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SALEM CITY CULINARY WATER AND WASTE WATER SYTEM IMPACT FEE STUDY

January 6, 2010

SALEM CITY

SALEM CITY CULINARY WATER AND WASTE WATER SYSTEM

IMPACT FEE STUDY

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Prepared by:

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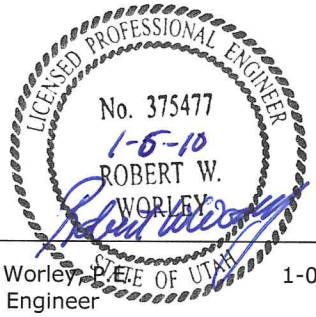
I certify that, to the best of my knowledge and understanding, the attached impact fee analysis:

1. includes only the costs for qualifying public facilities that are
   a. allowed under the Impact Fees Act; and
   b. projected to be incurred ore encumbered within six years after each impact fee is paid;
2. contains no cost for operation and maintenance of public facilities;
3. offsets costs with grants or other alternate sources of payment;
4. does not include costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is by existing residents; and
5. complies in each and every relevant respect with the Impact Fees Act.



Robert Worley, P.E. 1-06-10
Project Engineer

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EXECUTIVE SUMMARY

This report is an Impact Fee Study for Salem City's culinary water and wastewater systems. It analyzed the system to determine the maximum impact fee that can be charged based on a reasonable plan. The amount of the impact fee for future commercial customers will be based on the projected amount of water or wastewater based on equivalent residential connections (ERC's) required for a proposed new commercial connection, but no impact fee will be less than that paid for a standard residential connection. The use of impact fee money will help Salem City to maintain its high level of service to its water customers by reducing the amount of debt service required to finance future construction projects as they become necessary.

Salem City currently charges an impact fee of 2,275.96 for all new water system connections and a fee of 1,733.54 for wastewater connections.

The impact fee was based on a study period of 6 years. However, the fee was calculated by dividing the cost of planned system upgrades, existing bond/debt payments and miscellaneous fees attributed to growth by the number of ERC's expected to be added to the system in the next 20 years, as the improvements will be sized to accommodate 20 years worth of growth. Projects which will be completed after the 6 years will be included in the report but not in the calculated impact fee.

Each system is comprised of subsystems. The water system is made up of a supply system, distribution system, storage system, and treatment system. The supply limited by water rights and source capacity, the distribution system is the series of pipes that distribute water to the connections. The storage system is made up of tanks which provide storage capacity. And the treatment system is the chlorination system which insures a safe drinking supply. The Culinary Water Impact fee was calculated according in table 2.5 below. The table calculates the culinary impact fee by dividing the costs attributed to growth by the number of ERC's served. It then shows the percent of the impact fee which should be attributed to each portion of the impact fee. Table 2.3.4.2, below, breaks down the impact fee associated with each culinary water project, by project.

The wastewater system consists of the collection system, made up of collectors and larger interceptors, and the treatment system, which in Salem City's case is a lagoon system which treats the wastewater. The Wastewater Impact Fee was calculated according to table 3.6 below. The table calculates the wastewater impact fee by dividing the costs attributed to growth by the number of ERC's served. It then shows the percent of the impact fee which should be attributed to each portion of the impact fee. Table 3.4.3, below, breaks down the impact fee associated with each wastewater project, by project.

Table 2.5 -- Salem City Culinary Water Impact Fee Cost Per ERC						
Description	**Total Costs for projects in IF Period**	**% Attributable to Growth**	**Costs Attributable to Growth**	**Related ERCs Served**	**Cost per New ERC**	**Percent of Total IF**
Capital Project Fees						
Source Capital Project Costs	$ -	100%	$ -	2,127	$ -	0.0%
Storage Capital Project Costs	$ -	100%	$ -	2,127	$ -	0.0%
Distribution Capitol Projects						
*Woodland Hills Dr. Transmission Line	$ 525,574.94	100%	$ 525,574.94	2,127	$ 247.10	14.0%
*Salem Park Distribution Cost Difference	$ 19,862.19	100%	$ 19,862.19	2,127	$ 9.34	0.5%
1 - Elk Ridge Dr. Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
2 - Upper Zone 11200 S Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
3 - 8800 South Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
4 - Industrial Park Pipeline Project	$ 1,269,277.59	100%	$ 1,269,277.59	2,127	$ 596.75	33.7%
5 - Main Street Pipeline Extension Project	$ -	100%	$ -	2,127	$ -	0.0%
6 - Salem Park Connector Project	$ -	100%	$ -	2,127	$ -	0.0%
7 - Arrowhead Trail Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
Total Distribution Capital Project Costs	$ 1,814,714.72	100%	$ 1,814,714.72	2,127	$ 853.18	48.2%
Total Capital Project Fee	$ 1,814,714.72		$ 3,629,429.43		$ 853.18	48.2%
Existing Bond / Debt Payments						
1991 USBWR Annual Loan	$ 124,480.00	10%	$ 12,448.00	2,127	$ 5.85	0.3%
1996 General Obligation Bond	$ 2,534,425.00	59%	$ 1,484,412.72	2,127	$ 697.89	39.4%
1996 USBWR Annual Loan	$ 135,000.00	15%	$ 20,250.00	2,127	$ 9.52	0.5%
Nebo School District Payment	$ 29,589.00	100%	$ 29,589.00	2,127	$ 13.91	0.8%
Salem City Water Fund Payment	$ 390,959.00	100%	$ 390,959.00	2,127	$ 183.81	10.4%
Total Debt/Bond Payments:	$ 3,214,453.00		$ 1,937,658.72		$ 910.98	51.4%
Miscellaneous Fees						
Professional Expenses	$ 15,000.00	100%	$ 15,000.00	2,127	$ 7.05	0.4%
Total Miscellaneous Fee	$ 15,000.00		$ 15,000.00		$ 7.05	0.4%
*This is the actual cost of the project that was completed in 2009.						
			Total Impact Fee Cost per New ERC:			$ 1,771.21

Table 3.6 -- Salem City Wastewater Impact Fee Cost Per ERC						
Description	**Total Costs During IF Period**	**% Attributable to Growth**	**Costs Attributable to Growth**	**Related ERCs Served**	**Cost per New ERC**	**Percent of Total IF**
Capital Project Fees						
Sewer Treatment Project Costs	$ -	100%	$ -	2,127	$ -	0.0%
Sewer Collection Projects						
*Arrowhead Trail & 460 West Lift Station Project	$ 1,018,051.91	100%	$ 1,018,051.91	2,127	$ 478.63	30.0%
1-Elk Ridge Dr. & Lift Station Project	$ -	100%	$ -	2,127	$ -	0.0%
2-400 North Replacement Project	$ -	100%	$ -	2,127	$ -	0.0%
3-8800 South & Main Project	$ -	100%	$ -	2,127	$ -	0.0%
4-SCADA System Project	$ 63,760.07	100%	$ 63,760.07	2,127	$ 29.98	1.9%
5-Industrial Park Project	$ 1,085,393.54	100%	$ 1,085,393.54	2,127	$ 510.29	32.0%
Total Sewer Collection Project Costs	$ 8,489,952.40	100%	$ 2,167,205.52	2,127	$ 1,018.90	64.0%
Total Capital Project Fee	$ 8,489,952.40		$ 2,167,205.52		$ 1,018.90	127.9%
Existing Bond / Debt Payments						
Regionalized Land Acquisition	$ 856,345.80	100%	$ 856,345.80	2,127	$ 402.61	25.3%
Elk Ridge Buyout	$ 250,000.00	100%	$ 250,000.00	2,127	$ 117.54	7.4%
Total Debt/Bond Payments:	$ 250,000.00		$ 250,000.00		$ 520.14	32.6%
Miscellaneous Fees						
Sewer System Modeling Expenses	$ 100,000.00	100%	$ 100,000.00	2,127	$ 47.01	3.0%
Professional Expenses	$ 15,000.00	100%	$ 15,000.00	2,127	$ 7.05	0.4%
Total Miscellaneous Fee	$ 115,000.00		$ 115,000.00		$ 54.07	3.4%
*This is the actual cost of the project that was completed in 2009.						
			Total Impact Fee Cost per New ERC:			$ 1,593.11

The impact fee (IF) associated with each project or the cost per new ERC is calculated by dividing the cost attributed to growth by the related ERCs served. The related number of related ERC's is determined by subtracting the current number of ERCs from the 20 year projected number of ERCs. (see table 1.2)

This means that the maximum impact fee that can be charged for the culinary water system is $1,771.21. And the impact fee that can be charged for the wastewater system is $1,593.11

The City council has the discretion set the fee at or below the maximum allowable impact fee. It is recommended that the City council review the existing culinary water and wastewater impact fees and adjust the fees based on the information provided in this report. Impact fees should be reviewed every 3 to 5 years.

1.0 INTRODUCTION

Sunrise Engineering, Inc. has prepared for Salem City the **Impact Fee Methodology and Written Analysis** for the Culinary Water and Wastewater systems pursuant to Title 11, Chapter 36 *Impact Fees Act of the Utah Code Annotated (1953*, as amended).

In 2006, Salem City had prepared an Impact Fee Analysis for the both the culinary and wastewater systems. The purpose of this report is to update those analyses, by updating the opinions of probable cost as well as adding additional probable costs for projects that were not addressed in that report. Salem city currently requires developer outside of the existing system to complete the system improvements recommended in the master plan, as outlined in the 1997 Capitol Facilities plan and 2006 Impact Fee Analysis and Recommendations. Continuing this practice will insure the integrity of the existing system, and protect the existing customer capacity. These upgrades often provide capacity beyond the needs of the development for which they serve. The city currently reimburses the developer for the portion of the upgrades which serve additional connections using impact fees as growth occurs so as to provide a fair and equitable position among those who benefit from the system upgrades. In order to accomplish this a percentage of impact fees collected equivalent to the percentage of cost of the individual system upgrades completed by the developer to all of the recommended upgrades is paid to the developer until the developer is fully reimbursed. This study will identify the percentage of each project to the sum of all of the recommended projects.

This study will also review the impact fees previously set for the culinary and wastewater systems and determine if these fees are generating the required funds to sustain future growth. It is recommended that the impact fees be reviewed every 5 years to ensure that proper fees are being assessed.

Local political subdivisions with a population, or serving a population, of less than 5000 as of the last federal census, as is the case with Salem City – 2000 Census Population 4,372, need not comply with the capitol facilities plan requirements of the Impact Fees Act, but shall ensure that the impact fees imposed by them are based on reasonable plans

In order to determine impact fees, on development activities, that are fair and equitable to both the existing users and future users, separate analyses have been prepared for the culinary and wastewater systems. Each analysis will breakdown cost associated with maintaining an adequate level of service throughout the system as new development enters onto the system. These costs will be implemented into the budget for each utility to determine the impact fees associated with each.

1.1 General Information

1.1.1 Culinary Water System

"In 1995, Salem City completed a Culinary Water Master Plan which contained information similar to the capitol facilities plan requirements of the Impact Fee Act. This study resulted in the construction of approximately $6.5 Million of culinary water system improvements including distribution line upgrades, two new storage tanks, a new well and two new treatment buildings. This major culinary water system improvements project was funded through grant and low interest loans that will be paid off in 2016." (Sunrise 2001)

1.1.2 Wastewater System

In 1997, Salem City completed a Wastewater Collection & Treatment Capitol Facilities Plan which contained information similar to the capitol facilities plan requirements of the Impact Fee Act. That study makes several recommendations which included but were not limited to; 1) Treatment plant improvements; 2) Collection System Improvements. Most of the collection system improvements have been completed, as of yet no improvements have been made to the wastewater treatment system. In the 2006 Impact fee analysis several additional improvements were identified, and since that time one project has been completed and another has been added to the list of necessary improvements. These improvements will be identified in this Impact Fee Study.

1.2 Population Projection

One element in developing an impact fee is predicting the City's population growth rate. The population growth rate gives the planner foresight of what the systems will demand to accommodate the City with an adequate level of service. Although it should be noted that if the projected population growth rate is incorrect, the impact fee should still be valid. For example, if the actual growth rate is higher than predicted, the impact fee funds will grow at a much higher rate, but the system improvements will need to be installed sooner than expected also. The scenario would be just the opposite if the growth rate is smaller than anticipated. Either way, the impact fee funds and system improvements should balance each other out.

In 2006 Aqua Engineering completed a demographics study in conjunction with the impact fee studies; this study will be included in Appendix C – Demographics. Since the time of that study growth has temporally decreased due to an unusual financial and housing climate at this time, it is anticipated that growth will eventually rebound, however over the next few years a lower growth rate will be used for the purpose of this study. The following table has the estimated growth rates ranging from 2005-2049, the study period however will be based on a 10 year study period, ranging from 2009-2019.

Table 1.2 -- Salem City Growth Rate Estimate			**People per ERC 2.98**
Year	Population	Growth Rate	ERC
2005	5,300	3.78%	1,781.00
2006	5,555	4.81%	1,866.00
2007	5,868	5.65%	1,972.00
2008	5,980	1.91%	2,009.00
2009	6,022	0.70%	2,024.00
2010	6,065	0.70%	2,038.00
2011	6,107	0.70%	2,052.00
2012	6,150	1.91%	2,066.00
2013	6,268	3.78%	2,106.00
2014	6,505	4.37%	2,186.00
2015	6,789	4.37%	2,281.00
2016	7,086	4.37%	2,381.00
2017	7,395	4.37%	2,485.00
2018	7,718	4.37%	2,593.00
2019	8,056	4.37%	2,707.00
2029	12,356	4.37%	4,151.00
2039	18,951	4.37%	6,367.00
2049	29,066	4.37%	9,766.00
Actual building permits were used to estimate growth rate in 2005-2009 the remainder is based on the constant building permit growth rate as shown in the 2006 Aqua Demographics report.			

The number of people per ERC was calculated based on Table 1.2.2 below; by dividing the current population by the total number of ERC's. (6,022 people/2,024 ERC's = 2.98 people/ERC).

Table 1.1.2 -- Salem Equivalent Residential Connections			
Service Connection Type	service connections	ERC/Connections	ERC
Residential	1,737	1	1,737
Recreation Complex	5	0.6	3
Commercial	49	2.5	123
Church	7	1	7
School	6	25	150
Other	4	1	4
Total	1,808		2,024
		Current Population	6,022
		People per ERC	2.98

2.0 CULINARY WATER SYSTEM

2.1 Background Information

In 2006 Salem City completed a culinary water impact fee study. Several projects were identified in that study that would expand the system to serve more users. A project which was not identified in that study was completed in 2009 which provides service to additional areas. This project will be included in the impact fee calculations. As a result of the 2006 study the impact fee was set at $2,275, this impact fee is what is currently charged.

The source for all culinary water for the city is groundwater withdrawn from the underlying alluvial aquifer. Water is then collected in five storage sites and supplied to residents through the culinary distributions system. The system ranges in age from 60 years to new installation. A breakdown summary of the system was provided in the 2006 study. The following table was taken from that study, and updated with the pipe added in the 2009 waterline upgrade.

