WATER FACILITIES PLAN

for

CITY OF ARCADIA

FLORIDA

Prepared by

Julie Karleskint, P.E.
Hazen and Sawyer

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TABLE OF CONTENTS

Chapter 1.0 - Summary of Findings and Recommendations 1
Chapter 2.0 - Introduction 3
2.1. Background 3
2.2. Need 3
2.3. Scope of Study 4
Chapter 3.0 - Environmental Impacts 6
3.1. Description of Planning Area 6
3.2. Socio-economic Conditions 11
3.3. Water Supply, Treatment, and Transmission/Distribution System 12
3.4. Managerial Capacity 16
Chapter 4.0 - Development of Alternatives 18
4.1. General 18
4.2. Cost-effectiveness 18
4.3. Water Treatment 18
4.4. Plant Waste Disposal. 20
Chapter 5.0 - The Selected Plan 21
5.1. Description of Proposed Facilities 21
5.2. Environmental Impacts of Proposed Facilities. 24
5.3. Cost to Construct Facilities. 24
5.4. Consistency with the Comprehensive Plan. 24
Chapter 6.0 - Implementation and Compliance 24
6.1. Public Hearing/Dedicated Revenue Hearing 24
6.2. Regulatory Agency Review 23
6.3. Financial Planning 24
6.4. Implementation 24
6.5. Implementation Schedule 24
6.6. Compliance 26

Appendix A
Cost Information of the Selected Alternative
Appendix B
Detailed Cost Information and Present Worth Analysis for all Alternatives
Appendix C
Sanitary Survey and Consent Order
Appendix D
Capital Financing Plan (To be added)

TABLES

Table 1: Groundwater Quality 10
Table 2: Historical Service Population and Finished Water Production Annual Averages and Service Population Projections 15

FIGURES

Figure 1: City of Arcadia Service/ Planning Area 4
Figure 2: City of Arcadia Site Map 7
Figure 3: Topographic Map for the City of Arcadia 8
Figure 4: Aerial Map of Arcadia WTP Site 13
Figure 5: Water Demand and Service Population Projections 16
Figure 6: Schematic Process Flow Diagram of the Recommended Facilities 23

Chapter 1.0 - Summary of Findings and Recommendations

This Facilities plan was prepared for the Florida Department of Environmental Protection (FDEP) to meet the requirements of the State Revolving Fund (SRF) loan funding of drinking water systems. The area considered in preparing this plan includes the City of Arcadia water service area; other areas outside the City's service area are served by DeSoto County Utilities. This facilities plan addresses the potable water demands for year 2030, which marks the end of the planning period. Average annual daily demand is projected to be 1.3 million gallons per day (mgd) at the end of the planning period with a maximum demand of 1.7 mgd. The recommendations resulting from this study are consistent with both the City's and the County's Local Comprehensive Plans.

The existing treatment plant has reached the end of its serviceable life and is not adequate to serve the planning period needs without significant improvements to provide safe drinking water to the community on a continuous basis. Improvements to the distribution system are also required but these improvements will be evaluated in a separate report. To meet future potable water demands, the City must either provide extensive repairs and replacements to the existing facility, or construct a new facility. The existing facility is over forty years of age and is significantly deteriorated. The FDEP has issued a Consent Order which requires the City to evaluate options to the lime/backwash storage ponds which are part of the current lime treatment process. The City's source of water supply is groundwater that does not meet the primary drinking water standards for radionuclides and aluminum.

The plant currently serves a population of 9,720 and future projections indicate a population of 12,061 in 2020 and 14,702 in 2030. Proposed improvements are designed to meet the needs of the City in year 2020 with the ability to expand to meet the needs in 2030. These improvements consist of a a new well to provide additional redundancy, new treatment plant, ground storage and high service pumping to maintain distribution pressure.

Hazen and Sawyer evaluated four options to provide the necessary treatment of the groundwater in order to meet primary and secondary water quality standards. These options include the following:

- No Action
- Connect to DeSoto County
- Repair/replace existing lime plant
- Construct new ion exchange water treatment plant

The most cost effective alternative was determined to be a new ion exchange facility. The ion exchange facility comprises both anion and cation exchange units, chemical feed facilities for disinfection and corrosion control, ground storage and high service pumping. The capacity of the water treatment plant will be 2.0 mgd after the improvements are completed with the capability of adding addition ion exchange units for expansion.

The project cost for the ion exchange alternative is estimated at $5, 280,000. The City recently increased rates by 20% in order to maintain revenue sufficiency and is making application for both grants and loans to minimize the impact to users. Upon determination of the amount of grant and loans that will be obtained, the City will increase rates if necessary to insure repayment. The details of capital and annual O&M costs are shown in Appendix A.

The City operates a combined Water and Sewer Utility Fund. The pledged revenues for debt payments are the water and sewer charges by the Utility. The State Revolving Fund (SRF) Loan will be repaid in 40 semi-annual installments.

Chapter 2.0 - Introduction

2.1. Background

The City of Arcadia is responsible for the planning and implementation of the service area infrastructure needs. It is considered a small, agriculturally based community located in central DeSoto County approximately 40 miles east of the City of Sarasota. Figure 1 shows the planning area, which includes the City of Arcadia service area.

The City treats groundwater from five wells located near the City's treatment plant located off Turner Road. The first step of treatment is chemical addition with lime, polymer and sodium hexametaphosphate which removes the radionuclides and reduces hardness through precipitation in the solids contact basin. This is followed by filtration and disinfection through the addition of chlorine and ammonia to form chloramines. Water is then pumped from the clearwell to the distribution system and storage tanks.

2.2. Need

The existing 3-mgd water treatment plant, serves the city of Arcadia. This plant was constructed in 1968 and currently has a significant amount of corrosion due to the facility age. Many of the steel structures have deteriorated beyond repair and require replacement. The FDEP has issued a Consent Order for the disposal of backwash and filter wastewater into unlined storage ponds. The Consent Order requires the City to evaluate facility improvement options to eliminate the current method of disposal of lime and backwash water into the unlined ponds. Based on the deterioration of the current facility, elimination of the current facility with construction of a new facility or connection to an alternate water supply is recommended to eliminate the unlined backwash and lime storage ponds.

During periods of peak demands, all the wells must be utilized without rest. There are also periods of time, when wells must be taken out of service and pressure must be lowered to meet demands. Therefore, a new water supply well is recommended which will allow the necessary redundancy to meet peak demands and allow the existing wells to be rested as needed.

The existing distribution system will require additional lines before the end of the planning period to accommodate anticipated development. Replacement of the older galvanized and cast iron water supply lines is also needed; however this will be evaluated in a separate report. The existing 12-inch raw water transmission system from the wells to the plant is adequate; however the elevated storage tank has been in service for forty years and currently limits the pressure of the system to 50 psi due to its height. It should be replaced with a new ground storage tank and pumping facility at the treatment plant. This will also facilitate better mixing with flush water from DeSoto County when required.

