SUNRISE
ENGINEERING

LA VERKIN CITY
CULINARY WATER MASTER PLAN

OCTOBER 2009

LAVERKIN CITY
CULINARY WATER MASTER PLAN

OCTOBER 2009

INCLUDES:

FIVE POINT ANALYSIS
RECOMMENDED SYSTEM IMPROVEMENTS
WRITTEN ANALYSIS FOR WATER USER RATE
& IMPACT FEE CALCULATIONS

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SECTION I
INTRODUCTION

A. PREFACE

LaVerkin is located in Southern Utah. LaVerkin is in the process of evaluating its water system and the impact which future growth may have on it. The City has entered into an agreement with Sunrise Engineering, Inc. to provide a Master Plan for the culinary water system; this report does not analyze secondary or irrigation water, its rights, source, distribution system, etc.

B. INTRODUCTION

This Master Plan has been prepared for the City of LaVerkin. The City of LaVerkin has experienced an increase in population, and though growth is not as rapid as in past years the City is still growing. The City of LaVerkin wishes to be prepared for this growth. In order to meet the needs of its projected population growth and to rectify any current deficiencies in the culinary water system, LaVerkin has contracted with Sunrise Engineering, Inc. to make recommendations for improvements to the culinary water system.

The culinary water system has been analyzed under the State of Utah Division of Drinking Water regulations to determine the current system status and to determine possible system upgrades as the community grows during the next 20 years. As part of this plan, Sunrise Engineering, Inc. has recommended some improvements to the culinary water system and has developed a financing plan that will help LaVerkin City obtain the necessary funds for the recommended improvements.

The existing water rates and impact fees have also been analyzed as a possible means of supporting the recommended system improvements. The recommended culinary water rates and impact fees are fair and they will allow LaVerkin to continue to maintain the level of service that is required of culinary water systems for the present time and over the 20-year planning period.

SECTION II
SYSTEM USERS ANALYSIS

A. PROJECTED GROWTH RATE

An important element in the development of a Culinary Water Master Plan is the projection of the City's population growth rate. This projection gives the planner an idea of the future demands on the culinary water system for the length of the planning period.

Projecting the number of future culinary water connections is a subjective process. With this in mind, Table II.A-1 shows the official census historic growth rate and provides an idea of how the community has grown from 1970 through 2007.

Table II.A-1: Historic Growth Rate

Year	Census Population [1]	Annual Growth Rate	
1970	463	-	-
1980	1,174	1970-1980	9.8%
1990	1,786	1980-1990	4.3%
2000	3,392	1990-2000	6.6%
2008	4,624	2000-2008	3.9%

[1]http://factfinder.census.gov/servlet/SAFFPopulation

The census shows that there was a large gain of population in the 1970's and lesser gain in 1980's. Over the period from 1970 to 2000, the average annual population increase was 6.9%. Much of this overall growth can be attributed to the increased growth in 1990's to the 2000's. From 2000-2008 the annual growth rate has been at a lower rate of 3.9%.

Because of the current recession and the uncertainty of the future market, a growth rate of 3% will be assumed in this Plan for the 20-year planning period. It is important to understand that projected growth rate figures are not the cornerstone of this Master Plan. If the maximum number of system connections is reached earlier or later than projected, then future improvements to support growth may either come earlier or later. Impact Fees should not be significantly affected if the actual rate of growth varies from the rate used in the Plan.

B. LENGTH OF PLANNING PERIOD

This Culinary Water Master Plan uses a 20-year planning period beginning in year 2009 and running through year 2029. This period will allow an adequate evaluation of the system for potential infrastructure improvements or other needs. Revenue sources should be carefully evaluated each year as budgets are set.

C. CULINARY WATER CONNECTIONS

1. Existing Culinary Water Connections

Culinary water connection and usage data was supplied by LaVerkin City. The State of Utah Administrative Rules for Public Drinking Water Systems, R309-510, states that the average day demand is 400 gallons per ERU (Equivalent Residential Unit) for indoor use plus outdoor use or the average recorded usage for the City or the average day demand as recorded by the City can be used. The City of LaVerkin has sufficient water usage data. So, the total water use in the area of LaVerkin as recorded by the City is shown below in Table II.C-1 for 2007-2008. The majority of the connections have a secondary water connection for outdoor use. Therefore, the average water usage includes any outdoor usage not on a secondary system.

An ERU value allows the comparison of water use between residential and any other type of connection. For instance, if a commercial connection has an ERU of 2.5, then it uses 2.5 times the water that an average residential connection would use. The water usage data shows that an average residential connection consumes 371 gallons per day for LaVerkin in 2007-2008. The water usage of other types of connections was then divided by 371 gallons per day to provide the total ERUs for the other connections. Typically, commercial connections use much more water than residential connections. This is true for LaVerkin. There are currently 16 connections treated as commercial connections with the yearly average usage of 13,458,225 gallons together. By dividing the total yearly usage by the number of commercial connections and 365 for the number of days in a year, an average of 2,304 gallons is used per day per commercial connection. Dividing this average daily usage by the residential usage gives the commercial connections an ERU of 6.21. This means that for the City of LaVerkin the commercial connection use 6.21 times the water of the average residential connection. Therefore, the 16 commercial connections will be 99 ERUs. The same process is followed for connections listed in this report as “Other”. These are schools, government facilities, churches, etc. The City of LaVerkin has 8 “Other” connections with an ERU of 1.99 giving a total “Other” ERU of 16.

Table II.C-1: LaVerkin Water Usage 2007-2008

	2007	2008	Average
Residential			
Usage (gallons)	193,621,796	172,157,639	182,889,717
Connections (ERUs)	1,348	1,352	1,350
Usage Per Connection (gal/year)	143,658	127,367	135,512
Daily Usage Per Connection (gal/day)	394	349	**371**
Commercial			
Usage (gallons)	14,247,962	12,668,489	13,458,225
Connections	16	16	16
Usage Per Connection (gal/year)	890,498	791,781	841,139
Daily Usage Per Connection (gal/day)	2,440	2,169	2,304
Equivalent Residential Unit	6.20	6.22	6.21
Commercial ERUs	99	99	99
Other			
Usage (gallons)	2,281,616	2,028,685	2,155,150
Connections	8	8	8
Usage Per Connection (gal/year)	285,202	253,586	269,394
Daily Usage Per Connection (gal/day)	781	695	738
Equivalent Residential Unit	1.99	1.99	1.99
Other ERUs	16	16	16
Total ERUs	1,463	1,467	**1,465**

In this report the average culinary water usage will be 371 gpd/ERU. This average usage is below State average for Utah due to the large use of secondary irrigation water for outdoor use. It is also assumed that the ratio of residences having secondary water connections to residences not having secondary water connections will remain constant as the community grows; this will allow the calculated value of 371 gpd/ERU to remain valid through the planning period.

2. Projected Culinary Water Connections & ERUs

Historic data shows that residential connections, commercial ERUs and other ERUs have not all increased at the same growth rate. Because of this, projected ERUs have been determined using a different growth rate for each. Residential connections have been estimated using a 3% growth. Commercial and other ERUs have been estimated using a 1.5% growth rate; this assumes that commercial ERUs will grow at half the residential growth rate.

The number of future culinary ERUs can be calculated using the compound growth formula and inserting the projected growth rate, the existing number of culinary water ERUs, and the 20-year planning period for culinary water improvements.

$$F = P(1+i)^N$$

F = Future ERUs
P = Present ERUs
i = Projected Growth Rate
N = Years

The number of existing ERUs is as shown in Table II.C-1 above and is given as 1,465 ERUs in December 2008. Based on the growth rates assumed in the cash flow projection (see appendix E), the total number of ERUs at the end of the planning period will be 2,669 (2,511 residential connections, 22 commercial connections (136 commercial ERUs), 11 “Other” connections (22 “Other” ERUs)). It is recommended that LaVerkin City size all future culinary water related infrastructure improvements for at least 2,669 ERUs.

SECTION III
WATER RIGHTS ANALYSIS

A. EXISTING WATER RIGHT

The existing water rights owned by LaVerkin City are listed in Table III.A-1 below. The water rights are listed according to number, source, and flow. Exhibit III.A-1 shows the points of diversion for each water right according to GIS data obtained from the State's web site.

Table III.A-1: LaVerkin Water Rights

Culinary Water Rights			Flow		
W.R. #		**Source**	**gpm**	**cfs**	**AcFt**
81-1073		Upper Ash Creek Springs	134.6	0.300	72.0
81-2287		Toquerville Springs	149.5	0.333	241.0
81-687		Upper Ash Creek Springs	220.4	0.491	71.3
81-1602		Ash Creek Spring & Upper Ash Creek Spring	448.8	1.000	330.0
		Total Water Rights	**953.3**	**2.124**	**714.3**
Other Water Rights of Interest			**Flow**		
W.R. #		**Source**	**gpm**	**cfs**	**AcFt**
81-2481	Industrial	Virgin River	13.3	0.0297	20.0
81-2477	Irrigation	Virgin River			
a13530	Irrigation	Virgin River	3,576.9	7.970	1,640.2
81-4334	Irrigation	Virgin River	1,346.4	3.000	990.0
		Total Other Water Rights	**4,936.7**	**11.0**	**2,650.2**

Exhibit III.A-1
Points of Diversion

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B. EXISTING REQUIRED WATER RIGHT

The State of Utah Public Administrative Rules for Public Drinking Water Systems, R309-510, states that a community should have adequate water right to supply each culinary ERU with 400 gallons per day for indoor water use, plus an amount for outdoor use as dictated by irrigated acreage and a consumptive use value obtained from the State guidelines or the recorded water usage for the City. As explained previously LaVerkin has the average usage of 371 gallons per day per ERU.

Table III.A-1 shows that the total amount of water right available to LaVerkin City for culinary purposes is approximately 714.3 Acft. Based on the average use of 371 gallons per day (gpd) per ERU, the existing required water right is calculated in Table III.B-1.

Table III.B-1: Existing Required Water Rights Calculations

Average Demand (Total Use)								
1,507 ERU's X	371 gpd X / ERU	1 day X / 24 hr	1 hr / 60 min.	=	388 gpm			
1,507 ERU's X	371 gpd X / ERU	365 day X / 1 yr	1 Acft. / 325,829 gal	=	626 Acft			
Total Required Water Right					**626**	**Acft**	**388**	**gpm**
Existing Culinary System Water Right Surplus					**88**	**Acft**	**565**	**gpm**

The existing water right surplus or deficit is determined by subtracting the existing required water right of 626 Acft from the total available water right of 714.3 Acft, which yields a **surplus** of 88 Acft. The City currently has enough water right to supply all of its existing ERUs.

C. PROJECTED REQUIRED WATER RIGHT

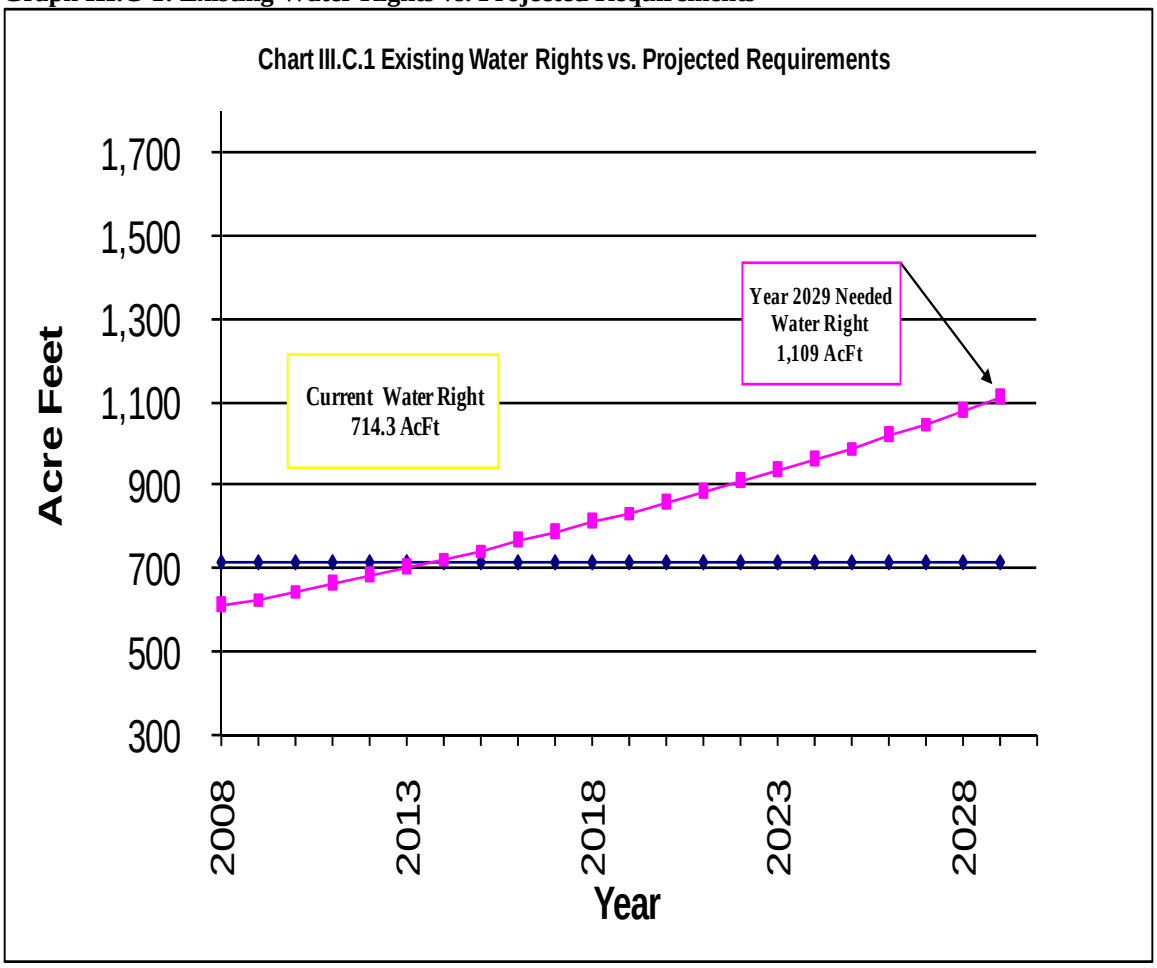
The projected required water right at the end of the 20-year planning period can be calculated by substituting the projected number of 2,669 ERUs in for the current number of ERUs. Table III.C-1 shows the calculations for the projected required water rights.

Table III.C-1: Projected Required Water Rights Calculations

Average Demand (Total Use)									
2,669	ERU's X	371 gpd / ERU	X 1 day / 24 hr	X 1 hr / 60 min.	=	688	gpm		
2,669	ERU's X	371 gpd / ERU	X 365 day / 1 yr	X 1 Acft. / 325,829 gal	=	1,109	Acft		
	Total Required Water Right					**1,109**	**Acft**	**688**	**gpm**
	Existing Culinary System Water Right Deficit					**(395)**	**Acft**	**266**	**gpm**

The projected water right surplus or deficit is determined by subtracting the projected required water right of 1,109 Acft from the total available water right of 714.3 Acft, which yields a **deficit** of approximately 395 Acft.

Graph III.C-1: Existing Water Rights vs. Projected Requirements



D. RECOMMENDED WATER RIGHT IMPROVEMENTS

The projections in this analysis show that LaVerkin City currently has sufficient water rights but has insufficient water rights to meet the needs of its users over the next 20 years. If LaVerkin City wishes to cover the demands of the growth, it should actively seek to purchase additional water rights that can be used for culinary purposes or make agreements for others to supply the needed water. LaVerkin City has entered into an agreement with Washington County Water Conservancy District (WCWCD); it is understood that this agreement can provide any additional water rights needed to supply LaVerkin's culinary water system.

LaVerkin's water rights should be reviewed at least every five years in order to ensure that the City of LaVerkin is able to meet future demands and maintain a right to the water. For more information on the water rights see Appendix F.

SECTION IV
WATER SOURCE CAPACITY ANALYSIS

A. EXISTING WATER SOURCE CAPACITY

To analyze source capacity, all available culinary water sources must first be identified. These sources are listed in the table below. The flow capacity numbers were acquired from LaVerkin City and are based on minimum spring flows in accordance with State of Utah Public Administrative Rules for Public Drinking Water Systems, R309-510-7-4. It should be noted that the capacity of the spring is greater than 953 gpm, but the water right limits usage to 953 gpm (the minimum spring flows are at a rate higher than can be used per the existing water rights). Hence, the source capacity is given as the maximum allowed by the right.

Table IV.A-1: Existing Water Source Capacity

LaVerkin City Sources	Total Flow	
	CFS	gpm
Upper Ash Creek Springs	0.300	135
Toquerville Springs	0.333	149
Upper Ash Creek Springs	0.491	220
Ash Creek Spring & Upper Ash Creek Spring	1.000	449
Source Total =	**2.124**	**953**

B. EXISTING REQUIRED WATER SOURCE CAPACITY

The State of Utah Public Administrative Rules for Public Drinking Water Systems, R309-510, states “a community should have an adequate water source capacity to supply a peak demand of 800 gallons per day per connection for indoor use, or twice the average amount of historical usage”. The regulations also require the source to be capable of meeting peak irrigation demands where no secondary source of irrigation water is available. To comply with State standards, the average water use was multiplied by a factor of two and a total of 742 gpd was used in the calculations; LaVerkin has a secondary source of irrigation water so no further consideration is needed. The required existing source capacity is calculated below.

Table IV.B-1: Existing Required Water Source Capacity

Required Indoor/Outdoor Source								
1,507	ERU's X	742	gpd X	1 day X	1 hr	=	777	gpm
			ERU	24 hr	60 min.			
	Total Required Source Capacity						**777**	**gpm**
	Existing Culinary System Source Capacity Surplus						**177**	**gpm**

The existing source capacity surplus or deficit is determined by subtracting the existing required source capacity of 777 gpm from the total available source capacity of 953 gpm as limited by the water right, which yields a **surplus** of 177 gpm.