Table 2.1 -- Salem City Culinary Water System

Storage Tanks		**Wells/ Springs**	
Name	Capacity (gal)	Name	Rate (gpm)
Water Canyon Springs	500,000.00	Water Canyon Upper Spring	50-300
Storage Tank 1	500,000.00	Water Canyon Lower Spring	200-1000
Storage Tank 2	300,000.00	Storage Tank Well	2,700
Maple Canyon	450,000.00	Maple Canyon Well	1,050
Cemetery	750,000.00		
Total	2,500,000.00	Total	4,000
Piping		**Pressure Reducing Valve Stations**	
Name	Capacity (gal)	Zone	Number
6"	103,920	1	1
8"	103,028	2	1
10"	9,539	3	1
12"	62,660	4	1
16"	10,339	5	1
20"	1,699	6	1
		7	7
		8	3
Total	291,185	Total	16

In 2006 Aqua Engineering prepared an Impact Fee Study for Salem City, the purpose of the study was to create a fair and reasonable plan to generate needed income for future growth. As a result of this impact study, the City adopted an impact fee of $2,275.

The purpose of revisiting the culinary water impact fees is to determine if the City is generating sufficient funds to pay for past improvement projects related to growth; and to save for future improvement needs that will be required as growth continues, as well as to identify the portions of the impact fee that needs to be set aside to reimburse developers as projects are completed by the developers.

As part of this analysis, the existing system will be analyzed to determine the future needs throughout the next 20 years based on a highly probable projected growth rate. Also, the analysis will look at the

current and expected budgets to determine if the $2,275 is properly paying off the necessary debt service (as well as providing funds for anticipated future capital improvement projects).

2.2 Existing System Analysis

Salem City's culinary water system will be evaluated to determine the future needs of the system. The cost of these future needs is expected to be borne by future growth. In determining the deficiencies of the system in relation to the expected population at the end of the planning period, Equivalent Residential Connections (hereto referred to by ERCs) will be used.

One ERC is equivalent to one average household water connection. The amount of water that is used by one ERC is equal to the water that the average household connection uses. In order to equate commercial users to ERCs, a usage must be determined. This will be the amount of water the average household uses in one month.

2.2.1 Water Source

Salem City maintains and operates two culinary wells, and two springs in providing the city's culinary water needs. This includes the Storage Tank Well, the Maple Canyon Well, and the Water Canyon Upper and Lower Springs.

The Storage Tank well is located near the city's main water Storage Tanks near 900 South and Woodland Hills Drive. The well is at approximately 4860 feet elevation, and has a pumping capacity of 2,700 gpm.

The Maple Canyon Well is located in Maple Canyon near Woodland Hills, and is jointly owned and operated with the City of Woodland Hills. The well is approximately 5,780 feet in elevation with a pumping capacity of 1,750 gpm; of which Salem own 60% or a flow of 1,050 gpm.

The two springs are located in water Canyon above the Water Canyon Springs water tank. The springs are at an approximate elevation of 5,420 feet. The upper spring has a capacity of between 50 gpm and 100 gpm and the lower spring has a capacity of between 200 and 1000 gpm. The lowest capacity of these springs will be used to establish the City's water source Capacity. Taking this into account the total water source capacity of the City is 4,000 gpm.

Water Source Capacity = 2,700 gpm +1,050 gpm +50 gpm + 200 gpm = 4,000 gpm.

2.2.2 Water Storage

The City Currently has five reinforced concrete water storage tanks ranging in size from 300,000 gallons to 750,000 gallons.

The Two main storage tanks are located at approximately 900 South and Woodland Hills drive at a ground elevation of 4860 feet. The capacities of these to tanks are 500,000 and 300,000 gallons respectively. These tanks discharge into the water system through a 20" distribution line. The Water Canyon Springs Storage tank has a capacity of 500,000 gallons which is supplied by the Upper and Lower Water Canyon Springs. This tank feeds the system through an 8" transmission line which also flows into the aforementioned main storage tanks. This Tank has a ground surface elevation of 5,160 feet. The Maple Canyon tank is fed by the aforementioned jointly owned Maple Canyon Well, and is also jointly owned by Salem City and the City of Woodland Hills. It is located at a ground surface elevation of 5,780 feet. The tank feeds the system via a 12" distribution line with an additional 12" transmission line, which feeds the Cemetery Storage Tank, which is the final tank. The Cemetery

Tank is located south of the city cemetery above the Highline Canal. It has a Capacity of 750,000 gallons and an approximate ground surface elevation of 4,860 feet. It feeds the system via a 16" distribution line.

2.2.3 Distribution System

The culinary distribution system is constantly expanding due to growth. The size of distribution line ranges from 6" in the older center part of town to 20" pipe coming from the Main Storage tanks. There is currently in excess of 291,000 feet of distribution line. The breakdown in pipe is shown in table 2.1.1, with the majority of the pipe being 12" and smaller.

2.2.4 Water Rights

The current production sources for Salem City include two culinary wells, and two springs. This includes the Storage Tank Well, the Maple Canyon Well, and the Water Canyon Upper and Lower Springs. As was previously mentioned the combined source capacity of these is 4,000 gpm. Salem City currently owns water rights totaling 4,892.10 Acre-Feet, as shown in table 2.2.4.1; Table 2.2.4.2 shows the current points of diversion for the various water rights. The total water right will vary as new rights are acquired. This value is based on the Water Rights Summary completed by Sunrise Engineering in 2006. There are two elements to water rights, 1 – the rate of diversion allowed (flow in cfs or gpm), and 2 – quantity of diversion allowed (volume in Acre-Feet per year). As the rate of diversion is not defined for all of the water rights in table 2.2.4.1 it will be assumed that the rate of diversion is sufficient to supply the source capacity as discussed in the Water Source Analysis section of this document.

In accordance with Section R309-510 of the Utah State Administrative Codes for Public Drinking Water Systems the indoor water right requirement is 146,000 gallons per year per ERC or about 0.45 Acre-Feet per year per ERC. "The outer water right requirement for the Salem City area is 2.37 Acre-Feet per year per irrigated acre, including a 70 percent efficiency for sprinkler irrigation" (Aqua 2006). The majority of outdoor watering is now accomplished by a newly completed pressurized irrigation system, with separate water rights and will not be addressed in this document.

Table 2.2.4.1—Salem City Existing Water Rights (per 2006 Salem Water Rights Summary Report as Prepare by Sunrise Engineering –2006)						
		Flow				
Water Right	**Priority**	**CFS**	**a-f**	**Source**	**Status**	**POD**
51-1035	9/9/35			Well	Cert	A,B
a20381		.55	197.88	Wells	Approved	
*51-1336	7/20/55	2.0	1299.6	Well	Cert	A
a19192	8/10/95			Well	Approved	A,B
a5631				Well	Cert	A
51-1340	9/28/55	.094	11.7	Well	Cert/ Needs Change	C
*51-1439	7/22/59	.1	42	Well	Cert	D
*51-2374	3/23/36	.111	12	Well	Cert	A
a14393				Well	Cert	A
51-2721	1922	1.25	904.97	Surface	Cert	E,F
*51-2878	6/17/69	1.0	428	Well	Cert	A
a14392				Well	Cert	A
*51-6189	7/10/24	2.5	1810	Surface Wells	Non-Use Approved	A
a15710						A
*51-6661	7/10/24	0.5		Wells	Cert	A
a15710a				Wells	Cert	A
51-7092	4/16/58		9.75	Wells		A,B
a25241				Wells	Approved	A,B
51-7093	4/16/58		3.25	Wells	Cert	G,H
51-7094	4/16/58		3.25	Wells	Cert	G,H
51-7095	4/16/58		3.25	Wells	Cert	G,H
51-7096	4/16/58		3.45	Wells	Cert	G,H
51-7160	1877			Surface		A,B
a21662	11/6/97		140	Wells	Approved	A,B
51-7337				Wells	Cert	A,B
a23777			13.0	Wells	Approved	A,B
51-7520	1902		10.0	Surface	Cert/Rejected POD	I,J,K,L
	Totals	**8.105**	**4892.1**			

*These Water Rights are combined under a19192 into POD's "A and B".

Table 2.2.4.2 – Current POD Table	
A	(1) S 101 ft E 1266 ft from NW cor, Sec 18, T 9S, R 3E, SLBM
B	(2) S 4659 ft E 5161 ft from NW cor, Sec 19, T 9S, R 3E, SLBM
C	(1) S 765 ft W 84 ft from E4 cor, Sec 02, T 9S, R 2E, SLBM
D	(1) N 41 ft W 924 ft from S4 cor, Sec 12, T 9S, R 2E, SLBM
E	(1) S 1267 ft E 1002 ft from NW cor, Sec 17, T 9S, R 3E, SLBM
F	(2) S 1978 ft E 3496 ft from NW cor, Sec 17, T 9S, R 3E, SLBM
G	(1) S 1395 ft W 74 ft from NE cor, Sec 23, T 9S, R 1E, SLBM
H	(2) S 1395 ft W 1032 ft from NE cor, Sec 23, T 9S, R 1E, SLBM
I	(1) S 105 ft E 1422 ft from NW cor, Sec 14, T 8S, R 1E, SLBM
J	(2) S 1160 ft E 585 ft from NW cor, Sec 14, T 8S, R 1E, SLBM
K	(3) N 2140 ft E 580 ft from W4 cor, Sec 14, T 8S, R 1E, SLBM
L	(4) N 1512 ft E 1418 ft from W4 cor, Sec 14, T 8S, R 1E, SLBM

2.3 Water System Requirements and Recommendations

2.3.1 Water Rights Requirements and Recommendations

2.3.1.1 Required Water Rights

The Annual Indoor water Right Requirement is calculated by multiplying the number of ERC's by the 0.45 Acre-Ft per ERC requirement stated in the previous section.

$$\text{ERC} \times 0.45 \text{ AF/ERC} = \text{Indoor Required (AF)}$$

The annual Outdoor Water Right Requirement is calculated by multiplying the number of ERC's by 2.37 Acre-ft per year per irrigated acre, and then multiplying it by an assumed irrigated acreage per ERC of 0.25 Irrigated Acres per ERC. As most of the outdoor requirement is now supplied by the pressurized irrigation system, it will be assumed that only 200 ERC will continue to use culinary water for outdoor use, and this will be assumed to be constant for the future as well.

$$\text{ERC} \times 2.37 \text{ AF/ERC/Irr. Acre} \times 0.25 \text{ Irr. Acre/ ERC} = \text{Outdoor Required (AF)}$$

The Required water right for current and future use is therefore:

Existing Water Right Requirements

Indoor Use:						
	2256 ERC	x	.45 Ac Ft. / ERC		=	**1015.2 Ac Ft**
Outdoor Use:						
	200 ERC	x	2.37 ac-ft / yr. – irr. acre	x ¼ irr. Acre / ERC	=	**118.5 Ac Ft**
Total:					**=**	**1,133.7 Ac Ft**

Existing Water Right ***EXCESS***
= **3,758.4 Ac Ft**

Future Water Right Requirements (10 year plan)

Indoor Use:						
	3,017 ERC	x	.45 Ac Ft / ERC		=	**1,357.65 Ac Ft**
Outdoor Use:						
	200 ERC	x	2.67 Ac ft / yr. – irr. Acre	x ¼ irr. Acre / ERC	=	**118.5 Ac Ft**
Total:					**=**	**1,476.15 Ac Ft**

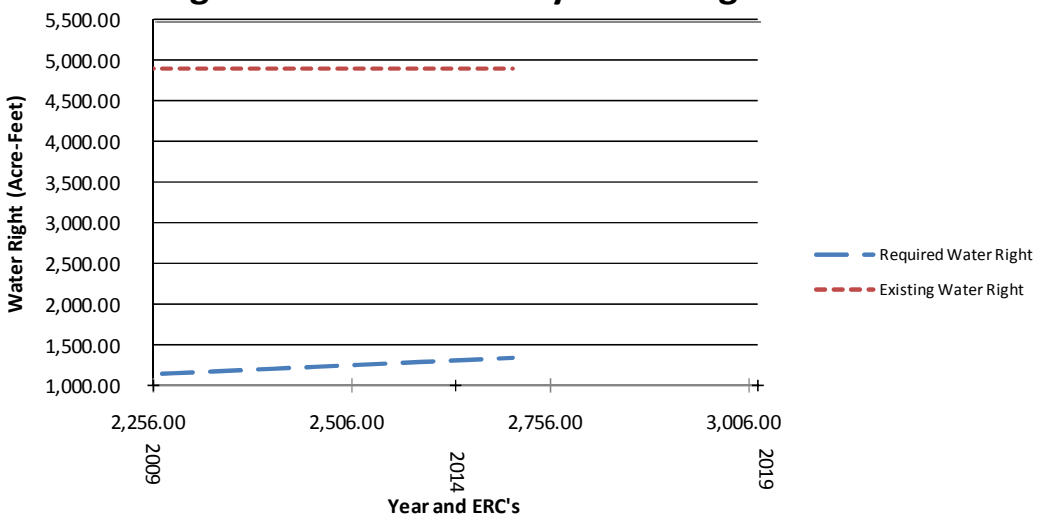
Future Water Right ***EXCESS*** = **3,415.95 Ac Ft**

2.3.1.2 Recommended Water Rights

Section 2.2.4 demonstrated that Salem City currently owns a water right of 4,982.10 Acre-Feet. The current water right requirement is 1,133.7 Acre-Feet. In 2019 Salem City will require 1,476.15 Acre-Feet of water. Base on this the City, has sufficient water right to meet the culinary needs now and throughout the planning period. Based on current ordinance new development is required to bring in adequate water rights for the development before it is approved. It is recommended that the city continues to require this in order to maintain water right for the reasonable future. According to Utah coded title 73 chapter 1 section 4 "The reasonable future water requirement of the public is the amount of water needed in the next 40 years by the persons within the public water supplier's projected service area based on projected population growth or other water use demand." It is important the City protects it water rights in order to retain their existing water rights. It is recommended that if it has not yet been done that the City creates a 40 year plan for it water rights, in order to protect those water rights not yet in use, and to determine at what point they should begin taking money in lieu of water rights. As "under current Utah water right law any surplus above reasonable future need can be taken by the State and allocated elsewhere." (Aqua 2006)

A graph of Water Right vs. Connections is provided in Figure 2.3.1.2.

Figure 2.3.1.2 -- Culinary Water Right



2.3.2 Water Source Requirements and Recommendations

Utah State Administrative Codes of Public Drink Water Systems R309-510-7 requires that the minimum indoor use per connection per day used for source sizing be 800 gallons. The outdoor water source requirement is 4.0 gpm/irrigated acre. As most of the outdoor requirement is now supplied by the pressurized irrigation system, it will be assumed that only 200 ERC will continue to use culinary water for outdoor use, and this will be assumed to be constant for the future as well.

