Syracuse City

SECONDARY WATER SYSTEM CAPITAL FACILITY PLAN 2006

February 2006

Epic Engineering, P.C.

SYRACUSE CITY

SECONDARY WATER SYSTEM

CAPITAL FACILITY PLAN

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February 2006

ACKNOWLEDGMENTS

Successful completion of this study was made possible by the cooperation and assistance of the Syracuse City Staff, as shown below. We sincerely appreciate the cooperation and assistance provided by these individuals.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SYRACUSE CITY

SECONDARY WATER SYSTEM IMPROVEMENTS
CAPITAL FACILITY PLAN

Executive Summary

The City of Syracuse, owns and maintains a Secondary Water System. The system includes 80 miles of water lines, two irrigation water sources, two water storage reservoirs, a connection to Weber Basin water, and a an elevated steel pressure regulation tank.

The purpose of this Capital Facility Plan is to initiate the process of master planning the required capital improvements to supply water at adequate pressures through build-out. In conjunction with the capital facility plan impact fees will be established which will fund the improvements as they are constructed. Through the combination of impact fees and infrastructure installed by developers, the identified improvements will be systematically installed through the next ten to twenty years. The exact timing of the installation of each capital improvement will be presented in the Impact Fee Determination as part of the final Impact Fee Written Analysis and Enactment.

This Capital Facility Plan will be used as the basis for the establishment of Secondary water Impact Fees. The total estimated cost of the identified required capital improvements is **$8,170,964**.

SYRACUSE CITY

SECONDARY WATER SYSTEM IMPROVEMENTS
CAPITAL FACILITY PLAN

Introduction

The purpose of this report is to provide a Capital Facility Plan for the City of Syracuse to revise the City's Secondary water impact fees to meet the cost of improvements required future growth within the City. This plan consists of a projection of the growth that the City will experience through build-out, a water model analysis of current and future water demands on the water system to determine deficiencies, a determination of the location and required sizing of future mainline piping and other system features to rectify these deficiencies with their associated costs. The resulting costs of this Plan is used to calculate the required impact fee for the Secondary Water System.

Demographics

Syracuse City is a community of approximately 13,000 people, located directly on the shore of the Great Salt Lake in Davis County, Utah. Syracuse is bordered on the East by Clearfield City and on the north by West Point City.

History

Settlement of Syracuse began in the late 1800's after the construction of a beach resort on the Great Salt Lake. Farms were homesteaded and a grid of rural roads were constructed to provide access to the farms. Syracuse has remained a rural farming community until the 1980's when growth the in neighboring north Davis communities of Layton and Clearfield spread westward into the City. In the 1990's growth within the City has accelerated and the limits of the City have expanded to include additional previously unincorporated land. Recent growth within the City has been at over ten percent (10%) annually for several years.

The City first constructed a secondary water system to service its residents in the 1980's. The water system consisted of a couple of connections to local irrigation company canals and several miles of small diameter piping in the main rural roads. The City constructed a open storage reservoir as part of a system expansion project in1988 to provide water storage so that the system can provide for fluxuating peak demands through the summer.

Population growth in the 1990's precipitated a Culinary Water Master Plan in 1988. Since this Master Plan the City has installed several miles of large diameter piping throughout the city, established a relationship with the City of Clearfield to receive water from Weber Basin Water Conservancy

District through their system, and has constructed an additional 2 million gallon reservoir on higher ground in Clearfield.

Existing Secondary Water System

The Secondary water system was first constructed in 1984 to provide secondary water for outdoor yard watering for the citizens of the City. The initial system was constructed with a 10-inch to 18-inch backbone along 1700 South and 8-inch to 10-inch distribution mains along portions of 1000 West, 2000 West and 3000 West, as well as small diameter supply mains in the existing Subdivisions. The initial System improvements also included a 5,600 gpm pump station, a 500,000 gallon elevated steel pressure regulating reservoir, and a 12 acre-foot storage pond on Bluff Road.

As the City has grown the Secondary Water System has been expanded to provide pressurized irrigation water to all parts of the City including southward along 1000 West from 1700 South, along 2700 South, along 700 South, along 200 South, along Bluff Road, and along 500 West. As the City boundary has expanded westward from Bluff Road, 8-inch mains have been installed westward in 2700 South, along 3000 West and along 4000 West.

