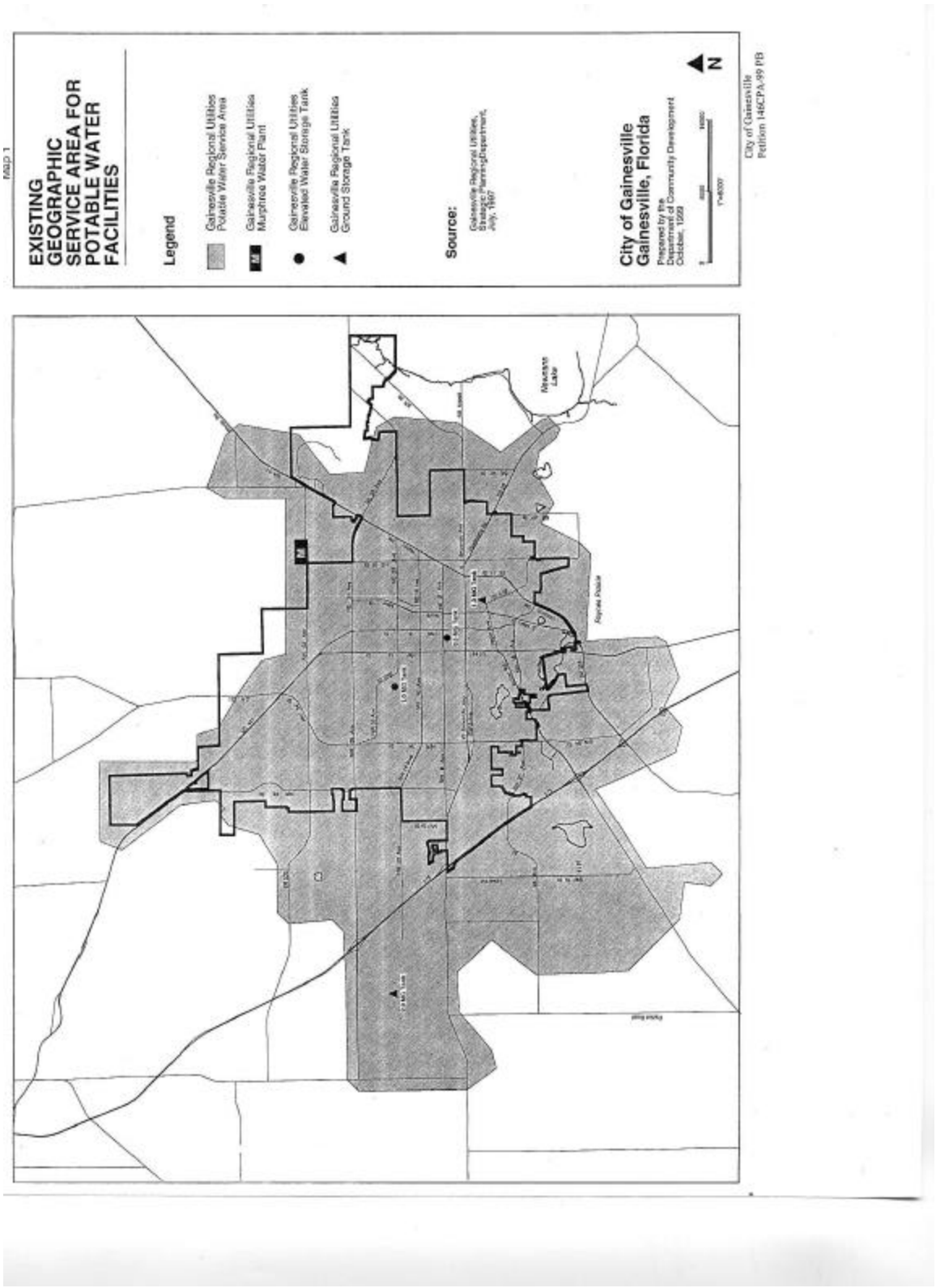
Proportional Capacity for the Murphree Water Plant

While the City does provide potable water for areas beyond its corporate limits, there are no formal or informal agreements allocating proportional capacity to any specific sub-areas. According to the Gainesville Code of Ordinances (see Appendix A, page A-1), service is provided on a "first come-first served" basis regardless of geographic or jurisdictional area.

Because there is a single water plant designed, operated and maintained to serve the urban area, it is not necessary to allocate proportional capacity. Plant capacity increases have historically been based on urban area level data and analyses since that is the population which is being served and will continue to be served.

There is adequate capacity (with a surplus) projected for both the City of Gainesville and the urban fringe in the two planning years, 2005 and 2010. In 2005 a 10.2 mgd surplus is projected; in 2010 a 5.9 mgd surplus is projected (see page 14). It should be especially noted that those surpluses are based on the maximum daily demand and not on average daily demand.

Based on the housing unit projections found in the Housing Element Data and Analysis Report, there will be more than enough capacity available to service the potable water


Map 1
EXISTING GEOGRAPHIC SERVICE AREA FOR POTABLE WATER FACILITIES
Legend
Gainesville Regional Utilities Potable Water Service Area
Gainesville Regional Utilities Murphree Water Plant
Gainesville Regional Utilities Elevated Water Storage Tank
Gainesville Regional Utilities Ground Storage Tank
Source:
Gainesville Regional Utilities, Strategic Planning Department, July, 1997
City of Gainesville
Gainesville, Florida
Prepared by the Department of Community Development
October, 1999
N
City of Gainesville
Petition 146CPA-99 PB

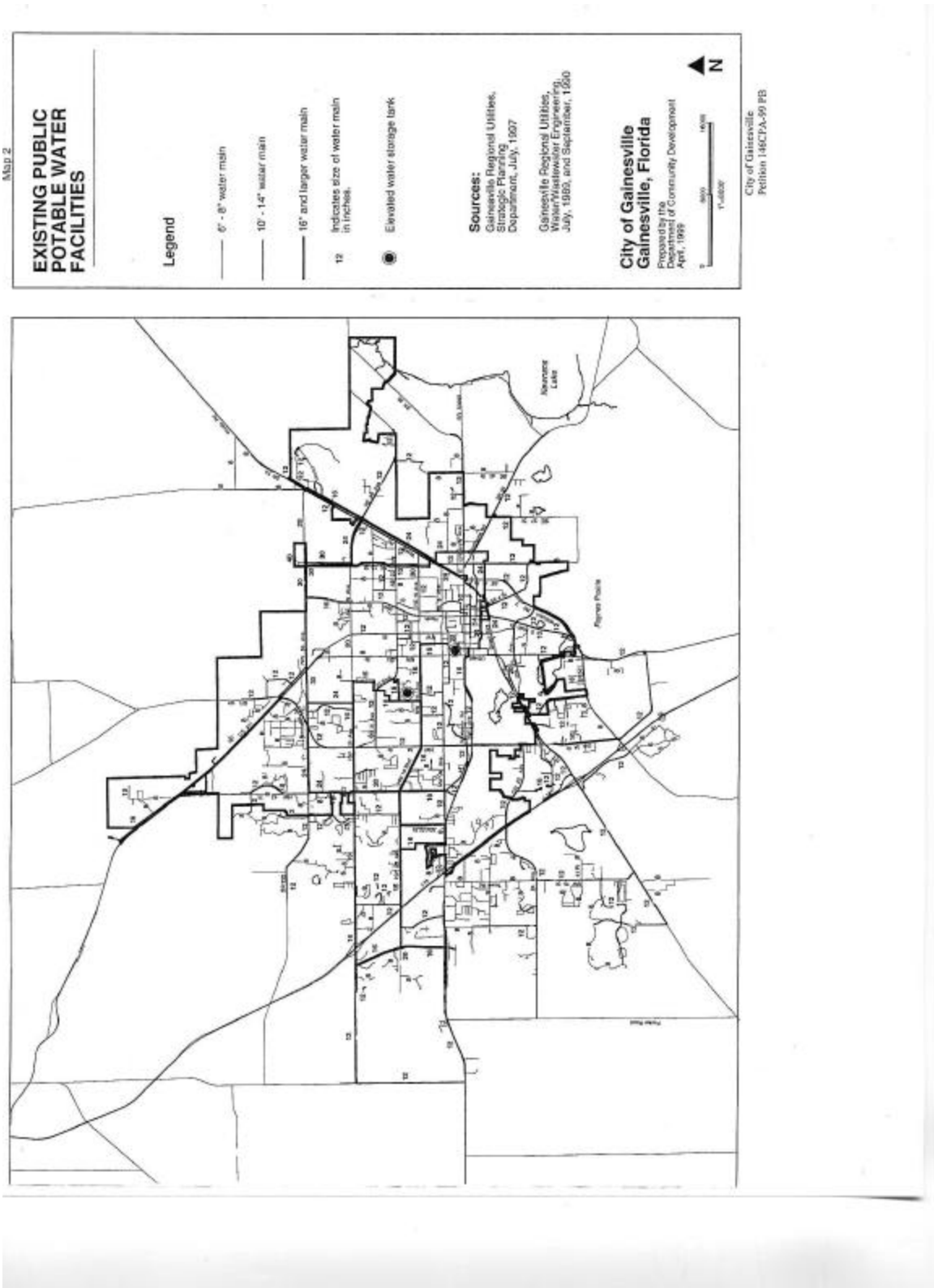
needs within city limits. The Housing Data and Analysis Report indicates that 1,977 households (off-campus housing units only) will be added between 2000 and 2005. That is an average addition of 395 units per year. There will be 3,038 housing units (off-campus housing units only) added between 2005 and 2010 (or approximately an average of 607 units per year). The projections are calculated using the UF Shimberg Center Affordable Housing Needs Assessment model, with the inclusion of the City's population projections.

Examining GRU's historical data for the period 1992-1996, it was found that the average number of connections to residential units per year (both inside and outside city limits) was 1,420. The average number of commercial connections in the same period was 115. The number of residential and commercial connections has increased slowly and with little variance. Projections (1997-2002) indicate a similar slow and low variance pattern (average of 1,175 residential units and 116 commercial units per year). Given the city's projected low population and housing unit growth rate, it is expected that GRU could service every anticipated housing and commercial unit to be built in the city within the planning horizon. Additionally, the anticipated 10.2 mgd surplus in 2005 allows for considerable projection error should the growth rate change radically in the first 5 years of the planning horizon. Thus, it is considered unnecessary to indicate a proportional capacity for the two jurisdictions since excess capacity exists for the projected needs of both areas.

The 2005 potable water maximum flow needed within the city to service the 1,977 projected housing units is .93 mgd (200 gallons per capita x (1,977 units x 2.354 persons per household (1999 figure obtained from the Bureau of Economic and Business Research). The additional 3,038 residential units projected for the period 2005-2010 will require about 1.43 mgd of capacity (200 gallons per capita x (3,038 units x 2.354). In both projection years, excess capacity exists to service the potable water needs of the city.