2.3.2.1 Required Source Capacity

The required source capacity is determined by multiplying the number of ERC's by 800 gal per day per ERC

Existing Required Source Capacity

Indoor Use:

2256 ERC x $\frac{800 \text{ gal}}{\text{Day-ERC}}$ x $\frac{1 \text{ day}}{1440 \text{ min}}$ = **1,253.33 gpm**

Outdoor Use:

200 ERC x $\frac{4.0 \text{ gpm}}{\text{irr. acre}}$ x $\frac{¼ \text{ irr. Acre}}{\text{ERC}}$ = **200 gpm**

Total = 1,453.33 gpm

Existing Water Source Capacity ***EXCESS*** = **2,546.67 gpm**

Future Required Source Capacity

Indoor Use:

3,017 ERC x $\frac{800 \text{ gal}}{\text{Day-ERC}}$ x $\frac{1 \text{ day}}{1440 \text{ min}}$ = **1,676.11 gpm**

Outdoor Use:

200 ERC x $\frac{4.0 \text{ gpm}}{\text{irr. acre}}$ x $\frac{¼ \text{ irr. Acre}}{\text{ERC}}$ = **200 gpm**

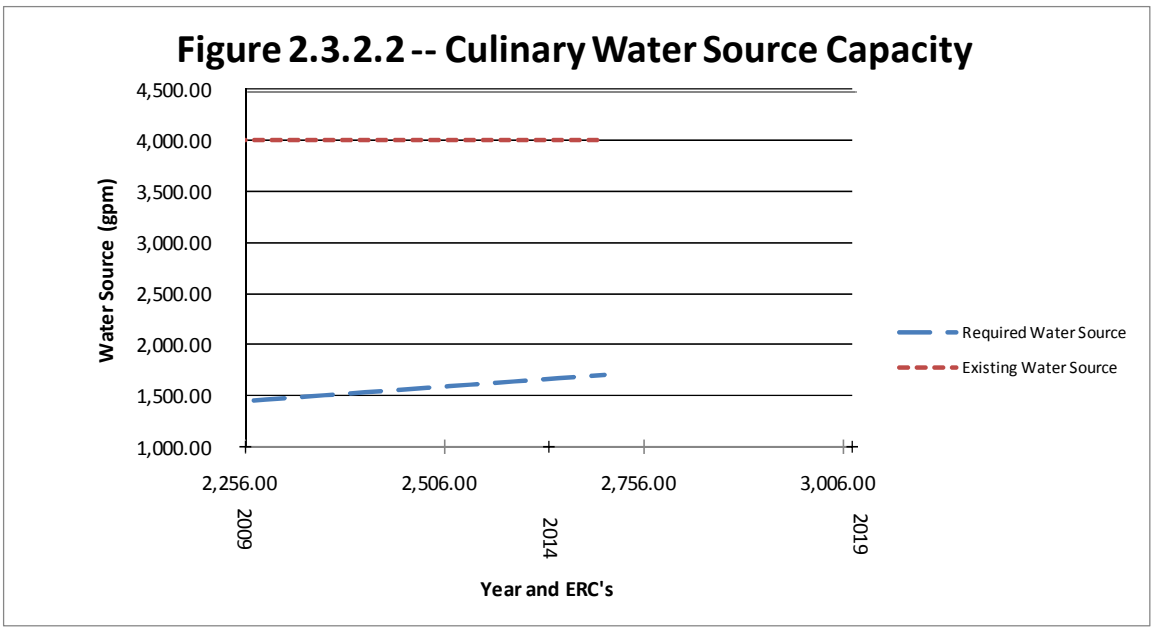
Total = 1,876.11 gpm

Future Water Source Capacity ***EXCESS*** = **2,123.89 gpm**

2.3.2.2 Recommended Source Capacity

As previously state the total water source capacity for Salem City is 4,000 gpm. This leaves a current excess of 2,556.67 gpm and an excess of 2,123.89 gpm at the end of the 10 year planning period. Therefore the source capacity is adequate for the planning period.

A graph of Water Source vs. Connections is provided in Figure 2.3.2.2 below.



2.3.3 Water Storage Requirements and Recommendations

Communities in Utah are required to provide adequate water storage capacity to satisfy both indoor and outdoor average day water demands. Additionally, fire suppression storage must be provided in accordance with R309-510 of the Utah Administrative Codes for Public Drinking Water Systems. The indoor use requirement is 400 gallons per ERC per day. The outdoor requirement is 2,848 gallons per irrigated acre per day. Additionally Salem City requires 1,500 gpm for 2 hours. Only 200 ERC's will be considered for outdoor use as most of the outdoor water is provided by the irrigation system.

2.3.3.1 Required Storage Capacity

The required storage capacity is determined by multiplying the number of ERC's by 400 gal per day per ERC and adding to it the outdoor and fire protection requirements.

Existing Required Water Storage Capacity

Indoor Use:

2256 ERC x $\frac{400 \text{ gal}}{\text{ERC}}$ = **902,400 gal**

Outdoor Use:

200 ERC x $\frac{2848 \text{ gal}}{\text{irr. acre}}$ x $\frac{¼ \text{ irr. acre}}{\text{ERC}}$ = **142,400 gal**

Fire Protection

1500 gpm x 120 minutes = **180,000 gal**

Total = 1,224,800 gal

Existing Water Storage Capacity ***EXCESS*** = **1,275,200 gal**

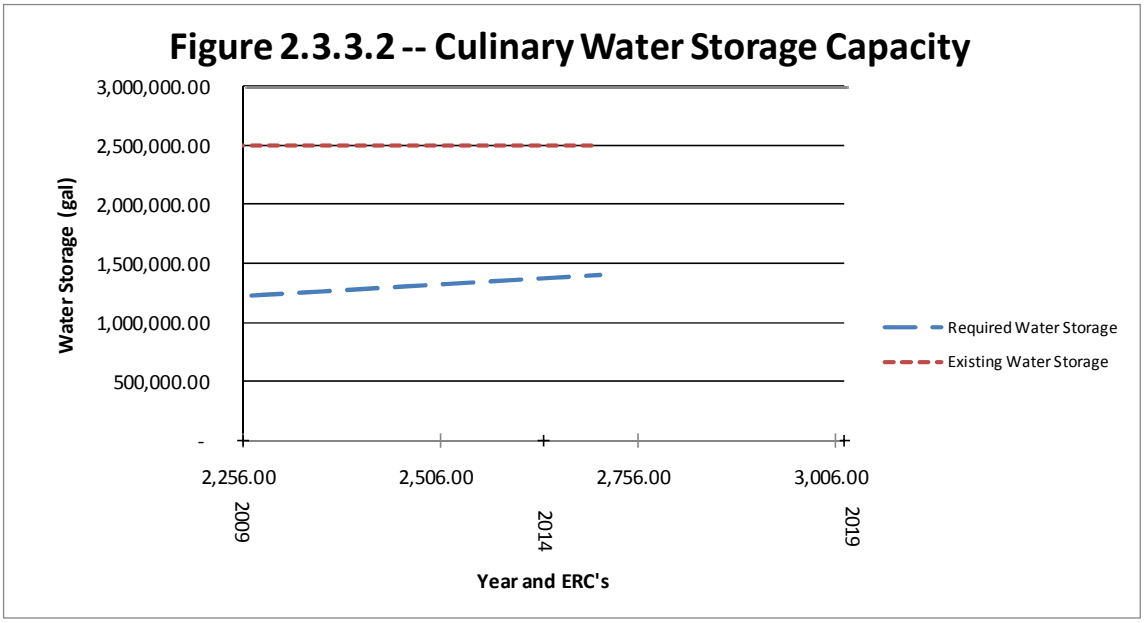
Future Required Water Storage Capacity

Indoor Use:						
3017 ERC	x	400 gal / ERC			=	**1,206,800 gal**
Outdoor Use						
200 ERC	x	2848 gal / irr. acre	x	¼ irr. acre / ERC	=	**142,400 gal**
Fire Protection						
1500 gpm	x	120 minutes			=	**180,000 gal**
				Total	**=**	**1,529,200 gal**
Future Water Storage Capacity ***EXCESS***					=	**970,000 gal**

2.3.3.2 Recommended Storage Capacity

As previously state the total water storage capacity for Salem City is 2,500,000 gallons. This leaves a current excess of 1,275,200 gal and an excess of 970,000 gal at the end of the 10 year planning period. Therefore the storage capacity is adequate for the planning period.

A graph of Water Source vs. Connections is provided in Figure 2.3.3.2 below.



2.3.4 Water Distribution Requirements and Recommendations

2.3.4.1 Water Distribution Requirements

The State of Utah Public Drinking Water Regulations Section R309-105-9 States:

(1) Unless otherwise specifically approved by the Executive Secretary, no water supplier shall allow any connection to the water system where the dynamic water pressure at the point of connection will fall below 20 psi during the normal operation of the water system. Water systems approved prior to January 1, 2007, are required to maintain the above minimum dynamic water pressure at all locations within their distribution system. Existing public drinking water systems, approved prior to January 1, 2007, which expand their service into new areas or supply new subdivisions shall meet the minimum dynamic water pressure requirements in R309-105-9(2) at any point of connection in the new service areas or new subdivisions.

(2) Unless otherwise specifically approved by the Executive Secretary, new public drinking water systems constructed after January 1, 2007 shall be designed and shall meet the following minimum water pressures at points of connection:

(a) 20 psi during conditions of fire flow and fire demand experienced during peak day demand;

(b) 30 psi during peak instantaneous demand; and

(c) 40 psi during peak day demand

Generally pressures should be maintained between 40 psi and 90 psi during normal system operation. As the community grows, water demands change within the system. Therefore, City currently has requirements that the new developments model their impact on the current system to evaluate what impacts that development will have on the system, and to insure that the requirements for pressure are met; the City Engineer then reviews these impacts. If a particular development requires major pipeline up-grades in order for the system to operate properly, then the City reserves the right to require the development to assist the City in the up-grades of the distribution system and/or pay the impact fees associated with the development if the improvements are associated with the current impact fees, in the event that the improvements fall outside of the current development plan, and only provide service to the particular development the City may require that the developer bare the cost of the improvements in addition to impact fees associated with the planned growth and development anticipated at the time of this report.

2.3.4.2 Water Distribution Recommendations

Based on anticipated future growth trends and in concordance with the current Salem City culinary water master planning there are 5 Major upgrades anticipated for the distribution system. The installation of these five projects is timed to handle new growth and to assist in providing required system capacity as stated in previous sections of this report. Table 2.3.4.2 contains a cost estimate summary for the planned improvements, construction timing and project locations for these system improvements. Figure 1 shows the project location for each of the improvements. A detailed breakdown of the cost estimates has been included in the appendix. Future costs have been projected based on a 3% per year inflation rate, and are shown in Table 2.3.4.2 along with the overall

percentage of improvement costs that each project represents. The total upgrade cost over the 10 year design period is $6,413,259.59.

Table 2.3.4.2 -- Culinary Water System Projects

Project Description	Year	Current Year Cost	Construction Year Cost	Cost During IF Period
*Woodland Hills Dr. Transmission Line	2009	$ 525,574.94	$ 525,574.94	$ 525,574.94
*Salem Park Distribution Cost Difference	2009	$ 19,862.19	$ 19,862.19	$ 19,862.19
1 - Elk Ridge Dr. Pipeline Project	2018	$ 1,403,000.00	$ 1,830,596.78	$ -
2 - Upper Zone 11200 S Pipeline Project	2018	$ 725,000.00	$ 945,960.56	$ -
3 - 8800 South Pipeline Project	2021	$ 78,000.00	$ 111,209.35	$ -
4 - Industrial Park Pipeline Project	2015	$ 1,063,000.00	$ 1,269,277.59	$ 1,269,277.59
5 - Main Street Pipeline Extension Project	2019	$ 761,000.00	$ 1,022,720.36	$ -
6 - Salem Park Connector Project	2019	$ 239,000.00	$ 321,196.01	$ -
7 - Arrowhead Trail Pipeline Project	2019	$ 385,000.00	$ 517,407.81	$ -
Total		$ 4,575,437.13	$ 6,046,397.78	$ 1,814,714.72

*This is the actual cost of the project that was completed in 2009.

It is also recommended that the City continue to require a model of each new development that enters on to the system to see how it will affect the entire system. Also, the City should continue to require the new developments to, at a minimum, install waterlines large enough to continue to provide itself and the rest of town with the equal level of service that it now receives.

2.3.5 Water Treatment

2.3.5.1 Water Treatment Requirements

At the time of any future water sources coming on line, the City shall also treat the water to meet the state specifications for culinary water. Determining a need for future treatment will be solely based upon the future water sources and for calculation purposes will not be broken out separately. The costs associated with treatment should be evaluated in the cost estimates for acquiring new water sources. However, no additional water treatment needs are anticipated in the 10 year planning period.

2.3.5.1 Water Treatment Recommendations

It is recommended that the City continue to treat existing water sources now being treated. Also, require all future water sources to be equipped with facilities to properly treat that source.

2.4 Impact Fee Cash Flows

2.4.1 Existing Bond/Debt Payments

A loan and Bond Payment Summary is shown in Table 2.4.1.1 for Salem City, these bonds are for projects for which a portion of the project is for future growth. The City also owes Impact Fee Reimbursement for previously completed culinary water improvements to the Nebo School District, and the City General Water Fund. The Nebo School District is owed $127,257 and the City General Water Fund is owed $320,150.

Table 2.4.1.1 -- Salem City Existing Bond/Debt Payments							
	1991 USBWR Annual Loan		1996 General Obligation Bond		1996 USBWR Annual Loan		
Fiscal Year	Annual Liabilit	10% Impact Fee	Annual Liability	10% Impact Fee	Annual Liabilit	10% Impact Fee	Total Expenses
2009	$ 31,520.00	$ 3,152.00	$ 317,087.50	$ 185,718.15	$ 15,000.00	$ 2,250.00	$ 191,120.15
2010	$ 31,440.00	$ 3,144.00	$ 315,962.50	$ 185,059.24	$ 15,000.00	$ 2,250.00	$ 190,453.24
2011	$ 30,320.00	$ 3,032.00	$ 319,087.50	$ 186,889.55	$ 15,000.00	$ 2,250.00	$ 192,171.55
2012	$ 31,200.00	$ 3,120.00	$ 316,287.50	$ 185,249.59	$ 15,000.00	$ 2,250.00	$ 190,619.59
2013	$ -	$ -	$ 317,675.00	$ 186,062.25	$ 15,000.00	$ 2,250.00	$ 188,312.25
2014	$ -	$ -	$ 318,050.00	$ 186,281.89	$ 15,000.00	$ 2,250.00	$ 188,531.89
2015	$ -	$ -	$ 313,075.00	$ 183,368.03	$ 15,000.00	$ 2,250.00	$ 185,618.03
2016	$ -	$ -	$ 317,200.00	$ 185,784.04	$ 15,000.00	$ 2,250.00	$ 188,034.04
2017	$ -	$ -	$ -	$ -	$ 15,000.00	$ 2,250.00	$ 2,250.00
2018	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2019	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Totals	$ 124,480.00	$ 12,448.00	$2,534,425.00	$ 1,484,412.72	$ 135,000.00	$ 20,250.00	$ 1,517,110.72

Table 2.4.1.2 shows the Impact fee account balance and anticipated cash flow for the ten-year study period. The table includes the capital project costs, placed at the suggested project year, the bond/debt payments, professional expenses, and anticipated impact fee revenues; along with a totalized expense column for the given year. Table 2.5.1.3 shows the anticipated ending impact fee fund balance, along with associated revenues, expenses, and excess and shortfalls.