C. PROJECTED REQUIRED WATER SOURCE CAPACITY

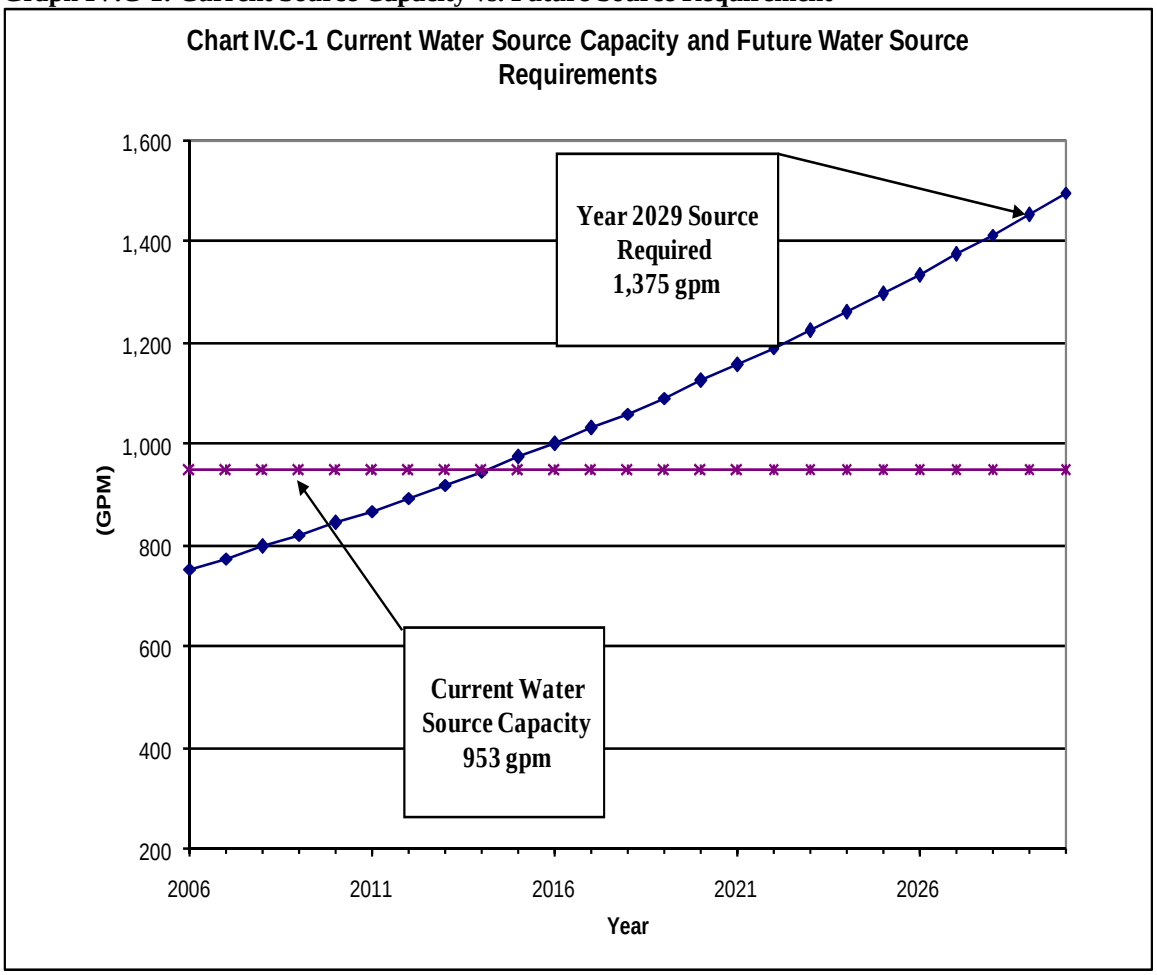
Projected required water source capacity at the end of the planning period is determined from the same information and calculations explained in Part B, except the projected number of culinary water ERUs is substituted in the calculations for the current number of ERUs.

Table IV.C-1: Projected Required Water Source Capacity

Required Indoor/Outdoor Source								
2,669	ERU's X	742	gpd X	1 day X	1 hr	=	1,375	gpm
			ERU	24 hr	60 min.			
	Total Required Source Capacity						**1,375**	**gpm**
	Projected Culinary System Source Capacity Deficit						**(422)**	**gpm**

The projected source capacity surplus or deficit is determined by subtracting the projected required source capacity of 1,375 gpm from the total available source capacity of 953 gpm, which yields a projected **deficit** of 422 gpm at the end of the 20-year planning period.

Graph IV.C-1: Current Source Capacity vs. Future Source Requirement



D. RECOMMENDED WATER SOURCE CAPACITY IMPROVEMENTS

The calculations in this section demonstrate that LaVerkin City currently has sufficient source capacity but does not have sufficient source capacity for the 20 year period. This limit on capacity is imposed by the amount allotted to the City through their water rights. The springs may have the capacity to supply LaVerkin in whole or greater part, but the City's water right limits their right to the source. This is primarily due to multiple water rights pulling from the same source. LaVerkin has made agreements with Washington County Water Conservation District to provide the needed sources.

SECTION V
WATER STORAGE CAPACITY ANALYSIS

A. EXISTING WATER STORAGE CAPACITY

LaVerkin City's culinary water storage capacity is identified below.

Table V.A-1: Existing Water Storage Capacity

Existing Storage Capacity:		
Lower Tank	1,500,000	gal.
Upper Tank	1,000,000	gal.
Total Existing Capacity	**2,500,000**	**gal.**

B. EXISTING REQUIRED WATER STORAGE CAPACITY

Water storage capacity requirements are found in the State of Utah Administrative Rules for Public Drinking Water Systems, R309-510. These regulations require storage for a community's culinary water system to meet one full day's use requirement for all connections in the community plus the required fire flows for a minimum of two hours.

As shown in previous sections, the average water use per ERU in the area for 2007-2008 is 371 gallons per day of culinary water for indoor and outdoor use. Storage requirements for fire protection vary slightly from community to community. In general, fire flow requirements are set by the local Fire Chief or are based on building size and type of construction. The Statewide minimum fire flow is 1,000 gpm. This is also the minimum fire flow required for LaVerkin. Based on this information, storage capacity is calculated as follows:

Table V.B-1: Existing Required Water Storage Capacity

Existing Required Storage Capacity Based On LaVerkin City Historic Average Consumption										
		371 gpd / ERU	X	1,507	ERU			=	559,097	gpd
1,000	gpm	X	60 / 1	min / hr	X		2	hr =	120,000	gal.
								Total Existing Required Storage	679,097	gal.
								Total Existing Capacity	2,500,000	gal.
								Existing Capacity Surplus	1,820,903	gal.

The existing water storage capacity surplus or deficit is determined by subtracting the existing required water storage capacity of 679,097 gallons from the total available water storage capacity of 2,500,000 gallons, which yields an existing **surplus** of 1,820,903 gallons.

C. PROJECTED REQUIRED WATER STORAGE CAPACITY

The projected required culinary water storage capacity at the end of the planning period is determined from the same factors explained in part B above, but the projected number of culinary water ERUs is inserted into the calculations.

Table V.C-1: Projected Required Water Storage Capacity

Required Storage Capacity in 2029										
Using LaVerkin City Historic Average Consumption										
		371	gpd	X	2,669	ERU		=	990,199	gpd
			ERU							
1,000	gpm	X	60	min	X		2	hr =	120,000	gal.
			1	hr						
								Total Required Storage	1,110,199	gal.
								Total Existing Capacity	2,500,000	gal.
								Future Capacity Surplus	1,389,801	gal.

The projected water storage capacity surplus or deficit is determined by subtracting the projected required water storage capacity of 1,110,199 gallons from the total available water storage capacity of 2,500,000 gallons, which yields a projected **surplus** of 1,389,801 gallons at the end of the planning period.

D. EXISTING ELEVATION CONSTRAINTS

It should be mentioned that, based on minimum pressure requirements at the service connections, the existing tanks have limitations on the development elevations that the tanks can serve. The Lower Tank should not feed developments above the 3,270 ft elevation line. The Upper Tank could serve higher developments, but is limited to serve elevations below 3,440 ft. See Exhibit V.D-1 for further details.

E. RECOMMENDED WATER STORAGE CAPACITY IMPROVEMENTS

Projected storage requirements will need to be evaluated as subdivisions are approved and constructed. It is anticipated that the majority of growth will be below the two tanks' limitations. Some growth has been allowed with the addition of booster

pumps to pressurize the system. As growth is planned above the tanks' elevation limit, additional tanks will need to be constructed.

LaVerkin City should review their storage needs every five years to ensure that they continue to provide enough storage for the culinary water system.

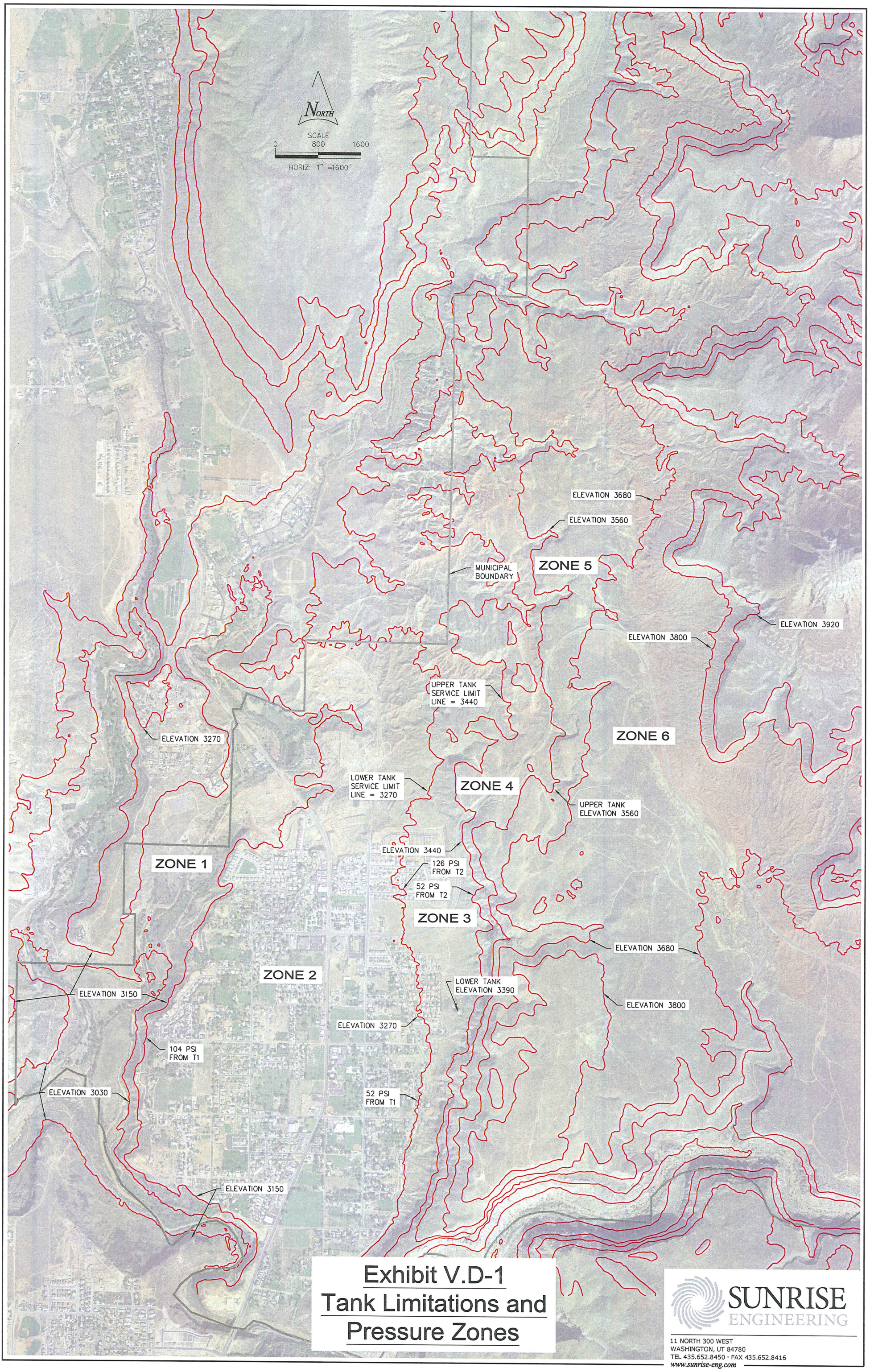


Exhibit V.D-1
Tank Limitations and Pressure Zones

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SECTION VI
WATER TREATMENT REQUIREMENTS

A. GENERAL REQUIREMENTS

The State of Utah Administrative Rules for Public Drinking Water Systems, R309-510, in accordance with the National Safe Drinking Water Act, have adopted "primary" regulations for the protection of public health and "secondary" regulations related to taste and aesthetics. The regulations recommend that all culinary water sources have provisions for continuous disinfection.

B. EXISTING TREATMENT FACILITIES

LaVerkin and Hurricane share the same treatment facility located in Toquerville City. LaVerkin City treats water from Toquerville Springs with a chlorine gas system. As LaVerkin City grows, it is planned that all future development not supplied by the current system will be fed and treated by the WCWCD. The City of LaVerkin's current system is sufficient for current and planned future treatment needs, limited by water rights. Hurricane City's future usage was not taken in to consideration. If Hurricane City increases usage the current treatment facility could be inadequate.

C. RECOMMENDED WATER TREATMENT FACILITY IMPROVEMENTS

It is recommended that LaVerkin take all necessary measures to maintain their treatment facility and make improvements as the system requires. Continued coordination with Hurricane will be needed to insure that the treatment facility is adequate for the two cities' combined water usage.

SECTION VII
WATER DISTRIBUTION SYSTEM ANALYSIS

A. EXISTING DISTRIBUTION SYSTEM ANALYSIS

The State of Utah Administrative Rules for Public Drinking Water Systems, R309-510, require distribution systems to be sized to supply peak instantaneous flows, while maintaining a minimum system pressure of 30 psi. The rule also requires that distribution systems are able to supply peak day flows plus fire flows for a minimum of 2 hours, while maintaining a minimum system pressure of 20 psi. The system also needs to provide peak day flows while maintaining a minimum system pressure of 40 psi. As a general guideline, it is recommended that the system be able to provide a minimum static pressure of 50 psi at every point in the distribution system.

Existing peak flows are calculated as follows:

Table VII.A-1: Existing Distribution Demands

Indoor Peak Instantaneous Demand:							
Q=	10.8 X N^.64			N= Number of ERU's			
Q=	10.8 X (1507) ^.64						
Q=					=	1,168	gpm
Outdoor Peak Instantaneous Demand:							
	380 ERU. X	0.13 acre / ERU	X	9.8 gpm / irr. acre	=	484	gpm
	Current Peak Instantaneous Demand				=	**1,652**	**gpm**
Peak Day Demand & Fire Flow							
1,507	ERU's X	742 gpd / ERU	X 1 day / 24 hr	1 hr / 60 min.	=	777	gpm
	Fire Flow				=	1,000	gpm
	Current Peak Day Demand + Fire Flow				=	**1,777**	**gpm**

The indoor peak instantaneous demand equation is found in the State of Utah Public Administrative Rules for Drinking Water Systems, R309-510. This Rule also provides the flow rate of 9.8 gpm per irrigated acre for the outdoor peak instantaneous demand. The 0.13 irrigated acres per ERU was determined by taking an average lawn size from a random sample of existing homes in LaVerkin City. The number of ERUs is the number of connections that do not have the secondary connection.

The State regulation for fire flow requires a minimum of 1,000 gpm if no recommendation has been provided by the local fire authority. State regulations require all fire hydrants to be served from 8-inch diameter or larger pipelines unless it can be proven through the use of modeling those 6-inch lines are sufficient. The local Fire Marshall was contacted and requires 1,000 gpm in residential areas and 1,500 gpm in commercial areas.

The existing LaVerkin City culinary water distribution system has been modeled using the computer program H2ONET® by MWH Soft, Inc. The main network of the distribution system is providing good service to the majority of connections. However, there are some sections that are deficient. 470 W, 400 N, along State St by Bringhurst Ln, and at the north end of 125 W, all have fire flow deficiencies. 500W has 4 inch lines feeding hydrants. The printouts from the H2ONET® analysis of the existing system are provided in Appendix B.

B. PROJECTED DISTRIBUTION SYSTEM ANALYSIS

The projected distribution system analysis is performed using the same assumptions as in the existing system analysis, except that the projected number of ERUs is inserted into the calculations. The projected distribution peak instantaneous demand and total instantaneous peak demand are calculated below.

Table VII.B-1: Projected Distribution Demands

Indoor Peak Instantaneous Demand:							
Q=	10.8 X N^.64			N= Number of ERU's			
Q=	10.8 X 2,669 ^.64						
Q=					=	1,684	gpm
Outdoor Peak Instantaneous Demand:							
634	ERU. X	0.13 acre X / conn.		9.8 gpm / irr. acre	=	808	gpm
	Projected Peak Instantaneous Demand				=	**2,491**	**gpm**
Peak Day Demand & Fire Flow							
2,669	ERU's X	742 gpd X / ERU	1 day / 24 hr	1 hr / 60 min.	=	1,375	gpm
	Fire Flow				=	1,000	gpm
	Projected Peak Day Demand + Fire Flow				**=**	**2,375**	**gpm**

In the modeling, the required flows were used for the appropriate area, but due to the small amount of commercial ERUs, the 1,000 gpm was used in the above calculations.

A computer model of the projected distribution system has also been created. In this model, all recommended storage and distribution system changes have been incorporated and modeled. With these modifications, the system will be able to meet peak day demands with a 1,000 gpm fire flow in residential and 1,500 gpm fire flow in commercial at any node equipped with a fire hydrant while maintaining a minimum 20 psi throughout the system, peak instantaneous demands while maintaining a minimum of 30 psi throughout the system, as well as peak day demand while maintaining a minimum of 40 psi throughout the system. One exception is multiple nodes in the model pushing the tank elevation limitations; these nodes are just short of the pressure requirements for peak day demands. The static pressure in the model shows pressures in the high 30 psi range along the tanks elevation limitation line. The low pressure is due to the elevation of the node compared to the elevation of the tanks. The pressure is close enough that a more detailed check at the meter may prove the pressure to be sufficient. The peak day H2ONET® analysis of the proposed system is provided in Appendix B.