Some of the major improvements constructed are two miles of 16-inch and 12-inch supply main down 500 West, A second 12 acre-foot pressure regulating pond and 4,000 gpm pump station near the Freeport Center, a mile and a half of 20-inch and 18-inch supply main in 1700 South, and two and a half miles of 20-inch to 12-inch supply main along 700 South. The existing Secondary Water System is shown in Figure 1 and more particularly described below.

Source Supply

Water for the Secondary Water System is provided primarily from established irrigation canals in the vicinity of Syracuse. There are three sources of water for the Secondary Water System. These connections are located on 700 South at approximately 2300 West, on 2000 West at 200 South and at approximately 800 West and 700 South to the north of the Freeport Reservoirs.

Ponds

The Secondary Water System includes two water storage ponds and one equalizing tank. A 12 acre-foot pond is located just off of Bluff Road at approximately 1800 South. This reservoir is a triangular clay lined earthen basin that is fed by the irrigation connection at 2300 West on 700 south through a mile long 15-inch reinforced concrete pipe (RCP). The second pond also contains 12 acre-feet of water. This pond is located at the City Reservoir property near the Freeport Center at approximately 1100 South and 700 West. The Freeport pond is concrete lined and is fed through a

half mile long 18-inch RCP pipe from a canal diversion structure at 800 West and 700 South. The pressure equalization tank is also located on the City's Freeport property next to the Freeport pond. The tank is a 500,000 gallon elevated steel tank. These ponds are shown in Figure 1.

Pump Stations

Water is fed into the secondary water distribution network from the storage reservoir by two pump stations. The first pump station is located near the storage pond on Bluff Road. The second pump station is located adjacent to the Freeport storage reservoir.

The Bluff Road pump station consists of three pumps with a combined pumping capacity of 5,600 gpm. The pumps are contained in a building. The pumps are of varying capacities and work in parallel to supply varying flows to the system according to system demands. The pumps are controlled through a RTU by the water elevation in the elevated steel tank.

The Freeport pump station consists of two 2,000 gpm pumps and an additional 3,000 gpm pump that was added to the pump station in 2003. These pumps feed directly from the Freeport pond. There is also an 800 gpm pump that is fed directly by the drainage channel that passes by the Freeport property. These pumps supply an 18-inch main that runs southward to 1700 South and a 20-inch main that runs northward to 700 South.