Table 2.4.1.2 -- Salem City Impact Fee Cash flows & Calculations					
Fiscal Year	Growth Rate	Total ERCs	Annual ERC's	Culinary Water Impact	Annual Impact Fee
2009	0.70%	2,024.00	16.00	$ 2,275.96	$ 36,415.36
2010	0.70%	2,038.00	14.00	$ 1,771.21	$ 24,797.00
2011	0.70%	2,052.00	14.00	$ 1,771.21	$ 24,797.00
2012	1.91%	2,066.00	14.00	$ 1,771.21	$ 24,797.00
2013	3.78%	2,106.00	40.00	$ 1,771.21	$ 70,848.58
2014	4.37%	2,186.00	80.00	$ 1,771.21	$ 141,697.17
2015	4.37%	2,281.00	95.00	$ 1,771.21	$ 168,265.39
2016	4.37%	2,381.00	100.00	$ 1,771.21	$ 177,121.46
2017	4.37%	2,485.00	104.00	$ 1,771.21	$ 184,206.32
2018	4.37%	2,593.00	108.00	$ 1,771.21	$ 191,291.18
2019	4.37%	2,707.00	114.00	$ 1,771.21	$ 201,918.46
Totals			699.00		$ 1,246,154.93
Fiscal Year	Growth Rate	Capital Project Costs	Bond/Debt Payments	Professional Expenses	Total Expenses
2009	0.70%	$ 545,437.13	$ 191,120.15	$ 10,000.00	$ 746,557.27
2010	0.70%	$ 2,776,557.34	$ 190,453.24	$ -	$ 2,967,010.57
2011	0.70%	$ -	$ 192,171.55	$ -	$ 192,171.55
2012	1.91%	$ -	$ 190,619.59	$ -	$ 190,619.59
2013	3.78%	$ 111,209.35	$ 188,312.25	$ -	$ 299,521.60
2014	4.37%	$ -	$ 188,531.89	$ 10,000.00	$ 198,531.89
2015	4.37%	$ -	$ 185,618.03	$ -	$ 185,618.03
2016	4.37%	$ 1,269,277.59	$ 188,034.04	$ -	$ 1,457,311.63
2017	4.37%	$ -	$ 2,250.00	$ -	$ 2,250.00
2018	4.37%	$ -	$ -	$ -	$ -
2019	4.37%	$ 1,022,720.36	$ -	$ 10,000.00	$ 1,032,720.36
Totals		$ 5,725,201.77	$ 1,517,110.72	$ 30,000.00	$ 7,272,312.49

Table 2.4.1.3 -- Salem City Impact Fee Summary				
Fiscal Year	Annual Impact Fee Revenues	Total Expenses	Excess/ Shortfalls	Annual Ending
2009	$ 36,415.36	$ 746,557.27	$ (710,141.91)	$ (244,818.45)
2010	$ 24,797.00	$ 2,967,010.57	$ (2,942,213.57)	$ (3,187,032.02)
2011	$ 24,797.00	$ 192,171.55	$ (167,374.54)	$ (3,354,406.57)
2012	$ 24,797.00	$ 190,619.59	$ (165,822.58)	$ (3,520,229.15)
2013	$ 70,848.58	$ 299,521.60	$ (228,673.01)	$ (3,748,902.16)
2014	$ 141,697.17	$ 198,531.89	$ (56,834.72)	$ (3,805,736.88)
2015	$ 168,265.39	$ 185,618.03	$ (17,352.64)	$ (3,823,089.52)
2016	$ 177,121.46	$ 1,457,311.63	$ (1,280,190.17)	$ (5,103,279.69)
2017	$ 184,206.32	$ 2,250.00	$ 181,956.32	$ (4,921,323.38)
2018	$ 191,291.18	$ -	$ 191,291.18	$ (4,730,032.20)
2019	$ 201,918.46	$ 1,032,720.36	$ (830,801.90)	$ (5,560,834.10)
Totals	$ 1,246,154.93	$ 7,272,312.49	$ (6,026,157.56)	

2.5 Impact Fee Summary

Since the impact fee study prepared in 2006, a city wide pressurized irrigation system has been installed. This system has relieved storage and water right needs of the Salem City Culinary Water System. This change has eliminated the need for additional storage within the 10 year planning period. The distribution system needs, however, are virtually the same as growth is anticipated to be scattered in areas which are not yet served with water. Therefore, most of the previously recommended distribution system improvements have been carried through to this study, however a project completed in 2009 deviated somewhat from what was master planned, causing some of the projects to be modified. This study also included the cost of the improvements completed in 2009 as the infrastructure has been installed for growth, and not to improve the level of service for existing customers.

Although, the study period is for ten (10) years, and the impact fee period is for six (6) years, the improvements recommended in the study are anticipated to serve Salem City for 20 years or more. Therefore, for the purpose of calculating the impact fee the Related ERC's Served by each of the projects is based on 20 years growth, or the difference in the current ERC's and the anticipated number of ERCs at 20 years (see table 1.2). During the next 6 years, it is estimated that Salem City will grow at a rate of 4.7% after the abnormal conditions of the current economic environment have somewhat normalized. This growth cannot be sustained without a corresponding increase in the City's ability to obtain, store, and deliver additional culinary water. The improvement required to sustain this growth along with the cost estimated for these improvements are listed in the preceding sections of this study.

Table 2.5 accounts for the recommended improvements and current debt services; based on this data a $1,771.21 impact fee per ERC is justified, this is a reasonable culinary water system impact fee for a district of Salem City's size. The City council has the discretion to adjust the fee up to the maximum allowable impact fee. It is recommended that the City council review the existing culinary water impact fee and determine if the fee should be adjusted based on the information provided in this report. Impact fees should be reviewed every 3 to 5 years.

Table 2.5 -- Salem City Culinary Water Impact Fee Cost Per ERC						
Description	**Total Costs for projects in IF**	**% Attributable to**	**Costs Attributable to Growth**	**Related ERCs Served**	**Cost per New**	**Percent of Total**
Capital Project Fees						
Source Capital Project Costs	$ -	100%	$ -	2,127	$ -	0.0%
Storage Capital Project Costs	$ -	100%	$ -	2,127	$ -	0.0%
Distribution Capitol Projects						
*Woodland Hills Dr. Transmission Line	$ 525,574.94	100%	$ 525,574.94	2,127	$ 247.10	14.0%
*Salem Park Distribution Cost Difference	$ 19,862.19	100%	$ 19,862.19	2,127	$ 9.34	0.5%
1 - Elk Ridge Dr. Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
2 - Upper Zone 11200 S Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
3 - 8800 South Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
4 - Industrial Park Pipeline Project	$ 1,269,277.59	100%	$ 1,269,277.59	2,127	$ 596.75	33.7%
5 - Main Street Pipeline Extension Project	$ -	100%	$ -	2,127	$ -	0.0%
6 - Salem Park Connector Project	$ -	100%	$ -	2,127	$ -	0.0%
7 - Arrowhead Trail Pipeline Project	$ -	100%	$ -	2,127	$ -	0.0%
Total Distribution Capital Project Costs	$ 1,814,714.72	100%	$ 1,814,714.72	2,127	$ 853.18	48.2%
Total Capital Project Fee	$ 1,814,714.72		$ 3,629,429.43		$ 853.18	48.2%
Existing Bond / Debt Payments						
1991 USBWR Annual Loan	$ 124,480.00	10%	$ 12,448.00	2,127	$ 5.85	0.3%
1996 General Obligation Bond	$ 2,534,425.00	59%	$ 1,484,412.72	2,127	$ 697.89	39.4%
1996 USBWR Annual Loan	$ 135,000.00	15%	$ 20,250.00	2,127	$ 9.52	0.5%
Nebo School District Payment	$ 29,589.00	100%	$ 29,589.00	2,127	$ 13.91	0.8%
Salem City Water Fund Payment	$ 390,959.00	100%	$ 390,959.00	2,127	$ 183.81	10.4%
Total Debt/Bond Payments:	$ 3,214,453.00		$ 1,937,658.72		$ 910.98	51.4%
Miscellaneous Fees						
Professional Expenses	$ 15,000.00	100%	$ 15,000.00	2,127	$ 7.05	0.4%
Total Miscellaneous Fee	$ 15,000.00		$ 15,000.00		$ 7.05	0.4%

*This is the actual cost of the project that was completed in 2009.

Total Impact Fee Cost per New ERC: $ 1,771.21

The impact fee (IF) associated with each project or the cost per new ERC is calculated by dividing the cost attributed to growth by the related ERCs served.

(Costs Attributed to Growth) / (Related ERCs Served) = (Cost per New ERC)

For example the cost per new ERC associated with the Arrowhead Trail Transmission Line is $221.57 ($525,574.94 / 2,372 = $221.57)

It is recommended that the City continue to account for impact fees separately for the improvements that will be required to sustain the projected growth rate. This will allow the City to pay for these improvements with least amount of debt. As growth continues, the amount of ERCs vs. the cash on hand should be carefully monitored to ensure that the recommended improvements can be built. The projects should be completed on an as needed basis, which may change the time-frame or order of the recommended improvements. The impact fee should be reevaluated from time to time to insure that it continues to meet Salem City's needs. The recommended impact fee is the amount that is justified by the planned improvements; however, the City will have the final say in the actual Impact Fee amount, and the city may choose to set the impact fee lower than what is justified by this report as a lower impact fee encourages growth. However, a lower impact fee will cause a greater portion of the financial burden to be borne by the existing customers, as user rates may need to be increased, or projects postponed in order to insure that the overall water system budget is balanced.

3.0 Wastewater System

3.1 Introduction

Salem City has been developing its wastewater system since the 1960's. The system is separated into the treatment and collection subsystems. The treatment sub-system consists of mixed aeration lagoons which were completed in 1987. The collection sub-system consists of collection piping and interceptor piping along with manholes, this subsystem conveys the waste to the treatment facility.

The purpose of this report is to update the Impact Fee Analysis and Recommendations prepared in 2006 by Aqua Engineering. In addition, information will be taken from the Impact Fee Methodology Written Analysis for the Culinary and Wastewater Systems prepared by Sunrise Engineering, Inc. in 2001, and the Wastewater Collection & Treatment Capital Facilities Plan prepared by Sunrise Engineering, Inc. in 1997. As there have been proposed upgrades and recent changes to the system, this report will address those upgrades and the effect those upgrades and changes have on the current Impact Fee schedule, along with the time frame of necessary improvements to the system. The costs of improvements and the population projections will be updated as necessary, along with identifying any other improvements which have been recently made or need to be made in the near future. This report will also identify the percentage of the total project cost associated with each of the proposed upgrades, in order to identify the percent of the impact fees which should be allocated to that project.

The two changes that have the greatest effect on the system include the additional capacity due to Elk Ridge City selling its ownership in the treatment plant to Salem City, and a planned addition to the system North of Salem City and south of the Interstate interchange. Additionally, a major addition to the water and sewer systems was recently completed which incorporated most of the upgrades that were suggested in the Aqua Engineering report as phase 1. The actual cost of those improvements will be shown in appendix A.

3.1.1 Demographics and Population Projections

A demographics report along with future population projections for Salem City was prepared by Aqua Engineering in 2006. A copy of this report will be included in the appendix. Current building permit data suggests a slowing in growth in the immediate future, however it is anticipated that the growth rate will increase after a couple of years to an approximate growth rate of 4.37 percent. The anticipated growth rate is shown in table 1.2 above.

3.1.2 Average Daily Flows

The average daily flows from the treatment facility for 2004, 2005, 2006, 2007, 2008 and the recorded flow data to date in 2009 are shown in table 3.1.1. "Also of note the daily flows for January and February of 2004 are inaccurate due to metering problems at the treatment facility." (Aqua Engineering 2006)

Table 3.1.1 -- Salem City Average Daily Wastewater Flows						
	2004	2005	2006	2007	2008	2009
Month	Average Daily Flow (MGD)	Average Daily Flow (MGD)	Average Daily Flow (MGD)	Average Daily Flow (MGD)	Average Daily Flow (MGD)	Average Daily Flow (MGD)
January	*0.123	0.501	0.558	0.480	-	0.480
February	*0.281	0.434	0.544	0.693	0.441	0.521
March	0.536	0.430	0.546	0.696	0.450	0.503
April	0.558	0.370	0.519	0.613	0.415	0.510
May	0.488	0.452	0.469	0.600	0.466	0.517
June	0.519	0.493	0.533	0.617	0.476	0.527
July	0.433	0.606	0.560	0.630	0.516	0.515
August	0.430	0.596	0.563	0.570	0.529	0.544
September	0.374	0.544	0.609	0.481	0.527	-
October	0.401	0.531	0.561	0.473	0.454	-
November	0.475	0.502	-	0.422	0.434	-
December	0.550	0.481	0.465	0.511	0.400	-
Annual Average	0.476	0.495	0.539	0.566	0.464	0.515
* These values were excluded from average as they are inaccurate due to metering problems at treatment facility.						

3.2 Wastewater Treatment

According to the Impact fee Analysis and Recommendations completed by Aqua Engineering completed in 2006; the city's treatment lagoons have a hydraulic capacity of 1.5 MGD and a biological capacity of 2,127 lbs/BOD-Day; with a total retention volume of 145.5 Ac-Ft. The present hydraulic load is approximately 0.542 MGD based on the approximate max month flow rate in 2008 of approximately 90 gpd per person.

$$6{,}022 \text{ people X } 90 \text{ gpd/person} = 542{,}022 \text{ gpd}$$

$$(542{,}022 \text{ gpd})/ (1{,}000{,}000 \text{ gal/MGD}) = 0.542022 \text{ MGD} \sim 0.542 \text{ MGD}$$

Based on this, there is approximately 0.96 MGD excess capacity (1.5 MGD-0.542 MGD = 0.958 MGD). This will serve an approximate additional population of 10,644 people (based on 90 gpd/person). Therefore, the treatment capacity is sufficient for the next 6 years.