C. RECOMMENDED DISTRIBUTION SYSTEM IMPROVEMENTS

In order to meet the State requirements with the current demands, there are a number of improvements that need to be made to the distribution system. These improvements will keep the City in State compliance throughout he design period of 20 years. The recommended improvements are shown on Exhibit VII.A-1. These improvements consist of upsizing the water lines in several areas.

Recommended Distribution Improvements:

1. Recommendation 1 (Exhibit VII.A-1)
   i. Upsize all 4” and 6” waterlines to 8” in 470 W, along State St, by Bringhurst Ln, and at the north end of 125 W, and 500 W. These upgrades are due to low fire flow and State code.
   ii. Upsize the 6” waterline to 10” in 400 N from 100 E to the end. This upgrade is due to low fire flow.
   iii. Upsize the 4” waterline in the 290 W Circle and 250 W Circle with a 8” waterline. This upgrade is optional in that no hydrant or water distribution deficiency exist. It will be the only remaining 4” line in the system and upsizing as part of a project will save the City funds.
   iv. Replace 6,700’ of 12” waterline on the west side of State Street from 450’ north of 630 N to 300 S. This replacement is due to the age of the existing line and the repeated waterline breaks in that line.

2. Future Improvements (Exhibit VII. A-2)
    i. Place 4,000 ft of 12” line from Main street at Zions View Estates II north to the road leading to Interstate Rock, Inc.’s crusher pit then along said road southeast to and crossing State Street, then north along State Street to connect at Riverwood Subdivision. This is to extend services along Main Street and create a loop in the system.

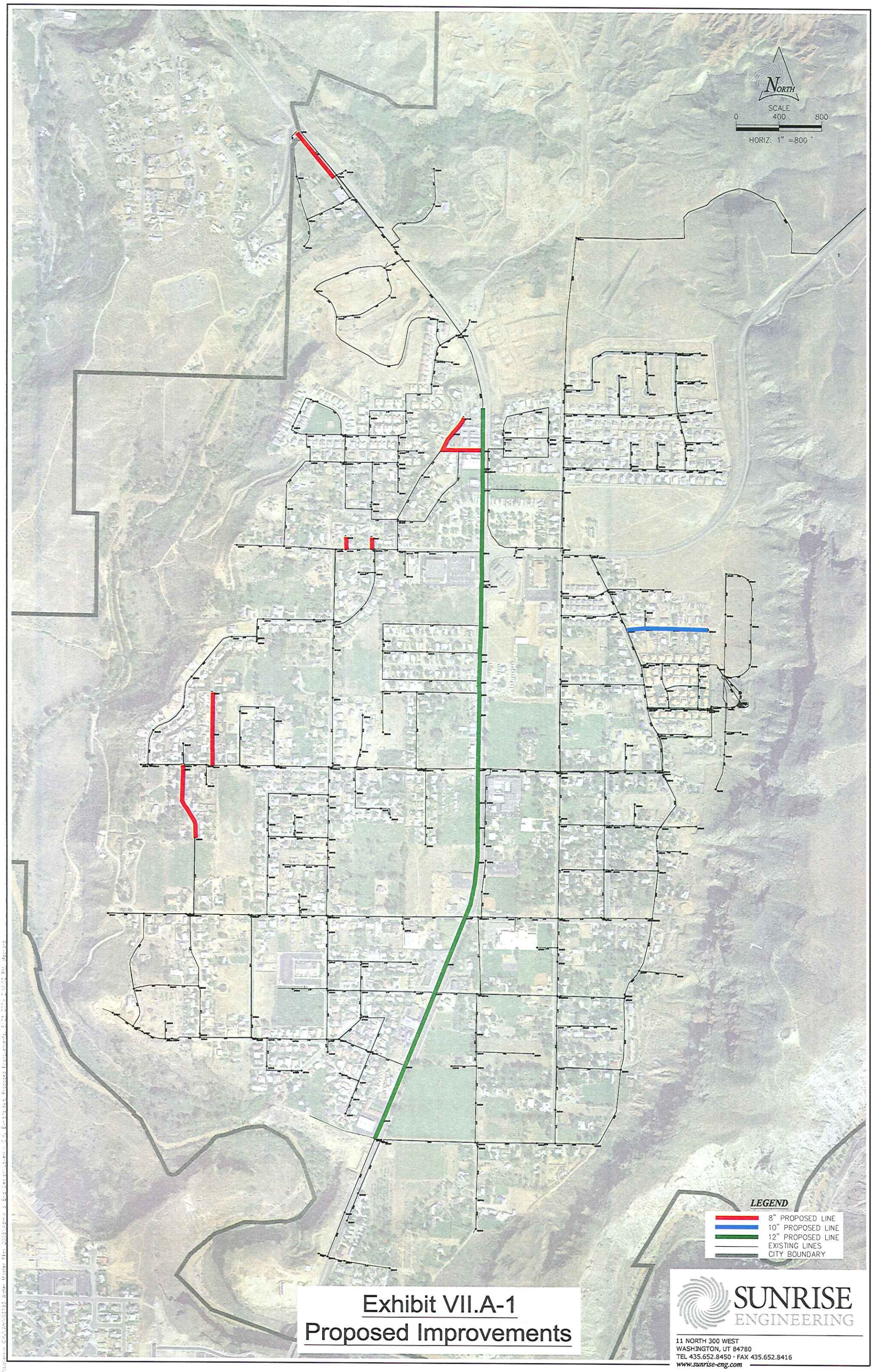

Exhibit VII.A-1
Proposed Improvements

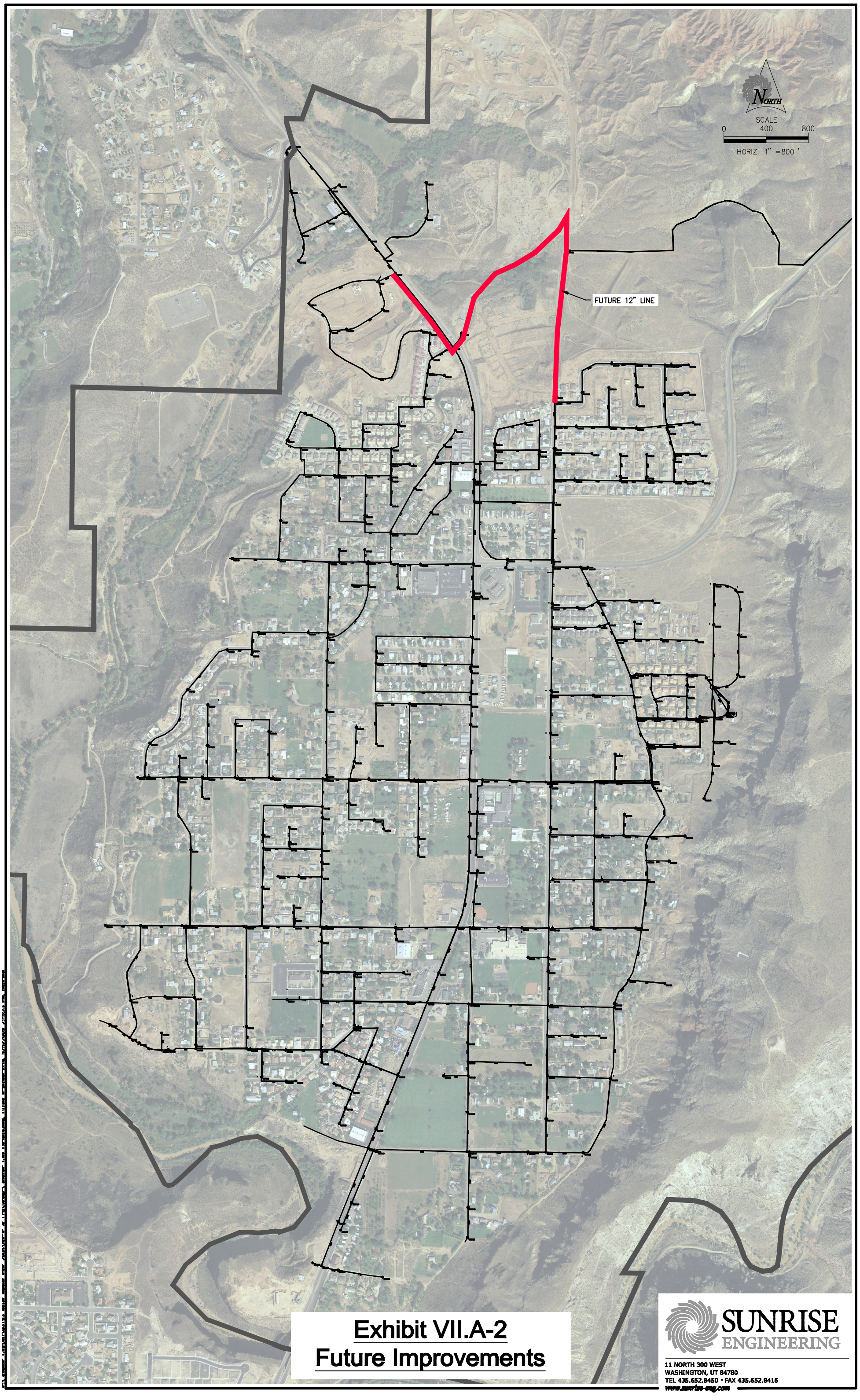

Exhibit VII.A-2
Future Improvements

SUNRISE ENGINEERING
11 NORTH 300 WEST
WASHINGTON, UT 84780
TEL 435.652.8450 · FAX 435.652.8416
www.sunrise-eng.com

SECTION VIII
SUMMARY OF RECOMMENDED SYSTEM IMPROVEMENTS

A. RECOMMENDED IMPROVEMENTS

Based on the findings from Sections III - VII, showing immediate system needs as well as requirements for growth projected over the next 20 years, it is recommended that LaVerkin City proceed with a construction project to implement improvements as required to bring the system into conformance with State rules. Table VIII.A-1 summarizes the recommended improvements.

Table VIII.A-1: Recommended System Improvements

RECOMMENDED CULINARY WATER SYSTEM IMPROVEMENTS	
ANALYSIS	**RECOMMENDED UPGRADE**
1. Water Rights	The projections in this analysis show that LaVerkin City currently has sufficient water rights but has insufficient water rights to meet the needs of its users over the next 20 years. If LaVerkin City wishes to cover the demands of the growth, it should actively seek to purchase additional water rights that can be used for culinary purposes or make agreements for others to supply the needed water. LaVerkin City has entered into an agreement with Washington County Water Conservancy District (WCWCD); it is understood that this agreement can provide any additional water rights needed to supply LaVerkin's culinary water system. LaVerkin's water rights should be reviewed at least every five years in order to ensure that the City of LaVerkin is able to meet future demands and maintain a right to the water. For more information on the water rights see Appendix F.
2. Water Source Capacity	The calculations in this section demonstrate that LaVerkin City currently has sufficient source capacity but does not have sufficient source capacity for the 20 year period. This limit on capacity is imposed by the amount allotted to the City through their water rights. The spring may have the capacity to supply LaVerkin in whole or greater part, but the City's water right limits their right to the source. LaVerkin has made agreements with Washington County Water Conservation District to provide the needed sources.

3. Water Storage Capacity	Projected storage requirements will need to be evaluated as subdivisions are approved and constructed. It is anticipated that the majority of growth will occure below the two tanks' service pressure limitation. Some growth has been allowed with the addition of booster pumps to pressurize the system. As growth is planned above the tanks service pressure limitation, additional tanks will need to be constructed. LaVerkin City should review their storage needs every five years to ensure that they continue to provide enough storage for the culinary water system.
4. Water Treatment	It is recommended that LaVerkin take all necessary measures to maintain their treatment facility and make improvements as the system requires. Continued coordination with Hurricane will be needed to ensure that the treatment facility is adequate for the two City's combined water usage.
5. Distribution System	In order to meet the State requirements with the current demands, there are a number of improvements that need to be made to the distribution system. These improvements will keep the City is State compliance throughout he design period of 20 years. The recommended improvements are shown on Exhibit VII.A-1. These improvements consist of upsizing the water lines in several areas. **Recommended Distribution Improvements:** 3. Recommendation 1 (Exhibit VII.A-1) i. Upsize all 4" and 6" waterlines to 8" in 470 W, along State St, by Bringhurst Ln, and at the north end of 125 W, and 500 W. These upgrades are due to low fire flow and State code. ii. Upsize the 6" waterline to 10" in 400 N from 100 E to the end. This upgrade is due to low fire flow. iii. Upsize the 4" waterline in the 290 W Circle and 250 W Circle with a 8" waterline. This upgrade is optional in that no hydrant or water distribution deficiency exist. It will be the only remaining 4" line in the system and upsizing as part of a project will save the City funds. iv. Replace 6,700' of 12" waterline on the west side of State Street from 450' north of 630 N to 300 S. This replacement is due to the age of the existing line and the repeated waterline breaks in that line. 4. Future Improvements (Exhibit VII. A-2) i. Place 4,000 ft of 12" line from Main street at Zions View Estates II north to the road leading to Interstate Rock, Inc.'s crusher pit then along said road southeast to and crossing State Street, then north along State

	Street to connect at Riverwood Subdivision. This is to extend services along Main Street and create a loop in the system.

As LaVerkin's system grows and subdivisions are constructed at higher elevations in the City, it will become necessary to have all the systems linked. Different pressure zones will be required (see Exhibit V.D-1) and the need for a good monitoring system will become more and more evident as growth occurs and connections increase. A monitoring system is not currently needed but is something to consider in the future.

B. PRELIMINARY ENGINEER'S OPINION OF PROBABLE COST

Tables showing the opinions of probable cost for the recommended water improvements projects are provided in Appendix C.

The opinion of probable cost is broken down into separate estimates for convenience, and all include anticipated construction costs, contingency budgets and a budget for all other normal project costs such as survey, administration, engineering, legal services, fiscal costs, rights-of-way, etc. Table VIII.B-1 outlines a sample financing scenario for the recommended improvements.

Table VIII.B-1: FY 2009 Proposed Financing Plan

TABLE VIII.B-1

LAVERKIN CITY WATER

FY 2009 PROPOSED FINANCING PLAN

TOTAL PROJECT COST			**$ 760,300**
FY 2009 EXPENSES			
Proposed Funding:	**Rate**	**Term in Yrs.**	**Principal**
Self Participation			$80,000
New Grant			$340,150
New Loan	3.50%	30	$340,150
TOTAL PROJECT FUNDING:			**$760,300**
EXPENSES: (First Year of New Debt Serv. Pmt.)			
Salaries and Wages			$375,778
Supplies, Tools,&Vehicle Cost			$163,806
Other Expenses			$35,594
Interest Expense			$7,026
Subtotal Expenses:			**$582,204**
EXISTING DEBT SERVICE			
1999 Water Revenue			$31,650
Subtotal Existing Annual Debt Service:			**$31,650**
NEW DEBT SERVICE			
New Loan(s)			$18,494
Loan Reserve (Payment/10)			$1,800
Subtotal New Annual Debt Service:			**$20,294**
Renewal and Replacement Fund			$30,129
GRAND TOTAL EXPENSES:			**$664,277**
ANNUAL INCOME			
*New Impact Fee	38	$836	$31,650
Total Number Of ERUs			1,529
Average Monthly Water User Rate/ERU			**$34.48**
TOTAL ANNUAL INCOME:			**$664,277**
Additional Water Costs			
Irrigation Water Average Cost			**$18.45**
WCWCD Fee			**$1.75**
Total Water Average Monthly User Rate/ERU			**$54.68**

* Number of Impact Fees shown is less then that in Appendix E due to lower than average growth and furture projected pojects not presented in this table.

SECTION IX
WATER RATE ANALYSIS

A. GENERAL

Generally, water rates are a combination of base rates and overage rates wherein a base amount of water is provided for the base rate charge. The base rate is charged to all connections in the system whether or not water is used, and should cover all fixed costs of the system. Overage rates are normally set to encourage water conservation, but should always cover all variable costs of the system. LaVerkin City has established the following service fee rate structure:

TABLE IX.A-1
LAVERKIN CITY WATER
Existing Water Rate Structure (5/8" Meter)

Total Base Rate (In Town)	$22.25	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	20,000
$1.47	20,001	35,000
$1.76	35,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$22.25	
9,000	$ 32.87	
12,000	$ 36.41	
23,000	$ 50.26	
45,000	$ 85.50	
70,000	$ 129.50	

TABLE IX.A-2
LAVERKIN CITY WATER
Existing Water Rate Structure (3/4" Meter)

Total Base Rate (In Town)	$32.04	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	20,000
$1.47	20,001	35,000
$1.76	35,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$ 32.04	
9,000	$ 42.66	
12,000	$ 46.20	
23,000	$ 60.05	
45,000	$ 95.29	
70,000	$ 139.29	

TABLE IX.A-3
LAVERKIN CITY WATER
Existing Water Rate Structure (1" Meter)

Total Base Rate (In Town)	$56.96	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	26,000
$1.47	26,001	52,000
$1.76	52,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$56.96	
9,000	$ 67.58	
12,000	$ 71.12	
23,000	$ 84.10	
45,000	$ 115.57	
70,000	$ 157.54	

TABLE IX.A-4
LAVERKIN CITY WATER
Existing Water Rate Structure (1 1/2" Meter)

Total Base Rate (In Town)	$128.16	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	58,000
$1.47	58,001	116,000
$1.76	116,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$ 128.16	
9,000	$ 138.78	
12,000	$ 142.32	
23,000	$ 155.30	
45,000	$ 181.26	
70,000	$ 214.24	

TABLE IX.A-5
LAVERKIN CITY WATER
Existing Water Rate Structure (2" Meter)

Total Base Rate (In Town)	$227.84	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	102,000
$1.47	102,001	204,000
$1.76	204,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$ 227.84	
9,000	$ 238.46	
12,000	$ 242.00	
23,000	$ 254.98	
45,000	$ 280.94	
70,000	$ 310.44	

TABLE IX.A-6
LAVERKIN CITY WATER
Existing Water Rate Structure (3" Meter)

Total Base Rate (In Town)	$512.64	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	230,000
$1.47	230,001	460,000
$1.76	460,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$ 512.64	
9,000	$ 523.26	
12,000	$ 526.80	
23,000	$ 539.78	
45,000	$ 565.74	
70,000	$ 595.24	

TABLE IX.A-7
LAVERKIN CITY WATER
Existing Water Rate Structure (4" Meter)

Total Base Rate (In Town)	$911.36	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	410,000
$1.47	410,001	820,000
$1.76	820,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$ 911.36	
9,000	$ 921.98	
12,000	$ 925.52	
23,000	$ 938.50	
45,000	$ 964.46	
70,000	$ 993.96	

TABLE IX.A-8
LAVERKIN CITY WATER
Existing Water Rate Structure (6" Meter)

Total Base Rate (In Town)	$2,050.56	per ERU/Month
Includes	0	Gallons

Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.18	0	922,000
$1.47	922,001	1,844,000
$1.76	1,844,001	& UP

Usage	Rates	
(Gallons)	Rate	
0	$ 2,050.56	
9,000	$ 2,061.18	
12,000	$ 2,064.72	
23,000	$ 2,077.70	
45,000	$ 2,103.66	
70,000	$ 2,133.16	

B. AVERAGE RATE DETERMINATION FOR FY2009

Table IX.B-1 shows a method used to determine the average water rate per ERU which should be divided among all system customers. Table IX.B-1 uses data for the year of the new debt service and uses the debt service as part of the equation.