Distribution Piping

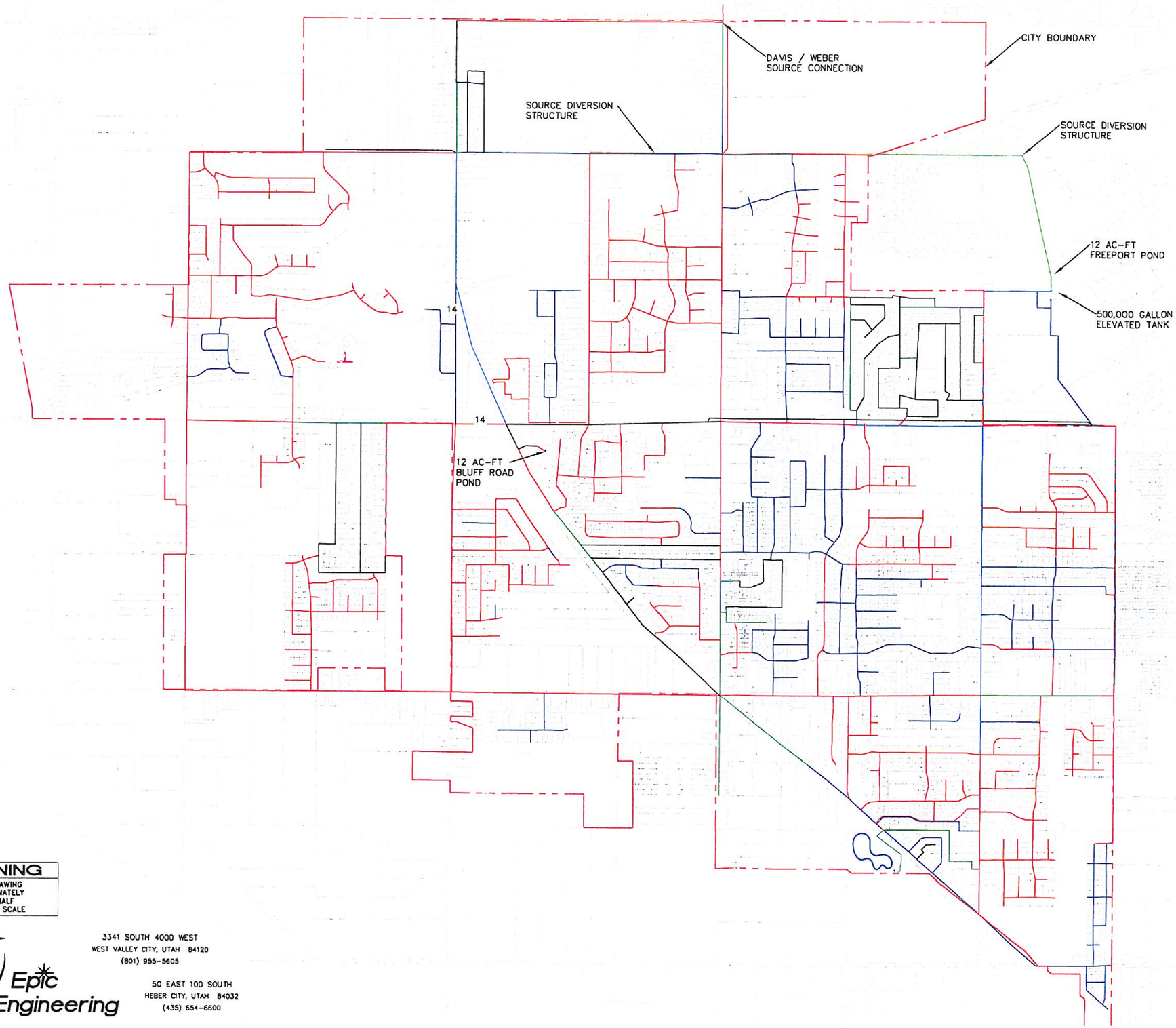
The Secondary Distribution System piping network is the network of piping that distributes the water to the users throughout the City. The distribution network consists of more than 80 miles of large diameter transmission and small diameter local distribution piping, as shown in Figure 1. The distribution system covers most of the developed area of the City.

Larger distribution piping is installed in the major collector streets. Until recently 1700 South was the primary distributor backbone from east to west between the two ponds. A second major distribution backbone to the west part of the City was created with the installation of large diameter piping down 700 South. The main distribution backbone from north to south is the large main running along the east City boundary on 500 West.

Smaller supply piping is installed in the minor collector and local streets of the individual neighborhoods within the City. When the original system was installed the local piping consisted of 3 and 4-inch mains. It was quickly determined soon after the original system was installed that this size of piping was too small for even local supply pipelines. Six inch piping was used thereafter as the standard size for local streets, with 4-inch mains in cul-de-sacs. Around the year 2000 the minimum size for secondary water piping in Subdivisions was increased to 8-inch. All piping installed since that date has

FIGURE 1

SYRACUSE CITY EXISTING SECONDARY WATER SYSTEM REQUIRED CAPITAL FACILITY IMPROVEMENTS JANUARY 2006



LEGEND

- 3" PIPE
- 4" PIPE
- 6" PIPE
- 8" PIPE
- 10" PIPE
- 12" PIPE
- 14" PIPE
- 16" PIPE
- 18" PIPE
- 20" PIPE
- 24" PIPE
- CITY BOUNDARY

GRAPHIC SCALE

1000 0 500 1000 2000 4000

(1" = 1000')

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been 8-inches or larger, except for some small cul-de-sacs.

Assessment of Required System Improvements for Future Growth

As the City grows and the number of users on the Secondary Water distribution system increases several issues, or deficiencies, emerge with the existing system due to this growth. The issues are generally the ability of the system to meet peak demands, adequate storage to supply water for high summer demands and adequate pressures to the user during peak demand periods.