3.3 Collection System

The collection system consists of a network of collectors and interceptors. These pipes range in size from 8 inches to 21 inches in diameter. The original system consisted of masonry manholes and clay and concrete pipes. The collection system was originally designed to lower the groundwater elevation through "planned infiltration into the wastewater collection system." The existing collection system is sufficient for existing connections, and it is estimated that the main trunk lines have sufficient capacity for the next 20 years. However, several projects will have to be completed in order to provide service to areas which will develop in the near future. These areas have been identified in the existing master plan. One of these improvements has been recently completed, and the actual construction cost will be included in the impact fee calculation. An additional improvement has been identified, which will serve the area to the north west of the sewer lagoons along 8400 south.

3.4 Wastewater System Analysis and Recommendations

3.4.1 Wastewater Treatment

3.4.1.1 Treatment Facility Recommendations

As noted previously, since the 2006 report was completed Elk Ridge has diverted all of its sewer flow to the Payson Wastewater Treatment Facility. The Removal of the Elk Ridge City wastewater will extend the life of the Salem Facility to a projected Salem City population of about 16,700 which is estimated to occur in 2036.

"It should be noted that a wastewater regionalization study has been completed by the South Utah Valley Municipal water Association (SUVMWA). This study generally reviewed the costs, State and Federal regulations, and the potential timing of the need for a regionalized wastewater treatment plant for South Utah County. One area of note reported in the SUVMWA report is the Total Maximum Daily Load (TMDL) regulations for phosphorus. Currently there is no set limit for phosphorus removal. The introduction of a TMDL limit for phosphorus may change the timeline for future treatment facility upgrades. For the purpose of this report changes in TMDL limits are not considered." (Aqua Engineering 2006)

3.4.1.2 Upgrade/Regionalization

Salem City has three alternatives, as outlined in the SUVMWA Feasibility Study for treatment. The city can upgrade the lagoon system to a mechanical treatment plant, negotiate with Payson City to have its wastewater treated at Payson's treatment facility, or participate in the wastewater treatment regionalization project proposed in the SUVMWA study. The aforementioned study compared the cost of each of these alternatives, and for comparative purposes those costs are assumed to be accurate. That study estimated the cost to upgrade to a mechanical treatment plant would be $22,200,000. The cost to buy into the Payson plant and upgrade the interceptor line to Payson would cost $21,700,000. And the cost to participate in the regional treatment plant would be $20,100,000.

Salem City has participated in the purchase of land for the regional treatment plant, is therefore assumed that the City will continue to treat its own waste until that facility is completed, at which point it will begin to convey its wastewater to that facility for treatment. However, the treatment plant will not be built within the study period, so only the land purchase will be considered in the impact fee calculation, as it was recently purchased for the purpose of growth.

3.4.2 Wastewater Collection

3.4.2.1 Collection System Recommendations

It is recommended that the City continue to require all future growth outside of the existing collection system to complete the collection system improvements recommended in the master plan, as outlined in the 1997 Capitol Facilities plan. Continuing this practice will insure the integrity of the existing system, and protect the existing customer capacity.

It is also recommended that new development continue to be required to model its impact on the current system. The City should and does reserve the right to require any future development to upgrade and or upsize any existing piping that may impact the overall collection system. It is also recommended that the city commission an updated system wide Sewer System model, and then continue to model upgrades as they are added to the system, this will allow the city to see potential issues and correct them as additional development occurs.

3.4.3 Collection System Upgrades

As anticipated with future growth trends and in association with current Salem City sewer master planning there are five major upgrades, in addition to a recently completed project. The installation of these five projects should be timed for implementation to both adequately handle new growth and also to assist in providing required system capacity as stated in previous sections of this report. Refer to Table 3.3.3 below for a cost estimate summary, and suggested construction timing, and Figure 2 in appendix B for project locations for these system improvements. A more detailed current value cost estimate for each project has been included in the appendix. Future construction costs have been projected assuming an estimated 3 percent per year for inflation and are shown in the construct year cost column in Table 3.3.3. Fees required for the total construction cost estimate over the twenty-year design period total $7,745,646.70.

Table 3.4.3 -- Sewer System Projects

Project	Year	Current Year Cost	Construction Year Cost	Cost Applied to IF
*Arrowhead Trail & 460 West Lift Station Project	2009	$ 1,018,051.91	$ 1,018,051.91	$ 1,018,051.91
1-Elk Ridge Dr. & Lift Station Project	2017	$ 1,802,960.00	$ 2,283,935.79	$ -
2-400 North Replacement Project	2016	$ 606,030.00	$ 745,340.46	$ -
3-8800 South & Main Project	2018	$ 2,524,171.00	$ 3,293,470.63	$ -
4-SCADA System Project	2014	$ 55,000.00	$ 63,760.07	$ 63,760.07
5-Industrial Park Project	2015	$ 909,000.00	$ 1,085,393.54	$ 1,085,393.54
Total		$ 6,915,212.91	$ 8,489,952.40	$ 2,167,205.52

*This is the actual cost of the project that was completed in 2009.

3.5 Impact Fee Cash Flows

3.5.1 Impact Fee Percentage

The percent of system capacity that is attributed to new growth and development was calculated by taking the existing capacity and ERC's in relationship to the total system capacity and associated ERC's. Currently the plant is operating at roughly 0.542 MGD with 2,256 ERC's. The sewer collection and treatment system will be maximized at 1.5 MGD at an estimated ERC of 6,243. The current percentage of ERC's was calculated to be 34%, in turn leaving 66% of the system attributed to new growth and development.

3.5.2 Existing Dept

Currently Salem City has very little debt in association with the existing wastewater collection system. The existing obligations of the City are in regards to buyout with Elk Ridge City. This buyout totaled $250,000 and 3 of the 5 years worth of payments have been made with yearly installments of $50,000.

3.5.3 Cash Flows

Table 3.4.3.1 shows the impact fee revenues and anticipated cash flow projection for the ten-year design period. The table includes the cost of each of the capital projects for the wastewater system expended at the projected year of construction. The impact fee summary as shown in Table 3.4.3.2, gives the projected annual ending fund balance, along with associated revenues, expenses, surpluses and shortfalls.

Table 3.5.3.1 -- Salem City Impact Fee Cash flows & Calculations					
Fiscal Year	Growth Rate	Total ERCs	Annual ERC's Added	Waste Water Impact Fee	Annual Impact Fee Revenues
2009	0.70%	2,024.00	16.00	$ 1,733.54	$ 27,736.64
2010	0.70%	2,038.00	14.00	$ 1,593.11	$ 22,303.58
2011	0.70%	2,052.00	14.00	$ 1,593.11	$ 22,303.58
2012	1.91%	2,066.00	14.00	$ 1,593.11	$ 22,303.58
2013	3.78%	2,106.00	40.00	$ 1,593.11	$ 63,724.52
2014	4.37%	2,186.00	80.00	$ 1,593.11	$ 127,449.04
2015	4.37%	2,281.00	95.00	$ 1,593.11	$ 151,345.73
2016	4.37%	2,381.00	100.00	$ 1,593.11	$ 159,311.30
2017	4.37%	2,485.00	104.00	$ 1,593.11	$ 165,683.75
2018	4.37%	2,593.00	108.00	$ 1,593.11	$ 172,056.20
2019	4.37%	2,707.00	114.00	$ 1,593.11	$ 181,614.88
Totals			699.00		$ 1,115,832.81
Fiscal Year	Growth Rate	Capital Project Costs	Bond/Debt Payments	Professional Expenses	Total Expenses
2009	0.70%	$ 1,018,051.91	$ 135,312.50	$ 10,000.00	$ 1,163,364.41
2010	0.70%	$ -	$ 135,649.70	$ -	$ 135,649.70
2011	0.70%	$ -	$ 135,647.30	$ -	$ 135,647.30
2012	1.91%	$ -	$ 85,755.30	$ -	$ 85,755.30
2013	3.78%	$ -	$ 85,670.10	$ -	$ 85,670.10
2014	4.37%	$ 63,760.07	$ 85,695.30	$ 10,000.00	$ 159,455.37
2015	4.37%	$ 1,085,393.54	$ 85,677.30	$ -	$ 1,171,070.84
2016	4.37%	$ -	$ 85,616.10	$ -	$ 85,616.10
2017	4.37%	$ -	$ 85,661.70	$ -	$ 85,661.70
2018	4.37%	$ -	$ 85,660.50	$ -	$ 85,660.50
2019	4.37%	$ -	$ -	$ 10,000.00	$ 10,000.00
Totals		$ 2,167,205.52	$ 1,006,345.80	$ 30,000.00	$ 3,203,551.32

Table 3.5.3.2 -- Salem City Impact Fee Summary				
Fiscal Year	Annual Impact Fee Revenues	Total Expenses	Excess/ Shortfalls	Annual Ending Balance
2009	$ 27,736.64	$ 1,163,364.41	$ (1,135,627.77)	$ (1,760,961.77)
2010	$ 22,303.58	$ 135,649.70	$ (113,346.12)	$ (1,874,307.89)
2011	$ 22,303.58	$ 135,647.30	$ (113,343.72)	$ (1,987,651.61)
2012	$ 22,303.58	$ 85,755.30	$ (63,451.72)	$ (2,051,103.33)
2013	$ 63,724.52	$ 85,670.10	$ (21,945.58)	$ (2,073,048.91)
2014	$ 127,449.04	$ 159,455.37	$ (32,006.34)	$ (2,105,055.24)
2015	$ 151,345.73	$ 1,171,070.84	$ (1,019,725.10)	$ (3,124,780.35)
2016	$ 159,311.30	$ 85,616.10	$ 73,695.20	$ (3,051,085.15)
2017	$ 165,683.75	$ 85,661.70	$ 80,022.05	$ (2,971,063.10)
2018	$ 172,056.20	$ 85,660.50	$ 86,395.70	$ (2,884,667.39)
2019	$ 181,614.88	$ 10,000.00	$ 171,614.88	$ (2,713,052.51)
Totals	$ 1,115,832.81	$ 3,203,551.32	$ (2,087,718.51)	

3.6 Impact Fee Summary

As has been shown in this report, with the removal of Elk Ridge from Salem's collection and treatment facility, the current capacity of the City's wastewater treatment system is adequate, for current and future needs within the 10 year planning period. However, due to growth and development patterns, long term planning must begin in regards to future treatment needs and capacities. Salem City will be faced with the decision of making major facility upgrades in approximately 2036 or in taking steps to align with regionalization efforts such as SUVMWA or other future regionalization efforts.

The City's wastewater treatment system also appears to be adequate for current needs; however as development takes place the collection system will need to grow to accept flow from those areas which do not yet have service. Although the study period is for ten (10) years, and the impact fee period for six (6) years, the improvements recommended in the study are anticipated to serve Salem City in excess of 20 years, therefore for the purpose of calculating the impact fee the Related ERC's Served by each of the projects is based on 20 years growth, or the difference in the current ERC's and the anticipated number of ERCs at 20 years (see table 1.2).

Table 3.6 accounts for the recommended improvements and current debt services; based on this data a $1,593.11 impact fee is justified, and is a reasonable fee for a district of Salem City's Size. The City council has the discretion to adjust the fee up to the maximum allowable impact fee. It is recommended that the City council review the existing waste water impact fee and determine how the fee should be adjusted based on the information provided in this report. Impact fees should be reviewed every 3 to 5 years.

Table 3.6 -- Salem City Wastewater Impact Fee Cost Per ERC

Description	Total Costs During IF Period	% Attributable to Growth	Costs Attributable to Growth	Related ERCs Served	Cost per New ERC	Percent of Total IF
Capital Project Fees						
Sewer Treatment Project Costs	$ -	100%	$ -	2,127	$ -	0.0%
Sewer Collection Projects						
*Arrowhead Trail & 460 West Lift Station Project	$ 1,018,051.91	100%	$ 1,018,051.91	2,127	$ 478.63	30.0%
1-Elk Ridge Dr. & Lift Station Project	$ -	100%	$ -	2,127	$ -	0.0%
2-400 North Replacement Project	$ -	100%	$ -	2,127	$ -	0.0%
3-8800 South & Main Project	$ -	100%	$ -	2,127	$ -	0.0%
4-SCADA System Project	$ 63,760.07	100%	$ 63,760.07	2,127	$ 29.98	1.9%
5-Industrial Park Project	$ 1,085,393.54	100%	$ 1,085,393.54	2,127	$ 510.29	32.0%
Total Sewer Collection Project Costs	$ 8,489,952.40	100%	$ 2,167,205.52	2,127	$ 1,018.90	64.0%
Total Capital Project Fee	$ 8,489,952.40		$ 2,167,205.52		$ 1,018.90	127.9%
Existing Bond / Debt Payments						
Regionalized Land Acquisition	$ 856,345.80	100%	$ 856,345.80	2,127	$ 402.61	25.3%
Elk Ridge Buyout	$ 250,000.00	100%	$ 250,000.00	2,127	$ 117.54	7.4%
Total Debt/Bond Payments:	$ 250,000.00		$ 250,000.00		$ 520.14	32.6%
Miscellaneous Fees						
Sewer System Modeling Expenses	$ 100,000.00	100%	$ 100,000.00	2,127	$ 47.01	3.0%
Professional Expenses	$ 15,000.00	100%	$ 15,000.00	2,127	$ 7.05	0.4%
Total Miscellaneous Fee	$ 115,000.00		$ 115,000.00		$ 54.07	3.4%

*This is the actual cost of the project that was completed in 2009.

Total Impact Fee Cost per New ERC: $ 1,593.11

The impact fee (IF) associated with each project or the cost per new ERC is calculated by dividing the cost attributed to growth by the related ERCs served.

(Costs Attributed to Growth) / (Related ERCs Served) = (Cost per New ERC)

For example the cost per new ERC associated with the Arrowhead Trail Lift Station Project is $429.20 (1,018,051.91 / 2,372 = $429.20)

It is recommended that the City continue to account for impact fees separately for the improvements that will be required to sustain the projected growth rate. This will allow the City to pay for these improvements with least amount of debt. As growth continues, the amount of ERCs vs. the cash on hand should be carefully monitored to ensure that the recommended improvements can be built. The projects should be completed on an as needed basis, which may change the time-frame or order of the recommended improvements. The impact fee should be reevaluated from time to time to insure that it continues to meet Salem City's needs. The recommended impact fee is the amount that is justified by the planned improvements; however, the City will have the final say in the actual Impact Fee amount, and the city may choose to set the impact fee lower than what is justified by this report as a lower impact fee encourages growth. However, a lower impact fee will cause a greater portion of the financial burden to be borne by the existing customers, as user rates may need to be increased, or projects postponed in order to insure that the overall wastewater system budget is balanced.