2.3. Scope of Study

The scope of the facilities plan is described below:

1. Inventory existing water plant, service area characteristics, and environmental conditions.
2. Establish design needs for the planning period.
3. Identify and evaluate various treatment alternatives to satisfy the planning year needs.
4. Recommend the most beneficial, cost-effective, environmentally sound facilities to meet the planning needs.
5. Describe, in detail, the recommended facilities and the estimated cost.
6. Present a schedule of implementation of the recommended facilities.
7. Identify any adverse environmental impacts and propose mitigating measures.
8. Identify a source of financing and estimate the cost per household.

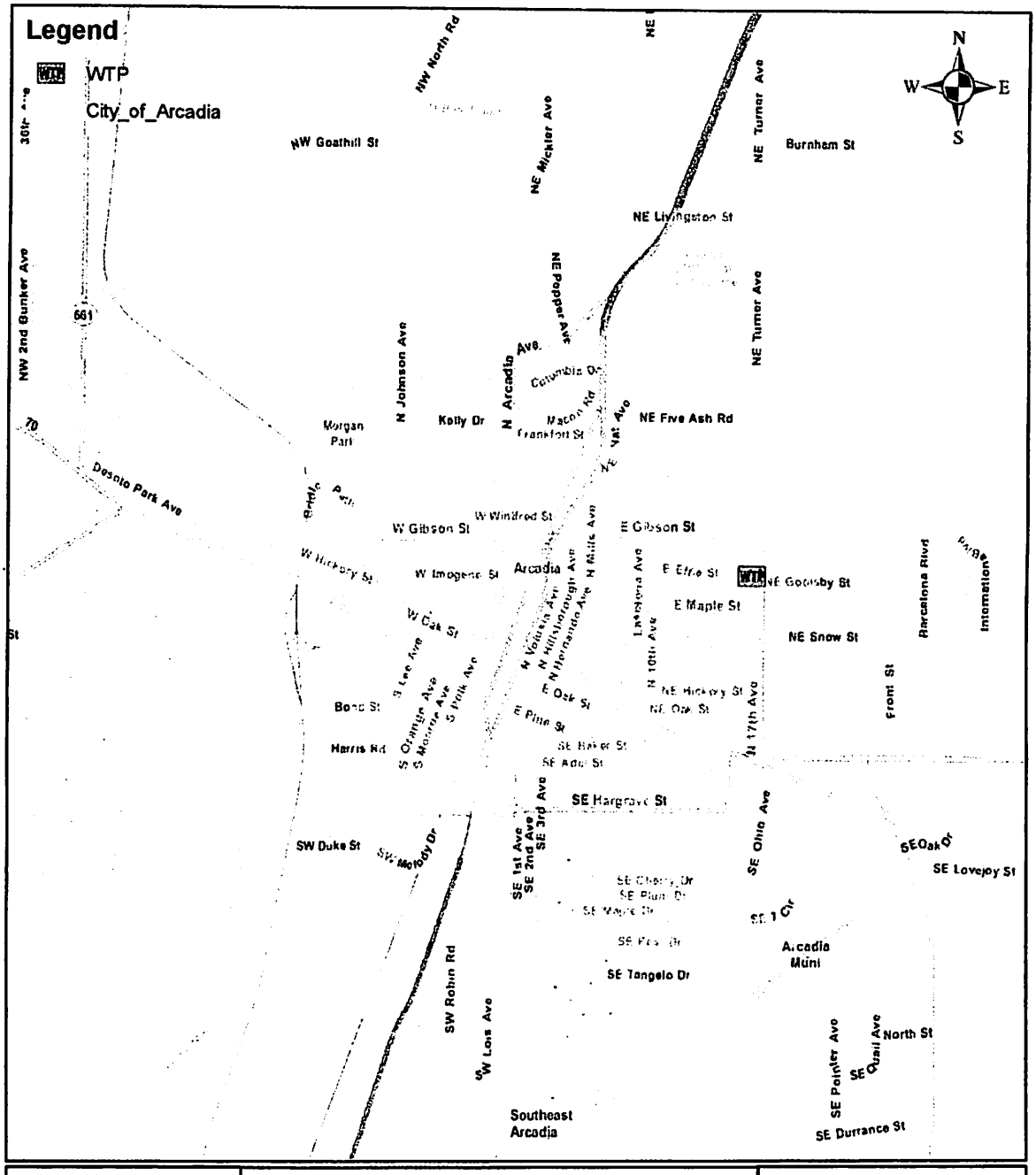

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Figure 1: City of Arcadia Service Area

Miles
0 0.45 0.9

Chapter 3.0 - Environmental Impacts

3.1. Description of Planning Area

3.1.1. Planning/Service/Project Area

The planning area and the service area are the same. The planning area consists primarily of the City of Arcadia which is the county seat for DeSoto County is shown in Figure 2. It is located within central DeSoto County with the Peace River to the east. The proposed construction area will be at the existing water treatment plant site which is on the east side of the City on Turner Road. The City and plant site are in a primarily flat area with gentle sloping to the west towards the Peace River. The plant site has already been cleared and has little to no vegetation

3.1.2. Climate

Like most of south Florida, DeSoto County is humid with warm temperatures, characteristic of long summers and mild winters. According to the Soil Survey of the area provided by the USDA Soil Conservation Service, the average annual temperature is approximately 72°F. During the summer, the average temperature is 81°F and the average daily maximum is 92 °F. Winters are generally short and mild, with average daily temperature of 62° F with the average daily minimum of 49° F. The lowest temperature on record for Arcadia is 18 °F.

The average annual rainfall is approximately 52 inches with 70 percent of the rainfall seen between the months of April thru September. The maximum rainfall on record for a one day period was 7 inches, which occurred in 1962.

3.1.3. Topography and Drainage

Review of the topographic maps shows Arcadia to be relatively flat with average elevations in the service area ranging from 20 to 70 feet above mean sea level (msl). The WTP site is flat with an approximate elevation of 65 ft. msl. A topographic map of the service area is shown in Figure 3. Soils at the water treatment plant site are fine sands and drain fairly well.