Public Facilities

Map 2 illustrates public potable water facilities: the Murphree Water Plant (which includes the water production wells, water treatment facilities, water storage and high service pumping equipment), elevated storage tanks and the distribution mains. The


Map 2
EXISTING PUBLIC POTABLE WATER FACILITIES
Legend
6" - 8" water main
10" - 14" water main
16" and larger water main
12 Indicates size of water main in inches.
Elevated water storage tank
Sources:
Gainesville Regional Utilities, Strategic Planning Department, July, 1997
Gainesville Regional Utilities, Water/Wastewater Engineering, July, 1999, and September, 1999
City of Gainesville
Gainesville, Florida
Prepared by the Department of Community Development
April, 1999
N
City of Gainesville
Petition 146CPA-99 PB

Murphree Plant is classified as a Community Water System (62-550.200 Florida Administrative Code (F.A.C.)).

The University of Florida's (UF) water supply comes from the Murphree Plant. However, UF owns and maintains its own water distribution mains. The UF Campus Master Plan contains maps showing those mains and the connection points to the City's water supply.

Operational Responsibility

The Murphree Water Plant is owned by the City of Gainesville and operated by Gainesville Regional Utilities.

Predominant Types of Land Uses Served by Potable Water Facilities

In order to document the predominant land uses served by the potable water facilities, it is necessary to break down the areas into two categories: existing land uses within the City of Gainesville and existing land uses outside of city limits which are controlled by Alachua County.

Category 1: Existing Land Uses within City Limits

Map 1 in the Future Land Use Element shows the existing land uses in the City of Gainesville and the contiguous urbanized area. Using that map, in conjunction with Map 1 of this Report, the predominant land uses within city limits associated with the Murphree Water Plant can be noted.

Table 1 in the Future Land Use Element summarize the various land uses and indicate percentages of each land use type. Table 1 from the Future Land Use Element Data and Analysis Report is replicated (in part) below as Table 1.

TABLE 1: Existing Land Uses within the City of Gainesville (Served by the Murphree Water Plant)

Land Use	Acreage	Percent of Total	Percent of Improved
Residential			
Single Family	6,456.72	23.48%	37.54%
Residential (Low)	1,077	3.92%	6.26
Residential (Medium)	780	2.83%	4.54%
Residential (High)	263	.96%	1.53%
Mixed Use Residential	35	.13%	.20%

Business			
Office	366.72	1.33%	2.13%
Commercial	416	1.51%	2.42%
Industrial	1,069	3.89%	6.21%
Mixed Use			
Mixed Use Low	376	1.37%	2.19%
Mixed Use Medium	319	1.16%	1.85%
Mixed Use High	119	.43%	.69%
Other			
Agriculture	1,495.91	5.44%	NA
Conservation	2,578.86	9.38%	NA
Education	2,205	8.02%	12.82%
Planned Use District	136	.49%	.79%
Public Facilities	3,387	12.32%	19.69%
Recreation	194	.71%	1.13%
Unimproved Land	6,226	22.64%	NA
TOTAL:	27,500.21		
TOTAL IMPROVED:	17,199.44		

Source: City of Gainesville Master Property System database, 1999.
As can be noted from the table, the predominant land uses served by the water plant are Residential and Public Facilities (accounting for approximately 70% of all improved land uses).

Category 2: Existing Land Uses outside City Limits

The Murphree Water Plant serves areas outside of city limits. Based on information from Alachua County, the predominant developed land uses in the urban fringe area are Residential and Institutional (including education, public buildings, and other public facilities).

Category 3: Existing Land Uses served by Private Facilities

Design Capacity and Current Demand

The design capacity and current demand levels for the water plant are listed in Table 2. Demand levels are given in millions of gallons per day (mgd). The demand figures for the Murphree Plant include demand from the entire service area (inside and outside of city limits).

TABLE 2: Design Capacity and Current Demand for the Murphree Plant

Water Plant	Design Capacity	Current Demand[1]
Murphree Water Plant	40.0 mgd	22.2 mgd
St. Michael's Child Care Center	5.0 tgd	2.0 tgd

[1]Figures for the Murphree Plant are for 1996. Demand is measured as average daily demand as delivered to the water distribution system.

Source: GRU Strategic Planning Department, 1997

Existing Levels of Service

Public Facilities

Four existing level of service (LOS) indicators have been examined for the Murphree Water Plant facility. These are:

1. Minimum design flow (measured as average daily per capita consumption in gallons)

2. Peak flow design capacity (measured as maximum daily demand)

3. Pressure

4. Storage tank capacity

LOS 1: Minimum Design Flow

The 1996 per capita daily consumption was calculated for the Murphree Plant. The contributions to this total consumption rate include average daily base consumption, commercial and other consumption. Other consumption includes unaccounted water uses such as fire hydrant tests, fire flows, theft, leaks, treatment uses, etc. However, sales to the University of Florida (927.83 mg) and power plants (59.63 mg) are excluded.

Water usage by UF is projected to range from approximately 939 mg in 1997 to 1,015 mg in 2005. Projections for the intermediate years can be found in GRU's Budget Year 1998 Forecast of Customer Sales and Revenues (May 1997). Water usage by the power plant is projected to be an average of 60 mg yearly during the period 1997 through 2005. The projected annual water usage for UF and the power plants will be reserved annually for them and will not be included within the available capacity for future development. The projections will be monitored annually to determine whether the annual reserved capacity should be changed.

The 1998 data indicate that 56% of GRU's potable water customers live inside city limits. The remaining 44% are customers living outside city limits.

Total 1996 water consumption was 6,997.39 mg (6,309.64 mg in sales increased by 10.9% for unaccounted water use, this excludes sales to UF and power plants). There were 45,594 residential connections and 4,257 non-residential connections in 1996 (GRU, 1997, Strategic Planning Dept.). Master metering in some multi-family units necessitates the use of a units per connection factor. Based on information from GRU, the 1996 number of units per connection was 1.37. Calculation of the existing 1996 level of potable water service is shown as follows.

Residential Connections x Units per Connection = Total Residential Units

45,594 x 1.37 = 62,464

Multiplying the total number of units by the persons per household (pph) yields an estimate of the population served by the water facility. A 1998 estimate of pph was obtained from the Bureau of Economic and Business Research (BEBR) at UF. Averaging the 1998 Alachua County pph (2.4) and the City of Gainesville pph (2.354) results in an estimate of 2.38 pph for the urban area served by the Murphree Plant. The pph is used in conjunction with total residential units to produce an estimate of population served.

Residential Units	x	pph	=	Population served
62,464	x	2.38	=	148,664

The per capita consumption rate is obtained by dividing total water consumption (excluding UF and power plant consumption) by total population served (6,997.39 mg/148,664). The 1996 per capita consumption was 47,068.5 gallons. Dividing by 365 to obtain the average daily per capita consumption, the result is 129 gallons.

1996 average daily per capita consumption: 129 gallons

The same methodology can be employed to calculate the overall per capita use which will be used to set the flow rate level of service standard. The standard is set using all flows (residential, non-residential, and unaccounted uses, but excludes flows to UF and the power plants).

Potable water demand is highly related to weather conditions. In order to set a level of service standard that reflects the impact of weather, a five-year average daily flow per capita was calculated using data for 1992 through 1996. The dwelling units per

residential connection, persons per household figures and 10.9% unaccounted use factor discussed above were used in combination with the average daily demand to calculate the LOS.Using the five-year average daily flow of 17.96 mgd divided by the five-year average size of the service population -- 139,505, the result is 129 gallons average flow per capita per day (identical to the 1996 average flow per capita per day). Given the very slight variation (8 gallons less) found between the LOS average standard set in 1995 (137 gallons) and the current figure of 129 gallons, the City has decided to maintain the existing standard of 137 gallons. Given the uncertainty cause by weather conditions (intervening El Nino and La Nina years have occurred), the City finds the 137 gallons average daily demand per capita standard to be reasonable.

LOS Average Standard:	**137 gallons average daily demand per capita** (retains 1995-adopted standard)

LOS 2: Peak flow design capacity

Peak flow design capacity is measured as maximum daily demand. This is the basis for FDEP's permitting of GRU's water facilities.

Peak demand is estimated using the maximum daily demand to average day demand ratio from historical GRU operating records (1976 to 1996) . To determine peak daily demand the average daily demand is multiplied by 1.46 (represents the average of 1976-1996 peak to average day ratios).

Using the data from the previous section and applying the peak factor ratio (1.46), the peak per capita daily demand is estimated to be 188.3 gallons (129 gallons x 1.46). The previously adopted (1995) LOS peak standard of 200 gallons daily flow per capita is not significantly different from the 188.3 gallons (less than 12 gallons per day) found during the Evaluation and Appraisal Report (EAR) process for the element. The final EAR for the Potable Water Element determined that the latest usage information did not exceed the adopted LOS standard. And, since the new figure is insignificantly different from the 1995-adopted standard, the City decided to maintain the existing standard.

LOS Maximum Day (Peak) Standard:	**200 gallons daily flow per capita** (maintains the 1995-adopted LOS standard).

LOS 3: Pressure

Adequate system pressure is required to meet fire flow demands and to maintain sanitary conditions in the water mains. Maintaining at least 20 pounds per square inch gauge (psig) pressure minimizes the chance of bacterial contamination.

The State of Florida has set a minimum pressure standard of 20 psig for potable water systems (62-555.320(7) F.A.C.). In the Gainesville service area the minimum system pressure in 1999 was approximately 50 psig (GRU, 1999). GRU's internal planning criteria is 40 psig, which is used to evaluate facilities under peak hour conditions assuming normal system operation. This criteria provides a necessary margin of safety to accommodate main breaks and fire flows while assuring at least 20 psig in GRU's facilities.

LOS standard: 20 psig for the overall water system

LOS 4: Storage Tank Capacity

Storage is required to meet distribution equalization, repump needs, fire and operational reserves. GRU's internally adopted standard is to provide storage capacity equal to 1/2 the maximum daily flow.

The 1996 maximum day consumption was 32.4 mgd. Thus, a storage tank capacity of 16.2 mg is the existing standard. Currently, there is 18.3 mg of storage available (1.5 mg in elevated storage tanks and ground storage of 16.8 mg), representing a surplus over the adopted LOS standard.

LOS standard: 1/2 of maximum day consumption volume

Needs Analysis

Facility capacity analysis based on existing conditions

The Murphree Water Plant has excess capacity available based on existing average daily demand. Table 3 contains data for the plant and shows the amount of surplus capacity. The capacity and demand figures are for the entire potable water service area, both inside and outside of city limits.

TABLE 3: Existing surpluses at the Murphree Water Plant

Facility	Design Capacity	Existing Average Demand[1]	Existing Peak Demand[1]	Surplus Based on Peak
Murphree Plant	40 mgd	22.2 mgd	31.8 mgd	8.2 mgd

[1]Based on 1996 data. Average and peak demand are measured as delivered to the water distribution system.