REFERENCES

Sunrise Engineering, Inc. – 2006
Salem Water Right Summary Report

Aqua Engineering, Inc. – 2006
Salem City Corporation Impact Fee Analysis and Recommendations – Water System

Aqua Engineering, Inc. – 2006
Salem City Corporation Impact Fee Analysis and Recommendations – Wastewater

Aqua Engineering, Inc. – 2006
Salem City Corporation Impact Fee Analysis and Recommendations – Demographics

Sunrise Engineering, Inc. – 2001
Impact Fee Methodology and Written Analysis for the Culinary Water and Wastewater Systems

Sunrise Engineering, Inc. – 1997
Wastewater Collection & Treatment Capital Facilities Plan User Rate, Hook-Up, and Impact Fee Methodology and Written Analysis

APPENDIX A – COST ESTIMATES

SALEM CITY WATER SYSTEM IMPACT FEE

APPENDIX A

Actual COST FOR WATER SYSTEM IMPROVEMENTS COMPLETED IN 2009
NEW 12" TRANSMISSION LINES

	ITEM	QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM IMPROVEMENTS COSTS					
1	12" C900 PVC Pipe	10200	LN.FT.	$ 26.67	$ 272,034.00
2	12" Tees	3	Each	$ 1,053.00	$ 3,159.00
3	12" Cross	2	Each	$ 2,012.00	$ 4,024.00
4	12" Valve	13	Each	$ 1,398.00	$ 18,174.00
5	12 X 6 Tees	1	Each	$ 2,186.00	$ 2,186.00
6	12" Bends	2	Each	$ 451.00	$ 902.00
7	12" Plug	7	Each	$ 240.00	$ 1,680.00
8	Fire Hydrant Assembly (fire hydrant & 12X6 Tee)	6	Each	$ 3,378.00	$ 20,268.00
9	12" Pressure Regulation Station	1	Each	$ 39,591.00	$ 39,591.00
10	Air Vac Valve	1	Each	$ 2,233.00	$ 2,233.00
11	Roadbase and Asphalt for Driveway	1	L.S.	$ 5,530.00	$ 5,530.00
12	Concrete Driveway Crossing	2	Each	$ 900.00	$ 1,800.00
13	Flatwork Labor and Concrete Materials (Drive Approach)	1	L.S.	$ 2,028.75	$ 2,028.75
14	UDOT Highway Crossing for 12" Transmission Line	1	L.S.	$ 66,082.00	$ 66,082.00
15	1 NON UDOT Road Crossings	1	L.S.	$ 4,406.00	$ 4,406.00
16	3" PRV Upgrade	1	L.S.	$ 2,158.00	$ 2,158.00
17	Pump and Equipment Rental	1	L.S.	$ 3,954.97	$ 3,954.97
18	Extend Water West of Phase 1	1	L.S.	$ 2,600.00	$ 2,600.00
	Total Construction Costs:			**$**	**452,810.72**
NON-CONSTRUCTION SERVICES					
a.	Testing	1	LS.	$ 1,789.22	$ 1,789.22
b.	Engineering Waterline Design	1	LS.	$ 11,700.00	$ 11,700.00
c.	7% Management Fee	1	LS.	$ 32,641.00	$ 32,641.00
d.	City Fee	1	LS.	$ 21,634.00	$ 21,634.00
e.	Impact Fee Study	1	LS.	$ 5,000.00	$ 5,000.00
	Total Non-Construction Costs:			**$**	**72,764.22**
	Total Project Costs:			**$**	**525,574.94**

APPENDIX A

Actual COST FOR WATER SYSTEM IMPROVEMENTS COMPLETED IN 2009
NEW 12" TRANSMISSION LINES

	ITEM	QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM IMPROVEMENTS COSTS					
1	12" C900 PVC Pipe	2206.91	LN.FT.	$ 9.00	$ 19,862.19

APPENDIX A

PROJECT 1
ELK RIDGE DR. PIPELINE PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 52,000.00	$ 52,000.00
2	12" C900 PVC Pipe	15180	LN.FT.	$ 29.00	$ 440,220.00
3	8" C900 PVC Pipe	1540	LN.FT.	$ 22.00	$ 33,880.00
4	Connection to Existing 16" Pipe	1	L.S.	$ 4,650.00	$ 4,650.00
5	Connection to Existing 12" Pipe	1	L.S.	$ 3,600.00	$ 3,600.00
6	Connection to Existing 10" Pipe	1	Each	$ 2,750.00	$ 2,750.00
7	Connection to Existing 8" Pipe	6	Each	$ 2,150.00	$ 12,900.00
8	Connection to Existing 6" Pipe	2	Each	$ 1,800.00	$ 3,600.00
9	10" Pressure Regulation Station	2	Each	$ 40,000.00	$ 80,000.00
10	Fire Hydrant Assembly	42	Each	$ 4,000.00	$ 168,000.00
11	Asphalt Repair and Replacement	83600	S.F.	$ 3.00	$ 250,800.00
12	UDOT Highway Crossing for 12" Transmission Line	120	LN.FT.	$ 320.00	$ 38,400.00
				Construction Costs Sub-Total:	**$ 1,090,800.00**
				Contingency:	$ 104,200.00
				Total Construction Costs:	**$ 1,195,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 10,000.00	$ 10,000.00
b.	Engineering Detail Design	1	LS.	$ 79,000.00	$ 79,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 100,000.00	$ 100,000.00
					$ 189,000.00
				Contingency:	$ 19,000.00
				Total Non-Construction Costs:	**$ 208,000.00**
				Total Project Costs:	**$ 1,403,000.00**

APPENDIX A

PROJECT 2
UPPER ZONE 11200 SOUTH PIPLINE PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 26,000.00	$ 26,000.00
2	12" C900 PVC Pipe	9700	LN.FT.	$ 29.00	$ 281,300.00
3	Connection to Existing 12" Pipe	1	L.S.	$ 3,600.00	$ 3,600.00
4	Fire Hydrant Assembly	25	Each	$ 4,000.00	$ 100,000.00
5	Asphalt Repair and Replacement	27000	S.F.	$ 3.00	$ 81,000.00
6	Bureau of Reclamation Canal Bore 12" Transmission Line	200	LN.FT.	$ 320.00	$ 64,000.00
				Construction Costs Sub-Total:	**$ 555,900.00**
				Contingency:	$ 53,100.00
				Total Construction Costs:	**$ 609,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 5,000.00	$ 5,000.00
b.	Engineering Detail Design	1	LS.	$ 40,000.00	$ 40,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 60,000.00	$ 60,000.00
			Subtotal Non-Construction Cost		$ 105,000.00
				Contingency:	$ 11,000.00
				Total Non-Construction Costs:	**$ 116,000.00**
				Total Project Costs:	**$ 725,000.00**

APPENDIX A

PROJECT 3
8800 SOUTH PIPELINE PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 2,500.00	$ 2,500.00
2	8" C900 PVC Pipe	1000	LN.FT.	$ 22.00	$ 22,000.00
3	Connection to Existing 8" Pipe	1	Each	$ 2,150.00	$ 2,150.00
4	Connection to Existing 6" Pipe	1	Each	$ 1,800.00	$ 1,800.00
5	Fire Hydrant Assembly	2	Each	$ 4,000.00	$ 8,000.00
6	Asphalt Repair and Replacement	5000	S.F.	$ 3.00	$ 15,000.00
				Construction Costs Sub-Total:	**$ 51,450.00**
				Contingency:	$ 4,550.00
				Total Construction Costs:	**$ 56,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 2,500.00	$ 2,500.00
b.	Engineering Detail Design	1	LS.	$ 7,000.00	$ 7,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 10,000.00	$ 10,000.00
			Subtotal Non-Construction Cost		$ 19,500.00
				Contingency:	$ 2,500.00
				Total Non-Construction Costs:	**$ 22,000.00**
				Total Project Costs:	**$ 78,000.00**

APPENDIX A

PROJECT 4
INDUSTRIAL PARK PIPELINE PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 39,000.00	$ 39,000.00
2	12" C900 PVC Pipe	11000	LN.FT.	$ 34.00	$ 374,000.00
3	Connection to Existing 12" Pipe	3	L.S.	$ 3,600.00	$ 10,800.00
4	Fire Hydrant Assembly	43	Each	$ 4,000.00	$ 172,000.00
5	Asphalt Repair and Replacement	55000	S.F.	$ 4.00	$ 220,000.00
				Construction Costs Sub-Total:	**$ 815,800.00**
				Contingency:	$ 78,200.00
				Total Construction Costs:	**$ 894,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 5,000.00	$ 5,000.00
b.	Engineering Detail Design	1	LS.	$ 59,000.00	$ 59,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 90,000.00	$ 90,000.00
			Subtotal Non-Construction Cost		$ 154,000.00
				Contingency:	$ 15,000.00
				Total Non-Construction Costs:	**$ 169,000.00**
				Total Project Costs:	**$ 1,063,000.00**

APPENDIX A

PROJECT 5
MAIN STREET PIPELINE EXTENSION PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 27,000.00	$ 27,000.00
2	8" C900 PVC Pipe	5500	LN.FT.	$ 28.00	$ 154,000.00
3	Connection to Existing 12" Pipe	1	Each	$ 3,600.00	$ 3,600.00
4	Connection to Existing 8" Pipe	2	Each	$ 2,150.00	$ 4,300.00
5	Fire Hydrant Assembly	32	Each	$ 4,000.00	$ 128,000.00
6	Asphalt Repair and Replacement	64000	S.F.	$ 4.00	$ 256,000.00
				Construction Costs Sub-Total:	**$ 572,900.00**
				Contingency:	$ 55,100.00
				Total Construction Costs:	**$ 628,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 5,000.00	$ 5,000.00
b.	Engineering Detail Design	1	LS.	$ 41,000.00	$ 41,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 75,000.00	$ 75,000.00
			Subtotal Non-Construction Cost		$ 121,000.00
				Contingency:	$ 12,000.00
				Total Non-Construction Costs:	**$ 133,000.00**
				Total Project Costs:	**$ 761,000.00**

APPENDIX A

PROJECT 6
SALEM PARK CONNECTOR PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 6,000.00	$ 6,000.00
2	12" C900 PVC Pipe	1800	LN.FT.	$ 34.00	$ 61,200.00
3	Connection to Existing 12" Pipe	1	Each	$ 2,150.00	$ 2,150.00
4	Fire Hydrant Assembly	6	Each	$ 4,000.00	$ 24,000.00
5	Asphalt Repair and Replacement	9000	S.F.	$ 4.00	$ 36,000.00
				Construction Costs Sub-Total:	**$ 129,350.00**
				Contingency:	$ 11,650.00
				Total Construction Costs:	**$ 141,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 5,000.00	$ 5,000.00
b.	Engineering Detail Design	1	LS.	$ 9,000.00	$ 9,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 75,000.00	$ 75,000.00
			Subtotal Non-Construction Cost		$ 89,000.00
				Contingency:	$ 9,000.00
				Total Non-Construction Costs:	**$ 98,000.00**
				Total Project Costs:	**$ 239,000.00**

APPENDIX A

PROJECT 7
ARROWHEAD TRAIL PIPELINE PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 11,000.00	$ 11,000.00
2	12" C900 PVC Pipe	3500	LN.FT.	$ 34.00	$ 119,000.00
3	Connection to Existing 12" Pipe	3	L.S.	$ 3,600.00	$ 10,800.00
4	Fire Hydrant Assembly	7	Each	$ 4,000.00	$ 28,000.00
5	Asphalt Repair and Replacement	17500	S.F.	$ 4.00	$ 70,000.00
				Construction Costs Sub-Total:	**$ 238,800.00**
				Contingency:	$ 23,200.00
				Total Construction Costs:	**$ 262,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 5,000.00	$ 5,000.00
b.	Engineering Detail Design	1	LS.	$ 17,000.00	$ 17,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 90,000.00	$ 90,000.00
			Subtotal Non-Construction Cost		$ 112,000.00
				Contingency:	$ 11,000.00
				Total Non-Construction Costs:	**$ 123,000.00**
				Total Project Costs:	**$ 385,000.00**

APPENDIX A

Project Completed in 2009
AIROWHEAD TRAIL & 460 WEST LIFT STATION PROJECT
ACTUAL COST FOR WASTE WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Traffic Control	1	L.S.	$ 7,500.00	$ 7,500.00
2	10" C-900 Sewer Pipe & Fittings forcemain	2340	Ln. Ft.	$ 31.61	$ 73,967.40
3	15" PVC Sewer Pipe & Fittings	3000	Ln. Ft.	$ 71.00	$ 213,000.00
4	Gravel Bedding	2265	Ton	$ 15.00	$ 33,975.00
5	Asphalt Cut	2400	L.F.	$ 1.50	$ 3,600.00
6	Asphalt Paving 3"	7120	L.F.	$ 1.59	$ 11,320.80
7	Asphalt Paving 2"	5390	L.F.	$ 1.09	$ 5,875.10
8	Chip Seal Arrow Head Trail	52800	SQ.FT.	$ 0.30	$ 15,840.00
9	Trench Import	10	Ton	$ 8,000.00	$ 80,000.00
10	Extra Trench Import	2075.61	Ton	$ 10.00	$ 20,756.10
11	Load and Haul Spoils away from pressure sewer site	1	L.S.	$ 10,560.00	$ 10,560.00
12	48" Diameter Pre-Cast Concrete Manhole	7	Each	$ 2,700.00	$ 18,900.00
13	60" Diameter Pre-Cast Concrete Manhole	2	Each	$ 3,800.00	$ 7,600.00
14	Core Cut Existing MH at point of connection	1	Each	$ 850.00	$ 850.00
15	DI 45 degree Bends for Sewer Alignment	2	Each	$ 425.00	$ 850.00
16	Asphalt Patch At Connection	1	Each	$ 1,850.00	$ 1,850.00
17	Asphalt Patch.(arrowhead trail rd Salem Utah 3" asphalt only)	1	L.S.	$ 7,125.00	$ 7,125.00
18	Pump Station Wet Well Excavation	1	L.S.	$ 21,000.00	$ 21,000.00
19	JLR Pump Station	1	L.S.	$ 346,836.73	$ 346,836.73
			Total Construction Costs:	**$**	**881,406.13**
NON-CONSTRUCTION SERVICES					
a.	Professional Services	1	LS.	$ 26,157.34	$ 26,157.34
b.	7% Management Fee	1	LS.	$ 63,529.44	$ 63,529.44
c.	City Fee	1	LS.	$ 41,959.00	$ 41,959.00
d.	Impact Fee Study	1	LS.	$ 5,000.00	$ 5,000.00
			Subtotal Non-Construction Cost		$ 136,645.78
				Total Project Cost	**$ 1,018,051.91**