Figure 2: Site Map for Acadia WTP
(Not to Scale)

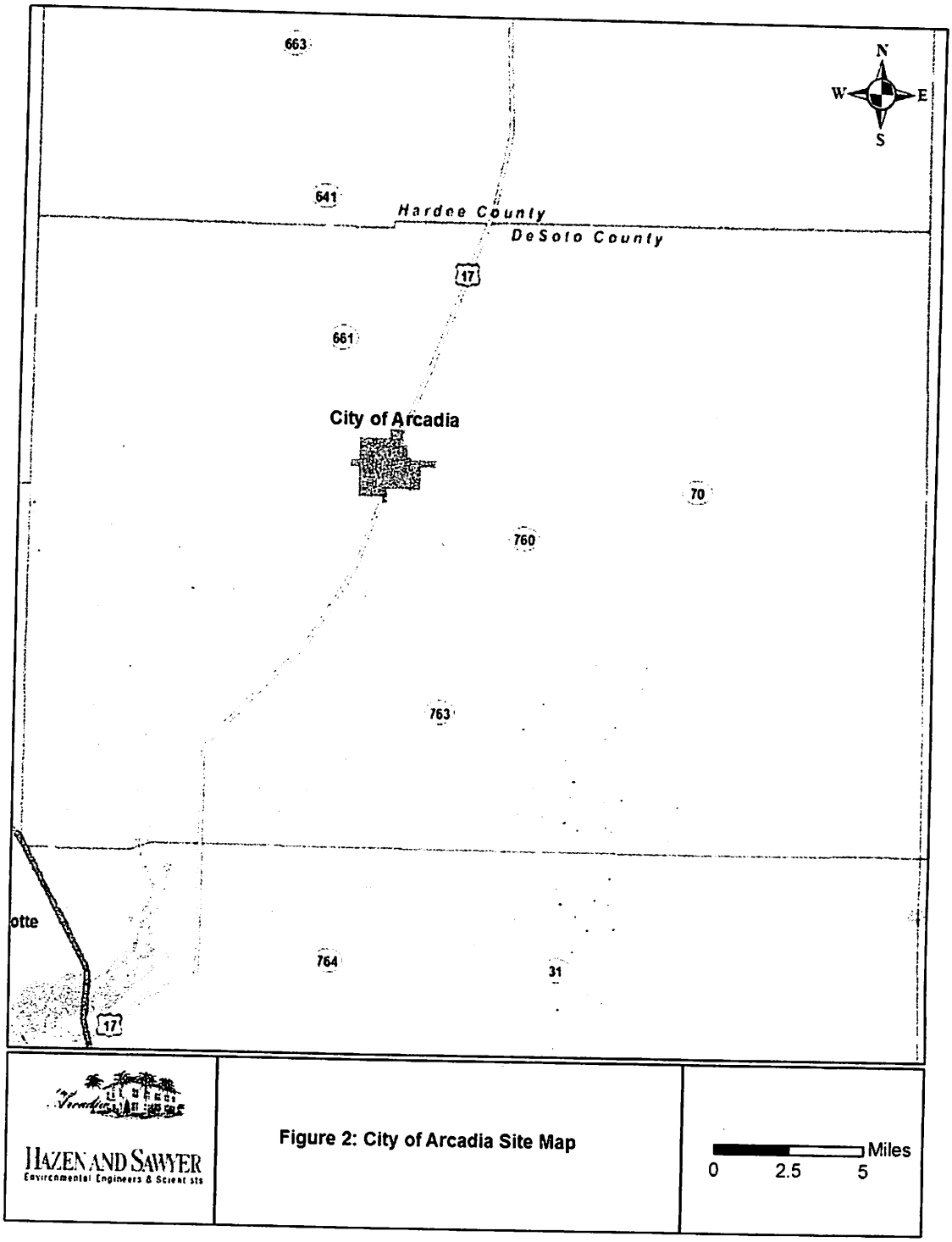

Figure 3 Topographic Map of Service Area

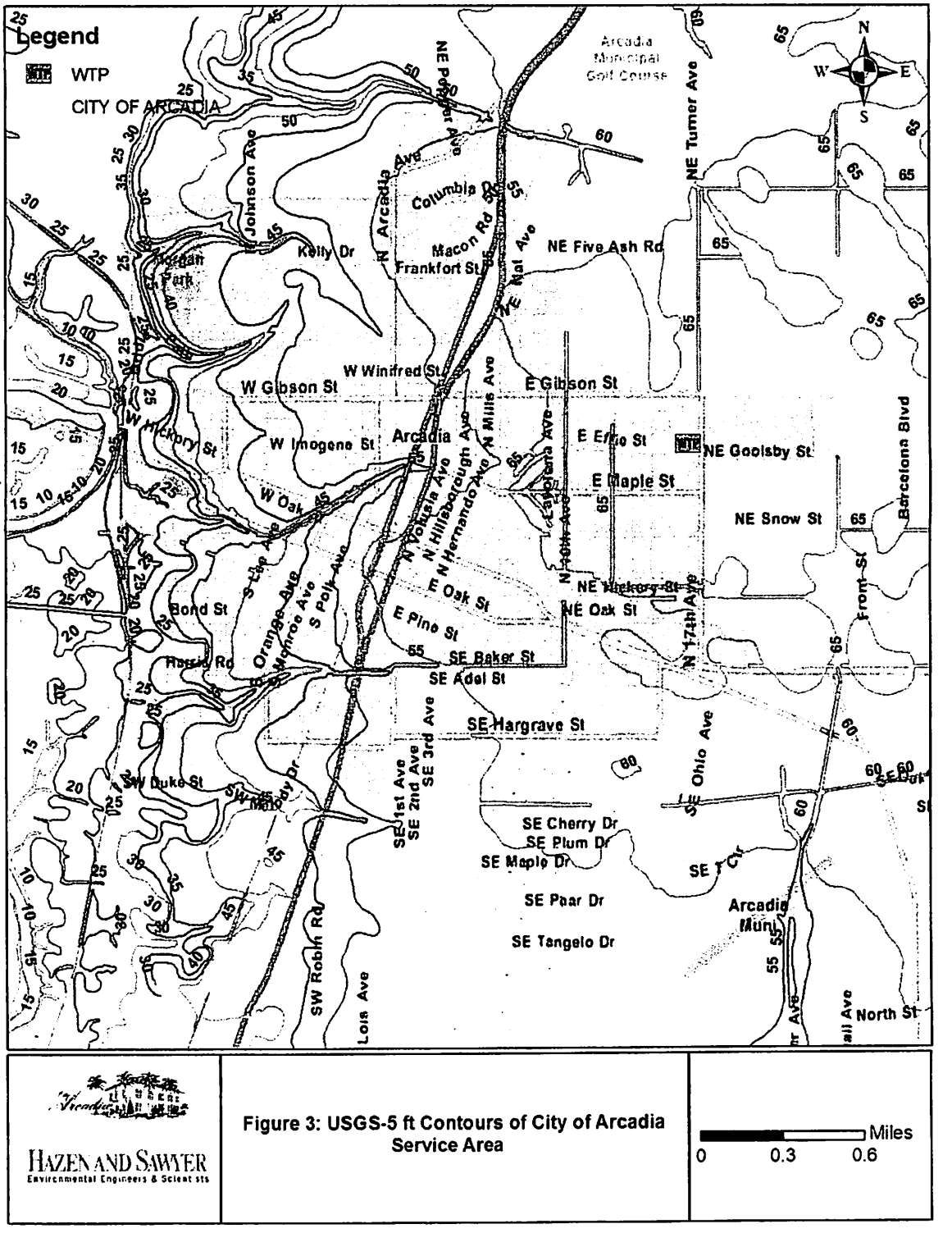

Figure 3: USGS-5 ft Contours of City of Arcadia Service Area

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3.1.4. Geology, Soils and Physiography.