Annual revenues must be sufficient to cover the expenses incurred by the construction, maintenance, and administration of the water system. These expenses include debt service, utilities, personnel salaries and benefits, system maintenance, legal and professional fees, and other miscellaneous items. It is strongly recommended that the water department maintain a funded depreciation account or a replacement fund to provide the money necessary for replacement and repair of water department facilities and pipelines. The loan for the proposed project may require a fund where at least 5% of the expenses, including debt service, be set aside for this purpose.

The total revenue for User Fees, FY2008 was $582,102 (not including connection fees, impact fees, or late fees). This amount divided by the estimated total number of ERUs in the system that year, 1,493, and again by 12 months, results in $32.49 per ERU per month, the average total cost per month that each ERU connected to the system paid in 2008 **(note that LaVerkin city has increased its rate structure since, but new average rate information is not yet available)**. Based on the calculations shown in Table VIII.B-1, the average water rate per residential connection (1 ERU) for any newly adopted rate structure for the year 2009 would need to be approximately **$34.48**. It should be noted that this assumes that the system has grown to 1,529 ERUs and that the City has chosen to pursue construction of the proposed improvements. It is estimated that this rate would allow LaVerkin City to pay the debt and operations costs associated with the culinary water system.

Table IX.B-1: Fixed Rate Analysis

TABLE IX.B-1 LAVERKIN CITY WATER FIXED RATE ANALYSIS						
FY 2009 Expenses		**Fixed**		**Variable**		**Total**
Salaries and Wages	$	375,778	$	-		$375,778
Supplies, Tools,&Vehicle Cost	$	122,855	$	40,952		$163,806
Other Expenses	$	17,797	$	17,797		$35,594
Interest Expense	$	7,026	$	-		$7,026
NEW DEBT SERVICE (NOT IMPACT FEE ELIGIBLE)						
New Loan(s)	$	18,494	$	-		$18,494
Loan Reserve (Payment/10)	$	1,800	$	-		$1,800
Renewal and Replacement Fund	$	15,065	$	15,065		$30,129
Total Expenses:	$	558,814	$	73,813	**$**	**632,627**
Total Projected System ERUs in FY2009		1,529		1,529		1,529
Monthly Cost/ERU in FY2009		$30.46		$4.02		**$34.48**

C. BASE AND OVERAGE RATE DETERMINATION

This Plan includes separating the average user rate into base and overage rates, and investigates possible rate structures that would promote conservation and work hand-in-hand with drought management policies. In order to determine a base and overage schedule, the projected expenses of the water system for FY2009 have been separated

into fixed and variable expenses (Table IX.B-1). It is recommended that the base rate should cover the fixed expenses of a system. However, LaVerkin City may decide to reduce the base rate and increase the variable costs in order to promote conservation. Table IX.B-1 suggests a possible scenario for determining base and overage rates for LaVerkin City. Included in the base rate is $30.46 for fixed costs and $4.02 for variable costs. This rate scenario simply identifies base and overage rates that should satisfy the revenue requirements based on estimated operation and maintenance (O&M) expenses and on projected water usage. LaVerkin City is able to set the rate structure to any amount it deems to be fair. However, the rates should be such that the system remains financially viable.

LaVerkin City will need to determine a rate schedule that will result in revenues that will average $34.48/ERU/month in order to provide the necessary culinary water system improvements as recommended in this Plan and maintain the current level of O&M. The base and overage rates should be examined each year to ensure that enough revenue is being generated to cover the expenses.

D. POSSIBLE RATE STRUCTURE

Tables IX.D-1 and IX.D-2 illustrate possible rate structures based on the base and overage rates suggested in Section C. The overage rate structure is stepped to promote conservation by charging a higher amount for excessive water usage. The tables also include some examples of water bills based on the proposed rate structure and show bills based on existing rates for comparison. An amount is shown for the average monthly water use of approximately 12,000 gallons which is based on the historical average usage of 371 gpd. The way to confirm that the average rate produced will cover annual expenses is to implement the structure and evaluate the results after a full year of use.

Calculations show that the newly adopted rate structure will provide an average rate which will be higher than the rate needed to sustain the system for the next five years. It is recommended that excess funds generated by the existing rate be saved in an interest bearing Renewal and Replacement account for expenditures on future projects.

Table IX.D-1: Possible Water Rate Structure

TABLE IX.D-1 LAVERKIN CITY WATER Possible Water Rate Structure		
Base Rate	$25.00	ERU/Month
Includes	0	Gallons
Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons
$0.75	0	5,000
$0.90	5,001	15,000
$1.15	15,001	25,000
$1.45	25,001	40,000
$1.85	40,001	55,000
$2.35	55,001	& Up
Usage	Rates	
(Gallons)	New Rate	
0	$ 25.00	
12,000	$ 35.05	
17,000	$ 40.05	
25,000	$ 49.25	
40,000	$ 71.00	
110,000	$ 227.99	

Table IX.D-2 Other Possible Water Rate Structures

TABLE IX.D-2 LAVERKIN CITY WATER Other Possible Water Rate Structures					
Base Rate	$31.00	ERU/Month	Base Rate	$31.00	ERU/Month
Includes	10,000	Gallons	Includes	5,000	Gallons
Overage Steps			Overage Steps		
Cost Per 1,000 Gal.	Low Gallons	High Gallons	Cost Per 1,000 Gal.	Low Gallons	High Gallons
$1.80	10,000	15,000	$0.55	5,000	15,000
$2.05	15,001	25,000	$0.80	15,001	25,000
$2.35	25,001	35,000	$1.10	25,001	35,000
$2.70	35,001	50,000	$1.45	35,001	50,000
$3.10	50,001	65,000	$1.85	50,001	65,000
$2.45	65,001	& Up	$2.35	65,001	& Up
Usage	In Town Rates		Usage	In Town Rates	
(Gallons)	New Rate		(Gallons)	New Rate	
0	$ 31.00		0	$ 31.00	
12,000	$ 34.60		12,000	$ 34.85	
17,000	$ 44.10		17,000	$ 38.10	
25,000	$ 60.50		25,000	$ 44.50	
40,000	$ 97.49		40,000	$ 62.75	
110,000	$ 281.24		110,000	$ 210.74	

E. SUMMARY

The water rate structures described in this section should provide the funding necessary to maintain the system and implement the recommended system improvements. Water rates and fees should be reviewed by LaVerkin City periodically to ensure that they keep up with inflation rates and increased costs in system maintenance. The Cash Flow Projection included in Appendix E assumes a yearly rate increase based on inflation.

LaVerkin City does not have to adopt the amounts shown in the rate analysis. However, the rates suggested are calculated to be enough to ensure that the water fund remains viable.

SECTION X
IMPACT FEES

A. IMPACT FEE

This report constitutes a capital facilities plan to determine the public facilities requirement to serve development resulting from new development activity. An impact fee that is charged by a community may be used to pay for capital costs and the debt service associated with surplus capacity built into the system. The surplus capacity in the water system can be assessed to growth, and for this reason, impact fees can pay for that portion of the debt service associated with the system surplus capacity. The impact fee should also be used to pay for the cost of improvements to the system that are required to support new growth as new connections are added to the system. It is recommended that an impact fee be charged on all new connections at the time of plat approval to help with the necessary capital improvements that LaVerkin City will be taking on. It should be noted that the connection fees may not be combined into the impact fee. The State of Utah has mandated that connection fees may only be charged for the actual costs of the connection into the water system.

B. CALCULATION

The total cost that is eligible for the impact fee assessment is equal to the existing debt service from previous water improvements projects that can be attributed to new growth plus the portion of any planned water improvements project that will be constructed in the next 6 years to accommodate new growth. The combined total cost that is due to new growth is divided by the projected number of new ERUs that will be added to the system within the service area. The proposed Water Improvements Project has no impact by new growth and therefore has no affect on the impact fees. The future improvements mentioned in Section VII. C-2 is based completely on new growth and does affect the impact fees. The impact fee calculation found in Table X.B-2 shows that the <u>maximum</u> impact fee that LaVerkin City may assess each new ERU is $836. LaVerkin City is free to charge less than the maximum if it decides to do so, but should ensure that collected impact fees are sufficient to cover future culinary water system needs. Please note that this impact fee calculation assumes that LaVerkin City is in agreement with WCWCD Regional Water Supply Agreement and thus will not need to purchase any additional water right. Should the City choose otherwise, the impact fee should be adjusted accordingly.

To simplify the process of determining the total impact fee for large water users, LaVerkin City may choose to base impact fees on service connections and water meter sizes. Table X.B-1 assumes that a ¾” water service connection is equivalent to 1 ERU and would pay an impact fee of $836 or less. For larger meters the base impact fee of $836 is increased according to the percent increase in flow capacity of each size of meter.

It is important to note that these impact fees are for the improvements suggested in Section VII and do not provide for the City to design and build anything beyond the proposed projects. All new additions to the system will need to be considered in the impact fee calculations. Otherwise the developer should be required to make the improvements.

Table X.B-2: Impact Fee Analysis FY2009

TABLE X.B-1

LAVERKIN CITY WATER

IMPACT FEE ANALYSIS FY2009

CULINARY WATER MASTER PLAN

6/19/09

EXISTING DEBT SERVICE	**% Eligible**		**Eligible**
1999 Water Revenue	100%	$	393,278
Existing Impact Fee Eligible Cost:		$	393,278
PROPOSED IMPROVEMENT PROJECTS			
Total Remaining Estimated 2009 Project Cost		$	760,300
Total Estimated 2015 Project Cost		$	404,200
% Of 2009 Project Cost Due to New Growth	0.0%	$	-
Interest From New Debt Service		$	-
% Of 2015 Project Cost Due to New Growth	100.0%	$	404,200
Impact Fee Eligible Cost		$	404,200
1999 Project			
No. of ERUs (2009)			1,507
Future ERU's (end of existing debt 2024)			2,312
No. of New ERU's Due to Growth			805
2015 Projected project			
No. of ERUs (2009)			1,507
Future ERUs (20 year projection)			2,669
No. of New ERU's Due to Growth			1,162
Impact Fee Eligible Cost for Improvement Projects		$	797,478
Impact Fee Amount for Improvement Projects = Total Eligible Cost / New ERU's		$	836 /Conn.
Additional Amount per connection for Future Water Rights		$	- /Conn.
Proposed Impact Fee for LaVerkin Water Users (FY2007) =		**$**	**836** /Conn.

Size	Sectional	Increase	Impact Fee
3/4"	0.44	0%	$ 836
1"	0.79	80%	$ 1,502
1 1/2"	1.77	302%	$ 3,365
2"	3.14	614%	$ 5,969
3"	7.07	1507%	$ 13,439
4"	12.57	2757%	$ 23,894
6"	28.27	6325%	$ 53,738

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APPENDIX A

FIVE POINT ANALYSIS

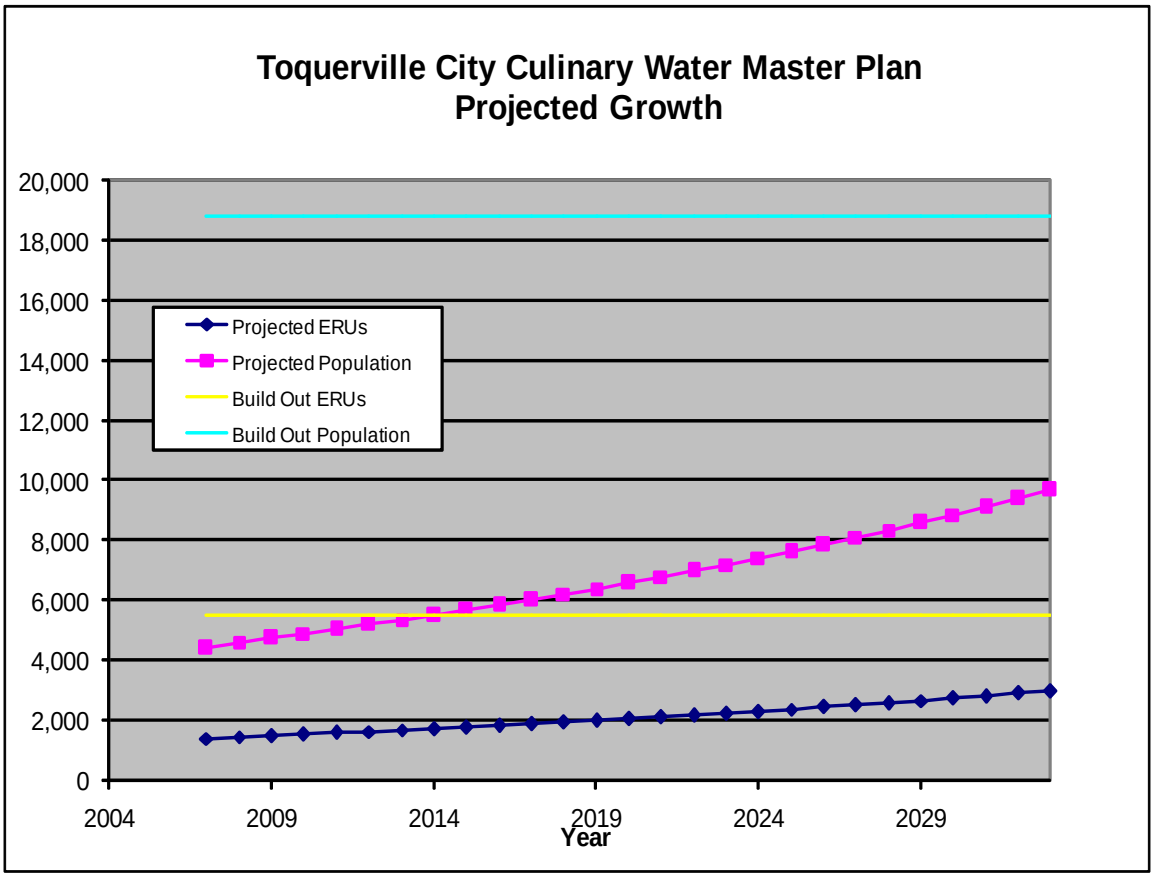
1. Population & Usage Data

Population Data

	Population	% Growth
1970 Census Population	463	
1980 Census Population	1,174	9.8%
1990 Census Population	1,786	4.3%
2000 Census Population	3,392	6.6%
2007 Census Population	4,624	6.4%

9.8%	Growth rate experienced between 1970 & 1980
4.3%	Growth rate experienced between 1980 & 1990
7.0%	Growth rate experienced between 1970 & 1990
6.6%	Growth rate experienced between 1990 & 2000
6.9%	Growth rate experienced between 1970 & 2000
6.4%	Growth rate experienced between 2000 & 2005
6.8%	Growth rate experienced between 1970 & 2005

Growth Rate for 20 Year Residential Projections	3.0%
Growth Rate for 20 Year Commercial Projections	1.5%
Projected 20 Year Population (2029)	8,602
Projected 20 Year ERU's (2029)	2,669



Year	Census Population	Annual Growth Rate	
1970	463	-	-
1980	1,174	1970-1980	9.8%
1990	1,786	1980-1990	4.3%
2000	3,392	1990-2000	6.6%
2008	4,624	2000-2008	3.9%

Year	Est. Residential Growth Rate	Estimated Residential ERUs	Estimated Commercial ERUs	Other ERUs	Estimated ERUs	Estimated Population	Irrigation connections	Resedential ERUs with out Irrigation
2006	-	1,211	97	15	1,323	4,147		
2007	-	1,296	98	16	1,410	4,434		
2008	-	1,350	99	16	1,465	4,624	1,094	256
2009	3.0%	1,390	101	16	1,507	4,763	1,127	263
2010	3.0%	1,432	102	16	1,551	4,906	1,161	271
2011	3.0%	1,475	104	17	1,596	5,053	1,195	279
2012	3.0%	1,519	106	17	1,642	5,204	1,231	288
2013	3.0%	1,565	107	17	1,689	5,360	1,268	296
2014	3.0%	1,612	109	17	1,738	5,521	1,306	305
2015	3.0%	1,660	110	18	1,788	5,687	1,345	315
2016	3.0%	1,710	112	18	1,840	5,858	1,386	324
2017	3.0%	1,761	114	18	1,893	6,033	1,427	334
2018	3.0%	1,814	115	18	1,948	6,214	1,470	344
2019	3.0%	1,868	117	19	2,004	6,401	1,514	354
2020	3.0%	1,924	119	19	2,062	6,593	1,560	365
2021	3.0%	1,982	121	19	2,122	6,790	1,607	376
2022	3.0%	2,042	123	20	2,184	6,994	1,655	387
2023	3.0%	2,103	124	20	2,247	7,204	1,704	398
2024	3.0%	2,166	126	20	2,312	7,420	1,756	410
2025	3.0%	2,231	128	21	2,380	7,643	1,808	423
2026	3.0%	2,298	130	21	2,449	7,872	1,862	435
2027	3.0%	2,367	132	21	2,520	8,108	1,918	448
2028	3.0%	2,438	134	21	2,593	8,351	1,976	462
2029	3.0%	2,511	136	22	2,669	8,602	2,035	476
2030	3.0%	2,586	138	22	2,746	8,860	2,096	490
2031	3.0%	2,664	140	22	2,826	9,126	2,159	505
2032	3.0%	2,744	142 [1]	23	2,909	9,400	2,224	520
2033	3.0%	2,826	144	23	2,993	9,682	2,291	535
2034	3.0%	2,911	146	23	3,081	9,972	2,359	552