APPENDIX A

PROJECT 1
ELK RIDGE DR. & LIFT STATION PROJECT
OPINION OF PROBABLE COST FOR RECOMMENDED WASTEWATER COLLECTION SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 70,000.00	$ 70,000.00
2	12" PVC Sewer Pipe & Fittings	3720	Ln. Ft.	$ 34.00	$ 126,480.00
3	10" PVC Sewer Pipe & Fittings	1840	Ln. Ft.	$ 30.00	$ 55,200.00
4	8" PVC Sewer Pipe & Fittings	2525	Ln. Ft.	$ 24.00	$ 60,600.00
5	Sewage Lift Station	1	Each	$ 500,000.00	$ 500,000.00
6	Electrical Service	1	L.S.	$ 70,000.00	$ 70,000.00
7	48" Diameter Pre-Cast Concrete Manhole	14	Each	$ 2,700.00	$ 37,800.00
8	Asphalt Repair and Replacement	166800	SF	$ 3.00	$ 500,400.00
9	UDOT Highway Crossing for 12" Interceptor Line	120	Ln. Ft.	$ 400.00	$ 48,000.00
				Construction Costs Sub-Total:	**$ 1,468,480.00**
				Contingency:	$ 149,480.00
				Total Construction Costs:	**$ 1,617,960.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 10,000.00	$ 10,000.00
b.	Engineering Detail Design	1	LS.	$ 110,000.00	$ 110,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 65,000.00	$ 65,000.00
				Subtotal Non-Construction Cost	$ 185,000.00
				Total Project Cost	**$ 1,802,960.00**

APPENDIX A

PROJECT 2
400 NORTH REPLACEMENT PROJECT
OPINION OF PROBABLE COST FOR RECOMMENDED WASTEWATER COLLECTION SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 23,000.00	$ 23,000.00
2	12" PVC Sewer Pipe & Fittings	3530	Ln. Ft.	$ 34.00	$ 120,020.00
3	Connection to Existing Trunk Line	1	L.S.	$ 3,600.00	$ 3,600.00
4	48" Diameter Pre-Cast Concrete Manhole	9	Each	$ 2,700.00	$ 24,300.00
5	Asphalt Repair and Replacement	105900	SF	$ 3.00	$ 317,700.00
				Construction Costs Sub-Total:	**$ 488,620.00**
				Contingency:	$ 52,410.00
				Total Construction Costs:	**$ 541,030.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 5,000.00	$ 5,000.00
b.	Engineering Detail Design	1	LS.	$ 40,000.00	$ 40,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 20,000.00	$ 20,000.00
				Subtotal Non-Construction Cost	$ 65,000.00
				Total Project Cost	**$ 606,030.00**

APPENDIX A

PROJECT 3
8800 SOUTH & MAIN ST. PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WASTEWATER COLLECTION SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 100,000.00	$ 100,000.00
2	24" PVC Sewer Pipe & Fittings	5290	Ln. Ft.	$ 55.00	$ 290,950.00
3	21" PVC Sewer Pipe & Fittings	1800	Ln. Ft.	$ 45.00	$ 81,000.00
4	18" PVC Sewer Pipe & Fittings	3533	Ln. Ft.	$ 42.00	$ 148,386.00
5	10" PVC Sewer Pipe & Fittings	2780	Ln. Ft.	$ 30.00	$ 83,400.00
6	60" Diameter Pre-Cast Concrete Manhole	18	Each	$ 3,800.00	$ 68,400.00
7	48" Diameter Pre-Cast Concrete Manhole	16	Each	$ 2,700.00	$ 43,200.00
8	Asphalt Repair and Replacement	402090	SF	$ 3.00	$ 1,206,270.00
9	UDOT Highway Crossing for 12" Interceptor Line	120	Ln. Ft.	$ 400.00	$ 48,000.00
				Construction Costs Sub-Total:	**$ 2,069,606.00**
				Contingency:	$ 209,565.00
				Total Construction Costs:	**$ 2,279,171.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 20,000.00	$ 20,000.00
b.	Engineering Detail Design	1	LS.	$ 150,000.00	$ 150,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 75,000.00	$ 75,000.00
				Subtotal Non-Construction Cost	$ 245,000.00
				Total Project Cost	**$ 2,524,171.00**

APPENDIX A

PROJECT 4
SCADA SYSTEM PROJECT

OPINION OF PROBABLE COST FOR RECOMMENDED WASTEWATER COLLECTION SYSTEM IMPROVEMENTS

ITEM		QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
2	Treatment Plant SCADA System Upgrade	1	L.S.	$ 50,000.00	$ 50,000.00
				Sub-Total:	**$ 50,000.00**
				Contingency:	$ 5,000.00
				Total Costs:	**$ 55,000.00**

APPENDIX A

PROJECT 5
INDUSTRIAL PARK PROJECT
OPINION OF PROBABLE COST FOR RECOMMENDED WASTE WATER SYSTEM IMPROVEMENTS

	ITEM	QTY.	UNITS	UNIT COST	AMOUNT
WASTEWATER COLLECTION SYSTEM PROPOSED IMPROVEMENTS COSTS					
1	Mobilization	1	L.S.	$ 35,000.00	$ 35,000.00
2	Traffic Control	1	L.S.	$ 7,500.00	$ 7,500.00
3	12" PVC Sewer Pipe & Fittings	5000	Ln. Ft.	$ 34.00	$ 170,000.00
4	8" PVC Sewer Pipe & Fittings	5400	Ln. Ft.	$ 24.00	$ 129,600.00
5	Gravel Bedding	2265	Ton	$ 15.00	$ 33,975.00
6	Asphalt Pavement Sawing	7000	L.F.	$ 2.50	$ 17,500.00
7	Asphalt Repair and Replacement	100000	S.F.	$ 3.00	$ 300,000.00
8	48" Diameter Pre-Cast Concrete Manhole	14	Each	$ 2,700.00	$ 37,800.00
9	Core Cut Existing MH at point of connection	1	Each	$ 850.00	$ 850.00
10	Asphalt Patch At Connection	1	Each	$ 1,850.00	$ 1,850.00
				Construction Costs Sub-Total:	**$ 734,075.00**
				Contingency:	$ 69,925.00
				Total Construction Costs:	**$ 804,000.00**
NON-CONSTRUCTION SERVICES					
a.	Administration, Legal, and Fiscal	1	LS.	$ 5,000.00	$ 5,000.00
b.	Engineering Detail Design	1	LS.	$ 70,000.00	$ 70,000.00
c.	Construction Engineering and Inspection	Job Duration	HOURLY	$ 30,000.00	$ 30,000.00
				Subtotal Non-Construction Cost	$ 105,000.00
				Total Project Cost	**$ 909,000.00**

APPENDIX B – FIGURES

SALEM CITY
CULINARY WATER PLAN

Project 6
Salem Park Connector (2019)

Salem Park Distribution
Completed 2009

Woodland Hills Drive
Transmission Line
Completed 2009

Project 4
Industrial Park (2015)

Project 7
Arrowhead Trail (2019)

Project 5
Main Street Extension (2019)

Project 3
8800 South (2021)

Project 1
Elk Ridge Dr. (2018)

Project 2
Upper Zone 11200 S. (2018)

N
W E
S

0 1,650 3,300

HORIZ. 1" = 3000'

Legend

Future Water Lines

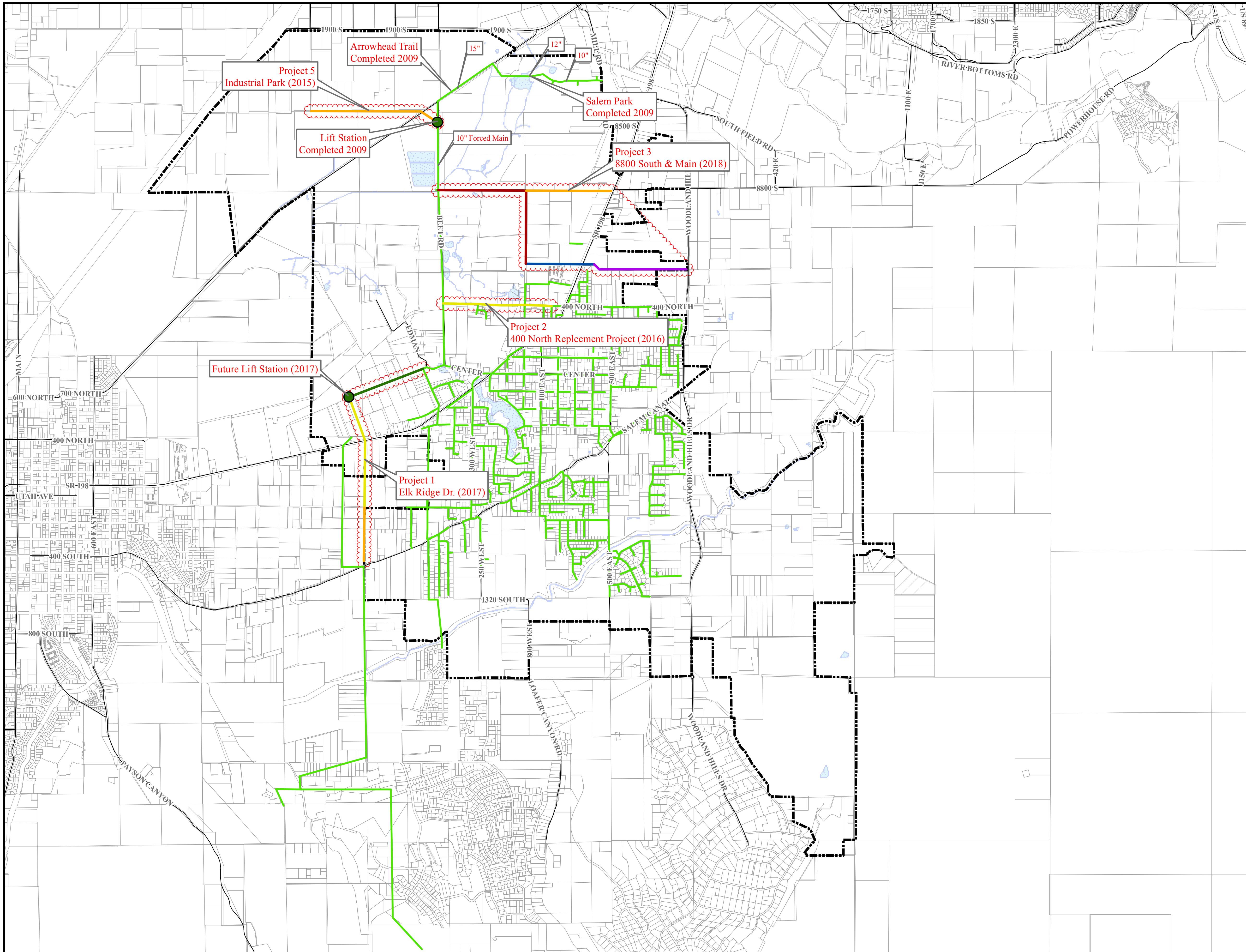
- 8"
- 12"

Existing Water Lines

- 2
- 4"
- 6"
- 8"
- 10"
- 12"
- 16"
- 20"
- Parcels
- Major Roads
- City Boundary
- Water Tank

SALEM CITY
IMPACT FEE STUDY
CULINARY WATER SYSTEM
FIGURE 1

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
03029	00000	00000	00000	00000	00


Project 5
Industrial Park (2015)
Arrowhead Trail
Completed 2009
15"
12"
10"
Salem Park
Completed 2009
Lift Station
Completed 2009
10" Forced Main
Project 3
8800 South & Main (2018)
Project 2
400 North Replcement Project (2016)
Future Lift Station (2017)
Project 1
Elk Ridge Dr. (2017)
1900 S
8500 S
8800 S
400 NORTH
CENTER
600 NORTH
700 NORTH
400 NORTH
SR-198
UTAH AVE
400 SOUTH
800 SOUTH
600 EAST
1320 SOUTH
800 WEST
300 WEST
250 WEST
100 EAST
500 EAST
BEET RD
EDMAN
SALEM CANAL
WOODLAND HILLS DR
LOAFER CANYON RD
PAYSON CANYON
SOUTH FIELD RD
RIVER BOTTOMS RD
POWERHOUSE RD
1750 S
1850 S
1700 E
2300 E
1100 E
1150 E
420 E
MAIN

SALEM CITY WASTEWATER PLAN

N
W E
S

0 1,500 3,000

HORIZ. 1" = 3000'

Legend

- Lift Station
- Future Sewerlines
- 8" Forced Main
- 10"
- 12"
- 18"
- 21"
- 24"
- Existing Sewerlines
- City Boundary
- Major Roads
- Parcels

SALEM CITY

IMPACT FEE STUDY

WASTEWATER COLLECTION SYSTEM

FIGURE 2

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
03029				

APPENDIX C – DEMOGRAPHICS

Demographics Impact Fee Analysis & Recommendation Study

Salem City Corporation

Impact Fee Analysis and Recommendations

Demographics

June 2006

AQUA ENGINEERING, INC.

Table of Contents

Demographics

1. Introduction

Salem City is a rural community located near the foothills of the Wasatch Mountains in south Utah County. It is approximately 60 miles south of Salt Lake City and 15 miles south of Provo. The community was established as a pioneer settlement in the mid 1800's and was first incorporated as a town in 1886. Salem City changed to its current Mayor and Council form of government in 1920. City government currently consists of a Mayor, and a five-member City Council. The administrative staff includes a Recorder, Treasurer, City Engineer, Public Works Director and support staff.

Administration of City utilities is under the direction of the City Engineer and the Public Works Director. Utility service is currently provided to approximately 5,347 residents through 1,570 service connections as of June 2006, which serves as the beginning date for this report.

As with other communities in this area, Salem City is experiencing pressure to expand, grow and develop. Within the City boundaries, the residences range from single family homes with average lots sizes near ¼ acre to small agricultural farms. There has been light commercial development within the City to support the needs of the community. Surrounding the current developed area are large tracts of developable land where the majority of the proposed growth will occur.

2. Population

Due to the accelerated growth experienced by Salem City and other communities in Utah County, this study reviewed and coordinated population growth projections and information from several Salem City impact fee and master planning documents, the U.S. Bureau of Census, the Mountainland Association of Governments (MAG), the Governors Office of Planning and Budget and Salem City Records.

After reviewing the available data Table 1 was generated utilizing the data from the Salem City Building permit records, two different projections by the Mountainland Association of Governments (a variable rate and a uniform rate) and the South Utah Valley Municipal Water Association (SUVMWA) Wastewater Regionalization Feasibility Study. This table and data was presented to the Salem City Development Review Committee and the committee selected the MAG variable growth rate, as the most probable projection of Salem City's growth.

Figure 1 was generated to graphically show all four growth rates for comparison, and the resultant estimated population of Salem City between the years 2006 and 2056. Using the MAG variable growth rate a population of approximately 18,955 is expected under the 20-year development window (YR 2026)

Typically, future municipal infrastructure needs are projected for a period of 20 years, although water resource planning efforts can extend as much as 50 years. Thus, the population projection is extended to the year 2056.