Evaluation of the USDA Soil Maps indicates that the soils at the WTP site are primarily fine sand. The primary type is the Smyrna fine sand with Myakka fine sand to the east and possibly a small amount of Immokalee fine sand to the south.

The City of Arcadia lies within the DeSoto Plain as noted in the USDA Soil Survey. The The DeSoto Plain is a very flat area and is a sub-marine plain probably formed under Pleistocene Wicomico seas which were about 70 to 100 feet above the present sea level.

3.1.5. Surface and Ground Water Hydrology, Quality and Uses.

3.1.5.1. Surface and Ground Water Hydrology

There are no Outstanding Florida Waters in the planning area. All surface waters are designated class III waters, suitable for recreation and for propagation of fish and wildlife. The water supply source is the intermediate aquifer which is considered a Class G-2 groundwater.

3.1.5.2. Surface Water and Ground Water Quality

The ground water quality of the intermediate aquifer was evaluated to verify the proposed treatment scenarios. Table 1 provides a summary of the ground water quality. The primary pollutants are total organic carbon (TOC), radionuclide's, sulfide and fluoride. In evaluating treatment options, it was determined that ion exchange and lime treatment would be the most cost effective treatments. However, these treatment options do not remove fluoride. Membrane treatment is the best available technology for fluoride removal but after evaluating the cost, it was determined that it would be more cost effective to blend water from the lower fluoride groundwater than provide membrane treatment. The raw water fluoride concentrations meet the primary maximum contaminant level (MCL) but exceed the secondary MCL, in three of the five wells. However, the concentrations are fairly low and by using the proper combination of wells, secondary MCLs can be met.

Table 1:

City of Arcadia Ground Water Quality

Combined Arcadia Raw Water		
Parameter	Result	unit
Sulfide	1.58	mg/L
Iron	0.03	mg/L
Color	11	units
Turbidity	0.5	NTU
Alkalinity	220	mg/L
Calcium H	47	mg/L
Chloride	19	mg/L
Flouride	2.26	mg/L
Hardness	258	mg/L
Sulfate	20	mg/L
TOC	5.2	mg/L
Aluminum	0.02	mg/L
Sodium	31	mg/L
Gross Alpha	26	pCi/L
Radium 226	9	pCi/L
Radium 228	1	pCi/L
P. Alk.	0	mg/L
C. Alk.	0	mg/L
B. Alk.	220	mg/L

3.1.5.3. Water Uses

The intermediate aquifer is the primary water source for the City of Arcadia which is classified as class G-II (potable water use). This water supply is regulated by a withdrawal permit from the Southwest Florida Water Management District (SWFWMD), review of the Water Use Permits in the area indicate that it also permitted for other agricultural, industrial and and as a domestic supply.

3.1.6. Sourcewater Protection

There are no known sources of contamination near the City wells, which are approximately 350 ft deep. The City recently brought many of its wells above grade as required by FDEP. The proposed well will be constructed with a 100' buffer it and located at the WTP site.

3.1.7. Environmentally Sensitive Areas or Features

3.1.7.1. Wetlands

The proposed project will not impact any wetlands.

3.1.7.2. Environmentally Sensitive Lands

The proposed project will not impact any environmentally sensitive lands.

3.1.7.3. Plant and Animal Communities (Endangered Species)

The proposed project will not impact any rare, endangered or threatened species of animals.

3.1.7.4. Archeological and Historical sites.

The proposed project will be located adjacent to the existing water treatment plant and will not impact any archeological or historical sites.

3.1.8. Flood Plain

Flood zones for the City were evaluated by utilizing the Flood Insurance Rate Map (FIRM) for Arcadia. The areas in which the proposed infrastructure improvements are to be constructed are located in Zone X, which is outside the 500 year flood plain.

3.1.9. Air Quality

The air quality in DeSoto County is high due to a lack of major sources of pollutant air emissions. According to FDEP, DeSoto County is classified as an area of attainment with respect to the National Ambient Air Quality Standards and for all of the criteria air pollutants. There are no major sources of emissions permitted by FDEP in DeSoto County.

3.2. Socio-economic Conditions

3.2.1. Population

The majority of the planning area population lives within the corporate limits of the City of Arcadia. Population and demand projections are shown in Table 2. There are some seasonal impacts to the City but most of the residents are full time residents.

The population of the City was calculated using the SWFWMD Demographics found in Utility and District Demographics. This information was used in preparing the public supply annual report for the city which was submitted prior to April 1, 2010. Using this methodology, the functional population for the city was determined to be 9,720.

3.2.2. Land Use and Development

The proposed treatment plant will be located adjacent to the existing water treatment plant site. Therefore, no changes in land use or development are anticipated. The water treatment site is shown in Figure 4.

3.3. Water Supply, Treatment, and Transmission/Distribution System

3.3.1. Description of the Existing Water system

The City provides both water and sewer service to the majority of the residents within the City limits. However, there are several areas within the City that do not have water and sewer lines and are served by individual wells and septic tanks. Residents and businesses outside the City's service are served by either DeSoto County or by private systems.

The current water treatment plant was constructed in the late 1960's, This facility replaced the original surface water treatment plant which was constructed west of town near the Peace River. Raw water is provided by five wells located near the treatment plant. The wells are in fair condition and a maintenance schedule for periodic acidizing and cleaning should be implemented.

Raw water is transmitted through a 12" raw water line to the water treatment plant. Currently, there is no aeration or scrubbing prior to treatment, which would be required for any future water wells constructed.