SOURCE: GRU Monthly Operating Records, Strategic Planning Dept., 1997

As can be noted from the table, an existing surplus capacity of 8.2 mgd exists and can be used for future development. However, GRU has indicated that it has commitments to serve 2,400 unbuilt residential units (this includes residential units located inside and outside of city limits). Including these future units in analyzing potable water capacity, GRU estimates that the peak demand from these units would add about 1.14 mgd to the total demand (2,400 x 2.38 (1998 city/county average persons per household)) x 200 gallons per capita per day). Table 4 accounts for the mgd already committed and shows the results. A surplus of 7.06 mgd remains even after the committed, but unbuilt units are taken into account.

TABLE 4: Total existing Potable Water Surplus

Facility	**Design Capacity**	**Peak Plus Committed Demand**	**Surplus**
Murphree Plant	40 mgd	32.94 mgd	7.06 mgd

Projected Needs Analysis

Projected needs are based on a GRU econometric model which calculates future water sales and connections for the entire service area (both inside and outside of city limits).[1] One component of this model is BEBR medium level population projections. The model predicts total sales (residential and non-residential). GRU's facility planning is based on the results of this model. The model assumes the absorption of the unbuilt, but committed units previously discussed. This alternative method of determining needs was used because the potable water service area does not correspond to a specific area for which population projections are available. Thus, it was decided that the best available information for projections would be from GRU's models.

The model projects total water sales through Fiscal Year 2018. It should be noted that these total sales projections include use by UF and the power plants. Water sales were multiplied by 1.109 to add a factor for unaccounted use. The resulting total was divided by 365 to provide a projection of average daily demand in the future.

2005 Facility capacity analysis

Table 5 contains data for the plant and indicates a projected 10.2 mgd surplus capacity in 2005. Since the demand column includes sales to UF and the power plants, the

surplus capacity represents the total amount of capacity projected to be available to serve new development.

TABLE 5: Projected 2005 Capacity Analysis at Water Plant

Facility	Design Capacity[1]	2005 Demand[2]	Surplus
Murphree Plant	51 mgd	33.0 mgd	10.2 mgd

1 Capacity represents planned plant expansion by end of FY 2002/2003.

2 Demand based on projections by GRU (GRU, 1996, Strategic Planning Department) which includes a 10.9% factor for unaccounted use. Demand represents maximum daily demand.

SOURCE: GRU, 1996, Strategic Planning Dept.

2010 Facility capacity analysis

The Murphree Plant's design capacity in 2010 will remain at 51 mgd based on a FY 2002/2003 projected expansion. Table 6 contains data for the plant and projects an excess capacity of 5.9 mgd in 2010.

TABLE 6: Projected 2010 Capacity Analysis at Water Plant

Facility	Design Capacity	2010 Demand[1]	Surplus
Murphree Plant	51 mgd	45.1 mgd	5.9 mgd

1 Demand based on projections by GRU (GRU, 1996, Strategic Planning Dept.) which includes a 10.9% factor for unaccounted use. Demand represents maximum daily demand.

SOURCE: GRU, 1996, Strategic Planning Dept.

General Performance of Existing Facilities

Adequacy of Current LOS provided by the Murphree Facility

LOS 1 and 2: Minimum and Peak Design Capacity

The Murphree Plant is currently meeting average and peak daily demand for the entire service area with an available surplus. In 1996, the maximum daily demand was 31.8 mgd. The maximum daily flow that has been experienced at the Murphree Water Treatment Plant was 36.6 mgd (this occurred in June 1998). This amount is within the plant's rated capacity.

As mentioned earlier, an expansion has already been scheduled for completion by the end of FY 2002/2003 for the Murphree Plant. The expansion will increase the plant capacity to 51 mgd.

LOS 3: Pressure

The water distribution system currently operates on an average day at pressures higher than the State-required 20 psig level of service. All fire flow deficiencies have been corrected.

LOS 4: Storage Capacity

As noted earlier, the existing storage capacity represents a surplus in the level of service standard which was set.

Other Measures of Potable Water System Performance

Well Capacity

The FDEP suggested standard for well capacity is average day use rate plus an excess equal to the capacity of the largest well. The largest well at the Murphree Plant is rated at 8 mgd. The average day use rate (based on 1996 data) is 22.2 mgd (based on raw water pumping). Combining these figures, the standard for the Murphree Plant would be 30.2 mgd. Currently, the well capacity is at 55 mgd. This capacity exceeds the FDEP standard.

High Service Pumping Capacity

FDEP recommends maximum day use rate as a standard for high service pumping capacity. In 1990 the maximum day use rate was 31.3 mgd of treated water. The existing high service pumping capacity at the Murphree Plant is 64 mgd. Thus, the plant exceeds the standard for high service pumping capacity.

Water Quality

The Federal Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP) set standards for water quality which are used for

evaluating water quality from the Murphree Plant. Currently, the Murphree Plant meets all EPA and FDEP water quality standards. GRU also softens, filters, fluoridates and stabilizes its water. These actions exceed minimum State requirements for a groundwater source of potable water.

General Condition and Expected Life of Facilities

A 1998 study undertaken by Black & Veatch (Five Year Report for the Period October 1, 1993 to September 30, 1998) to satisfy bonding requirements evaluated the potable water facilities and presented the following findings :

1. The general condition of water facilities observed during the inspections was found to be good. All of the wells and treatment process units, storage reservoirs and high service pumping facilities observed at the Murphree Plan were in satisfactory operating condition.

2. Both the Water Distribution and Water Treatment Departments maintain current standard operating procedures which ensure that the operations staff have proper information and directions to have the facilities perform in an efficient and effective manner.

3. The water treatment plant meets all FDEP standards. High service pumping facilities are sufficient to meet the demands of the system, and the pumping facilities meet FDEP standards for standby power for 50 percent of design capacity. The GRU water system is considered to be in compliance with all applicable regulatory requirements.

4. GRU procedures for maintaining the water system conform to accepted industry standards regulatory requirements.

5. The capital improvements program is indicative of a well administered utility, with planning for future system expansions to meet community needs, programming of improvements as they are required to sustain or expand service, and budgeting of the projects to manage cost. The projected ability of the water system to meet debt service coverage requirements and to meet its financial obligations under the existing rates for utility service is considered by Black & Veatch as reasonable and attainable.

Based on these findings, the potable water system is deemed to be in very good condition and the life of facilities extends beyond the 2010 planning horizon of the Comprehensive Plan.

Impact of the Facilities on Adjacent Natural Resources

There are no known negative impacts on adjacent natural resources from the Murphree Water Plant. The only documented effect of the Murphree Plant has been drawdown in the potentiometric surface of the underlying Floridan Aquifer due to withdrawals (GRU, 1989a and GRU, 1987c).[2] No ill effects have been noted from this drawdown because the confined nature of the Floridan Aquifer produces artesian conditions which preserve system pressure.

Opportunities for Facility Replacement, Expansion and New Facility Siting

Improvements or expansions to the current public potable water system include the following (GRU, et al., 1997, Strategic Planning Dept.):

1. An 11.0 expansion of the Murphree Water Treatment Plant is scheduled for completion by the end of FY 2002/2003.

2. A 2 mg expansion of storage facilities was completed in FY 97/98.

Improvements scheduled through the end of FY 2003/2004 have funding for the capital improvements secured from internally generated funds and external funds generated from revenue bonds (GRU, Strategic Planning, 1996). Utility bond proceeds will be used to fund the remaining capital improvements. GRU has established a schedule of rates to assure its ability to secure and service anticipated debt to fund programmed improvements.

Public and Private Wastewater Facilities

Service Area

Gainesville Regional Utilities (GRU), owned by the City of Gainesville, provides wastewater services for areas within the city limits and the surrounding unincorporated urbanized fringe (Alachua County's jurisdiction). The University of Florida (UF) provides wastewater services on its campus. Information about the UF Wastewater System has been deleted from this report because that is included in the UF Campus Master Plan, per State law. Map 3 illustrates the existing GRU geographic service area. As indicated on the map, the University of Florida (UF) has its own wastewater facilities which provide service to university property.

Proportional Capacity

Proportional Capacity for the City-owned Wastewater Plants

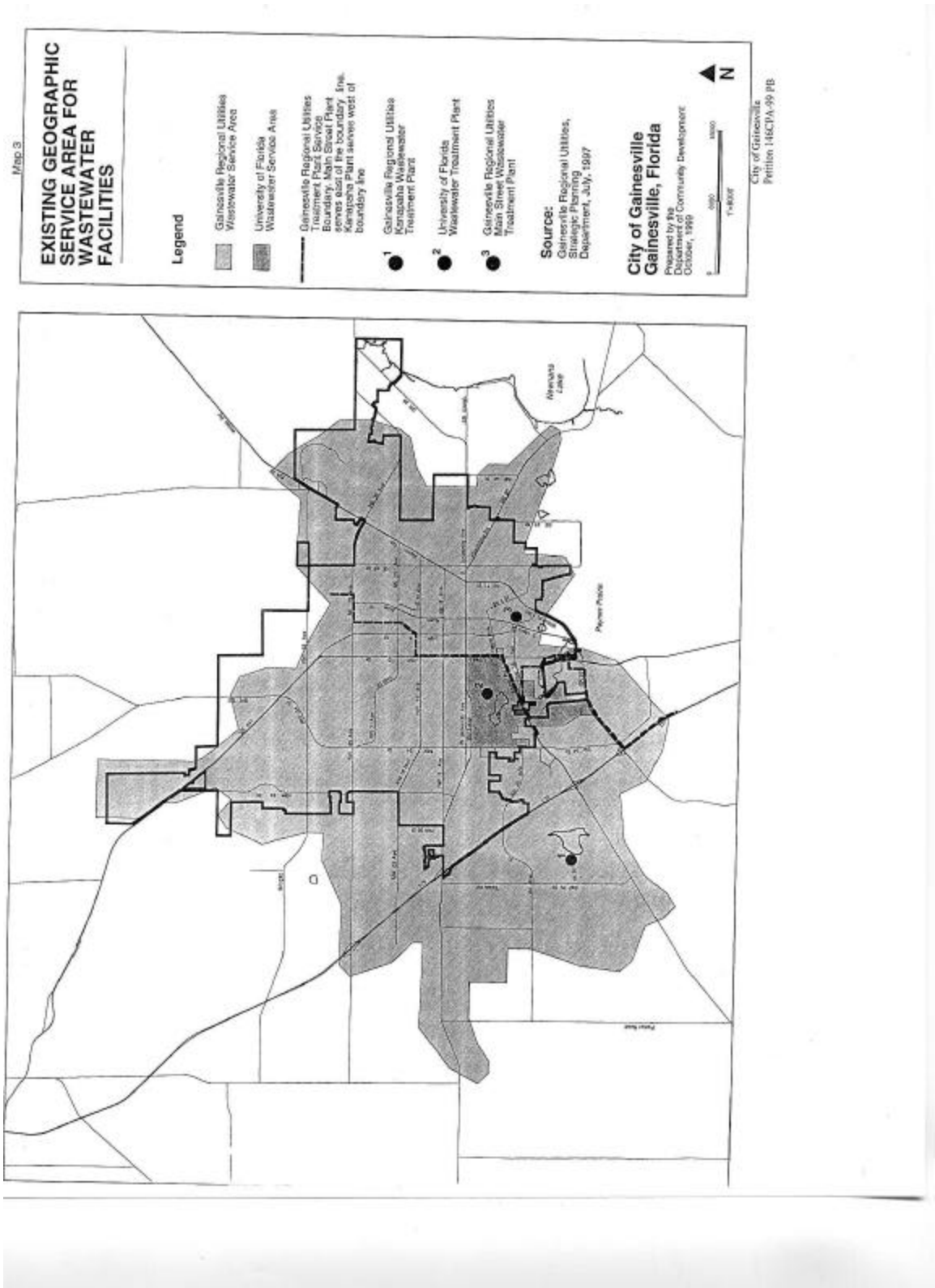
While the City does provide wastewater services for areas beyond its corporate limits, there are no formal or informal agreements allocating proportional capacity to any specific sub-areas. According to the Gainesville Code of Ordinances (see Appendix A, page A-1), service is provided on a "first come-first served" basis regardless of geographic or jurisdictional area.