* Estimated Population is determined by multiplying the Estimated Residential ERU's by 3.4

Historic Usage Data

Month & Year	Water Usage Data				Connection Data		
	Residental	Commercial	City	Other	Residental	Commercial	Other
Jan-07	9,124	671	527	108			
Feb-07	9,833	724	568	116	1,340	16	8
Mar-07	10,579	779	611	125			
Apr-07	25,495	1,876	1,473	300	1,337	16	8
May-07	14,713	1,083	850	173			
Jun-07	20,755	1,527	1,199	245			
Jul-07	20,787	1,530	1,201	245	1,350	16	8
Aug-07	27,948	2,057	1,615	329			
Sep-07	19,605	1,443	1,133	231			
Oct-07	15,997	1,177	924	189	1,353	16	8
Nov-07	9,635	709	557	114			
Dec-07	9,151	673	529	108			
Jan-08	10,345	761	598	122	1,359	16	8
Feb-08	8,692	640	502	102	1,370	16	8
Mar-08	6,758	497	391	80			
Apr-08	13,809	1,016	798	163			
May-08	14,604	1,075	844	172	1,361	16	8
Jun-08	29,919	2,202	1,729	353	1,366	16	8
Jul-08	10,796	794	624	127			
Aug-08	21,781	1,603	1,259	257	1,335	16	8
Sep-08	18,465	1,359	1,067	218			
Oct-08	14,976	1,102	865	176			
Nov-08	14,037	1,033	811	165			
Dec-08	7,977	587	461	94	1,319	16	8

Year	Yearly Averages in 1,000 Gallons				Average Yearly Connections		
2007	193,622	14,248	11,190	2,282	1,348	16	8
2008	172,158	12,668	9,949	2,029	1,352	16	8

Year	Monthly Averages by Year (Gallons)			
2007 Ave	16,135,150	1,187,330	932,469	190,135
2008 Ave	14,346,470	1,055,707	829,099	169,057

Year	Avg Residential Usage Per Connection	
	Residential	
	Monthly	Daily
2007	11,971	394

Year	Residential Connections	Commercial Connections	Other Connections	**Total Connections**
2007	1,348	16	8	1,372
2008	1,352	16	8	1,376
*2009	1,406	16	8	1,430

** Projected data using Utah Projected Growth Rates*

Average Usage Per Connection

	2007	2008	Average
Residential			
Usage (gallons)	193,621,796	172,157,639	182,889,717
Connections (ERUs)	1,348	1,352	1,350
Usage Per Connection (gal/year)	143,658	127,367	135,512
Daily Usage Per Connection (gal/day)	394	349	**371**
Commercial			
Usage (gallons)	14,247,962	12,668,489	13,458,225
Connections	16	16	16
Usage Per Connection (gal/year)	890,498	791,781	841,139
Daily Usage Per Connection (gal/day)	2,440	2,169	2,304
Equivalent Residential Unit	6.20	6.22	6.21
Commercial ERUs	99	99	99
Other			
Usage (gallons)	2,281,616	2,028,685	2,155,150
Connections	8	8	8
Usage Per Connection (gal/year)	285,202	253,586	269,394
Daily Usage Per Connection (gal/day)	781	695	738
Equivalent Residential Unit	1.99	1.99	1.99
Other ERUs	16	16	16
Total ERUs	1,463	1,467	**1,465**

2. Water Rights Data

Culinary Water Rights		Flow		
W.R. #	Source	gpm	cfs	AcFt
81-1073	Upper Ash Creek Springs	134.6	0.300	72.0
81-2287	Toquerville Springs	149.5	0.333	241.0
81-687	Upper Ash Creek Springs	220.4	0.491	71.3
81-1602	Ash Creek Spring & Upper Ash Creek Spring	448.8	1.000	330.0
	Total Water Rights	**953.3**	**2.124**	**714.3**

Other Water Rights of Interest			Flow		
W.R. #		Source	gpm	cfs	AcFt
81-2481	Industrial	Virgin River	13.3	0.0297	20.0
81-2477	Irrigation	Virgin River			
a13530	Irrigation	Virgin River	3,576.9	7.970	1,640.2
81-4334	Irrigation	Virgin River	1,346.4	3.000	990.0
		Total Other Water Rights	**4,936.7**	**11.0**	**2,650.2**

Average Water Right Required	2009	2029	2034	
ERU's	1,507	2,669	9,972	ERU's
Average Water Use (Indoor + Outdoor) (gpd)	371	371	371	gpd/ERU
Required Water Right (Indoor + Outdoor) (gpm)	388	688	2,569	gpm
Required Water Right (Indoor + Outdoor) (AcFt)	626	1,109	4,144	Ac-Ft
Culinary System Water Right Surplus/(Deficit) (gpm)	565	266	(1,616)	gpm
Culinary System Water Right Surplus/(Deficit) (AcFt)	88	(395)	(3,430)	Ac-Ft

Current Required Water Right

Using LaVerkin City Historic Average Consumption 371 gpd/conn.

Table 3.B-1

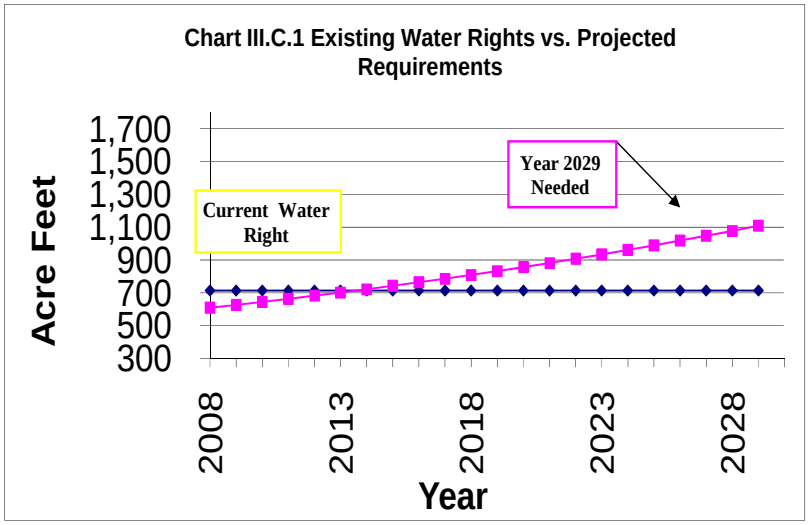
Average Demand (Total Use)									
1,507	ERU's X	371 gpd X	1 day X	1 hr	=	388	gpm		
		ERU	24 hr	60 min.					
1,507	ERU's X	371 gpd X	365 day X	1 Acft.	=	626	Acft		
		ERU	1 yr	325,829 gal					
	Total Required Water Right					**626**	**Acft**	**388**	**gpm**
	Existing Culinary System Water Right Surplus					**88**	**Acft**	**565**	**gpm**

Projected 20 Year Required Water Right

Using LaVerkin City Historic Average Consumption 371 gpd/conn.

Table 3.C-1

Average Demand (Total Use)									
2,669	ERU's X	371 gpd X	1 day X	1 hr	=	688	gpm		
		ERU	24 hr	60 min.					
2,669	ERU's X	371 gpd X	365 day X	1 Acft.	=	1,109	Acft		
		ERU	1 yr	325,829 gal					
	Total Required Water Right					**1,109**	**Acft**	**688**	**gpm**
	Existing Culinary System Water Right Deficit					**(395)**	**Acft**	**266**	**gpm**



Minimum Required Water Right

Year	Water Right Available AcFt.	Build Out AcFt.
2006	714	550
2007	714	586
2008	714	609
2009	714	626
2010	714	645
2011	714	663
2012	714	682
2013	714	702
2014	714	722
2015	714	743
2016	714	765
2017	714	787
2018	714	810
2019	714	833
2020	714	857
2021	714	882
2022	714	908
2023	714	934
2024	714	961
2025	714	989
2026	714	1,018
2027	714	1,047
2028	714	1,078
2029	714	1,109
2030	714	1,141
2031	714	1,174
2032	714	1,209
2033	714	1,244
2034	714	1,280

Water Rights Surplus/(Deficit) (395)

3. Water Source Capacity

LaVerkin City Sources	Total Flow	
	CFS	gpm
Upper Ash Creek Springs	0.300	135
Toquerville Springs	0.333	149
Upper Ash Creek Springs	0.491	220
Ash Creek Spring & Upper Ash Creek Spring	1.000	449
Source Total =	**2.124**	**953**

Report Table 4.B-1

Required Indoor/Outdoor Source

1,507	ERU's X	742 gpd X / ERU	1 day X / 24 hr	1 hr / 60 min.	=	777	gpm

Total Required Source Capacity	**777**	**gpm**
Existing Culinary System Source Capacity Surplus	**177**	**gpm**

Report Table 4.C-1

Required Indoor/Outdoor Source

2,669	ERU's X	742 gpd X / ERU	1 day X / 24 hr	1 hr / 60 min.	=	1,375	gpm

Total Required Source Capacity	**1,375**	**gpm**
Projected Culinary System Source Capacity Deficit	**(422)**	**gpm**

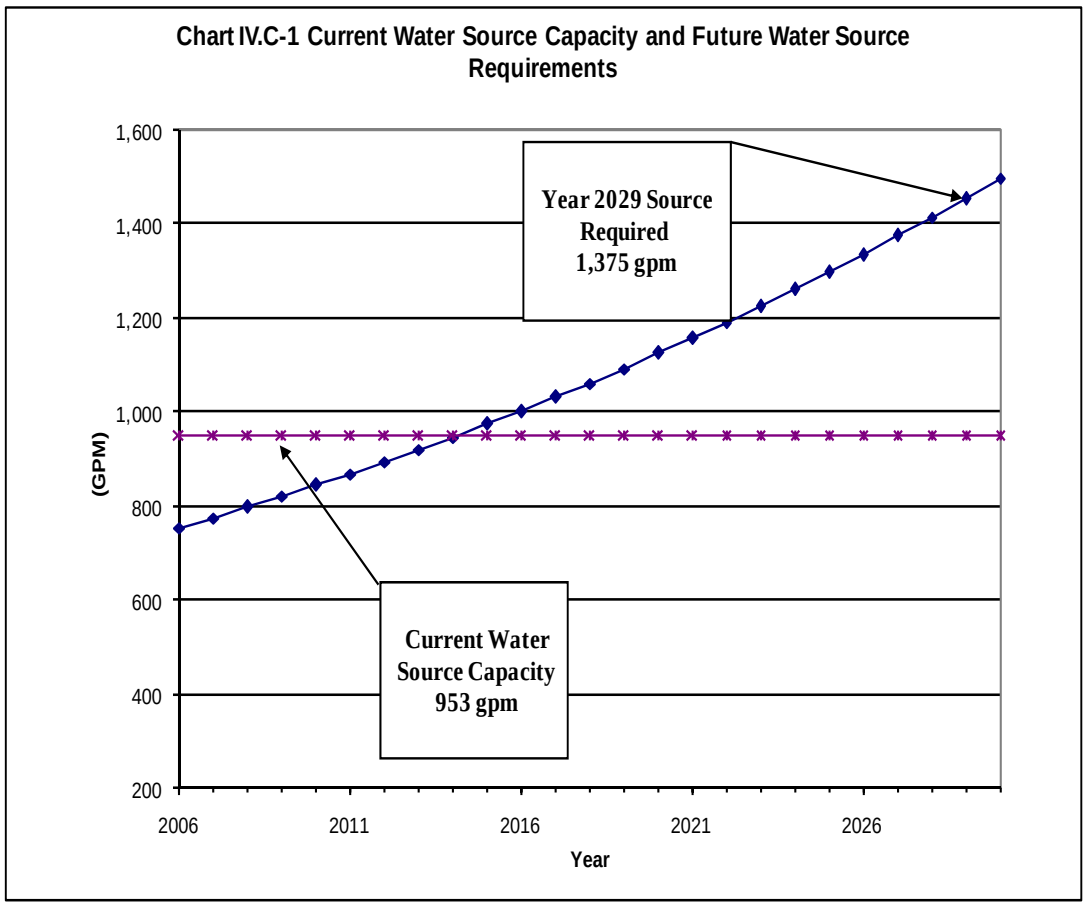


Chart IV.C-1 Current Water Source Capacity and Future Water Source Requirements
1,600
1,400
1,200
1,000
800
600
400
200
(GPM)
2006
2011
2016
2021
2026
Year
Year 2029 Source Required 1,375 gpm
Current Water Source Capacity 953 gpm

Water Storage Capacity:

Report Table 5.A-1

Existing Storage Capacity:		
Lower Tank	1,500,000	gal.
Upper Tank	1,000,000	gal.
Total Existing Capacity	**2,500,000**	**gal.**

Report Table 5.B-1

Existing Required Storage Capacity Based On
LaVerkin City Historic Average Consumption

		371	gpd	X	1,507	ERU			=	559,097	gpd
			ERU								
1,000	gpm	X	60	min	X		2	hr	=	120,000	gal.
			1	hr							
									Total Existing Required Storage	679,097	gal.
									Total Existing Capacity	2,500,000	gal.
									Existing Capacity Surplus	1,820,903	gal.

Report Table 5.C-1

Required Storage Capacity in 2029
Using LaVerkin City Historic Average Consumption

		371	gpd	X	2,669	ERU			=	990,199	gpd
			ERU								
1,000	gpm	X	60	min	X		2	hr	=	120,000	gal.
			1	hr							
									Total Required Storage	1,110,199	gal.
									Total Existing Capacity	2,500,000	gal.
									Future Capacity Surplus	1,389,801	gal.

Water Distribution:

Total Current ERU's = 1,507

Existing Distribution Requirement:

Report Table 7.A-1

Indoor Peak Instantaneous Demand:

Q= 10.8 X N^.64 N= Number of ERU's

Q= 10.8 X (1507) ^.64

Q= = 1,168 gpm

Outdoor Peak Instantaneous Demand:

380 ERU. X 0.13 acre / ERU X 9.8 gpm / irr. acre = 484 gpm

Current Peak Instantaneous Demand = **1,652 gpm**

Peak Day Demand & Fire Flow

1,507 ERU's X 742 gpd / ERU X 1 day / 24 hr 1 hr / 60 min. = 777 gpm

Fire Flow = 1,000 gpm

Current Peak Day Demand + Fire Flow = **1,777 gpm**

Total Projected ERU's = 2,669

Distribution Requirement for projected 20 year growth:

Report Table 7.B-1

Indoor Peak Instantaneous Demand:

Q= 10.8 X N^.64 N= Number of ERU's

Q= 10.8 X 2,669 ^.64

Q= = 1,684 gpm

Outdoor Peak Instantaneous Demand:

634 ERU. X 0.13 acre / conn. X 9.8 gpm / irr. acre = 808 gpm

Projected Peak Instantaneous Demand = **2,491 gpm**

Peak Day Demand & Fire Flow

2,669 ERU's X 742 gpd / ERU X 1 day / 24 hr 1 hr / 60 min. = 1,375 gpm

Fire Flow = 1,000 gpm

Projected Peak Day Demand + Fire Flow = **2,375 gpm**

Category	Unit	Existing	Current Requirement	Existing Surplus/ (Deficit)	Requirement at Build-Out	Build-Out Surplus/ (Deficit)	Estimated Year of Deficit
Water Rights	ac-ft	714	626	88	1,109	(395)	2014
Water Source Capacity	gpm	953	777	177	1,375	(422)	2014
Water Storage Capacity	gallons	2,500,000	679,097	1,820,903	1,110,199	1,389,801	After projected date
Water Distribution (PI)	gpm		1,777		2,491		

APPENDIX B

H2ONET® ANALYSIS

-Current Distribution System Peak Day Pressures
- Current Distribution System Peak Day with Fire Flow
- Current Distribution System Peak Instantaneous Pressures

-Future Distribution System Peak Day Pressures
-Future Distribution System Peak Day with Fire Flow
-Future Distribution System Peak Instantaneous Pressures