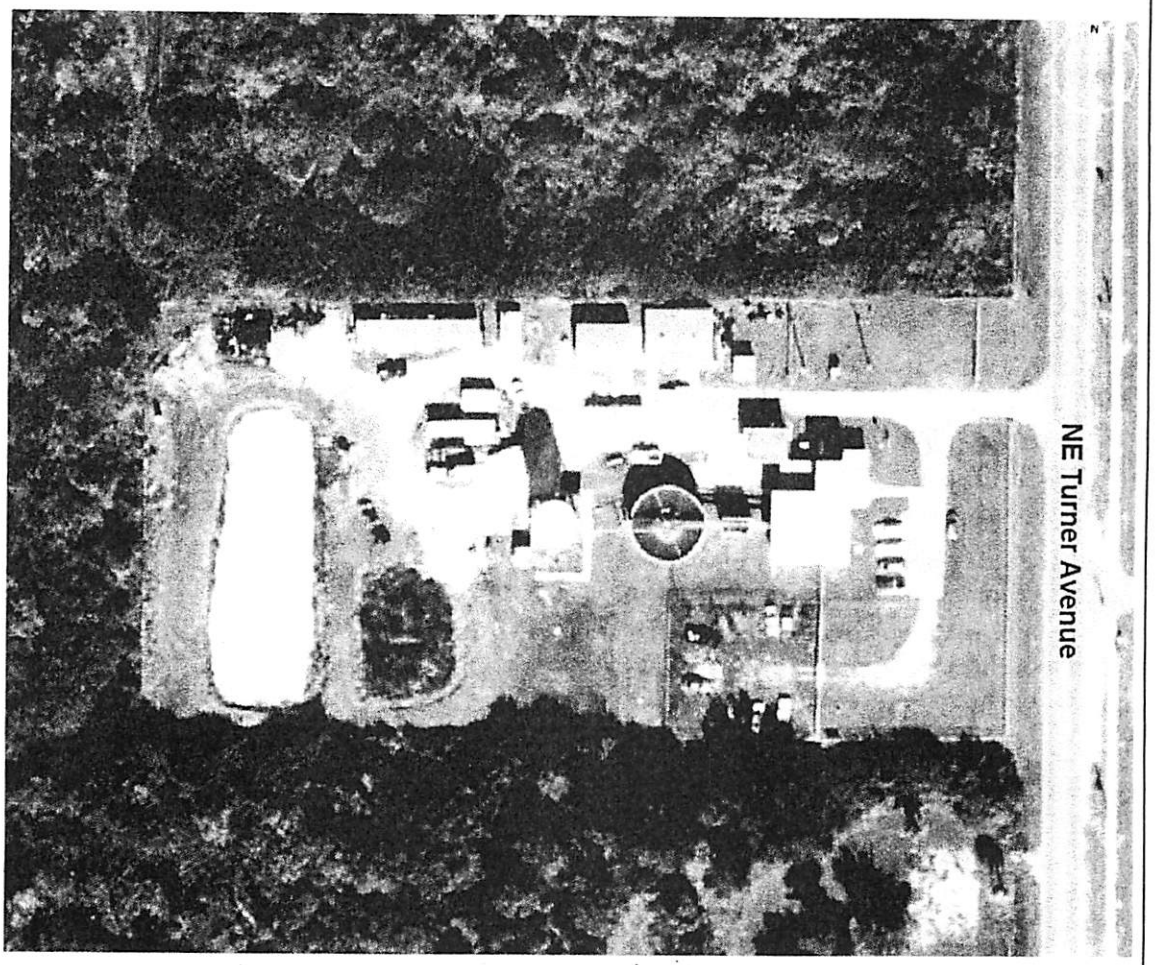
The treatment plant is designed to provide 3.0 mgd peak flows, although the City has never required this amount of capacity nor does it have the well capacity. The maximum day demand is currently limited to the maximum pumping capacity of the five water supply wells which is currently limited to 1,500 gpm. The City is planning to construct a new well that will increase the current maximum pumping capacity from 1,500 gpm 1,850 gpm. Acidification of the wells is also recommended to help improve the current well capacity.

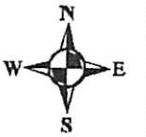
3.3.2. Present and historical water usage.

The per capita water consumption is estimated to be approximately 90 gpcd. There is no significant industry in the City and the most recent data indicates the city population as of 2009 was 9,720.

3.3.3. Water Conservation

Individual water meters are used throughout the City. Utility consumers are periodically reminded, via monthly billing, that water bills depend on water use. Information about water saving faucets and plumbing fixtures is also sent out periodically with the billings.





HAZEN AND SAWYER Environmental Engineers & Scientists	Figure 3: Aerial Site Map for Acadia WTP	NOT TO SCALE

3.3.4. Performance of Existing Water System.

The capacity of the treatment plant is adequate to treat the projected demand; however based on the current condition of many of the treatment plant components, repair and/or replacement of many of the components is required in order to provide safe drinking water in the future.

3.3.5. Water Demand Projection.

The water demand for 2020 is developed based upon a two percent growth rate compounded annually. This was developed by evaluating historical growth rates and flows. Results are shown in Table 3 below.

3.3.7. Service Population and Finished Water Projections

Table 3 lists service area population and actual finished water production annual averages for five previous years along with population and demand forecasts through the year 2030. The population forecast was obtained using an annual population increase of two percent. Figure 5 plots the Annual Average Daily Flow, Average Maximum Daily Flow, and Service Population projections. The finished water forecasts shown in Figure 4 were obtained as straight-line projections of the annual averages given by Table 2.

The maximum daily water production (or demand) is anticipated to be 1.4 mgd by the year 2020 with a corresponding 1.1 mgd average daily flow and service population of 9,720. By the year 2030 the maximum daily water production should be approximately 1.7 mgd with an average demand of approximately 1.3 mgd with a corresponding service population of forecasted.

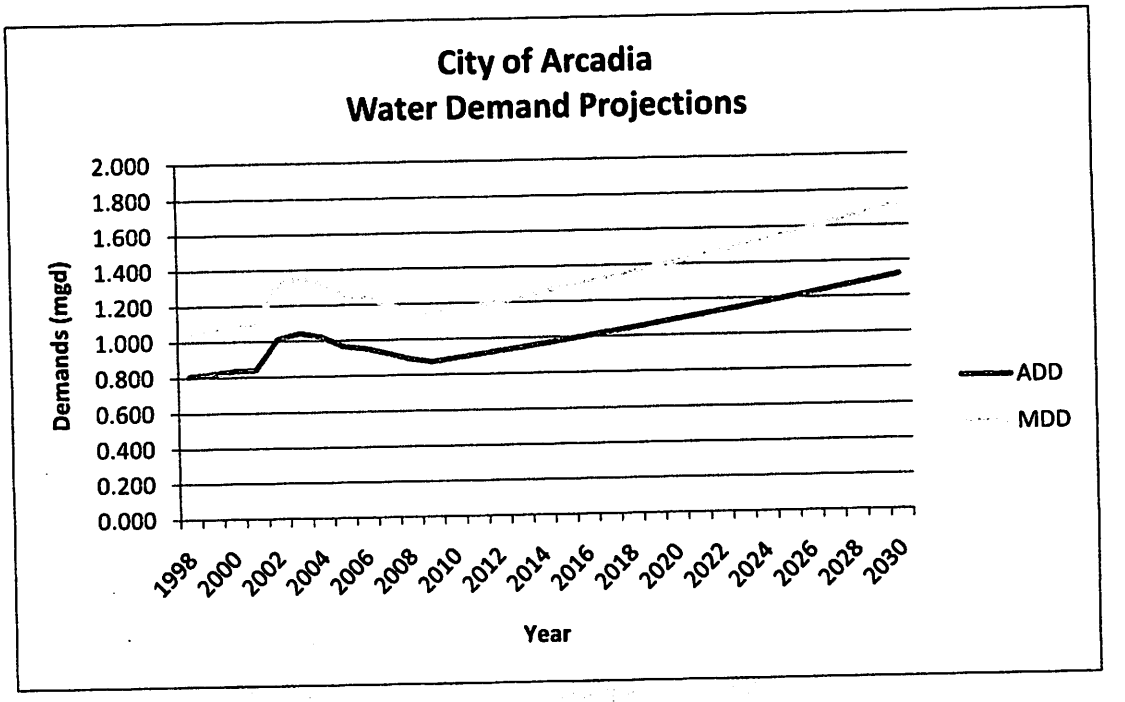
Population was determined using the SWFWMD Utility and District Demographics for the city of Arcadia which was reported on the 2009 Public Supply Annual Report. Past populations were determined by taking the per capita water usage of 90 gpcd and dividing it into the actual water demands. Based on this methodology, a population decrease is noted since 2003 with water demands reduced since that time. This can be attributed to the effect of Hurricane Charley which had a significant impact on the City in 2004. This Category 4 Hurricane hit Arcadia on August 13, 2004 which caused considerable damage, loss of housing in the area. As a result, emergency housing was constructed and connected to City Water. Since that time, the housing is no longer needed and there has been a decrease in water demands. However, the City has stabilized and growth is anticipated for future projections using a 2% growth rate.