Because the wastewater plants are designed, operated and maintained to serve the urban area, it is not necessary to allocate proportional capacity. During FY 1991/1992 an automated shunt system was constructed which increased the capacity to shift flows between the plants to 3.5 mgd. Plant capacity increases have historically been based on urban area level data and analyses since that is the population which is being served and will continue to be served.

There is adequate capacity (with a surplus) projected for both the City of Gainesville and the urban fringe in the two planning years, 2005 and 2010. In 2005 a 3.71 mgd surplus is projected; in 2010 a 1.96 mgd surplus is projected (see page 26). It should be especially noted that those surpluses are based on the average daily flow since that is how the plants are rated for flow limitation capacity by the Florida Department of Environmental Protection.

Based on the housing unit projections found in the Housing Element Data and Analysis Report, there will be more than enough capacity available to service the wastewater needs within city limits. The Housing Report indicates that 1,977 households will be added between 2000 and 2005. That is an average addition of 395 units per year. There will be 3,038 housing units added between 2005 and 2010 (or approximately an average of 607 units per year). The projections are calculated using the UF Shimberg Center Affordable Housing Needs Assessment model, with the inclusion of the City's population projections.

Examining GRU's historical data for the period 1993-1996, it was found that the average number of residential connections per year (both inside and outside city limits) was 1,216. The average number of non-residential connections in the same period was 70. The number of residential and non-residential connections has increased slowly. Projections (1996 to 2001) indicate a similar slow growth pattern (average of 1,465 residential connections and 83 non-residential connections per year). Given the city's projected low population and housing unit growth rate, it is expected that GRU could service every anticipated housing and commercial unit to be built in the city within the planning horizon. Additionally, the anticipated 3.71 mgd surplus in 2005 (see Table 12, p. 26) allows for considerable projection error should the growth rate change radically in the first 5 years of the planning horizon. Thus, it is considered unnecessary to indicate a proportional capacity for the two jurisdictions since excess capacity exists for the projected needs of both areas.


Map 3
EXISTING GEOGRAPHIC SERVICE AREA FOR WASTEWATER FACILITIES
Legend
Gainesville Regional Utilities Wastewater Service Area
University of Florida Wastewater Service Area
Gainesville Regional Utilities Treatment Plant Service Boundary. Main Street Plant serves east of the boundary line. Kanapaha Plant serves west of boundary line
1 Gainesville Regional Utilities Kanapaha Wastewater Treatment Plant
2 University of Florida Wastewater Treatment Plant
3 Gainesville Regional Utilities Main Street Wastewater Treatment Plant
Source:
Gainesville Regional Utilities, Strategic Planning Department, July, 1997
City of Gainesville
Gainesville, Florida
Prepared by the Department of Community Development October, 1999
N
City of Gainesville
Petition 146CPA-99 PB

The 2005 wastewater flow needed within the city to service the 1,977 projected housing units is .53 mgd (113 gallons per capita x (1,977 units x 2.354 pph)). The additional 1,909 residential units projected for the period 2005-2010 will require about .81 mgd of capacity (113 gallons x (3,038 units x 2.354 pph)). In both projection years, excess capacity exists to service the wastewater needs of the city.

Public Sanitary Sewer Facilities

GRU operates two sewage treatment plants, Kanapaha and Main Street, which provide service to the Gainesville urban area. Map 3 shows the location of these treatment plants and the regions which they serve.

Map 4 displays the sanitary sewer facility system. The treatment plants, trunk mains, interceptors and lift stations are delineated on this map. The Kanapaha Plant uses deep well injection into the aquifer on site and water re-use as the disposal system. The Main Street Plant discharges into the Sweetwater Branch.

The Kanapaha Plant currently operates as a tertiary treatment plant. The Main Street Plant is classified as an advanced secondary treatment plant.

Private Facilities

Aside from individually-owned septic tank systems, there are no private wastewater facilities (package plants) operating within city limits (Florida Dept. of Environmental Protection, 1996). There are several package plants in the existing wastewater service area; however, they fall outside city limits.

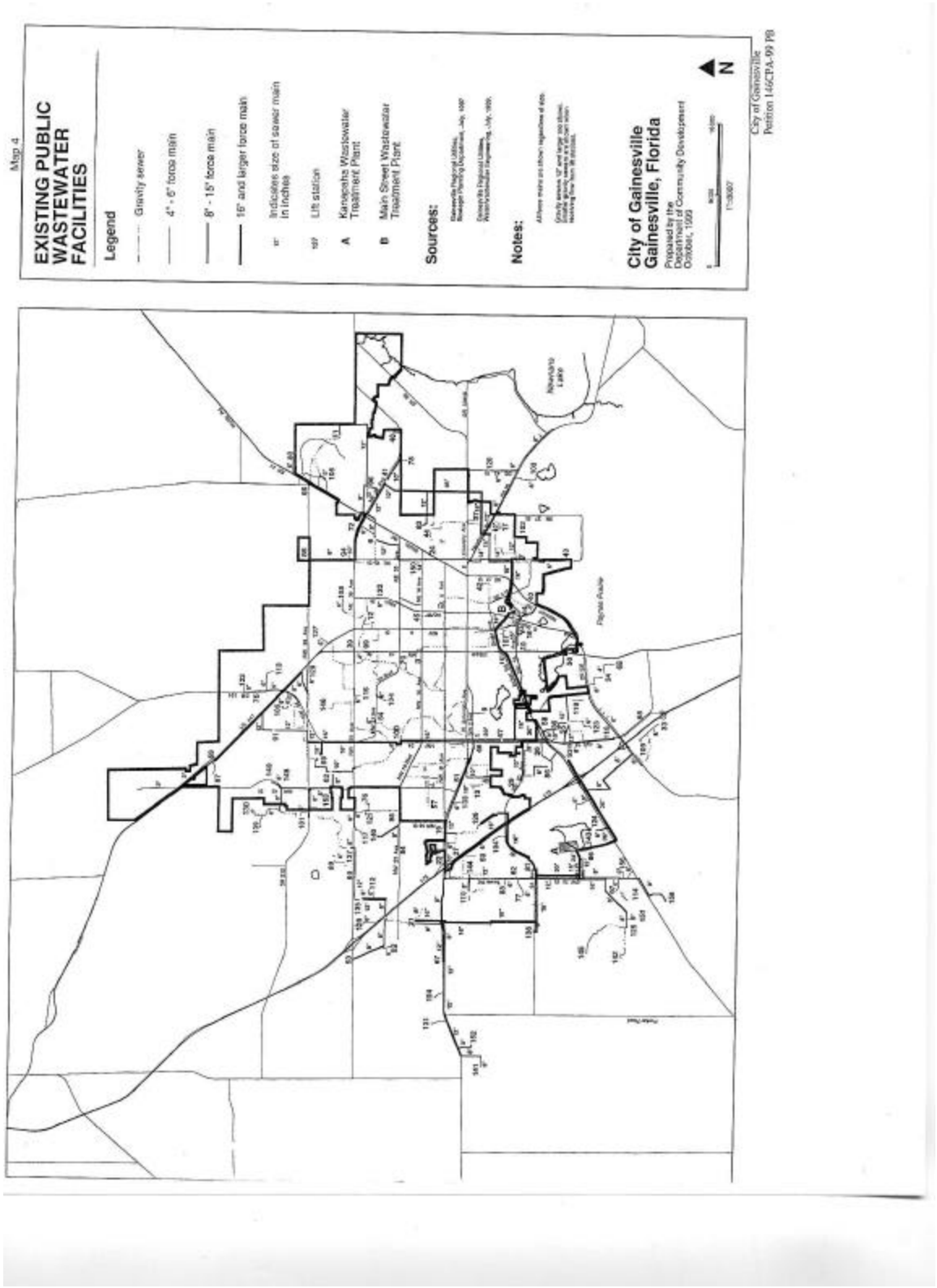
Operational Responsibility

Table 7 lists the entity having operational responsibility for each facility.

TABLE 7: Operational Responsibility for Sanitary Sewer Facilities

Sanitary Sewer Facility	Operational Responsibility
Kanapaha Water Reclamation Facility	Gainesville Regional Utilities (City of Gainesville)
Main Street Wastewater Treatment Plant	Gainesville Regional Utilities (City of Gainesville)

SOURCE: Gainesville Regional Utilities, 1998.


Map 4
EXISTING PUBLIC WASTEWATER FACILITIES
Legend
Gravity sewer
4" - 6" force main
8" - 15" force main
16" and larger force main
Indicates size of sewer main in inches
Lift station
A Kanapaha Wastewater Treatment Plant
B Main Street Wastewater Treatment Plant
Sources:
Notes:
City of Gainesville
Gainesville, Florida
Prepared by the Department of Community Development
October, 1999
N
City of Gainesville
Petition 146CPA-99 PB

Predominant Types of Land Uses Served by Sanitary Sewer Facilities

In order to document the predominant land uses served by the two wastewater treatment facilities, it is helpful to break down the areas into two categories: existing land uses within the City of Gainesville and existing land uses outside of city limits which are controlled by Alachua County.

Category 1: Existing Land Uses within City Limits

Map 1 in the Future Land Use Element shows the existing land uses in the City of Gainesville and the contiguous urbanized area. Using that map, in conjunction with Map 3 of this Data and Analysis Report, the predominant land uses within city limits associated with the Kanapaha and Main Street Plants can be noted.

Table 1 in the Future Land Use Element Data and Analysis Report summarizes the various land uses and indicate percentages of each land use type. Table 1 is replicated (in part) as Table 8 below. Acreage and land uses associated with the University of Florida have been subtracted out of this table because they are served by the UF sewage treatment facility.