Salem City Population & Growth Percentages Comparisons

	Building Permits		Mountainland Assoc. Gov.				SUVMWA	
Year	Population	Growth Rate	Population	Variable Growth Rate	Population	Uniform Growth Rate	Population	Growth Rate
2000	4,372	5.07%	4,372	**4.11%**	4,372	**4.29%**	4,372	5.33%
2001	4,594	4.42%	4,552	4.11%	4,560	4.29%	4,605	4.42%
2002	4,797	3.08%	4,739	4.11%	4,755	4.29%	4,809	3.08%
2003	4,944	3.29%	4,934	4.11%	4,959	4.29%	4,957	3.29%
2004	5,107	4.27%	5,136	4.11%	5,172	4.29%	5,120	4.27%
2005	**5,325**	**4.79%**	**5,347**	**4.11%**	**5,394**	**4.29%**	**5,338**	**5.33%**
2006	5,579	3.90%	5,567	7.64%	5,625	4.29%	5,622	5.33%
2007	5,797	**4.37%**	5,993	7.64%	5,866	4.29%	5,922	5.33%
2008	6,050	4.37%	6,450	7.64%	6,118	4.29%	6,238	5.33%
2009	6,315	4.37%	6,943	7.64%	6,381	4.29%	6,570	5.33%
2010	**6,591**	**4.37%**	**7,474**	**7.64%**	**6,654**	**4.29%**	**6,921**	**5.11%**
2011	6,879	4.37%	8,045	6.47%	6,940	4.29%	7,274	5.11%
2012	7,179	4.37%	8,565	6.47%	7,238	4.29%	7,646	5.11%
2013	7,493	4.37%	9,119	6.47%	7,548	4.29%	8,037	5.11%
2014	7,821	4.37%	9,709	6.47%	7,872	4.29%	8,447	5.11%
2015	8,162	4.37%	10,337	6.47%	8,210	4.29%	8,879	5.11%
2016	8,519	4.37%	11,006	6.47%	8,562	4.29%	9,333	5.11%
2017	8,891	4.37%	11,718	6.47%	8,929	4.29%	9,809	5.11%
2018	9,280	4.37%	12,477	6.47%	9,312	4.29%	10,311	5.11%
2019	9,685	4.37%	13,284	6.47%	9,712	4.29%	10,838	5.11%
2020	**10,109**	**4.37%**	**14,143**	**6.47%**	**10,128**	**4.29%**	**11,391**	**3.47%**
2021	10,550	4.37%	15,058	4.71%	10,563	4.29%	11,787	3.47%
2022	11,011	4.37%	15,768	4.71%	11,016	4.29%	12,196	3.47%
2023	11,493	4.37%	16,510	4.71%	11,488	4.29%	12,619	3.47%
2024	11,995	4.37%	17,288	4.71%	11,981	4.29%	13,057	3.47%
2025	12,519	4.37%	18,102	4.71%	12,495	4.29%	13,510	3.47%
2026	13,066	4.37%	18,955	4.71%	13,031	4.29%	13,979	3.47%
2027	13,637	4.37%	19,847	4.71%	13,590	4.29%	14,464	3.47%
2028	14,233	4.37%	20,782	4.71%	14,173	4.29%	14,966	3.47%
2029	14,855	4.37%	21,761	4.71%	14,781	4.29%	15,485	3.47%
2030	**15,504**	**4.37%**	**22,786**	**4.71%**	**15,416**	**4.29%**	**16,022**	**3.59%**
2031	16,182	4.37%	23,859	3.54%	16,077	4.29%	16,597	3.59%
2032	16,889	4.37%	24,704	3.54%	16,767	4.29%	17,193	3.59%
2033	17,627	4.37%	25,578	3.54%	17,486	4.29%	17,810	3.59%
2034	18,397	4.37%	26,484	3.54%	18,236	4.29%	18,450	3.59%
2035	19,201	4.37%	27,421	3.54%	19,018	4.29%	19,112	3.59%
2036	20,040	4.37%	28,392	3.54%	19,834	4.29%	19,798	3.59%
2037	20,916	4.37%	29,397	3.54%	20,685	4.29%	20,509	3.59%
2038	21,830	4.37%	30,438	3.54%	21,573	4.29%	21,245	3.59%
2039	22,784	4.37%	31,515	3.54%	22,498	4.29%	22,008	3.59%
2040	**23,780**	**4.37%**	**32,631**	**3.54%**	**23,463**	**4.29%**	**22,798**	**2.64%**
2041	24,819	4.37%	33,786	2.22%	24,470	4.29%	23,400	2.64%
2042	25,903	4.37%	34,536	2.22%	25,520	4.29%	24,018	2.64%
2043	27,035	4.37%	35,303	2.22%	26,614	4.29%	24,652	2.64%
2044	28,217	4.37%	36,087	2.22%	27,756	4.29%	25,303	2.64%
2045	29,450	4.37%	36,888	2.22%	28,947	4.29%	25,971	2.64%
2046	30,737	4.37%	37,707	2.22%	30,189	4.29%	26,656	2.64%
2047	32,080	4.37%	38,544	2.22%	31,484	4.29%	27,360	2.64%
2048	33,482	4.37%	39,399	2.22%	32,834	4.29%	28,082	2.64%
2049	34,945	4.37%	40,274	2.22%	34,243	4.29%	28,824	2.64%
2050	**36,472**	**4.37%**	**41,168**	**2.22%**	**35,712**	**4.29%**	**29,585**	**2.64%**
2051	38,066	4.37%	42,082	2.22%	37,244	4.29%	30,366	2.64%
2052	39,730	4.37%	43,016	2.22%	38,842	4.29%	31,167	2.64%
2053	41,466	4.37%	43,971	2.22%	40,508	4.29%	31,990	2.64%
2054	43,278	4.37%	44,947	2.22%	42,246	4.29%	32,835	2.64%
2055	45,169	4.37%	45,945	2.22%	44,058	4.29%	33,702	2.64%
2056	**47,143**	**4.37%**	**46,965**	**2.22%**	**45,948**	**4.29%**	**34,591**	**2.64%**

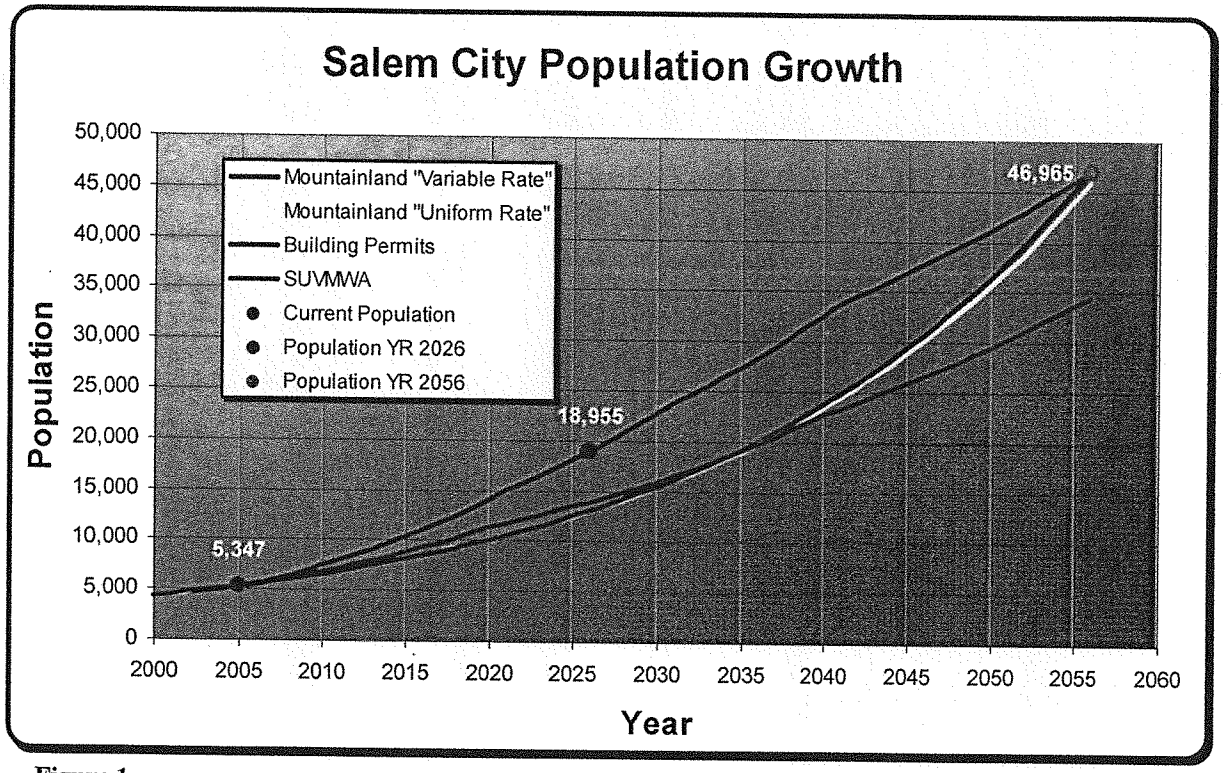


Figure 1

3. Land Use

Figure 2 located in the appendix, shows the current types and locations of land uses (Zoning) permitted under the current development code. Primary land use types are Agricultural (A), Commercial (C), Industrial (I), and Residential (R). These designations have been assigned through recommendation by the Planning Commission and approved by the City Council within the current Salem City Annexation declaration boundary.

For population density determinations Salem City provided the future possible zoning changes given in parenthesis as shown on Figure 2. These classifications were used to calculate the total population figures for this report.

4. Planning Units

For utility master planning and impact fee development efforts, the preferred planning unit is the Equivalent Residential Connection (ERC). One ERC represents a single family dwelling with known utility requirements. The conversion from service connections to ERC was calculated using approved methods as outlined in the State of Utah Administrative Code R309-510 and as shown in Table 2. As can be seen, the total ERC for the City is currently 1,984.

Table 2

Salem Equivalent Residential Connections			
Service Connection Type	Service Connections	ERC / Connection	ERC
Residential	1,522	1	1,522
Recreation Complex	4	75	300
Commercial	28	2.5	70
Church	6	0.25	2
School	6	15	90
Other	4	1	4
Totals	1,570	-	1,984

5. Growth

To allocate future growth for infrastructure analysis, it is necessary to first convert the 20 year and 50 year population projections into ERC. This is accomplished by dividing the projected population by 2.7, which represents the present ERC per current city population, to obtain a total ERC. Maintaining this ERC per population ratio, the city's future ERC can be established, by subtracting the present number of ERC with future total ERC. These future estimations are expressed in Table 3.

Table 3

Salem Future Equivalent Residential Connections				
Projection	Population	Total ERC	Current ERC	Future ERC
20 Year (YR 2026)	18,955	7,020	1,984	5,036
50 Year (YR 5056)	46,965	17,394	1,984	15,410

6. Growth Distribution

This demographic study utilizes the assigned land use designations discussed in section 3, and the assigned zoning density values under current City code to calculate projected populations in undeveloped agricultural areas and to project where the major growth will occur in the City. Table 4 was created to show the population values for each of the designated zoning classifications for the City. This enables both the evaluation of site-specific growth-related infrastructure requirements for the undeveloped areas and the projection of the probable total buildout population for Salem City, based on each zone classification as shown in Figure 2. This data can then be used in the subsequent Master Plan, Rate Structure and Impact Fee documents.

Table 4

Salem City Buildout Population Projections						
Zone	Square Footage	Acreage	Unit / Acre	Sq Ft / Unit	Units	Population @ 3.5/Unit
Commercial						
C1/C2	15,344,437.80	352.26	-	-	-	-
Industrial						
I1	21,106,710.43	484.54	-	-	-	-
I5	10,463,873.93	240.22	-	-	-	-
R2 PUD	5,883,085.09	135.06	3	-	405	1,418
Commercial						
High Density	8,486,714.47	194.83	5	-	974	3,409
Agricultural						
A1 (R2)	4,417,403.56	101.41	2.3	15,000	233	816
A1/R2 PUD	24,441,974.33	561.11	3	-	1,683	5,892
A1/R3	59,146,027.93	1,357.81	1.5	Unbuildable Mountain Slopes		
Residential						
R1	39,795,521.71	913.58	3	10,000	2,741	9,593
R2	89,402,382.83	2,052.40	2.3	15,000	4,721	16,522
R2/PUD	139,649,041.72	3,205.90	3	-	9,618	33,662
R3 (R2)	9,218,461.58	211.63	2.3	15,000	487	1,704
R4	2,819,153.21	64.72	9	-	582	2,039
R5	883,004.29	20.27	9	-	182	639
Total Buildout Population						**75,693**

References

Aqua Engineering – 2006
Salem City General Plan Land Use Map

Salem City – 2006
City Utility Connections

Mountainland Association of Governments – 2006
Municipalities, Counties – Population Projections Utah Office of Planning and Budget

South Utah Valley Municipal Water Association - 2005
Wastewater Regionalization Feasibility Study Phase II

LEI Consulting Engineers and Surveyors Inc. - 2003
Impact Fee Study and Water User Rate Analysis

Appendix

Figure 2
Salem City General Plan Land Use Map

C-1/I-1 (HIGH DENSITY)

A-1 (R-2)

R-2

(R-2/PUD)

I-1

C-1/R-2

(R-2/PUD)

A-1/R-3 (R-2/PUD)

C-1

R-5

I-1

C-1

R-3 (R-2)

R-2

R-3

R-1

C-2

R-1

C-1

C-2

C-1

R-1

A-1/R-3 (R-2/PUD)

A-1/R-3 (UNBUILDABLE MOUNTAIN SLOPES)

I-1 (R-2)

A-1 (R-2)

R-2

R-3 (R-2)

R-2

R-3

R-3 (R-2)

A-1/R-3 (R-2/PUD)

A-1 R-2 PUD

R-2

A-1/R-3 (R-2/PUD)

LEGEND

- C1
- C2
- C1/I1
- C1/R2
- I1
- I5
- A1
- A1/R2 PUD
- A1/R3
- R1
- R2
- R2/PUD
- R3
- R4
- R5
- CITY BOUNDARY
- ANNEX BOUNDARY

DESIGN: JDB
DRAWN: BFA
CHECKED: JDB
SCALE: HORZ. 1"=3000'
VERT. NONE
DATE: 6-12-06

ENGINEERS SEAL

REVISIONS

NO.	DATE

SALEM CITY

GENERAL PLAN LAND USE MAP

AQUA ENGINEERING, INC.
828 SOUTH 1040 WEST, PAYSON UTAH 84651
PHONE (801) 465-5700
FAX (801) 465-5715

FIGURE 2

SALEM CITY GENERAL PLAN

N
W E
S

0 1,500 3,000

HORIZ. 1" = 3000'

Legend

- City Boundary
- Major Roads
- Parcels
- A-1
- A-1/R-1
- A-1/R-2
- A-1/R-3
- C-1
- C-1/I-1
- C-1/R-2
- C-2
- C-3
- I-1
- I-5
- R-1
- R-1/R-2
- R-2
- R-2/R-3
- R-3
- R-4
- R-5

SALEM CITY
IMPACT FEE STUDY
LAND USE MAP
FIGURE 3

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
03029				

SUNRISE ENGINEERING

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