Table 2: Historical Service Population and Finished Water Production Annual Averages and Service Population Projections

Year	Avg. Day Demand mgd	Max. Day Demand mgd	Population
1998	0.807	1.05	8,969
1999	0.820	1.07	9,106
2000	0.834	1.08	9,268
2001	0.839	1.09	9,326
2002	1.011	1.31	11,238
2003	1.042	1.35	11,578
2004	1.022	1.33	11,357
2005	0.965	1.25	10,726
2006	0.951	1.24	10,567
2007	0.924	1.20	10,269
2008	0.890	1.16	9,891
2009	0.873	1.13	9,720
2010	0.890	1.16	9,894
2011	0.908	1.18	10,092
2012	0.926	1.20	10,294
2013	0.945	1.23	10,500
2014	0.964	1.25	10,710
2015	0.983	1.28	10,924
2016	1.003	1.30	11,142
2017	1.023	1.33	11,365
2018	1.043	1.36	11,593
2019	1.064	1.38	11,825
2020	1.085	1.41	12,061
2021	1.107	1.44	12,302
2022	1.129	1.47	12,548
2023	1.152	1.50	12,799
2024	1.175	1.53	13,055
2025	1.198	1.56	13,316
2026	1.222	1.59	13,583
2027	1.247	1.62	13,854
2028	1.272	1.65	14,131
2029	1.297	1.69	14,414
2030	1.323	1.72	14,702

Shaded values are projections.

Figure 5: Water Demand and Service Population Projections



3.3.8. Plant Waste.

The filter backwash and solids contact unit produce wastewater in the plant. This wastewater is estimated to be 15,000 gpd for the plant's current production of 1 mgd. Water for filter backwashing is presently obtained from the clearwell. Backwash water and lime sludge are disposed of in an onsite ponds. Periodically, the ponds must be cleaned and the dried sludge removed. Pond cleaning and ultimate waste disposal is presently conducted by a third party service and is not conducted by WTP staff.

The FDEP has issued a Consent Order to the City which requires the City to evaluate alternatives to the current method of disposal.

3.4. Managerial Capacity

The City of Arcadia has the sole responsibility and authority to build, operate, and maintain the water system. The City is currently in the process of approving an interconnect agreement with DeSoto County for drinking water which will provide a back-up emergency water supply to the City. The City's water and sewer utility department provides the drinking water services under the City Administrator who is responsible for both the water and wastewater facilities. The water plant is operated 16 hours/day, 7 days per week with at least one Class C Drinking Water Operator or higher on site. The lead operator is assigned the shift with the highest flow and must be licensed as a Class B Drinking Water Operator or higher.

3.4.1. Operation and Maintenance Program.

The Utility staff are maintaining and operating the water system. Repairs/rehabilitation of the water mains due to broken pipes and joints are periodically made.

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Chapter 4.0 - Development of Alternatives

4.1. General

The alternatives for resolving Arcadia's water treatment issues require an evaluation of water quality, treatment facilities and plant waste disposal system. It is planned to design the facilities for the year 2030, covering a design period of 20 years. The planning year is also 2030. The capital and O&M costs along with the present worth of all alternatives are given in Appendix C.

The Options for Water Treatment are:

1. No Action.
2. Connect to DeSoto County
3. Improvements to the Existing Plant.
4. Constructing a New Plant

The Options for Plant Waste Disposal are:

1. No Action.
2. Connect to DeSoto County
2. Discharging into the Municipal Sewer.
3. Lagooning.

4.2. Cost-effectiveness

Present worth has been used to compare the various alternatives developed in this facilities plan. Present worth combinations for the viable alternatives incorporated the following considerations:

1. Planning period of 20 years.
2. A discount rate of 4% was used in this
3. Capital costs (land acquisition, construction, contingency, engineering, legal, fiscal, and administrative costs).
4. Operation and maintenance costs.
5. No salvage values were considered due to age and condition of existing equipment.
6. Costs are obtained from recent bids and sales representatives/consultants in the area.

4.4. Water Treatment

4.4.1. No action

Under this alternative, the existing water treatment plant will continue to be in operation until it can no longer provide safe drinking water. Since the plant is in very poor condition and a Consent Order has been issued which requires

alternatives to the backwash/lime sludge disposal ponds, this alternative is not viable and will no longer be considered.

4.4.2. Connect to DeSoto County

Under this alternative, the existing water treatment plant would be eliminated and the City would connect to DeSoto County for a viable drinking water source. A new storage tank and pump station would be required for this option as well as a new water supply line from the DeSoto storage tank to the new storage tank. An option could also be provided to allow the City to blend treated groundwater in the tank which would reduce the amount of purchased water required. Sufficient water would be purchased in order to assure that all drinking water quality standards would be maintained. It should be noted that this is the lowest capital cost alternative, however, based on the present value analysis it was determined to be the most expensive option based on the proposed bulk rate from DeSoto County. The City is currently in negotiations with DeSoto County and should a reduced bulk rate become viable, this option may become more viable.

4.4.3. Improving the Existing Treatment Plant.

Under this alternative, the following improvements would be implemented:

- New solids contact unit
- New forced draft aerator
- New lime slaker/feeder
- Upgrade existing filters with new media, underdrains and controls
- Upgrade motor control center
- New ground storage tank
- New high service pumps
- New water supply well

For disposal of lime sludge and backwash water a new lined storage pond would be required with the capability of recycling the backwash water to the head of the treatment plant. Improvements to the existing water treatment plant would also be required and new standby power generator.

4.4.4. Constructing a New Ion Exchange Treatment Plant

This alternative involves abandoning the existing treatment plant and constructing a new 2.0-mgd ion-exchange plant. The new plant would be located adjacent to the existing plant and would utilize the existing raw water and finished water transmission lines. Regenerate water would be stored on site and fed to the wastewater plant through the sanitary sewer system for treatment and disposal at a rate that would not impact the wastewater treatment process. A new storage tank would be located at the plant site to replace the existing elevated storage tank which is forty years old and restricts pressure to 50 psi based on its height. A new standby power generator would also be included.