TABLE 8: Existing Land Uses Within the City of Gainesville Served by City-owned Wastewater Facilities

Land Use	Acreage	Percent of Total	Percent of Improved
Residential			
Single Family	6,456.72	25.16%	41.88%
Residential (Low)	1,077	4.20%	6.98%
Residential (Medium)	780	3.03%	5.06%
Residential (High)	263	1.02%	1.71%
Mixed Use Residential	35	.14%	.23%
Business			
Office	366.72	1.43%	2.38%
Commercial	416	1.62%	2.70%
Industrial	1,069	4.17%	6.93%
Mixed Use			
Mixed Use Low	376	1.46%	2.44%
Mixed Use Medium	319	1.24%	2.07%

Mixed Use High	119	.46%	.77%
Table 8.--Continued			
Other			
Agriculture	1,495.91	5.83%	NA
Conservation	2,578.86	10.05%	NA
Education	422.98	1.65%	2.74%
Planned Use District	136	.53%	.88%
Public Facilities	3,387	13.20%	21.97%
Recreation	194	.76%	1.26%
Unimproved Land	6,170.87	24.05%	NA
TOTAL:	25,663.06		
IMPROVED TOTAL:	15,417.42		

[1]NOTE: This total does not include circulation, right-of-way or UF acreage served by the UF Wastewater Plant.

SOURCE: Department of Community Development, April 1999.

As can be noted from the table, the predominant developed land uses served by both wastewater plants are Residential and Public Service (accounting for 77.8% of all improved land uses).

Category 2: Existing Land Uses outside City Limits

Both the Kanapaha and Main Street Plants serve areas outside of city limits. Based on information from Alachua County Plan, the predominant land uses in the urban fringe area are Residential and Institutional (including education, public buildings, and other public facilities).

Design Capacity and Current Demand

The design capacity and current average and peak daily flow levels for each wastewater plant are listed below in Table 9. Demand levels are indicated in millions of gallons per day (mgd). The design capacity and demand figures for Main Street and Kanapaha include demand from the entire service area (inside and outside of city limits).

Table 9: Design Capacity and Current Demand for Wastewater Plants

Wastewater Plant	Design Capacity	Current Demand	Current Peak Demand[2]
Kanapaha Wastewater Plant[1]	10.0 mgd	8.2 mgd	9.9 mgd
Main Street Plant[1]	7.5 mgd	6.5 mgd	8.0 mgd

[1]Figures are averages for 1996. Demand is measured as average daily flow.

[2]Peak demand is measured as maximum 3-month average daily flow.

SOURCE: GRU Monthly Operating Records, Strategic Planning Dept., 1996.

Existing Levels of Service

Public Facilities

Two existing level of service (LOS) indicators have been examined for wastewater facilities. These are:

1. Average flow design capacity (measured as average daily per capita flow)

2. Peak flow design capacity (measured as a ratio of maximum 3-month average daily flow to annual average daily flow)

It should be noted that all discussions of flows and associated levels of service are for the entire wastewater service area, both inside and outside of city limits.

LOS 1: Average flow design capacity

The daily per capita flow was calculated from the combined flows to the Main Street and Kanapaha plants because flows can be shunted between the plants. The contributions to this total flow rate include average daily base flow, infiltration/inflow, commercial and industrial flows.

The 1998 data indicate that 59% of the billed wastewater flow is for customers inside city limits (percentage based on a total which excludes flows due to infiltration/inflow). The remaining 41% is for customers outside city limits.

Total 1996 sewage flow was 5,267 mg (reflects plant flow data which includes infiltration/inflow). There were 41,602 residential connections and 3,198 non-residential connections (GRU, 1997, Strategic Planning Department). Because master metering is common in multi-family units, it is necessary to multiply the number of connections by a units/connection factor to determine total residential units served. GRU estimates that the units per wastewater connection are 1.41. Calculation of the existing 1996 level of wastewater service is shown below.

Residential Connections x Units per Connection = Total Residential Units

41,602 x 1.41 = 58,659

Multiplying the total number of units by the persons per household (pph) yields an estimate of the population served by the wastewater facilities. A 1998 estimate of pph was obtained from the Bureau of Economic and Business Research at UF. Averaging the 1998 Alachua County pph (2.4) and the City of Gainesville pph (2.354) results in an estimate of 2.38 pph for the urban area served by the wastewater plants. The calculation of estimated population served is illustrated as follows.

Residential Units x pph = Population served

58,657 x 2.38 = 139,603

The per capita wastewater discharge rate is obtained by dividing total wastewater flow by population (5,267 mg/ 139,603). The 1996 per capita flow was 37,728.4 gallons. Dividing by 365 to obtain the average daily per capita flow, the result is 103.3 gallons for the system as a whole.

1996 average daily flow per capita: 103.3 gallons

The same methodology can be employed to calculate the overall per capita flow which will be used to set the flow rate level of service standard. The standard is set using all flows (residential, non-residential, and infiltration/inflow). A five year average daily flow per capita was calculated using wastewater plant flow data for 1992 through 1996 (GRU, 1997). The dwelling units per residential connection and persons per household figures discussed above were used in combination with the average flow to calculate the LOS.

Using the five-year average annual daily flow of 13.54 mgd divided by the five-year average size of the service population--136,031, the result is 100 gallons average flow per capita per day. The previously adopted (1995) LOS standard of 113 gallons average daily flow per capita is not significantly different from the 100 gallons (13 gallons per day) found during the Evaluation and Appraisal Report (EAR) process for the element. The final EAR did not identify a need to change the 1995-adopted standard. During the EAR process, it was determined that the latest usage information did not exceed the adopted 1995-adopted LOS standard. Thus, the City decided to maintain the 1995-adopted standard.

LOS Average Standard: **113 gallons average daily flow per capita** (maintains the 1995-adopted LOS standard)

LOS 2: Peak flow design capacity

Peak flow design capacity is measured as maximum 3-month average daily flow. However, it should be noted that the Florida Department of Environmental Protection (FDEP) uses average daily flow as the basis for permitting of GRU's wastewater facilities. This permitting sets the standard for the maximum effluent limitation which can be handled by the wastewater plants. Thus, that is why the average daily flow is used to set the wastewater level of service standard.

Peak flow is estimated using a maximum 3-month average daily flow to average day flow ratio from historical GRU wastewater records (GRU, 1996, Strategic Planning Department). To determine peak daily flow, the average daily flow is multiplied by 1.092 (represents the average of the years 1992-1996 of maximum 3-month average daily flow data to annual average day ratios). Multiplying 1.092 times the average daily flow of 100 results in a figure of 109 gallons peak flow per capita. As with the average flow LOS standard, the City has decided to maintain the 1995-adopted standard since the differences are minor.

LOS Peak Standard: **123 gallons daily flow per capita** (maintains the 1995-adopted LOS standard)

Needs Analysis

Facility capacity analysis based on existing conditions: city-owned systems

Both the Kanapaha and Main Street plants have capacity surpluses based on existing average daily flows. Table 10 contains data for each plant and shows the amount of surplus capacity at each plant. The capacity and demand figures are for the entire wastewater service area, both inside and outside of city limits.

TABLE 10: Existing surpluses at Wastewater Plants

Facility	Design Capacity	Current Average Flow	Surplus Based on Average Flow
Kanapaha Plant	10.0 mgd	8.2 mgd	1.8 mgd
Main Street	7.5 mgd	6.5 mgd	1.0 mgd
TOTAL	17.5 mgd	14.7 mgd	2.8 mgd

As indicated in the table, a surplus capacity of 2.8 mgd, based on average daily flow, currently exists which can be used for future development. However, GRU has indicated that it has commitments to serve 2,121 unbuilt residential units (this includes residential units located inside and outside of city limits). Sewage capacity to serve these future units must be considered in calculating available surpluses. GRU estimates that the average sewage flow from these units would add about .57 mgd to the total demand. Table 11, below, accounts for the mgd associated with commitments to serve and reflects the results of including those units.

TABLE 11: Total existing Wastewater Plant Surplus

Facility	Design Capacity	Average Daily and Committed Flow	Surplus Based on Average Flow
TOTAL	17.5 mgd	15.27 mgd	2.23 mgd

Projected Needs Analysis

Projected needs are based on a GRU econometric model which calculates future wastewater sales and connections for the entire service area using BEBR medium population projections as one factor in the model.[3] Historical trends (connections resulting from population growth) are also a factor in the model. The model predicts total sales (residential and non-residential). GRU's facility planning is based on the results of this model. The model includes absorption of the unbuilt, but committed units. This alternative method of determining needs was used because the wastewater service area does not correspond to a specific area for which population projections are available. Thus, it was decided that the best available information for projections would be from GRU's models.

GRU's policy (in City ordinances) is that development (inside or outside of city limits) pays the fully allocated cost of treatment facilities required to serve it. GRU also has a policy that requires developers to contribute the water and wastewater distribution or collection systems internal to a development. Because development pays its way in providing water and wastewater facilities, a built-in mechanism for provision of projected facility needs is already in existence.

The model projects total wastewater connections for the entire service area (both inside and outside of city limits) through FY 2018. Projected wastewater connections were multiplied by 323.6 gallons per day/connection, the median wastewater generation per customer for the years 1989 through 1996. Projections of peak flows were made by multiplying average daily flows by 1.066 (the ratio of maximum 3-month average daily flow to annual average day flow for the years 1992-1996). A 1.0 mgd base infiltration/inflow factor was also added to the peak flow projections.

2005 Facility capacity analysis

Flow projections are for the combined plants because currently up to 3.5 mgd of wastewater flows can be shifted between the plants using an automated shunt system. Table 12 contains data which project the total 2005 average daily flow and peak flow to both plants.

TABLE 12: Projected 2005 Capacity Analysis for Wastewater Plants

Facility	Design[1] Capacity	2005 Average Daily Flow	2005 Peak Flow	Surplus Based on Average Daily Flow
TOTAL	21.5 mgd	17.79 mgd	14.6 mgd	3.71 mgd

[1]This reflects an expansion of 4.0 mgd at Kanapaha in FY 2001.

SOURCE: GRU, 1997, Strategic Planning Department.

2010 Facility capacity analysis

Table 13 contains projections for 2010 average and peak day total flows. The overall system capacity still shows a surplus through the year 2010.

TABLE 13: Projected 2010 Capacity Analysis for Wastewater Plants

Facility	Design Capacity[1]	2010 Average Daily Flow	2010 Peak Flow	Surplus Based on Average Daily Flow
TOTAL	21.5 mgd	19.54 mgd	21.49 mgd	1.96 mgd

[1]This reflects an expansion of 4.0 mgd at Kanapaha in FY 2001.

SOURCE: GRU, 1997, Strategic Planning Department.

General Performance of Existing Facilities

Adequacy of Current level of service provided by the City-owned Facilities

LOS 1: Average daily flow design capacity

The Kanapaha and Main Street plants are currently meeting the existing average daily demand with surplus capacity available at both plants. A planned expansion of the Kanapaha Water Reclamation Facility should assure adequate average daily flow capacity through the planning time-frame.