	Future Peak Day Demand				Future Peak Day Demand with Fire Flows							Future Peak Instantaneous Demand			
ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow @Hydrant (gpm)	Available Flow Pressure (psi)	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J10	3.37	3,120.00	3,379.09	112.26	3.37	112.26	3,379.09	1,000.00	101.28	3,560.44	20.13	6.12	3,120.00	3,369.05	107.91
J100	3.37	3,238.00	3,379.72	61.41	3.37	61.41	3,379.72	1,500.00	35.86	1,984.97	20.04	6.12	3,238.00	3,370.96	57.61
J102	3.37	3,239.00	3,379.24	60.76	3.37	60.76	3,379.24	1,500.00	52.52	4,371.56	20.19	6.12	3,239.00	3,369.50	56.54
J104	3.37	3,250.00	3,379.22	55.99	3.37	55.99	3,379.22	1,500.00	47.38	3,900.68	20.15	6.12	3,250.00	3,369.44	51.75
J106	3.37	3,246.00	3,379.14	57.69	3.37	57.69	3,379.14	1,000.00	47.1	2,164.75	20.05	6.12	3,246.00	3,369.19	53.38
J108	3.37	3,240.00	3,379.14	60.29	3.37	60.29	3,379.14	1,000.00	50.71	2,414.89	20.06	6.12	3,240.00	3,369.20	55.98
J110	3.37	3,228.00	3,379.03	65.44	3.37	65.44	3,379.03	1,000.00	55.44	2,541.34	20.06	6.12	3,228.00	3,368.88	61.04
J112	3.37	3,211.00	3,378.98	72.79	3.37	72.79	3,378.98	1,000.00	58.88	2,212.04	20.05	6.12	3,211.00	3,368.73	68.35
J114	3.37	3,218.00	3,378.98	69.75	3.37	69.75	3,378.98	1,000.00	56.16	2,170.69	20.05	6.12	3,218.00	3,368.71	65.3
J116	3.37	3,213.00	3,378.98	71.92	3.37	71.92	3,378.98	1,000.00	54.69	1,909.53	20.04	6.12	3,213.00	3,368.71	67.47
J118	3.37	3,250.00	3,378.97	55.88	3.37	55.88	3,378.97	1,000.00	46.26	2,272.86	20.05	6.12	3,250.00	3,368.71	51.44
J12	3.37	3,110.00	3,379.08	116.59	3.37	116.59	3,379.08	1,000.00	101.27	2,923.25	20.09	6.12	3,110.00	3,369.04	112.24
J120	3.37	3,245.00	3,379.01	58.07	3.37	58.07	3,379.01	1,000.00	50.03	2,691.12	20.07	6.12	3,245.00	3,368.81	53.65
J122	3.37	3,242.00	3,379.20	59.45	3.37	59.45	3,379.20	1,500.00	49.7	3,721.71	20.14	6.12	3,242.00	3,369.39	55.2
J124	3.37	3,244.00	3,379.18	58.57	3.37	58.57	3,379.18	1,000.00	45.34	1,886.57	20.04	6.12	3,244.00	3,369.34	54.31
J126	3.37	3,240.00	3,379.24	60.33	3.37	60.33	3,379.24	1,500.00	52.08	4,332.68	20.19	6.12	3,240.00	3,369.51	56.11
J128	3.37	3,240.00	3,379.24	60.33	3.37	60.33	3,379.24	1,500.00	45.67	2,773.48	20.08	6.12	3,240.00	3,369.51	56.12
J130	3.37	3,228.00	3,379.24	65.53	3.37	65.53	3,379.24	1,000.00	60.77	4,690.04	20.22	6.12	3,228.00	3,369.52	61.32
J132	3.37	3,218.00	3,379.25	69.87	3.37	69.87	3,379.25	1,000.00	65.14	4,995.40	20.25	6.12	3,218.00	3,369.54	65.66
J134	3.37	3,221.00	3,379.25	68.57	3.37	68.57	3,379.25	1,000.00	58.43	2,570.18	20.07	6.12	3,221.00	3,369.53	64.36
J136	3.37	3,240.00	3,379.24	60.33	3.37	60.33	3,379.24	1,000.00	50.06	2,286.09	20.05	6.12	3,240.00	3,369.53	56.12
J138	3.37	3,242.00	3,378.94	59.34	3.37	59.34	3,378.94	1,000.00	47.95	2,132.02	20.05	6.12	3,242.00	3,368.60	54.85
J14	3.37	3,096.00	3,379.09	122.66	3.37	122.66	3,379.09	1,000.00	106.89	2,963.19	20.09	6.12	3,096.00	3,369.04	118.31
J140	3.37	3,230.00	3,378.90	64.52	3.37	64.52	3,378.90	1,000.00	52.83	2,261.42	20.05	6.12	3,230.00	3,368.49	60.01
J142	3.37	3,209.00	3,378.84	73.59	3.37	73.59	3,378.84	1,000.00	58.83	2,165.49	20.05	6.12	3,209.00	3,368.29	69.02
J144	3.37	3,210.00	3,378.83	73.15	3.37	73.15	3,378.83	1,000.00	58.17	2,136.68	20.05	6.12	3,210.00	3,368.26	68.57
J146	3.37	3,209.00	3,378.82	73.58	3.37	73.58	3,378.82	1,000.00	58.61	2,148.97	20.05	6.12	3,209.00	3,368.24	69
J148	3.37	3,212.00	3,378.81	72.28	3.37	72.28	3,378.81	1,000.00	52.88	1,793.56	20.03	6.12	3,212.00	3,368.21	67.68
J150	3.37	3,231.00	3,378.82	64.05	3.37	64.05	3,378.82	1,000.00	45.2	1,652.86	20.03	6.12	3,231.00	3,368.25	59.47
J152	3.37	3,232.00	3,378.83	63.62	3.37	63.62	3,378.83	1,000.00	45.15	1,664.34	20.03	6.12	3,232.00	3,368.26	59.04
J154	3.37	3,239.00	3,378.94	60.64	3.37	60.64	3,378.94	1,000.00	47.92	2,015.48	20.04	6.12	3,239.00	3,368.60	56.16
J156	3.37	3,230.00	3,378.99	64.56	3.37	64.56	3,378.99	1,000.00	53.36	2,309.77	20.05	6.12	3,230.00	3,368.75	60.12
J158	3.37	3,220.00	3,379.17	68.97	3.37	68.97	3,379.17	1,000.00	61.18	3,153.57	20.1	6.12	3,220.00	3,369.29	64.69
J16	3.37	3,108.00	3,379.09	117.46	3.37	117.46	3,379.09	1,000.00	75.22	1,598.67	20.03	6.12	3,108.00	3,369.05	113.11
J160	3.37	3,210.00	3,379.27	73.34	3.37	73.34	3,379.27	1,500.00	65.46	5,335.84	20.28	6.12	3,210.00	3,369.59	69.15
J162	3.37	3,240.00	3,380.53	60.89	3.37	60.89	3,380.53	1,000.00	55.8	3,773.12	20.14	6.12	3,240.00	3,373.44	57.82
J164	3.37	3,245.00	3,380.61	58.76	3.37	58.76	3,380.61	1,000.00	54.37	4,221.29	20.18	6.12	3,245.00	3,373.66	55.75
J166	3.37	3,238.00	3,380.81	61.88	3.37	61.88	3,380.81	1,000.00	57.52	4,347.01	20.19	6.12	3,238.00	3,374.27	59.04
J168	3.37	3,248.00	3,380.85	57.57	3.37	57.57	3,380.85	1,000.00	53.66	4,561.11	20.21	6.12	3,248.00	3,374.41	54.77
J170	3.37	3,265.00	3,380.65	50.11	3.37	50.11	3,380.65	1,000.00	34.96	1,494.65	20.02	6.12	3,265.00	3,373.79	47.14
J172	3.37	3,250.00	3,381.17	56.84	3.37	56.84	3,381.17	1,000.00	53.64	5,452.71	20.3	6.12	3,250.00	3,375.39	54.33
J174	3.37	3,275.00	3,381.17	46	3.37	46	3,381.17	1,000.00	41.54	3,152.74	20.1	6.12	3,275.00	3,375.38	43.5
J176	3.37	3,296.00	3,381.17	36.91	3.37	36.91	3,381.17	1,000.00	31.49	2,076.27	20.04	6.12	3,296.00	3,375.38	34.4
J178	3.37	3,305.00	3,471.72	72.24	3.37	72.24	3,471.72	1,000.00	30.17	1,789.18	20.03	6.12	3,305.00	3,431.50	54.81
J18	3.37	3,110.00	3,379.09	116.6	3.37	116.6	3,379.09	1,000.00	85.73	1,907.14	20.04	6.12	3,110.00	3,369.06	112.25
J180	3.37	3,311.00	3,471.72	69.64	3.37	69.64	3,471.72	1,000.00	27.09	1,540.20	20.02	6.12	3,311.00	3,431.49	52.21
J182	3.37	3,328.00	3,471.72	62.27	3.37	62.27	3,471.72	1,000.00	19.67	973.57	20.01	6.12	3,328.00	3,431.49	44.84
J184	3.37	3,328.00	3,471.72	62.27	3.37	62.27	3,471.72	1,000.00	20.02	1,004.10	20.01	6.12	3,328.00	3,431.49	44.84
J186	3.37	3,330.00	3,471.72	61.41	3.37	61.41	3,471.72	1,000.00	20.04	1,006.73	20.01	6.12	3,330.00	3,431.50	43.98
J188	3.37	3,310.00	3,382.96	31.62	3.37	31.62	3,382.96	1,000.00	30.23	4,486.91	20.2	6.12	3,310.00	3,380.84	30.69
J190	3.37	3,295.00	3,382.46	37.9	3.37	37.9	3,382.46	1,000.00	35.1	3,110.81	20.1	6.12	3,295.00	3,379.29	36.52
J192	3.37	3,260.00	3,381.89	52.81	3.37	52.81	3,381.89	1,000.00	50.59	6,374.59	20.41	6.12	3,260.00	3,377.56	50.94
J194	3.37	3,237.00	3,381.27	62.51	3.37	62.51	3,381.27	1,000.00	55.81	2,959.73	20.09	6.12	3,237.00	3,375.69	60.09
J196	3.37	3,225.00	3,380.77	67.49	3.37	67.49	3,380.77	1,000.00	61.17	3,324.01	20.11	6.12	3,225.00	3,374.15	64.63
J198	3.37	3,223.00	3,380.43	68.21	3.37	68.21	3,380.43	1,000.00	60.68	3,008.60	20.09	6.12	3,223.00	3,373.12	65.05
J20	3.37	3,090.00	3,379.08	125.26	3.37	125.26	3,379.08	1,500.00	96.22	3,147.53	20.1	6.12	3,090.00	3,369.04	120.91
J200	3.37	3,242.00	3,380.39	59.97	3.37	59.97	3,380.39	1,000.00	53.9	3,243.70	20.1	6.12	3,242.00	3,373.01	56.77
J202	3.37	3,250.00	3,381.72	57.07	3.37	57.07	3,381.72	1,000.00	54.9	6,986.10	20.49	6.12	3,250.00	3,377.05	55.05
J204	3.37	3,266.00	3,382.05	50.28	3.37	50.28	3,382.05	1,000.00	48.4	6,459.52	20.42	6.12	3,266.00	3,378.05	48.55
J206	3.37	3,308.00	3,382.43	32.25	3.37	32.25	3,382.43	1,000.00	30.75	4,413.25	20.19	6.12	3,308.00	3,379.20	30.85
J208	3.37	3,335.00	3,471.72	59.24	3.37	59.24	3,471.72	1,000.00	13.55	574.82	20	6.12	3,335.00	3,431.49	41.81
J210	3.37	3,312.00	3,471.72	69.21	3.37	69.21	3,471.72	1,000.00	22.93	1,155.86	20.01	6.12	3,312.00	3,431.49	51.77
J212	3.37	3,310.00	3,471.72	70.07	3.37	70.07	3,471.72	1,000.00	20.95	1,042.86	20.01	6.12	3,310.00	3,431.49	52.64
J214	3.37	3,250.00	3,380.57	56.58	3.37	56.58	3,380.57	1,000.00	52.99	5,063.62	20.26	6.12	3,250.00	3,373.55	53.54
J216	3.37	3,219.00	3,380.29	69.89	3.37	69.89	3,380.29	1,000.00	65.95	5,584.61	20.31	6.12	3,219.00	3,372.69	66.59
J218	3.37	3,209.00	3,380.02	74.1	3.37	74.1	3,380.02	1,000.00	69.07	4,612.13	20.21	6.12	3,209.00	3,371.87	70.57
J22	3.37	3,079.00	3,379.08	130.03	3.37	130.03	3,379.08	1,000.00	104.08	2,268.89	20.05	6.12	3,079.00	3,369.03	125.67
J220	3.37	3,204.00	3,379.65	76.11	3.37	76.11	3,379.65	1,000.00	71.78	5,696.74	20.32	6.12	3,204.00	3,370.75	72.25
J222	3.37	3,201.00	3,379.41	77.3	3.37	77.3	3,379.41	1,500.00	69.78	5,758.17	20.33	6.12	3,201.00	3,370.03	73.24
J224	3.37	3,197.00	3,379.41	79.04	3.37	79.04	3,379.41	1,500.00	47.25	2,138.85	20.05	6.12	3,197.00	3,370.02	74.97
J226	3.37	3,194.00	3,379.27	80.28	3.37	80.28	3,379.27	1,500.00	72.25	5,663.41	20.32	6.12	3,194.00	3,369.61	76.09
J228	3.37	3,192.00	3,379.30	81.16	3.37	81.16	3,379.30	1,500.00	59.11	2,717.11	20.07	6.12	3,192.00	3,369.70	77
J230	3.37	3,198.00	3,380.03	78.87	3.37	78.87	3,380.03	1,000.00	59.5	1,885.75	20.04	6.12	3,198.00	3,371.90	75.35
J232	3.37	3,205.00	3,380.01	75.83	3.37	75.83	3,380.01	1,000.00	69.02	3,625.24	20.13	6.12	3,205.00	3,371.84	72.29
J234	3.37	3,219.00	3,380.15	69.83	3.37	69.83	3,380.15	1,000.00	63.64	3,649.05	20.13	6.12	3,219.00	3,372.27	66.41
J236	3.37	3,233.00	3,380.18	63.77	3.37	63.77	3,380.18	1,000.00	55.33	2,696.76	20.07	6.12	3,233.00	3,372.37	60.39
J238	3.37	3,256.00	3,380.24	53.83	3.37	53.83	3,380.24	1,000.00	49.7	4,203.09	20.18	6.12	3,256.00	3,372.55	50.5
J24	3.37	3,193.00	3,379.45	80.79	3.37	80.79	3,379.45	1,000.00	72.36	3,362.47	20.11	6.12	3,193.00	3,370.15	76.76
J240	3.37	3,292.00	3,380.24	38.23	3.37	38.23	3,380.24	1,000.00	31.32	1,850.98	20.03	6.12	3,292.00	3,372.55	34.9
J242	3.37	3,278.00	3,380.13	44.25	3.37	44.25	3,380.13	1,000.00	38.05	2,390.14	20.06	6.12	3,278.00	3,372.21	40.82
J244	3.37	3,256.00	3,380.05	53.75	3.37	53.75	3,380.05	1,000.00	49.29	3,928.85	20.15	6.12	3,256.00	3,371.96	50.25
J246	3.37	3,219.00	3,380.03	69.77	3.37	69.77	3,380.03	1,000.00	62.84	3,372.15	20.11	6.12	3,219.00	3,371.91	66.25
J248	3.37	3,194.00	3,379.17	80.23	3.37	80.23	3,379.17	1,000.00	56.3	1,696.26	20.03	6.12	3,194.00	3,369.30	75.96