This alternative was selected since it was environmentally acceptable and cost effective. A new water supply well is recommended which will allow the wells to be rotated on a more frequent basis and provide redundancy during peak demand periods when one well is taken out of service for maintenance.

4.5. Plant Waste Disposal

4.5.1. No action

This alternative will involve continuation of the present practice of disposing the filter back wash water and clarifier blow-down to the percolation ponds for disposal. This operation is not acceptable since the FDEP has issued a consent order which requires that City to evaluate alternatives to the present method of disposal and was therefore rejected.

4.5.2. Eliminate WTP and connect to DeSoto County

This alternative would be to eliminate the current plant and connecting to DeSoto County; thereby eliminating the current method of disposal.

4.5.3. Discharging into the Municipal Wastewater Treatment System

This alternative involves collecting the wastes and transporting or conveying them to the municipal wastewater treatment system for disposal. The City has a suitable wastewater collection and treatment system, however, for the upgrade existing facility alternative, a pump station would be required to convey the waste due to the volume of waste generated and hydraulic limitations of the collection system. In addition, a new dedicated force main may be required since the waste stream solids content (1.5 to 3 percent) could adversely impact the existing collection system. .

4.5.4. Settling Ponds

This alternative involves construction of a lined storage pond to settle the lime sludge and recycle the supernatant to the head of the treatment plant. The waste solids would be then disposed of periodically by land application or sanitary land fill.

Chapter 5.0 - The Selected Plan

5.1. Description of Proposed Facilities

The proposed 2 - mgd water plant, shown in Figure 5, consists of 5- ion exchange vessels, disinfection, spent regenerate storage tanks, finished water storage and high service pumping.

5.1.1. New Water Supply Well

A new water supply well will be constructed to provide redundancy to the current wells and provide for peak demands. This well will be constructed at the water treatment plant site and will be designed similar to the existing wells with a design capacity of 350 gpm. Water from the intermediate aquifer will be pumped into the existing raw water line and treatment will be provided by ion exchange which will provide removal of sulfides.

5.1.2. Water Treatment.

A new anion-cation ion exchange treatment facility with bypass capability will be constructed followed by disinfection and ground storage. The proposed ion exchange facility will be designed to treat a maximum flow of 2 mgd (1400 gpm) with both cation and anion exchange units. The proposed cation exchange system willbe for radionuclide and aluminum removal. The cation exchange system will be designed with a bypass so that treated water can be blended with bypass water since it will not be necessary to treat the entire flow stream. The anion exchange system will be for sulfide and TOC removal and will be designed to handle the average daily flow of 1050 gpm with the capability to bypass and blend higher flows to meet treatment goals. All the flow will then be disinfected using chloramines and a corrosion inhibitor will be added prior to going into the ground storage tank. A schematic of the proposed facility is provided in Figure 6.

5.1.3. Finished Water Pumps and Distribution System.

Presently, there is one variable frequency drive (VFD) driven 50 HP (900 gpm) pump and two constant speed 40-HP (600 gpm) pumps that pump finished water from the clearwell to the elevated storage tank and distribution system. The 50 HP pump can pump the average daily demand with the smaller pumps being utilized for backup and higher demands. The proposed facility will replace the existing 80,000 gallon clearwell and high service pump station with a new 250,000 gallon ground storage tank and pump station. A new ground storage tank will be constructed to provide storage and equalize diurnal variation. This tank will replace the elevated storage tank which is over 40 years old and limits pressure in the distribution system to 50 psi. The proposed pump station will consist of three 50 HP pumps, two of which will be with

VFDs. Alternation of the pumps will be made to equalize the operating time and the wear on the pumps. The existing standby power generator will be upgraded to 150 kW.

5.1.4 Plant Waste Disposal.

The proposed alternative will include a holding tank for regenerate brine waste that will be pumped to the to the sanitary sewer system at a rate slow enough to avoid any impacts to the wastewater treatment plant. The waste will then be treated and utilized for reclaimed water and/ or discharged to surface water. Due to the small amount of regenerate anticipated, approximately 20,000 gpd, no impacts to the wastewater plant are anticipated.

5.2. Environmental Impacts of Proposed Facilities.

The short-term impacts during construction include increased noise levels, increased airborne particulates and surface run-off during rainfall. Control measures will be implemented to minimize these temporary effects. The long-term impacts of the project are beneficial. The City will have adequate, uninterrupted potable water supply.

The proposed project will not have significant adverse effects on wild and scenic rivers or on flora, fauna, threatened or endangered plant or animal species, prime agricultural lands, wetlands, undisturbed natural areas, or the socio-economic character of the area. The State Historic Preservation Officer has indicated that no archeological, historical or cultural sites are recorded in the area of construction.

5.3. Cost to Construct Facilities.

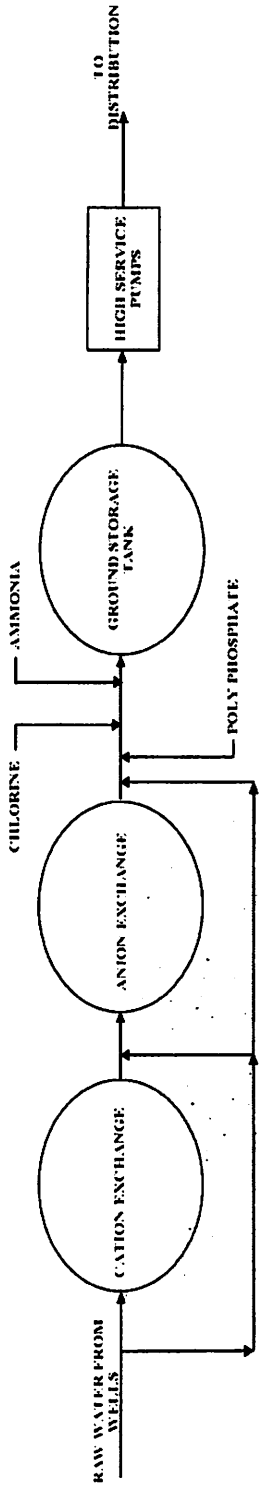
The details of construction and the O&M costs for the project are presented in Appendix A. The following tabulation presents the total project cost inclusive of the non-construction items.

Construction (including contingency)	$4,400,000
Engineering and inspection @ 15%	$660,000
Legal, fiscal, and administrative @ 5%	$220,000
Total Project Cost	$5,280,000

5.4. Consistency with the Comprehensive Plan.

The recommendations resulting from this study are consistent with both the City's and the County's local comprehensive plans.