Current System Issues due to Recent Growth

The Secondary Water Distribution System has already shown signs of demands getting too large for the existing distribution mains. There are two issues occurring with the existing system. These issues are the supply capacity of the existing pumps and low pressure issues in some portions of the City.

The demands on the Secondary Water System are large enough during peak summer times that all of the existing pumps are running for several hours and are barely able to keep up with the water demands. During some particularly high demand days, pressures throughout the network can drop to minimum desirable supply values.

Low supply pressures have been an issue especially in the southeast part of the City and out in the western region of the City. The southeast portion of the City, primarily those areas south of 2700 South Street and east of 1000 West Street, seems to have problems maintaining high pressures during high demand days because of the distance of this part of the City from the existing source pump stations and the ground elevation in this area.

Modeled System Issues due to Future Growth

The Secondary Water System was modeled using the computer modeling software Cybernet. A model of the current system with its source reservoirs and pump stations, and the distribution and supply piping was first created. Parameters such as pipe sizes, pipe lengths, water demands, and ground elevations were incorporated into the model.

A second model was then created for future build-out conditions. The future model included the projected extra future demands on the system in their geographic specific locations according to current zoning and historical average residential demands. The future system water model shows the need for additional water pumping capacity to satisfy future demands and additional water storage to supply the pumps. The future water model also shows a greatly increased inability to transmit water to several portions of the City with sufficient pressures. Of particular issue on the water model are the

western and southwestern portion of the City to the west of Bluff Road and the southeast portion of the City south of 2700 South Street.

Determination of Required System Improvements

The Secondary Water System issues and model results were reviewed by City staff and consulting engineers to determine the best solutions for the system to be able to provide the required amounts of water at adequate pressures for future growth. This review concluded that there are four main improvements needed for future growth. These required improvements are 1) 10,000 to 12,000 gpm of additional source pumping capacity for peak day demands, 2) a large distribution backbone along 2700 South Street, 3) large distribution piping in 1000 West, 2000 West, 3000 West and 4000 West to connect the distribution backbones in 700 South, 1700 South and 2700 South and increase flow capacity southward in the City, and 4) a third storage reservoir and pump station in the southeast part of the City to resolve chronic pressure problems in that area.

The future water model was used to model the effects of the proposed improvements and to determine the required size of each improvement. The recommended storage, pumping and distribution improvements with their required sizes are discussed in the next section below.

Required System Improvements

Pumping Stations

The Secondary Water System will require additional pumping capacity of 10,000 to 12,000 gpm through build-out. The water model shows that the bulk of the additional demand will be in the western and northern parts of the City. A new pump station was entered into the water model along Bluff Road in the southeastern part of the City. Several water sources can be captured at this location to supply water for the pump station including the Layton Canal that runs along Bluff Road, an irrigation line along 1000 West and City land drains that outfall in the vicinity. The model showed that the installation of an 8,000 gpm pump station at this point resolved pressure issues in the southeast part of the City and freed up water flows from the Freeport and existing Bluff Road ponds to supply demands in the western part of the City. The model also showed that adding a new pump to the Freeport pump station to supply an additional 3,000 gpm additional flows along the 700 South Street backbone transmission main is the best alternative for supplying the additional water needed in the west part of the City.

The City has several land drain networks throughout the City that collect shallow ground water in Subdivisions and outfalls the water to surface drainage channels. Some of these land drain networks have constant and sometimes significant flows. The collected ground water from these land drain

networks can be routed through individual shallow well pump stations at various locations around the western and southern areas of the City. The construction of two or three of these land drain pump stations will provide up to 1,000 gpm of additional flows.

The required pumping Improvements are listed in Table 1 below.

TABLE 1
Required Pump Station System Improvements

Location	Flow (gpm)	Number of Pumps
1500 West Bluff Road (Jensen Property)	8,000	4
Freeport Pump Station - Additional Pump	3,000	1
Land Drain shallow Well Pump Stations	1,000	2 to 3

Pressure equalization pond

Additional water storage is also required to provide adequate stored source water for the pumping stations. The property at the location of the new pump station along Bluff Road also provides space for a new water storage reservoir to supply the new pump station. The Secondary Water System will require an additional 24 acre feet of water storage. A 51 acre foot storage reservoir is being built at this location to supply water for the new pump station. The proposed reservoir is sized at more than double the required storage volume because the reservoir will also be used as a fish pond. This is the only identified increase in water storage. The required storage is listed in Table 2 below.