LOS 2: Peak flow design capacity

Both wastewater treatment plants are currently meeting peak flow demands with excess capacity. A 4.0 mgd expansion for Kanapaha has been scheduled for completion during FY 2001 (included in the capital budget to be complete by the end of FY 2000/2001).

General Condition and Expected Life of City-owned Facilities

A 1998 study undertaken by Black & Veatch (Five Year Report for the Period October 1, 1993 to September 30, 1998) to satisfy bonding requirements evaluated the wastewater facilities and presented the following findings :

1. The general condition of the GRU wastewater collection and treatment facilities observed during the inspections was found to be good. All of the pump stations and the treatment process units observed at the Kanapaha and Main Street Plants were in satisfactory operating condition.

2. The best indication of the general state of the wastewater system was found to be the record of compliance with wastewater treatment plant effluent limits. Both of the treatment plants are required to meet extremely high standards of performance, and the record of compliance was found to be outstanding.

3. The two wastewater treatment plants regularly meet the effluent quality requirements established by their operating permits.

4. GRU has an active commercial and industrial waste pretreatment program in conformance with the EPA requirements and as contained in state regulations. The program provides assurance that wastewater discharged to the collection system from commercial and industrial sources is of acceptable quality and will not be harmful to the wastewater system.

5. GRU procedures for maintaining the wastewater system conform to industry standards and regulatory requirements.

6. Based on a review of the Water/Wastewater Systems FY 1998-2005 Capital Budget Request report, it is evident that GRU has a satisfactory system for planning , programming, and financing capital improvements required to maintain the condition of the existing wastewater system as well as provide for expansion of the system to meet projected demands. The capital improvements program is indicative of a well administered utility, with planning for future system expansions to meet community needs, programming of improvements as they are required to sustain or expand service, and budgeting of the projects to manage costs.

Based on these findings and the GRU Strategic Planning Department's assessment, the wastewater system is deemed to be in very good condition and the life of facilities extends beyond the 2010 planning horizon of the Comprehensive Plan.

Impact of the City-owned Facilities on Adjacent Natural Resources

In 1989 the Main Street Wastewater Plant was listed by the US Environmental Protection Agency (EPA) as having levels of lindane and silver higher than currently permissible for Class III surface waters (the effluent is being disposed into Sweetwater Branch Creek). A major upgrade was completed in 1992 which now allows the plant to meet the current effluent limits. GRU has also instituted an Industrial Pre-treatment Program to reduce lindane and silver levels.

The Kanapaha Plant's major impact on the environment is an alteration of the groundwater quality at a depth of 450 - 1020 feet below ground level in the Floridan Aquifer. However, extensive monitoring and analysis have found that water is at background conditions for nutrients, organic chemicals and microbiological constituents within 2,300 feet of the plant due to absorption, adsorption, filtration, precipitation and bacterial breakdown below the surface (GRU, 1987).

The re-use of reclaimed water from the Kanapaha Water Reclamation Facility (KWRF) for the creation of water features and landscape irrigation was initiated in 1993. Expansions are planned near the KWRF that will eventually provide 4.2 mgd of reclaimed water for beneficial use.

A large holding pond at the plant is used for by-pass should the effluent not meet drinking water standards prior to aquifer recharge. This pond has suffered water loss in the past due to sinkhole formation and is now lined to prevent the re-occurrence of such events. As a precautionary measure, all private wells adjacent to the plant have been replaced by central potable water.

Odors have been significantly reduced at the plant by the installation of a biofilter for odor control. Monitoring of this system by UF has found it to remove 99.9% of the hydrogen sulfide from the waste air stream (Allen, 1989).

Sludge from the wastewater plants is land applied by GRU at various farming sites which request the sludge. The sludge is sampled monthly and reports are sent to FDEP. GRU's sludge is rated as Grade B under the FDEP criteria for land application or disposal of domestic wastewater treated sludge (62-640 F.A.C.). GRU submits for FDEP review a new Land Application Field Package for Grade B Sludges (FDEP Form 62-40.210(2)(a)) for each site where land application will occur. Given the grading level of the sludge and FDEP oversight, no adverse environmental impacts are expected.

Opportunities for City-owned Facility Replacement, Expansion and New Facility Siting

Improvements or expansions to the current public wastewater system include the following (GRU Strategic Planning, 1997):

1. The Main Street Treatment Plant has been upgraded to provide advanced secondary treatment. This upgrade included replacing the existing trickling filter process train with an activated sludge process train; upgrading the clarifiers; and providing grit removal, chemical treatment, filtration, and gravity belt thickeners. (Improvement begun FY 1989 and completed in 1992).

2. A 4.0 mgd expansion of wastewater treatment capacity at the Kanapaha Water Reclamation Facility is planned to be complete by the end of Fiscal Year 2001.

Improvements scheduled through the end of FY 01/02 have funding for the capital improvements secured from external funds generated from revenue bonds (GRU, Strategic Planning Dept., 1997). Utility bond proceeds will be used to fund the remaining capital improvements. GRU has established a schedule of rates to assure its ability to secure and service anticipated debt to fund programmed improvements.

Opportunities for expanding centralized wastewater facilities to septic tank areas

Records from the Alachua County Health Department (1998-1999) indicate that septic tank problems are minimal within the City of Gainesville. According to Mark Lander with the Health Department (phone conversation 10/20/99), less than ten percent of the complaints received by the Health Department are for septic tanks within city limits. Drainfield problems (often caused by lack of owner maintenance) is the most common problem. All problems (20-25 cases) have been resolved by system repairs or by encouraging property owners to hook to the centralized system, where available. Thus, to date, expansion of wastewater facilities to service those areas currently being served by septic tanks which seem to be in good operating order has not been a priority.

It should be noted that the City amended its connection policy ordinance (change adopted September 30, 1991) which provides an economic incentive for owners of septic tanks to hook up to the centralized system. Ordinance 3740, which amended the utilities section of the City's Code of Ordinances, included a provision for the elimination of frontage charges. In an analysis of those charges (GRU, "Water and Wastewater Connection and Extension Charges Policy Review,"July 16, 1991), GRU found that there were frequent requests for hook up information from existing structures adjacent to existing wastewater facilities. However, the frontage fee charges were seen as a serious impediment to this type of system infill. The elimination of the frontage fees encourages those adjacent to existing wastewater facilities to voluntarily hook up.

The City also has existing mechanisms for property owners to hook into the centralized sewer system, if they so desire. Property owners can pay the costs of expansion to them directly or through a special assessment procedure. The special assessment method allows property owners to pay the costs of hook up over a fixed time period as part of their annual property tax bill. The City also passed an ordinance which makes available an installment payment plan for connection charges so that property owners served by septic tanks or package treatment plants are encouraged to hook to the centralized system by spreading payments over a ten-year period.

In the case of a septic tank problem causing a sanitary nuisance or endangering a water supply, an existing section of City code (Section 27-168.2) (see copy of text in Appendix B), requires connection to the public sanitary sewer, within 30 days of notice, if the property is abutting on any street, alley or right-of-way in which a public sanitary sewer is installed, or within 200 feet of the nearest available public sanitary sewer. Chapter 64E-6 F.A.C of the State of Florida regulates how abandoned septic tanks must be handled.

Soil Suitability for Septic Tanks

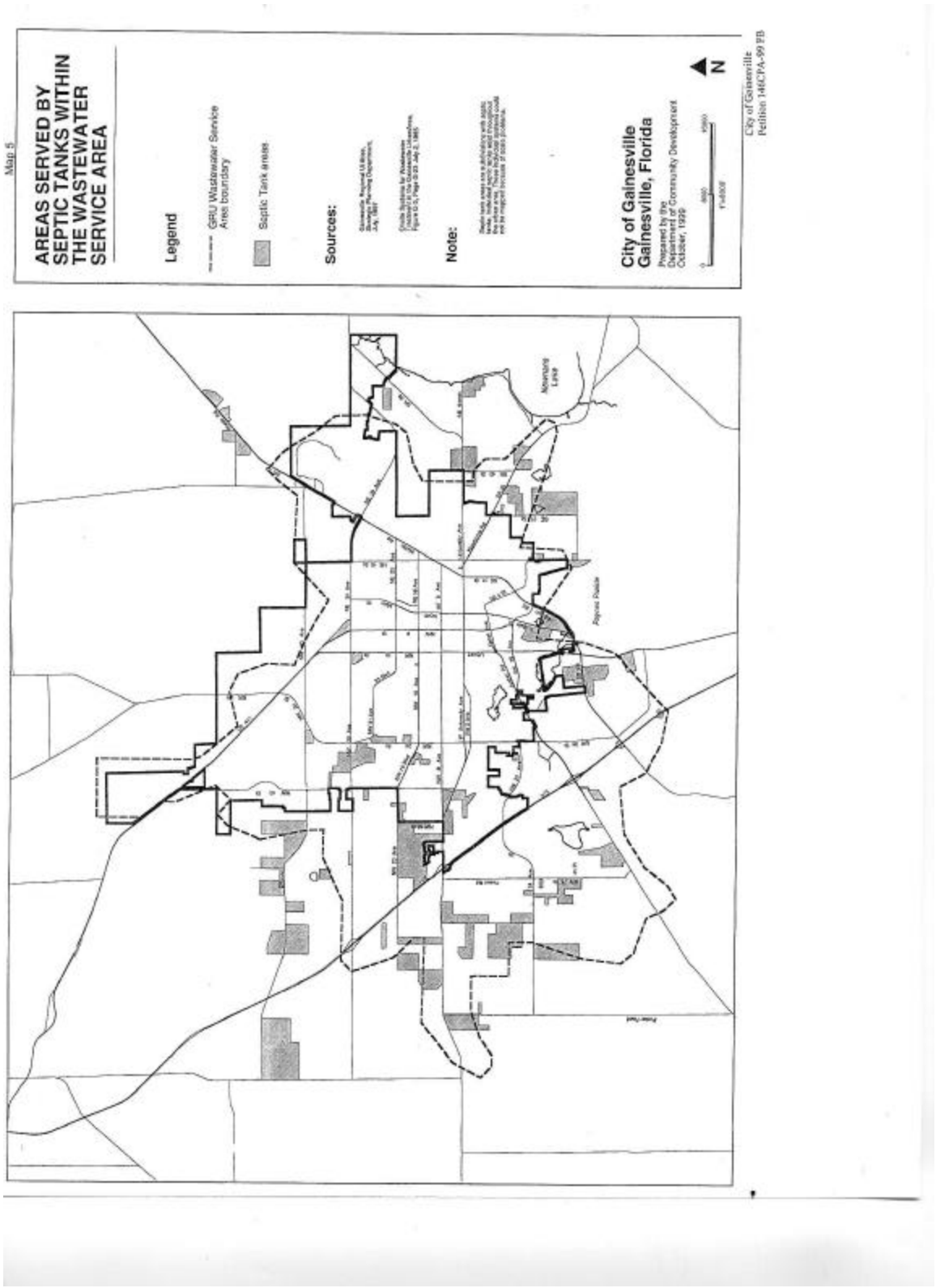
Subdivisions served by septic tanks are indicated on Map 5. Soil suitability for these septic tanks in these subdivisions is superimposed on the septic tank areas and is illustrated in Map 6. The soil limitations for septic tanks are rated as slight, moderate or severe as shown on the map. The soils constituting each level of limitation can be found in Appendix B Table B2. As can be