J250	3.37	3,204.00	3,379.16	75.9	3.37	75.9	3,379.16	1,000.00	69.97	4,332.95	20.19	6.12	3,204.00	3,369.28	71.62
J252	3.37	3,224.00	3,379.04	67.18	3.37	67.18	3,379.04	1,000.00	60.38	3,505.53	20.12	6.12	3,224.00	3,368.90	62.79
J254	3.37	3,230.00	3,378.99	64.56	3.37	64.56	3,378.99	1,000.00	56.1	2,835.67	20.08	6.12	3,230.00	3,368.75	60.12
J256	3.37	3,230.00	3,378.94	64.54	3.37	64.54	3,378.94	1,000.00	56.62	2,995.00	20.09	6.12	3,230.00	3,368.61	60.06
J258	3.37	3,229.00	3,378.84	64.93	3.37	64.93	3,378.84	1,000.00	52.05	2,140.98	20.05	6.12	3,229.00	3,368.31	60.36
J26	3.37	3,110.00	3,379.09	116.6	3.37	116.6	3,379.09	1,000.00	108.48	4,618.39	20.21	6.12	3,110.00	3,369.07	112.26
J260	3.37	3,229.00	3,378.82	64.92	3.37	64.92	3,378.82	1,000.00	50.92	2,026.80	20.04	6.12	3,229.00	3,368.24	60.33
J262	3.37	3,231.00	3,378.81	64.05	3.37	64.05	3,378.81	1,000.00	47.84	1,822.01	20.03	6.12	3,231.00	3,368.21	59.45
J264	3.37	3,229.00	3,378.81	64.91	3.37	64.91	3,378.81	1,000.00	51.54	2,095.65	20.04	6.12	3,229.00	3,368.21	60.32
J266	3.37	3,228.00	3,378.81	65.35	3.37	65.35	3,378.81	1,000.00	53.56	2,304.86	20.05	6.12	3,228.00	3,368.21	60.75
J268	3.37	3,221.00	3,378.81	68.38	3.37	68.38	3,378.81	1,000.00	55.91	2,295.06	20.05	6.12	3,221.00	3,368.22	63.79
J270	3.37	3,221.00	3,378.89	68.41	3.37	68.41	3,378.89	1,000.00	56.55	2,354.22	20.06	6.12	3,221.00	3,368.44	63.89
J272	3.37	3,222.00	3,378.89	67.98	3.37	67.98	3,378.89	1,000.00	55.34	2,239.89	20.05	6.12	3,222.00	3,368.46	63.46
J274	3.37	3,221.00	3,378.90	68.42	3.37	68.42	3,378.90	1,000.00	58.37	2,647.10	20.07	6.12	3,221.00	3,368.48	63.9
J276	3.37	3,223.00	3,378.98	67.59	3.37	67.59	3,378.98	1,000.00	52.73	1,993.19	20.04	6.12	3,223.00	3,368.72	63.14
J278	3.37	3,212.00	3,378.97	72.35	3.37	72.35	3,378.97	1,000.00	44.12	1,424.80	20.02	6.12	3,212.00	3,368.71	67.9
J28	3.37	3,095.00	3,379.09	123.1	3.37	123.1	3,379.09	1,000.00	114.95	4,780.10	20.23	6.12	3,095.00	3,369.07	118.75
J280	3.37	3,221.00	3,378.90	68.42	3.37	68.42	3,378.90	1,000.00	57.91	2,564.33	20.07	6.12	3,221.00	3,368.48	63.9
J282	3.37	3,219.00	3,378.89	69.28	3.37	69.28	3,378.89	1,000.00	55.48	2,143.76	20.05	6.12	3,219.00	3,368.44	64.75
J284	3.37	3,219.00	3,378.90	69.29	3.37	69.29	3,378.90	1,000.00	51.15	1,798.02	20.03	6.12	3,219.00	3,368.49	64.78
J286	3.37	3,215.00	3,378.88	71.01	3.37	71.01	3,378.88	1,000.00	60.03	2,562.51	20.07	6.12	3,215.00	3,368.43	66.48
J288	3.37	3,211.00	3,378.81	72.71	3.37	72.71	3,378.81	1,000.00	58.69	2,228.32	20.05	6.12	3,211.00	3,368.21	68.12
J290	3.37	3,206.00	3,378.81	74.88	3.37	74.88	3,378.81	1,000.00	60.26	2,216.49	20.05	6.12	3,206.00	3,368.22	70.29
J292	3.37	3,221.00	3,378.82	68.39	3.37	68.39	3,378.82	1,000.00	57.74	2,565.28	20.07	6.12	3,221.00	3,368.25	63.81
J294	3.37	3,223.00	3,378.83	67.52	3.37	67.52	3,378.83	1,000.00	58.06	2,771.62	20.08	6.12	3,223.00	3,368.26	62.94
J296	3.37	3,205.00	3,378.86	75.33	3.37	75.33	3,378.86	1,000.00	67.29	3,441.37	20.12	6.12	3,205.00	3,368.37	70.79
J298	3.37	3,208.00	3,378.91	74.06	3.37	74.06	3,378.91	1,000.00	63.97	2,804.36	20.08	6.12	3,208.00	3,368.52	69.55
J30	3.37	3,175.00	3,379.09	88.43	3.37	88.43	3,379.09	1,000.00	80.7	3,922.77	20.15	6.12	3,175.00	3,369.06	84.09
J300	3.37	3,198.00	3,378.97	78.41	3.37	78.41	3,378.97	1,000.00	71.8	4,145.97	20.17	6.12	3,198.00	3,368.68	73.96
J302	3.37	3,198.00	3,378.96	78.41	3.37	78.41	3,378.96	1,000.00	71.58	4,034.63	20.16	6.12	3,198.00	3,368.65	73.94
J304	3.37	3,188.00	3,379.10	82.8	3.37	82.8	3,379.10	1,000.00	76.16	4,221.16	20.18	6.12	3,188.00	3,369.09	78.47
J306	3.37	3,187.00	3,379.10	83.24	3.37	83.24	3,379.10	1,000.00	72.49	2,892.17	20.08	6.12	3,187.00	3,369.09	78.9
J308	3.37	3,190.00	3,379.23	81.99	3.37	81.99	3,379.23	1,500.00	73.3	5,418.63	20.29	6.12	3,190.00	3,369.49	77.77
J310	3.37	3,188.00	3,378.97	82.75	3.37	82.75	3,378.97	1,000.00	57.89	1,699.78	20.03	6.12	3,188.00	3,368.69	78.29
J312	3.37	3,188.00	3,378.97	82.75	3.37	82.75	3,378.97	1,000.00	73.38	3,224.68	20.1	6.12	3,188.00	3,368.70	78.3
J314	3.37	3,194.00	3,378.96	80.14	3.37	80.14	3,378.96	1,000.00	73.18	4,028.46	20.16	6.12	3,194.00	3,368.67	75.68
J316	3.37	3,195.00	3,378.96	79.71	3.37	79.71	3,378.96	1,000.00	61.71	2,010.09	20.04	6.12	3,195.00	3,368.67	75.25
J318	3.37	3,189.00	3,378.96	82.31	3.37	82.31	3,378.96	1,000.00	75.2	4,032.66	20.16	6.12	3,189.00	3,368.67	77.85
J32	3.37	3,182.00	3,379.11	85.41	3.37	85.41	3,379.11	1,500.00	71.47	3,870.17	20.15	6.12	3,182.00	3,369.13	81.08
J320	3.37	3,179.00	3,378.99	86.66	3.37	86.66	3,378.99	1,000.00	78.4	3,674.76	20.13	6.12	3,179.00	3,368.76	82.22
J322	3.37	3,188.00	3,379.16	82.83	3.37	82.83	3,379.16	1,500.00	68.15	3,624.23	20.13	6.12	3,188.00	3,369.27	78.54
J324	3.37	3,187.00	3,379.30	83.32	3.37	83.32	3,379.30	1,000.00	76.63	4,109.51	20.17	6.12	3,187.00	3,369.69	79.16
J326	3.37	3,186.00	3,379.29	83.75	3.37	83.75	3,379.29	1,000.00	72.81	2,862.25	20.08	6.12	3,186.00	3,369.67	79.58
J328	3.37	3,184.00	3,379.29	84.62	3.37	84.62	3,379.29	1,000.00	70.68	2,455.32	20.06	6.12	3,184.00	3,369.68	80.45
J330	3.37	3,183.00	3,379.23	85.02	3.37	85.02	3,379.23	1,500.00	75.71	5,251.98	20.28	6.12	3,183.00	3,369.47	80.8
J332	3.37	3,179.00	3,379.02	86.67	3.37	86.67	3,379.02	1,000.00	78.41	3,659.27	20.13	6.12	3,179.00	3,368.84	82.26
J334	3.37	3,177.00	3,378.96	87.51	3.37	87.51	3,378.96	1,000.00	80.08	4,073.57	20.17	6.12	3,177.00	3,368.67	83.05
J336	3.37	3,187.00	3,378.90	83.15	3.37	83.15	3,378.90	1,000.00	72.34	2,936.20	20.09	6.12	3,187.00	3,368.48	78.63
J338	3.37	3,178.00	3,378.86	87.03	3.37	87.03	3,378.86	1,000.00	57.49	1,598.37	20.03	6.12	3,178.00	3,368.35	82.48
J34	3.37	3,182.00	3,379.11	85.41	3.37	85.41	3,379.11	1,500.00	73.93	4,489.91	20.2	6.12	3,182.00	3,369.11	81.08
J340	3.37	3,179.00	3,378.86	86.6	3.37	86.6	3,378.86	1,000.00	66.34	1,999.26	20.04	6.12	3,179.00	3,368.36	82.05
J342	3.37	3,188.00	3,378.85	82.7	3.37	82.7	3,378.85	1,000.00	71.94	2,952.42	20.09	6.12	3,188.00	3,368.35	78.14
J344	3.37	3,193.00	3,378.85	80.53	3.37	80.53	3,378.85	1,000.00	69.5	2,840.29	20.08	6.12	3,193.00	3,368.34	75.97
J346	3.37	3,208.00	3,378.82	74.02	3.37	74.02	3,378.82	1,000.00	62.13	2,528.34	20.06	6.12	3,208.00	3,368.25	69.44
J348	3.37	3,186.00	3,378.82	83.55	3.37	83.55	3,378.82	1,000.00	71.61	2,772.23	20.08	6.12	3,186.00	3,368.25	78.97
J350	3.37	3,216.00	3,378.82	70.55	3.37	70.55	3,378.82	1,000.00	58.61	2,426.01	20.06	6.12	3,216.00	3,368.25	65.97
J352	3.37	3,216.00	3,378.82	70.55	3.37	70.55	3,378.82	1,000.00	59.47	2,561.65	20.07	6.12	3,216.00	3,368.25	65.97
J354	3.37	3,195.00	3,378.82	79.65	3.37	79.65	3,378.82	1,000.00	65.97	2,428.95	20.06	6.12	3,195.00	3,368.24	75.07
J356	3.37	3,195.00	3,378.82	79.65	3.37	79.65	3,378.82	1,000.00	67.84	2,696.60	20.07	6.12	3,195.00	3,368.25	75.07
J358	3.37	3,195.00	3,378.82	79.65	3.37	79.65	3,378.82	1,000.00	67.91	2,708.72	20.07	6.12	3,195.00	3,368.25	75.07
J36	3.37	3,185.00	3,379.08	84.09	3.37	84.09	3,379.08	1,000.00	71.16	2,579.19	20.07	6.12	3,185.00	3,369.02	79.74
J360	3.37	3,189.00	3,379.41	82.51	3.37	82.51	3,379.41	1,000.00	74.04	3,354.02	20.11	6.12	3,189.00	3,370.03	78.44
J362	3.37	3,191.00	3,379.52	81.69	3.37	81.69	3,379.52	1,000.00	73.32	3,349.99	20.11	6.12	3,191.00	3,370.37	77.72
J364	3.37	3,196.00	3,379.68	79.59	3.37	79.59	3,379.68	1,000.00	73.01	3,918.72	20.15	6.12	3,196.00	3,370.85	75.76
J366	3.37	3,206.00	3,379.85	75.33	3.37	75.33	3,379.85	1,000.00	68.54	3,656.71	20.13	6.12	3,206.00	3,371.36	71.65
J368	3.37	3,250.00	3,379.88	56.28	3.37	56.28	3,379.88	1,000.00	50.46	3,228.81	20.1	6.12	3,250.00	3,371.46	52.63
J370	3.37	3,190.00	3,379.59	82.15	3.37	82.15	3,379.59	1,000.00	67.03	2,263.21	20.05	6.12	3,190.00	3,370.58	78.25
J372	3.37	3,195.00	3,379.57	79.97	3.37	79.97	3,379.57	1,000.00	71.31	3,223.07	20.1	6.12	3,195.00	3,370.51	76.05
J374	3.37	3,197.00	3,379.53	79.09	3.37	79.09	3,379.53	1,000.00	72.05	3,752.87	20.14	6.12	3,197.00	3,370.38	75.12
J376	3.37	3,256.00	3,379.66	53.58	3.37	53.58	3,379.66	1,000.00	48.36	3,445.80	20.12	6.12	3,256.00	3,370.79	49.74
J378	3.37	3,216.00	3,379.50	70.85	3.37	70.85	3,379.50	1,000.00	53.79	1,882.18	20.04	6.12	3,216.00	3,370.31	66.86
J38	3.37	3,187.00	3,379.06	83.22	3.37	83.22	3,379.06	1,000.00	75.25	3,662.63	20.13	6.12	3,187.00	3,368.98	78.85
J380	3.37	3,260.00	3,379.54	51.8	3.37	51.8	3,379.54	1,000.00	46.2	3,145.79	20.1	6.12	3,260.00	3,370.44	47.85
J382	3.37	3,208.00	3,379.50	74.31	3.37	74.31	3,379.50	1,000.00	66.31	3,241.46	20.1	6.12	3,208.00	3,370.30	70.33
J384	3.37	3,207.00	3,379.46	74.73	3.37	74.73	3,379.46	1,000.00	65.59	2,951.10	20.09	6.12	3,207.00	3,370.17	70.7
J386	3.37	3,255.00	3,379.46	53.93	3.37	53.93	3,379.46	1,000.00	48.02	3,139.13	20.1	6.12	3,255.00	3,370.20	49.91
J388	3.37	3,209.00	3,379.41	73.84	3.37	73.84	3,379.41	1,000.00	67.94	4,166.27	20.17	6.12	3,209.00	3,370.02	69.77
J390	3.37	3,188.00	3,379.31	82.89	3.37	82.89	3,379.31	1,000.00	72.19	2,879.92	20.08	6.12	3,188.00	3,369.72	78.74
J392	3.37	3,195.00	3,379.33	79.87	3.37	79.87	3,379.33	1,000.00	72.3	3,569.26	20.13	6.12	3,195.00	3,369.80	75.74
J394	3.37	3,198.00	3,379.27	78.55	3.37	78.55	3,379.27	1,500.00	67.76	4,337.31	20.19	6.12	3,198.00	3,369.62	74.36
J396	3.37	3,194.00	3,379.23	80.26	3.37	80.26	3,379.23	1,500.00	70.47	4,800.63	20.23	6.12	3,194.00	3,369.48	76.04
J398	3.37	3,184.00	3,379.02	84.5	3.37	84.5	3,379.02	1,000.00	60.62	1,768.49	20.03	6.12	3,184.00	3,368.84	80.09
J40	3.37	3,205.00	3,379.00	75.39	3.37	75.39	3,379.00	1,000.00	60.4	2,168.33	20.05	6.12	3,205.00	3,368.79	70.97
J400	3.37	3,203.00	3,379.27	76.38	3.37	76.38	3,379.27	1,000.00	68.88	3,507.02	20.12	6.12	3,203.00	3,369.61	72.19
J402	3.37	3,210.00	3,379.23	73.33	3.37	73.33	3,379.23	1,000.00	65.55	3,323.86	20.11	6.12	3,210.00	3,369.48	69.1
J404	3.37	3,218.00	3,379.23	69.86	3.37	69.86	3,379.23	1,000.00	60.31	2,736.99	20.07	6.12	3,218.00	3,369.48	65.64
J406	3.37	3,215.00	3,379.33	71.21	3.37	71.21	3,379.33	1,000.00	61.42	2,704.82	20.07	6.12	3,215.00	3,369.80	67.07
J408	3.37	3,207.00	3,379.33	74.67	3.37	74.67	3,379.33	1,000.00	65.72	2,990.97	20.09	6.12	3,207.00	3,369.80	70.54