TABLE 2
Required Water Storage Pond Improvements

Location	Volume (Ac*ft)
Bluff Road (Jensen Park Property)	24

Source Supply Piping

As stated earlier, there are several water sources for the Jensen Park pond and pump station. One of these sources are outflows from the City's land drain system. One land drain outfall from Subdivisions to the north of Bluff Road between 1000 West and 2000 West runs to the Jensen property and is available for supply to the pond. A second land drain network from several Subdivisions outfalls to 1000 West near Bluff Road. This land drain outfall experiences flows between 200 and 500 gpm and is an excellent water source for the pond. Flows from this land drain will increase as additional Subdivision are constructed and connected to the land drain network in the future. A 3,300 foot long 10-inch land drain should be installed from 1000 West to the pond to provide this land drain as a source to the Secondary Water System.

Transmission System

As stated earlier, the water model shows the need for new large diameter distribution mains in several of the major streets. There are already sufficient backbone mains running from east to west in 700 South and 1700 South Streets. An additional large diameter main is required in 2700 South from the large main in 500 West to 4000 West Street. New distribution mains are also required in 1000 West, 2000 West, 3000 West and 4000 West Streets. Finally new distribution mains are required along Bluff Road from the existing pond southeasterly to Gentile Street and along Gentile. The limits of these new pipes and their required sizes are listed in Table 3 and shown in Figure 2.

TABLE 3
Required Distribution Main Improvements

Location	Size (in)	Length (ft)
1700 South - Bluff Road to 4000 West	14	6,400
2700 South - 500 West to 1000 West	12	2650
2700 South - 1000 West to 2000 West	14	5,300
2700 South - 2000 West to 3000 West	14	5,300
2700 South - 3000 West to 4000 West	14	5,300
3700 South (Gentile Street) - Bluff Road to 580 West	10	1,100
1000 West - 1700 South to 2700 South	12	5,300
1000 West - 2700 South to 3200 South	18	2,650
1000 West - 3200 South to Bluff Road	16	1,600
2000 West - 700 South to 1700 South	14	5,300
2000 West - 1700 South to 2700 South	14	5,300
2000 West - 2700 South to 3300 South	8	3,400
3000 West - 700 South to 1700 South	14	5,300
3000 West - 1700 South to 2700 South	14	5,300
4000 West - 700 South to 1700 South	14	5,300
4000 West - 1700 South to 2700 South	14	5,300
Bluff Road - Bluff Road Pond to 2700 South	10	6,400
Bluff Road - 2700 South to 1000 West	16	7,500
Bluff Road - 1000 West to 3700 South	10	1,600

Prioritization of Required System Improvements

The 25 improvements identified were prioritized according to current needs, areas of immediate growth, areas of short term growth and areas of long term growth. Table 4 shows a prioritized list of these required improvements from first priority to 25th priority.

FIGURE 2

SYRACUSE CITY SECONDARY WATER SYSTEM REQUIRED CAPITAL FACILITY IMPROVEMENTS JANUARY 2006

CITY BOUNDARY

FREEPORT PUMP STATION
ADD 2 PUMPS

JENSEN PARK
RESERVOIR
51 AC-FT

JENSEN PARK
PUMP STATION
8,000 gpm

LEGEND

- 3" PIPE
- 4" PIPE
- 6" PIPE
- 8" PIPE
- 10" PIPE
- 12" PIPE
- 14" PIPE
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TABLE 4
Prioritized List of Required System Improvements