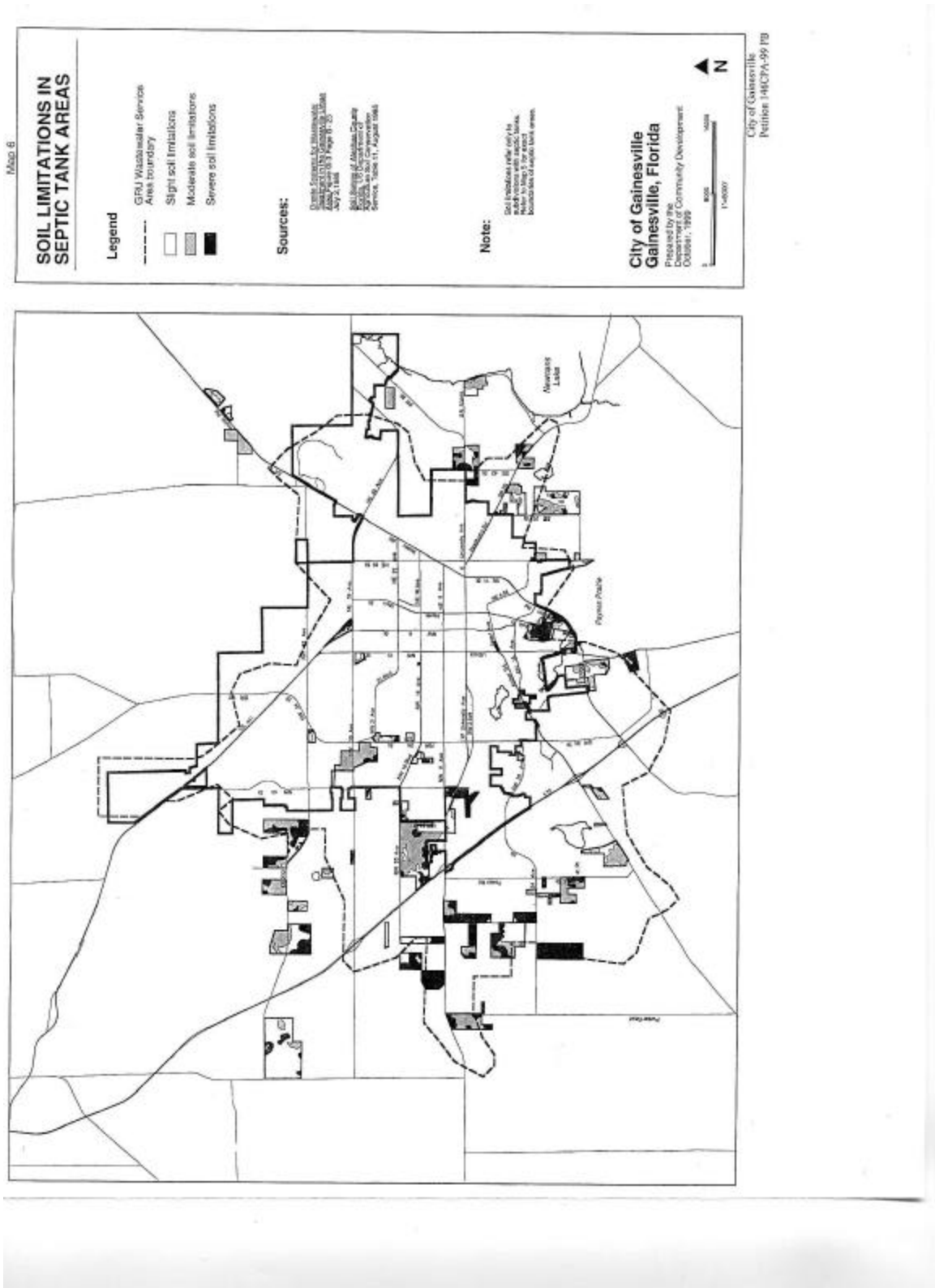
noted, there are several areas of septic tank concentration with soils which are either moderately or highly unsuitable for septic tanks. The small scale of the Soil Conservation Service maps precludes their use for specific sites. Thus, Map 5 should only be used for generalized purposes.

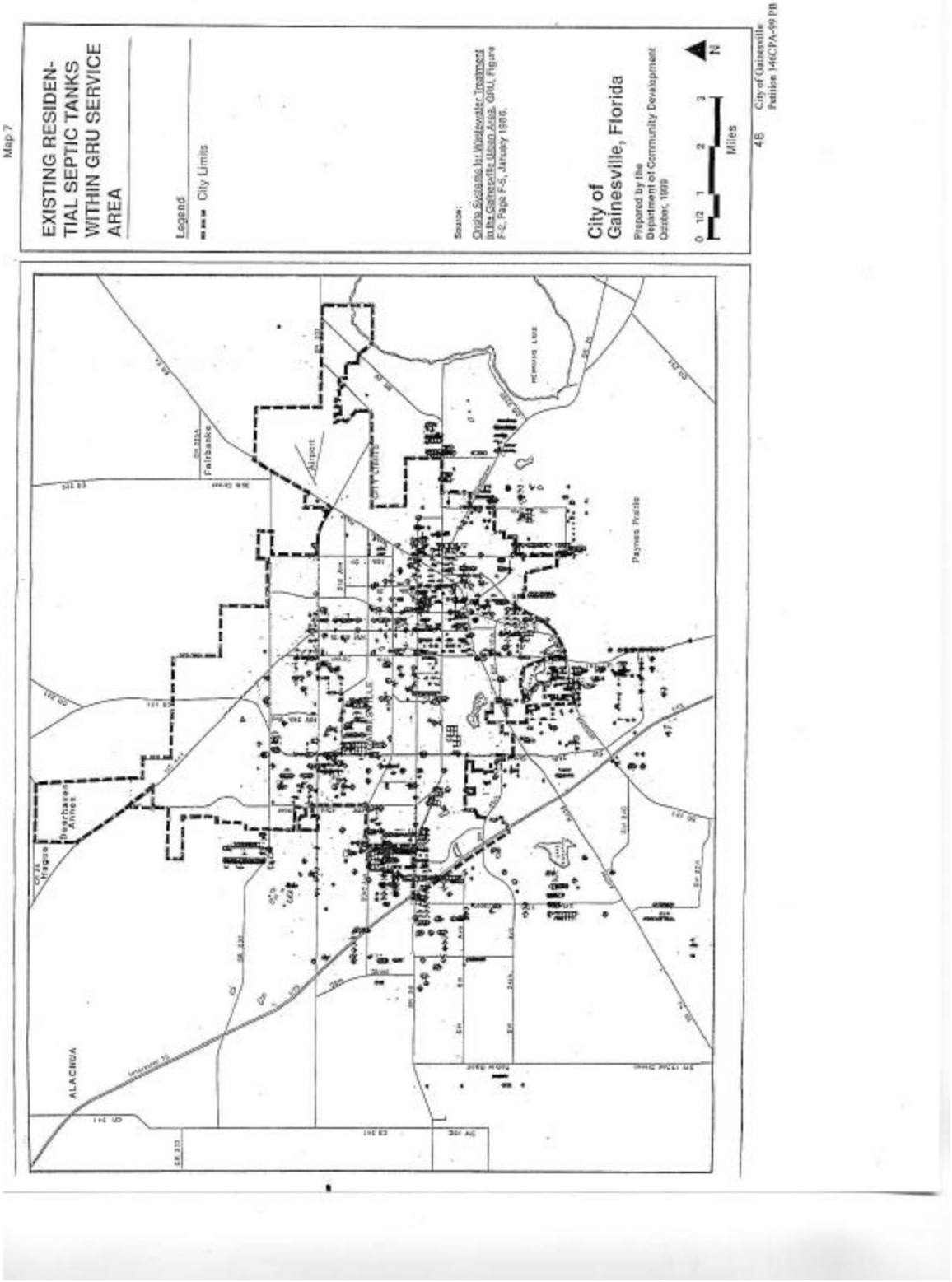
Map 7 illustrates the approximate locations of existing septic tanks in the Gainesville urban area. As can be noted from the map, septic tanks are scattered over various areas within city limits. Table B2 in Appendix B (based on the US Department of Agriculture Soil Conservation Service (USDASCS) ratings) shows the soil types corresponding to moderate and severe limitations for septic tanks. The mapped soil type information from the USDASCS is very generalized and not at a scale which can be used to determine suitability for a particular location. Terry Shipley of the Alachua County Public Health Unit has indicated that soil profiles on a particular parcel can change within 10-20 feet.
The State of Florida has granted statutory authority (FS 381 and Chapter 64E-6 of F.A.C.) for permitting septic tanks to public health departments (a division of the Florida Department of Health). The Alachua County Health Department uses soil suitability as only one criteria in determining whether a septic tank permit will be granted. Site evaluations are made for each permit granted and mounding or other engineering methods can be used as mitigation techniques for some soils which are unsuitable. The City believes that the permitting criteria established by the Alachua County Health Department and the State are adequate to prevent problems associated with septic tanks.

Analyzing the information on Map 6 and the information in the USDASCS atlas, it can be noted that septic tanks do exist in areas with both moderate and severe limitations for septic tanks. Despite this, the number of septic tank complaints received by the Public Health Department is very low. Given this low reporting of problems and an indication from the Health Department that corrections could easily be made with repairs, septic tanks do not appear to pose a major problem in the City of Gainesville. Thus, while it is possible to note where unsuitable soils for septic tanks exist in Gainesville, given the scale of the soil maps, it is not a useful predictor of septic tank problems or acceptability.

It should also be noted that the use of septic tanks for new development is uncommon in the city. City Building Inspections Department personnel have indicated that over the last few years (1994-1999) very few new construction building permits have been issued for buildings using septic tanks (averaging about two per year). Most new construction hooks to existing wastewater lines (recall that Gainesville is about 80 percent built out and that much of the new construction is infill type) or pays the cost of line extension from a proximate location.