Figure 6: Schematic Process Flow Diagram of the Recommended Facilities



Chapter 6.0 - Implementation and Compliance

6.1. Public Hearing/Dedicated Revenue Hearing

A public hearing/dedicated revenue hearing will be held in Arcadia after after completion of the capital financing plan. It will be advertised in the area newspapers and interested parties will be notified of the hearing. After the hearing, an update to FUP will be provided which will include a list of those citizens who attended the hearing and comments that were received. A copy of the public notice and minutes will also be provided.

6.2. Regulatory Agency Review

To qualify for a subsidized loan from the SRF, various governmental agencies must be satisfied with the way that Arcadia's water system problem is to be solved. Copies of the facilities plan will be sent to the following government agencies for review and comments.

1. Florida Department of Environmental Protection
2. Florida Department of Health
3. Southwest Florida Water Management District
4. U. S. Environmental Protection Agency
5. Southwest Florida Regional Planning Council
6. Department of Community Affairs, State Clearinghouse

6.3. Financial Planning

The Department of Environmental Protection's State Revolving Fund loan and grant program is expected to be the financing source for the project. A capital financing plan (CFP) is currently being prepared to show the public and state agencies what the financial impact on the users of the water system will be. It is anticipated that the Water and Sewer Utilities which serves 3,600 customers would pay the cost for the upgrade unless grant funding is secured. As part of this FUP, the City is also requesting grant funding which may or may not be received.

6.4. Implementation

The City of Arcadia has the sole responsibility and authority to implement the recommended facilities. There are no inter-local agreements necessary for the City to provide drinking water services throughout the planning area.

6.5. Implementation Schedule

April 2010- Submit Facility Use Plan to FDEP.

June 2010 – Hold public hearing on facilities plan and capital financing plan and incorporate recommended revisions to facility use plan.

June 2010 – Complete design criteria package for new treatment plant.

July 2010 – Submit final facilities plan and design criteria package to FDEP and other governmental agencies.

October 2010 – Publication of the Department's environmental information document in the Florida Administrative Weekly.

November 2010 – End of 30-day comment period for the environmental information document and approval of planning documents. Submit to the FDEP (Tallahassee) and submit construction permit application to the FDEP (District Office).

January 2011 – Notice of intent to permit construction of project issued and project added to the priority list.

January 2011 – Submit request for addition of the project to the FDEP's project priority list.

June 2011 – Hearing to add the project to the Fundable portion of the priority list.

August 2011 – Sign SRF loan/ grant agreement.

September 2011 – Advertise for design build contractor.

October 2011 – Open construction bids.

November 2011 – Award contracts.

December 2011 – Start project construction.

December 2012 – Complete construction of the project.

February 2013 – Certify operational performance of the project and close out project.

July 2013 – Begin SRF loan repayments to the FDEP.

6.6. Compliance

1. The treated water from the selected alternative will be in compliance with the FDEP drinking water standards.
2. The selected alternatives will meet the reliability requirements as per chapter 62-555, F.A.C.
3. Ion exchange resin will be regenerated and disposed of in accordance with the applicable regulations.
4. The environmental aspects of the proposed facilities are satisfactory.
5. The recommended facilities are consistent with Arcadia's comprehensive plan and with DeSoto County's comprehensive plan.

Appendix A

Cost Information of the Selected Alternative

Cost Information of the Selected Alternative

DESCRIPTION	AMOUNT
Ion Exchange System	$1,800,000
Chemical Feed System	$100,000
Ground Storage	$250,000
High Service Pumping	$400,000
Office/MCC	$300,000
Brine Waste Storage	$50,000
Effluent Pump Station	$100,000
Demolition	$200,000
Generator	$150,000
New Well	$150,000
Site Work, Paving and Grading	$200,000
Electrical, Instrumentation and Controls	$300,000
Subtotal	$4,000,000
Contingency @ 10%	$400,000
Construction Total	*$4,400,000*
Engineering/Inspection	*$660,000*
Administration	*$220,000*
Total	**$5,280,000**

O&M Cost

DESCRIPTION	AMOUNT/YR
Salt for Resin Regineration	$63,000
Disinfection and Corrosion Control	$20,000
Power (pumping)	$110,000
Resin Replacement	$20,000
Reginerate Disposal	$5,000
Annual Estimated O&M	**$218,000**

Appendix B

Detailed Cost Information and Present Worth Analysis for all Alternatives

Connect to DeSoto County and Blend

DESCRIPTION	AMOUNT
Forced Draft Aerator	$200,000
Ground Storage	$250,000
High Service Pumping	$400,000
Chemical Feed Facilities	$100,000
MCC	$100,000
Piping	$100,000
Generator	$150,000
Site Work, Paving and Grading	$150,000
Electrical, Instrumentation and Controls	$50,000
Subtotal	$1,500,000
Contingency @ 10%	$150,000
Construction Total	*$1,650,000*
Engineering/Inspection	*$247,500*
Administration	*$82,500*
Total	**$1,980,000**

O&M Cost

DESCRIPTION	AMOUNT/YR
Purchase .5 mgd from DeSoto County (3.75/1000 gals)	$684,375
Chemicals (disinfection, scrubbing and corrosion control)	28,000
Power (pumping)	$100,000
Annual Estimated O&M	**$812,375**

Repair/Rehab Existing Plant

DESCRIPTION	AMOUNT
Elev. Forced Draft Aerator	$300,000
Treatment Basin	$1,000,000
Recarbonation Unit	$100,000
Lime Slaker/feeder	$200,000
Rehab Filters/ Controls	$700,000
Building Repairs	$300,000
Lime/Backwash Disposal	$200,000
Piping	$100,000
Ground Storage	$250,000
High Service Pumping	$400,000
New Water Supply Well	$200,000
Generator	$150,000
Site Work, Paving and Grading	$200,000
Electrical, Instrumentation and Controls	$300,000
Subtotal	$4,300,000
Contingency @ 10%	$430,000
Construction Total	*$4,730,000*
Engineering/Inspection	*$709,500*
Administration	*$236,500*
Total	**$5,676,000**

O&M Cost

DESCRIPTION	AMOUNT/YR
Chemicals (lime, polymer, chlorine and corrosion)	$101,000
Power (pumping)	$110,000
Sludge Removal and Disposal	$30,000
Annual Estimated O&M	**$231,000**

Present Worth Analysis of Alternatives

Proposed Alternative	Total Estimated Benefit (mgd)	Description	Present Capital Cost ($M)	Annual O & M Cost ($M)	Present Worth O&M ($M)	Present Worth Value ($M)[1]
Treatment Alternatives						
Connect to DeSoto County	2.0	Purchase . 5 mgd from DeSoto County and blend.	2.0	0.81	11.0	13
Repair/Replace Existing Plant	2.0	New Treatment Basin, lime slaker, filter rehab, gst and pumping	5.7	0.23	3.1	8.8
New Ion Exchange Plant	2.0	Anion/Cation exchange, GST and pumping	5.3	0.22	3.0	8.3

[1]An interest rate of 4% was assumed for the present worth analysis

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