Priority	Improvement Type	Improvement Size	Location
1	Reservoir	24 Ac*ft	Bluff Road (Jensen Park Property)
2	Pump Station	8,000 gpm	1500 West Bluff Road (Jensen Park Property)
3	Waterline	16-inch	Bluff Road - 1500 West to 1000 West
4	Source Feed Line	10-inch	Bluff Road - 1000 West to 1500 West
5	Waterline	16-inch	Bluff Road - 2700 South to 1500 West
6	Waterline	8-inch	2000 West - 2700 South to 3300 South
7	Waterline	10-inch	3700 South - Bluff Road to 580 West
8	Waterline	10-inch	Bluff Road - 1000 West to 3700 South
9	Waterline	16-inch	1000 West - 3200 South to Bluff Road
10	Waterline	18-inch	1000 West - 2700 South to 3200 South
11	Waterline	14-inch	2000 West - 1700 South to 2700 South
12	Waterline	14-inch	2000 West - 700 South to 1700 South
13	Waterline	14-inch	1700 South - Bluff Road to 4000 West
14	Waterline	14-inch	1700 South - 3000 West to 4000 West
15	Waterline	10-inch	Bluff Road - Bluff Road Pond to 2700 South
16	Waterline	12-inch	2700 South - 500 West to 1000 West
17	Waterline	14-inch	2700 South - 1000 West to 2000 West
18	Waterline	14-inch	2700 South - 2000 West to 4000 West
19	Pump Station	3,000 gpm	Freeport Pump Station
20	Waterline	14-inch	3000 West - 700 South to 1700 South
21	Waterline	14-inch	3000 West - 1700 South to 2700 South
22	Waterline	14-inch	4000 West - 700 South to 1700 South
23	Waterline	14-inch	4000 West - 1700 South to 2700 South
24	Waterline	12-inch	1000 West - 1700 South to 2700 South
25	Pump Station	1,000 gpm	Land Drain Pump Stations

Capital Improvement Costs

The final step of the capital Facility Plan is to determine the anticipated cost of the required Capital Improvements identified in this report. The cost to install the improvements is then used to calculate the required Secondary Water Impact Fee in the Impact Fee Enactment. Prices are based upon current construction prices from similar construction projects bid in 2005.

The reservoir price consists of only the price to construct only the 24 ac*ft portion of the proposed 51 ac*ft Jensen Nature Park pond. This pond is membrane lined with a protective layer of sands and gravels. The cost of the pump station is the cost to construct wet wells, install pumps, piping, electrical and control, and construct a protective structure, as required. The cost of the waterlines is for engineering, asphalt cutting and removal, excavation, pipe installation, fittings, backfilling and compaction, asphalt restoration, construction management, and testing. These prices reflect the recent inflation of materials such as concrete and PVC pipe. Pipeline Costs are calculated in Table 5 and the total costs of all improvements are shown in Table 6.

TABLE 5
Waterline Improvement Costs

Location	Size	Length	Unit Price	Construction Cost
Bluff Road - 1500 West to 1000 West	16-inch	3,300	$78.00	$257,400
Bluff Road - 2700 South to 1500 West	16-inch	4,200	$78.00	$327,600
2000 West - 2700 South to 3300 South	8-inch	3,400	$40.00	$136,000
3700 South - Bluff Road to 580 West	10-inch	1,100	$47.00	$51,700
Bluff Road - 1000 West to 3700 South	10-inch	1,600	$47.00	$75,200
1000 West - 3200 South to Bluff Road	16-inch	1,600	$78.00	$124,800
1000 West - 2700 South to 3200 South	18-inch	2,650	$95.00	$251,750
2000 West - 1700 South to 2700 South	14-inch	5,300	$67.00	$355,100
2000 West - 700 South to 1700 South	14-inch	5,300	$67.00	$355,100
1700 South - Bluff Road to 3000 West	14-inch	1,100	$67.00	$73,700
1700 South - 3000 West to 4000 West	14-inch	5,300	$67.00	$355,100
Bluff Road - Bluff Road Pond to 2700 South	10-inch	6,400	$47.00	$300,800
2700 South - 500 West to 1000 West	12-inch	2,650	$58.00	$153,700
2700 South - 1000 West to 2000 West	14-inch	5,300	$67.00	$355,100
2700 South - 2000 West to 4000 West	14-inch	10,600	$67.00	$710,200
3000 West - 700 South to 1700 South	14-inch	5,300	$67.00	$355,100
3000 West - 1700 South to 2700 South	14-inch	5,300	$67.00	$355,100
4000 West - 700 South to 1700 South	14-inch	5,300	$67.00	$355,100
4000 West - 1700 South to 2700 South	14-inch	5,300	$67.00	$355,100
1000 West - 1700 South to 2700 South	12-inch	5,300	$58.00	$307,400