Map 5
AREAS SERVED BY SEPTIC TANKS WITHIN THE WASTEWATER SERVICE AREA
Legend
GRU Wastewater Service Area boundary
Septic Tank areas
Sources:
Note:
City of Gainesville
Gainesville, Florida
Prepared by the Department of Community Development October, 1999
N
City of Gainesville
Petition 146CPA-99 PB


Map 6
SOIL LIMITATIONS IN SEPTIC TANK AREAS
Legend
GRU Wastewater Service Area boundary
Slight soil limitations
Moderate soil limitations
Severe soil limitations
Sources:
Note:
City of Gainesville
Gainesville, Florida
Prepared by the Department of Community Development
October, 1999
N
City of Gainesville
Petition 146CPA-99 PB


Map 7
EXISTING RESIDEN-
TIAL SEPTIC TANKS
WITHIN GRU SERVICE
AREA
Legend
City Limits
Source:
Onsite Systems for Wastewater Treatment
in the Gainesville Urban Area, GRU, Figure
F-2, Page F-5, January 1986.
City of
Gainesville, Florida
Prepared by the
Department of Community Development
October, 1999
0 1/2 1 2 3
Miles
N
46
City of Gainesville
Petition 146CPA-99 PB
Airport
Fairbanks
Paynes Prairie
Oakview
Arbors
ALACHUA

FOOTNOTES

APPENDIX A

Potable Water Information

GRU

INTER-OFFICE COMMUNICATION

LEGAL SERVICES

DATE: January 4, 1991

TO: Norman Bowman
Community Development Director

FROM: Raymond Manasco
Utilities Attorney

SUBJECT: Allocation of Water and Wastewater Capacity

Rule 9J-5.011(1)(C), FAC, promulgated under the Florida Growth Management Act requires each local government that shares facilities to indicate "proportional capacity of the system allocated to serve its jurisdiction". Since GRU serves both the City of Gainesville and unincorporated Alachua County, capacity in GRU's facilities is shared between the City and County. I have been asked to articulate GRU's policy on the allocation of water and wastewater capacity between the City of Gainesville and the unincorporated area of Alachua County that receives service from GRU. The following is my interpretation of the City of Gainesville's ordinances concerning capacity allocation.

Chapter 27, Article IV of the Gainesville Code of Ordinances contains ordinances pertaining to GRU's Water and Wastewater System. These ordinances deal in detail with matters such as specifications for connection to GRU's system, fees for various services rendered in connection with water or wastewater service, water and wastewater treatment plant connections, and off-site extensions of water or wastewater facilities. The ordinances do not differentiate between requests for service in the City or in the County. Extension ordinances and plant connection ordinances treat extension requests or capacity requests the same regardless of whether or not they are in the City. As such, capacity is available to all customers on a first come-first served basis, and is not allocated on a geographical or jurisdictional basis. This applies to capacity in collection or distribution facilities as well as treatment plant capacity. It is our understanding that capacity allocation on a first come - first served basis is consistent with the requirements of 9J-5, FAC. If I may be of any further assistance, please feel free to contact me.

M/s

cc: Ralph Hilliard, Chief of Comprehensive Planning
Mike Kurtz
Bob Moye
Bob McVay
Ed Regan
David Richardson

City of Gainesville
Petition 146CPA-99 PB

A-1

APPENDIX B

Wastewater Information

and other applicable federal and state laws and regulations;

(6) Improve the opportunity to recycle and reclaim wastewaters and sludges from the wastewater treatment system.

(c) This section shall apply to the city and to persons outside the city who are, by contract or agreement with the city, users of the municipal wastewater treatment system. Except as otherwise provided in this division, the general manager for utilities or his/her designee shall administer, implement, and enforce the provisions set forth in this division.
(Code 1960, § 28-56; Ord. No. 3696, § 16, 2-18-91)

Sec. 27-167. Permit fee for plumbing and sewerage installation.

Before a permit is issued for any plumbing, sewer or drainage work or installation for which a permit is required, a fee therefor shall be paid to the plumbing inspector in accordance with the schedule set out in Appendix A.
(Code 1960, § 28-57)

Sec. 27-168. Sewer connection—New buildings.

No building permit for the construction of any building or structure located on property abutting any street, alley or right-of-way in which there is located a public sanitary sewer shall be issued, unless all waste disposal from the sanitary facilities in the buildings or structures shall be directly connected with a public sanitary sewer or to a graywater disposal system approved pursuant to section 27-182(b). However, if there is no available sanitary sewer located within 200 feet of the nearest property line whereon the building or structure is to be constructed, the terms of this section shall not apply.
(Code 1960, § 28-58)

Sec. 27-168.1. Same—Existing buildings generally.

The owner of any house, building, or other improvement on any property used, or to be used, for human occupancy, employment, recreation, business, or other purpose which is or shall be served by a sewerage disposal system other than a direct connection to the city's public sanitary sewer system and located on property abutting on any street, alley, right-of-way, or easement on which a public sanitary sewer line is installed, and located within 200 feet of such sewer line, shall, within two years after the completed construction of such sewer line in operative condition, connect, or cause to be connected, all sanitary sewerage disposal facilities from the property and improvement to the public sanitary sewer line or to a graywater disposal system approved pursuant to section 27-182(b).
(Code 1960, §§ 28-56.1(a), 28-59.1(a); Ord. No. 3754, § 80, 1-27-92)

Sec. 27-168.2. Same—Existing buildings with inadequate, unsatisfactory, etc., individual sewage disposal system.

The owner of any existing house, building or property used, or to be used, for human occupancy, employment, recreation, business or other purpose now served by an individual sewage disposal system other than a direct connection to a public sanitary sewer, and located on property abutting on any street, alley or right-of-way in which a public sanitary sewer is installed, or within 200 feet of the nearest available public sanitary sewer, shall be required, within 30 days after date of notice that the individual sewage disposal system is inadequate, unsatisfactory, causing a sanitary nuisance or endangering the water supply, to abandon the existing individual sewage disposal system and fill the same with suitable materials approved by the city health officer, and connect all waste from sanitary fixtures used by him/her directly with the public sanitary sewer or to a graywater disposal system approved pursuant to section 27-182(b).
(Code 1960, § 28-59; Ord. No. 3754, § 80, 1-27-92)

Sec. 27-169. Rates and charges.

(a) *Rates.* There is hereby established a schedule of monthly rates and charges for the use of or availability for the use of wastewater collection, treatment and disposal services to read as set out in the schedule in Appendix A, which in part is based on the amount of water used from the city's water system. Wastewater service charges shall

~~APPENDIX TABLE B2: Soil Types associated with Limitations for Septic Tanks~~

~~Slight~~	~~Moderate~~	~~Severe~~
~~2B, 2C Candler~~	~~8B, 8C Millhoppper~~	~~7B Kanapaha~~
~~3B, 3C Arredondo~~	~~9B Millhopper~~	~~11 Riviera~~
~~4B Arredondo~~	~~20B Tavares~~	~~13 Pelham~~
~~5B Fort Meade~~	~~33B, 33C Norfolk~~	~~14 Pomona~~
~~6B, 6C Apopka~~	~~39B Bonneau~~	~~15 Pompano~~
~~30B, 30C Kendrick~~	~~45 Millhopper~~	~~16 Surrency~~
~~35B, 35C Gainesville~~	~~46B Bonneau~~	~~17 Wauchula~~
~~46B Cadillac~~		~~18 Wauchula~~
~~47B Candler~~		~~19 Monteocha~~
~~48 Apopka~~		~~21 Newnan~~
~~55B Lake~~		~~22 Floridana~~
~~58B Lake~~		~~23 Mulat~~
		~~25 Pomona~~
		~~26 Samsula~~
		~~28 Chipley~~
		~~29B, 29C Lochloosa~~
		~~31A Blichton~~
		~~31B, 31C Blichton~~
		~~32 B, 32C Bivans~~
		~~32D Bivans~~
		~~34 Placid~~
		~~37 Zolfo~~
		~~41B Pedro~~
		~~42B Pedro~~
		~~42B Jonesville~~
		~~44B Blichton~~
		~~46B Jonesville~~
		~~48 Myakka~~
		~~49A Lochloosa~~
		~~50 Sparr~~
		~~51 Plummer~~
		~~52 Ledwith~~
		~~53 Shenks~~
		~~54 Emeralda~~
		~~56 Wauberg~~
		~~57B Micanopy~~
		~~59 Pottsburg~~
		~~60 Udorthents~~
		~~61 Oleno~~
		~~62C Boardman~~
		~~63 Terra Ceia~~
		~~64 Okeechobee~~
		~~65 Martel~~
		~~66 Lynne~~
		~~67C Wacahoota~~

Appendix C

References

References

Allen, Eric. 1989. *Design and Assistance of an Odor Control Biofilter System at the Kanapaha Wastewater Treatment Plant.* Report prepared for GRU. Gainesville, FL.

CH2M Hill. July 1986. *Groundwater Monitoring Plan for the University of Florida Wastewater Treatment Plant and Lake Alice Recharge Well System.* GN20506.A1. Gainesville, FL.

_____. October 1988. *Evaluation of Facilities and Operations at the University of Florida Wastewater Treatment Plant.* GNV20506.C0. Gainesville, FL.

_____. May 1987a. Revised December 1987. *Gainesville Urban Area 201 Facilities Plan Completion Report.* GN20224.C0. Gainesville, FL.

_____. 1987b. *Gainesville's Main Street Wastewater Treatment Plant and Sweetwater Branch.* Report prepared for GRU. Gainesville, FL.

Gainesville Regional Utilities. 1989a. *Assessment and Response to the St. Johns River Water Management District Water Shortage Declaration.* Report by the Water and Wastewater Engineering Department. Gainesville, FL.

_____. February 1989b. "Distribution System." *Forecast, Methodology and Capital Budget Review.* Gainesville, FL.

_____. 1989c. *Gainesville Regional Utilities 1989 Water and Wastewater Customer and Sales Forecasts.* Gainesville, FL.

_____. April 1987. *Kanapaha Deep Well Disposal Assessment.* Report from the Strategic Planning Dept. and the Wastewater Systems Group. Gainesville, FL.

_____. 1989b. *Response of Gainesville Regional Utilities to May 17, 1989 Information Request By the Environmental Protection Agency.* Gainesville, FL.

Gainesville Regional Utilities, CH2M Hill and Stanley Consultants. March 1989. *Gainesville Regional Utilities FIVE-YEAR REPORT.* Gainesville, FL.

KBN Engineering and Applied Sciences. 1987. *Lake Kanapaha: Application of Treated Domestic Wastewater As a Restorative Technique for a Hypereutrophic Lake.* Study prepared for GRU. Gainesville, FL.

[1] For a detailed explanation of this model see GRU, 1989c.

[2] In the Murphree Plant area the Floridan Aquifer is overlain with roughly 200 feet of clay known as the Hawthorne Formation. The integrity and degree of confinement afforded by the Hawthorne Formation at the Murphree Plant is such that withdrawals have not resulted in any known surface water table effects.

The drawdown which was mentioned in the text is evident in the Floridan Aquifer. At Lake Alice and Alachua Sink, both of which receive treated wastewater effluent, the direction of groundwater flow in the Floridan appears to be towards the Murphree Wellfield based upon the regional potentiometric surface. These water bodies discharge into intermediate zones of the Hawthorne Formation and GRU does not anticipate movement of these waters into the wellfield in the foreseeable future.

[3] For a detailed explanation of this model, see GRU, 1989a. future.