TABLE 6
Capital Improvement Costs

NUM	PROJECT	CONSTRUCTION COSTS	DESIGN COSTS	PROPERTY/ ROW COSTS	TOTAL
1	Jensen Park Reservoir	$800,000	$56,000		$856,000
2	Jensen Park Pump Station	$800,000	$56,000		$856,000
3	New 16" Waterline: Bluff Road - 1000 West to Jensen Park	$257,400	$18,018		$275,418
4	Tie 1000 West Land Drain into Fish Pond	$152,000	$10,640	$5,000	$167,640
5	New 16" Waterline: Bluff Road - Jensen Park to 6 Way	$327,600	$22,932		$350,532
6	New 8" Waterline: 2000 West - 2700 South to 3300 South	$136,000	$9,520		$145,520
7	New 10" Waterline: 3700 South - Bluff Road to 580 West	$51,700	$3,619		$55,319
8	New 10" Waterline: Bluff Road - 1000 West to 3700 South	$75,200	$5,264		$80,464
9	New 16" Waterline: 1000 West - 3200 South to Bluff Road	$124,800	$8,736		$133,536
10	New 18" Waterline: 1000 West - 2700 South to 3200 South	$251,750	$17,623		$269,373
11	New 14" Waterline: 2000 West - 1700 South to 2700 South	$355,100	$24,857		$379,957
12	New 14" Waterline: 2000 West - 700 South to 1700 South	$355,100	$24,857		$379,957
13	New 14" Waterline: 1700 South - Bluff Road to 3000 West	$73,700	$5,159		$78,859
14	New 14" Waterline: 1700 South - 3000 West to 4000 West	$355,100	$24,857		$379,957
15	New 10" Waterline: Bluff Road - Bluff Road Pond to 6 Way	$300,800	$21,056		$321,856
16	New 12" Waterline: 2700 South - 500 West to 1000 West	$153,700	$10,759		$164,459
17	New 14" Waterline: 2700 South - 1000 West to 6 Way	$355,100	$24,857		$379,957
18	New 14" Waterline: 2700 South - 2000 West to 4000 West	$710,200	$49,714		$759,914
19	Add 2 pumps to pump station at Freeport reservoir	$50,000	$3,500		$53,500
20	New 14" Waterline: 3000 West - 700 South to 1700 South	$355,100	$24,857		$379,957
21	New 14" Waterline: 3000 West - 1700 South to 2700 South	$355,100	$24,857		$379,957
22	New 14" Waterline: 4000 West - 700 South to 1700 South	$355,100	$24,857		$379,957
23	New 14" Waterline: 4000 West - 1700 South to 2700 South	$355,100	$24,857		$379,957
24	New 12" Waterline: 1000 West - 1700 South to 2700 south	$307,400	$21,518		$328,918
25	2 or 3 Land Drain Pump Stations	$200,000	$14,000	$20,000	$234,000
	TOTAL	$7,613,050	$532,914	$25,000	**$8,170,964**

Improvement Costs Summary

The cost of improvements to the Syracuse Secondary Water System that will benefit future connections is **$8,170,964**. The cost of each type of improvement is listed below.

Source Supply Piping	$167,640
Pressure equalization ponds	$856,000
Pump Station Improvements	$1,143,500
Distribution Waterlines	$6,003,824
TOTAL	**$8,170,964**

EVALUATION OF UTAH STATE CODE
V.S. GENERATION OF SYRACUSE CITY SECONDARY WATER WRITTEN ANALYSIS

Utah State Code Requirement		Addressed in Impact Fee Document
Code	**Requirement**	
11-36-201 (5) a	(i) Identify the impact on the City caused by the development	As the City grows the need for capacity in the secondary water system will continue to increase. Additional residences and businesses will connect to the secondary water system to provide for outdoor irrigation needs. Eventually the cumulative demands of new connections become too great for the existing piping in areas of the City experiencing growth. **New larger piping must be installed to handle the increased demand of the new connections. Increased storage capacity will also be required for the new development.**
	(ii) Demonstrate how the impacts on the City are reasonably related to the development	The City Council has determined the existing level of the secondary water system is adequate. The City Council has also established a goal of maintaining adequate pressure and storage according to accepted engineering principals and acceptable functionality of end user sprinkler systems. As demands on the existing system increase, increased headloss in the piping will diminish available water pressure. **To maintain proper water pressure to all end users, new larger piping will need to be installed in several sections of the City.**
	(iii) Estimate the proportionate share of the costs of impacts to the City that are reasonable related to the development	The City Council has adopted the policy that new facilities required as a result of new growth should be funded and paid for by the new developments. **New improvements are directly required because of the new development and should be funded 100% by the new development.** It is reasonable to assume the complete costs of new waterlines should be born by the new developments or existing residences would be subsidizing the construction of the new parks.

	(iv) Identify how the impact fee was calculated	The number of new connections were calculated from growth projections and typical population densities. These new connections were assumed to have the same usage as existing connections. The water system was computer modeled and required capacity increases were identified. Costs for these improvements were determined and then divided by the number of new connections to determine the impact Fee. This is addressed in the **Summary of Impact Fee Process** on page 3.
11-36-201 (5) b	(i) Identify (if applicable) the cost of existing public facilities.	All existing components of the secondary water system have been payed for by the existing residents. **Existing "past" incurred facility costs were not considered or applicable in the determination of future secondary water improvement costs.**
	(ii) Identify (if applicable) the manner of financing existing public facilities.	The City has no existing bonds or debts which would impact new residences. **New connections will not be impacted by the costs of the existing facilities.**
	(iii) Identify (if applicable) the relative extent that existing new developments have already contributed to the cost of existing facilities.	The City has no outstanding debts for secondary water that would impact new developments. **The City has no procedure in which new developments would have contributed to the cost of existing facilities.**
	(iv) Identify (if applicable) the relative extent to which new developments will contribute to the cost of existing public facilities in the future	**Not applicable to the Impact Fee**: No reference is shown that new developments should contribute to the cost of existing facilities. Costs to maintain, or complete existing secondary waterlines was not considered or applicable in the determination of the Impact Fees
	(v) Identify (if applicable) the extent to which new developments are entitled to a credit due to improvements which are or will be paid for by other means within the City.	**Not applicable to the Impact Fee:** The City has no outstanding debts for parks that would impact new developments. A credit was not considered or applicable in the determination of Impact Fees since no contribution to existing improvements has been, or will be, collected by the City from future developments.
	(vi) Identify (if applicable) extraordinary costs if any in servicing the new development	**No extraordinary cost was identified or known that would be needed to be born by any new development.** Any extraordinary cost did not apply to calculation of new secondary water impact fee.

	(vii)Identify (if applicable) the time-price differential inherent in fair comparisons of amounts paid at different times.	An inflation rate of 3.50 percent was assumed to determine increases in the cost of construction projects in and given year from 1996 through 2011. The resulting Impact Fee is increased every three years as a result of inflation.
11-36-201 (5) c	Prepare a summary of the written analysis designed to be understood by a lay person	**Detailed text is provided in which a lay person could follow and understand the basis and calculation process of the impact fee.**
11-36-202 (2) a	Enactment establishes one or more service areas for which the impact fees shall apply	**The complete City is used within the basis for the assessment of fees. Only one service area encompassing the complete City is used.**
11-36-202 (2) b	Enactment contains the formula used to calculate the impact fees	**A detailed narrative text and all calculations are provided to assist the reader in understanding and calculating the impact fees**
11-36-202 (2) c	Enactment contains a provision to (i) respond to unusual circumstances in specific cases, (ii) ensure that impact fees are imposed fairly	Assessment of the impact fees are a function of the number of equivalent residential connections. Each residential connection being equal to 0.4 acres or total land. **No unusual circumstances is known that should be included as the basis for establishment of the impact fee.**
11-36-202 (2) c	Enactment contains a provision that permits adjustment of the amount of the fee based upon studies and data submitted by the developer.	Assessment of the impact fees are a function of developed land. **Provisions have been included in the Enactment which allows adjustment of he amount of the fee based upon studies and data submitted by the developer.**