J410	3.37	3,260.00	3,379.45	51.76	3.37	51.76	3,379.45	1,000.00	44.98	2,716.79	20.07	6.12	3,260.00	3,370.15	47.73
J412	3.37	3,273.00	3,379.45	46.12	3.37	46.12	3,379.45	1,000.00	38.87	2,286.85	20.05	6.12	3,273.00	3,370.14	42.09
J414	3.37	3,278.00	3,379.45	43.96	3.37	43.96	3,379.45	1,000.00	36.79	2,189.04	20.05	6.12	3,278.00	3,370.14	39.92
J416	3.37	3,285.00	3,379.45	40.92	3.37	40.92	3,379.45	1,000.00	33.04	1,871.97	20.03	6.12	3,285.00	3,370.14	36.89
J418	3.37	3,280.00	3,379.45	43.09	3.37	43.09	3,379.45	1,000.00	36.09	2,180.37	20.05	6.12	3,280.00	3,370.14	39.06
J42	3.37	3,195.00	3,379.00	79.73	3.37	79.73	3,379.00	1,000.00	65.95	2,392.98	20.06	6.12	3,195.00	3,368.79	75.3
J420	3.37	3,287.00	3,379.45	40.06	3.37	40.06	3,379.45	1,000.00	32.35	1,853.33	20.03	6.12	3,287.00	3,370.14	36.02
J422	3.37	3,275.00	3,379.45	45.26	3.37	45.26	3,379.45	1,000.00	36.85	2,003.97	20.04	6.12	3,275.00	3,370.14	41.22
J424	3.37	3,287.00	3,379.45	40.06	3.37	40.06	3,379.45	1,000.00	33.38	2,071.69	20.04	6.12	3,287.00	3,370.14	36.02
J426	3.37	3,292.00	3,379.45	37.89	3.37	37.89	3,379.45	1,000.00	30.49	1,779.88	20.03	6.12	3,292.00	3,370.14	33.86
J428	3.37	3,268.00	3,379.45	48.29	3.37	48.29	3,379.45	1,000.00	41.48	2,521.20	20.06	6.12	3,268.00	3,370.14	44.26
J430	3.37	3,270.00	3,379.45	47.42	3.37	47.42	3,379.45	1,000.00	39.55	2,208.59	20.05	6.12	3,270.00	3,370.14	43.39
J432	3.37	3,260.00	3,379.45	51.76	3.37	51.76	3,379.45	1,000.00	45.35	2,844.95	20.08	6.12	3,260.00	3,370.16	47.73
J434	3.37	3,260.00	3,379.46	51.76	3.37	51.76	3,379.46	1,000.00	45.69	2,970.03	20.09	6.12	3,260.00	3,370.19	47.74
J436	3.37	3,263.00	3,379.46	50.46	3.37	50.46	3,379.46	1,000.00	43.38	2,544.55	20.06	6.12	3,263.00	3,370.19	46.44
J438	3.37	3,275.00	3,379.46	45.26	3.37	45.26	3,379.46	1,000.00	38.03	2,234.60	20.05	6.12	3,275.00	3,370.17	41.24
J44	3.37	3,195.00	3,379.01	79.73	3.37	79.73	3,379.01	1,000.00	69.89	3,035.69	20.09	6.12	3,195.00	3,368.81	75.31
J440	3.37	3,283.00	3,379.45	41.79	3.37	41.79	3,379.45	1,000.00	34.39	2,006.47	20.04	6.12	3,283.00	3,370.15	37.76
J442	3.37	3,287.00	3,379.45	40.06	3.37	40.06	3,379.45	1,000.00	33.32	2,055.86	20.04	6.12	3,287.00	3,370.14	36.03
J444	3.37	3,292.00	3,379.45	37.89	3.37	37.89	3,379.45	1,000.00	30.45	1,772.25	20.03	6.12	3,292.00	3,370.14	33.86
J446	3.37	3,290.00	3,379.45	38.76	3.37	38.76	3,379.45	1,000.00	31.2	1,801.77	20.03	6.12	3,290.00	3,370.15	34.73
J448	3.37	3,286.00	3,379.45	40.49	3.37	40.49	3,379.45	1,000.00	33.78	2,088.46	20.04	6.12	3,286.00	3,370.15	36.46
J450	3.37	3,277.00	3,379.45	44.39	3.37	44.39	3,379.45	1,000.00	37.77	2,352.80	20.06	6.12	3,277.00	3,370.15	40.36
J452	3.37	3,267.00	3,379.46	48.73	3.37	48.73	3,379.46	1,000.00	42.27	2,654.54	20.07	6.12	3,267.00	3,370.17	44.7
J454	3.37	3,255.00	3,379.48	53.94	3.37	53.94	3,379.48	1,000.00	48.38	3,333.50	20.11	6.12	3,255.00	3,370.22	49.93
J456	3.37	3,258.00	3,379.22	52.52	3.37	52.52	3,379.22	1,000.00	30.45	1,254.66	20.02	6.12	3,258.00	3,369.44	48.29
J458	3.37	3,252.00	3,379.22	55.12	3.37	55.12	3,379.22	1,000.00	34.64	1,370.24	20.02	6.12	3,252.00	3,369.44	50.89
J46	3.37	3,183.00	3,379.02	84.94	3.37	84.94	3,379.02	1,000.00	73.91	2,923.70	20.09	6.12	3,183.00	3,368.85	80.53
J460	3.37	3,249.00	3,379.22	56.42	3.37	56.42	3,379.22	1,000.00	38.2	1,501.19	20.02	6.12	3,249.00	3,369.45	52.19
J462	3.37	3,250.00	3,379.24	56	3.37	56	3,379.24	1,500.00	44.72	3,115.24	20.1	6.12	3,250.00	3,369.51	51.78
J464	3.37	3,250.00	3,379.22	55.99	3.37	55.99	3,379.22	1,500.00	47.48	3,938.19	20.15	6.12	3,250.00	3,369.46	51.76
J466	3.37	3,249.00	3,379.24	56.43	3.37	56.43	3,379.24	1,500.00	48.19	4,072.59	20.17	6.12	3,249.00	3,369.51	52.22
J468	3.37	3,244.00	3,379.99	58.93	3.37	58.93	3,379.99	1,500.00	51.54	4,502.15	20.2	6.12	3,244.00	3,371.80	55.37
J470	3.37	3,242.00	3,380.10	59.84	3.37	59.84	3,380.10	1,500.00	52.62	4,637.17	20.21	6.12	3,242.00	3,372.13	56.39
J472	3.37	3,250.00	3,380.31	56.46	3.37	56.46	3,380.31	1,500.00	49.42	4,439.40	20.2	6.12	3,250.00	3,372.77	53.2
J474	3.37	3,250.00	3,380.61	56.59	3.37	56.59	3,380.61	1,000.00	52.79	4,788.23	20.23	6.12	3,250.00	3,373.68	53.59
J476	3.37	3,250.00	3,380.65	56.61	3.37	56.61	3,380.65	1,000.00	52.84	4,822.14	20.23	6.12	3,250.00	3,373.80	53.64
J478	3.37	3,270.00	3,380.65	47.94	3.37	47.94	3,380.65	1,000.00	25.45	1,134.96	20.01	6.12	3,270.00	3,373.79	44.97
J48	3.37	3,179.00	3,379.04	86.68	3.37	86.68	3,379.04	1,000.00	77.95	3,533.57	20.12	6.12	3,179.00	3,368.89	82.28
J480	3.37	3,238.00	3,380.60	61.79	3.37	61.79	3,380.60	1,000.00	57.35	4,340.44	20.19	6.12	3,238.00	3,373.64	58.77
J482	3.37	3,234.00	3,380.76	63.59	3.37	63.59	3,380.76	1,000.00	59.21	4,414.80	20.19	6.12	3,234.00	3,374.13	60.72
J484	3.37	3,250.00	3,380.87	56.71	3.37	56.71	3,380.87	1,000.00	53.23	5,137.63	20.26	6.12	3,250.00	3,374.48	53.94
J486	3.37	3,260.00	3,381.17	52.5	3.37	52.5	3,381.17	1,000.00	48.79	4,277.79	20.18	6.12	3,260.00	3,375.38	50
J488	3.37	3,260.00	3,381.17	52.5	3.37	52.5	3,381.17	1,000.00	43.1	2,081.57	20.04	6.12	3,260.00	3,375.38	50
J490	3.37	3,258.00	3,381.78	53.63	3.37	53.63	3,381.78	1,000.00	51.34	6,375.82	20.41	6.12	3,258.00	3,377.22	51.66
J492	3.37	3,267.00	3,382.12	49.88	3.37	49.88	3,382.12	1,000.00	47.86	6,366.18	20.4	6.12	3,267.00	3,378.27	48.21
J494	3.37	3,290.00	3,382.56	40.11	3.37	40.11	3,382.56	1,000.00	38.46	5,643.18	20.32	6.12	3,290.00	3,379.60	38.82
J496	3.37	3,268.00	3,382.17	49.47	3.37	49.47	3,382.17	1,000.00	46.7	4,206.90	20.18	6.12	3,268.00	3,378.41	47.84
J498	3.37	3,295.00	3,382.35	37.85	3.37	37.85	3,382.35	1,000.00	35.18	3,202.39	20.1	6.12	3,295.00	3,378.97	36.39
J50	3.37	3,243.00	3,379.16	59	3.37	59	3,379.16	1,000.00	50.42	2,563.91	20.07	6.12	3,243.00	3,369.28	54.72
J500	3.37	3,254.00	3,381.90	55.42	3.37	55.42	3,381.90	1,000.00	53.49	7,053.00	20.5	6.12	3,254.00	3,377.60	53.56
J502	3.37	3,254.00	3,381.90	55.42	3.37	55.42	3,381.90	1,000.00	53.54	7,341.25	20.54	6.12	3,254.00	3,377.61	53.56
J504	3.37	3,270.00	3,382.15	48.59	3.37	48.59	3,382.15	1,000.00	45.94	4,279.24	20.18	6.12	3,270.00	3,378.35	46.95
J506	3.37	3,294.00	3,382.35	38.28	3.37	38.28	3,382.35	1,000.00	35.82	3,450.68	20.12	6.12	3,294.00	3,378.95	36.81
J508	3.37	3,301.00	3,382.40	35.27	3.37	35.27	3,382.40	1,000.00	33.05	3,360.98	20.11	6.12	3,301.00	3,379.11	33.85
J510	3.37	3,301.00	3,382.43	35.28	3.37	35.28	3,382.43	1,000.00	33.71	4,892.33	20.24	6.12	3,301.00	3,379.21	33.89
J512	3.37	3,308.00	3,382.50	32.28	3.37	32.28	3,382.50	1,000.00	30.89	4,703.04	20.22	6.12	3,308.00	3,379.40	30.94
J514	3.37	3,270.00	3,381.72	48.41	3.37	48.41	3,381.72	1,000.00	44.07	3,124.53	20.1	6.12	3,270.00	3,377.05	46.38
J516	3.37	3,250.00	3,380.62	56.6	3.37	56.6	3,380.62	1,000.00	53.22	5,346.05	20.29	6.12	3,250.00	3,373.71	53.6
J518	3.37	3,250.00	3,381.69	57.06	3.37	57.06	3,381.69	1,000.00	54.85	6,991.68	20.49	6.12	3,250.00	3,376.95	55.01
J52	3.37	3,205.00	3,379.01	75.4	3.37	75.4	3,379.01	1,000.00	58.48	2,004.14	20.04	6.12	3,205.00	3,368.83	70.99
J520	3.37	3,250.00	3,380.72	56.64	3.37	56.64	3,380.72	1,000.00	53.35	5,462.50	20.3	6.12	3,250.00	3,374.00	53.73
J522	3.37	3,248.00	3,380.67	57.49	3.37	57.49	3,380.67	1,000.00	52.5	3,597.71	20.13	6.12	3,248.00	3,373.87	54.54
J524	3.37	3,227.00	3,380.39	66.47	3.37	66.46	3,380.39	1,000.00	62.64	5,463.32	20.3	6.12	3,227.00	3,373.01	63.27
J526	3.37	3,210.00	3,380.02	73.67	3.37	73.67	3,380.02	1,000.00	69.65	5,877.13	20.35	6.12	3,210.00	3,371.87	70.14
J530	3.37	3,209.00	3,379.96	74.08	3.37	74.08	3,379.96	1,000.00	69.99	5,812.43	20.34	6.12	3,209.00	3,371.69	70.49
J532	3.37	3,203.00	3,380.00	76.7	3.37	76.7	3,380.00	1,000.00	70.3	3,846.17	20.15	6.12	3,203.00	3,371.84	73.16
J534	3.37	3,216.00	3,380.14	71.12	3.37	71.12	3,380.14	1,000.00	65.78	4,187.79	20.18	6.12	3,216.00	3,372.24	67.7
J536	3.37	3,232.00	3,380.18	64.21	3.37	64.21	3,380.18	1,000.00	57.5	3,210.59	20.1	6.12	3,232.00	3,372.37	60.82
J538	3.37	3,215.00	3,380.03	71.51	3.37	71.51	3,380.03	1,000.00	65.17	3,694.72	20.14	6.12	3,215.00	3,371.90	67.98
J54	3.37	3,200.00	3,379.01	77.57	3.37	77.57	3,379.01	1,000.00	64.83	2,464.92	20.06	6.12	3,200.00	3,368.82	73.15
J540	3.37	3,195.00	3,379.66	80.01	3.37	80.01	3,379.66	1,000.00	73.9	4,197.49	20.18	6.12	3,195.00	3,370.80	76.17
J542	3.37	3,260.00	3,379.88	51.95	3.37	51.95	3,379.88	1,000.00	47.2	3,615.28	20.13	6.12	3,260.00	3,371.46	48.3
J544	3.37	3,196.00	3,379.52	79.52	3.37	79.52	3,379.52	1,000.00	72.97	4,016.13	20.16	6.12	3,196.00	3,370.36	75.55
J546	3.37	3,256.00	3,379.65	53.58	3.37	53.58	3,379.65	1,000.00	48.34	3,439.30	20.12	6.12	3,256.00	3,370.75	49.72
J548	3.37	3,198.00	3,379.50	78.65	3.37	78.65	3,379.50	1,000.00	69.63	3,108.07	20.1	6.12	3,198.00	3,370.32	74.66
J550	3.37	3,238.00	3,379.50	61.31	3.37	61.31	3,379.50	1,000.00	35.46	1,308.11	20.02	6.12	3,238.00	3,370.31	57.33
J552	3.37	3,212.00	3,379.43	72.55	3.37	72.55	3,379.43	1,000.00	66.69	4,130.34	20.17	6.12	3,212.00	3,370.09	68.5
J554	3.37	3,194.00	3,379.33	80.31	3.37	80.31	3,379.33	1,000.00	74.41	4,466.96	20.2	6.12	3,194.00	3,369.80	76.17
J556	3.37	3,194.00	3,379.33	80.3	3.37	80.3	3,379.33	1,000.00	74.41	4,473.93	20.2	6.12	3,194.00	3,369.79	76.17
J558	3.37	3,199.00	3,379.27	78.11	3.37	78.11	3,379.27	1,500.00	67.35	4,325.00	20.19	6.12	3,199.00	3,369.61	73.92
J56	3.37	3,201.00	3,379.01	77.13	3.37	77.13	3,379.01	1,000.00	67.19	2,928.91	20.09	6.12	3,201.00	3,368.80	72.71
J560	3.37	3,200.00	3,379.23	77.66	3.37	77.66	3,379.23	1,500.00	67.72	4,612.85	20.21	6.12	3,200.00	3,369.49	73.44
J562	3.37	3,200.00	3,379.23	77.66	3.37	77.66	3,379.23	1,500.00	67.64	4,577.64	20.21	6.12	3,200.00	3,369.49	73.44
J564	3.37	3,186.00	3,379.29	83.75	3.37	83.75	3,379.29	1,000.00	71.8	2,697.71	20.07	6.12	3,186.00	3,369.68	79.59
J566	3.37	3,187.00	3,379.29	83.32	3.37	83.32	3,379.29	1,000.00	76.63	4,123.29	20.17	6.12	3,187.00	3,369.67	79.15
J568	3.37	3,185.00	3,379.23	84.16	3.37	84.16	3,379.23	1,500.00	75.37	5,477.81	20.3	6.12	3,185.00	3,369.48	79.94
J570	3.37	3,188.00	3,379.30	82.89	3.37	82.89	3,379.30	1,500.00	70.51	4,048.64	20.16	6.12	3,188.00	3,369.71	78.73

J572	3.37	3,191.00	3,379.30	81.59	3.37	81.59	3,379.30	1,500.00	64.88	3,253.77	20.11	6.12	3,191.00	3,369.70	77.43
J574	3.37	3,189.00	3,379.29	82.45	3.37	82.45	3,379.29	1,500.00	71.41	4,408.77	20.19	6.12	3,189.00	3,369.67	78.28
J576	3.37	3,190.00	3,379.24	82	3.37	82	3,379.24	1,500.00	73.66	5,616.11	20.32	6.12	3,190.00	3,369.51	77.78
J578	3.37	3,201.00	3,379.30	77.26	3.37	77.26	3,379.30	1,500.00	69.72	5,806.63	20.34	6.12	3,201.00	3,369.68	73.09
J58	3.37	3,268.00	3,379.45	48.29	3.37	48.29	3,379.45	1,000.00	41.03	2,398.39	20.06	6.12	3,268.00	3,370.14	44.26
J580	3.37	3,203.00	3,379.17	76.34	3.37	76.34	3,379.17	1,000.00	70.45	4,376.52	20.19	6.12	3,203.00	3,369.31	72.06
J582	3.37	3,206.00	3,379.15	75.03	3.37	75.03	3,379.15	1,000.00	69.07	4,282.67	20.18	6.12	3,206.00	3,369.24	70.73
J584	3.37	3,190.00	3,379.17	81.97	3.37	81.97	3,379.17	1,000.00	52.04	1,511.75	20.02	6.12	3,190.00	3,369.30	77.69
J586	3.37	3,215.00	3,379.26	71.17	3.37	71.17	3,379.26	1,000.00	66.53	5,167.04	20.27	6.12	3,215.00	3,369.56	66.97
J588	3.37	3,225.00	3,380.77	67.5	3.37	67.5	3,380.77	1,000.00	61.61	3,498.30	20.12	6.12	3,225.00	3,374.16	64.63
J590	3.37	3,232.00	3,379.17	63.77	3.37	63.77	3,379.17	1,000.00	53.29	2,374.59	20.06	6.12	3,232.00	3,369.29	59.49
J592	3.37	3,218.00	3,379.25	69.87	3.37	69.87	3,379.25	1,000.00	65.2	5,046.08	20.25	6.12	3,218.00	3,369.55	65.67
J594	3.37	3,220.00	3,379.25	69	3.37	69	3,379.25	1,000.00	64.27	4,930.85	20.24	6.12	3,220.00	3,369.53	64.79
J596	3.37	3,238.00	3,379.24	61.2	3.37	61.2	3,379.24	1,000.00	51.91	2,485.56	20.06	6.12	3,238.00	3,369.53	56.99
J598	3.37	3,226.00	3,378.99	66.29	3.37	66.29	3,378.99	1,000.00	59.31	3,400.76	20.12	6.12	3,226.00	3,368.75	61.85
J60	3.37	3,279.00	3,379.45	43.52	3.37	43.52	3,379.45	1,000.00	36.13	2,112.48	20.04	6.12	3,279.00	3,370.14	39.49
J600	3.37	3,226.00	3,378.98	66.29	3.37	66.29	3,378.98	1,000.00	59.28	3,394.75	20.12	6.12	3,226.00	3,368.73	61.84
J602	3.37	3,229.00	3,378.94	64.97	3.37	64.97	3,378.94	1,000.00	57.95	3,345.10	20.11	6.12	3,229.00	3,368.61	60.49
J604	3.37	3,229.00	3,378.92	64.96	3.37	64.96	3,378.92	1,000.00	57.68	3,247.82	20.11	6.12	3,229.00	3,368.55	60.47
J606	3.37	3,222.00	3,378.90	67.99	3.37	67.99	3,378.90	1,000.00	58.89	2,839.60	20.08	6.12	3,222.00	3,368.48	63.47
J608	3.37	3,229.00	3,378.84	64.92	3.37	64.92	3,378.84	1,000.00	51.76	2,110.62	20.04	6.12	3,229.00	3,368.29	60.35
J610	3.37	3,219.00	3,378.89	69.28	3.37	69.28	3,378.89	1,000.00	57.82	2,439.77	20.06	6.12	3,219.00	3,368.44	64.75
J612	3.37	3,222.00	3,378.89	67.98	3.37	67.98	3,378.89	1,000.00	49.12	1,726.92	20.03	6.12	3,222.00	3,368.44	63.45
J614	3.37	3,222.00	3,378.90	67.98	3.37	67.98	3,378.90	1,000.00	58.2	2,691.63	20.07	6.12	3,222.00	3,368.47	63.47
J616	3.37	3,219.00	3,378.91	69.29	3.37	69.29	3,378.91	1,000.00	58.56	2,551.41	20.06	6.12	3,219.00	3,368.50	64.78
J618	3.37	3,221.00	3,378.90	68.42	3.37	68.42	3,378.90	1,000.00	43.46	1,466.15	20.02	6.12	3,221.00	3,368.49	63.91
J62	3.37	3,275.00	3,379.45	45.26	3.37	45.26	3,379.45	1,000.00	37.4	2,106.36	20.04	6.12	3,275.00	3,370.14	41.22
J620	3.37	3,199.00	3,378.95	77.97	3.37	77.97	3,378.95	1,000.00	71.45	4,198.09	20.18	6.12	3,199.00	3,368.65	73.51
J622	3.37	3,199.00	3,378.95	77.97	3.37	77.97	3,378.95	1,000.00	71.39	4,162.51	20.17	6.12	3,199.00	3,368.63	73.5
J624	3.37	3,205.00	3,378.91	75.36	3.37	75.36	3,378.91	1,000.00	68.07	3,715.57	20.14	6.12	3,205.00	3,368.52	70.85
J626	3.37	3,212.00	3,378.91	72.32	3.37	72.32	3,378.91	1,000.00	57.77	2,133.89	20.05	6.12	3,212.00	3,368.52	67.82
J628	3.37	3,206.00	3,378.88	74.91	3.37	74.91	3,378.88	1,000.00	67.34	3,601.07	20.13	6.12	3,206.00	3,368.42	70.38
J630	3.37	3,205.00	3,378.86	75.34	3.37	75.34	3,378.86	1,000.00	67.42	3,491.29	20.12	6.12	3,205.00	3,368.37	70.79
J632	3.37	3,222.00	3,378.83	67.95	3.37	67.95	3,378.83	1,000.00	58.97	2,906.35	20.08	6.12	3,222.00	3,368.27	63.38
J634	3.37	3,222.00	3,378.83	67.95	3.37	67.95	3,378.83	1,000.00	58.76	2,852.02	20.08	6.12	3,222.00	3,368.27	63.38
J636	3.37	3,190.00	3,378.82	81.82	3.37	81.82	3,378.82	1,000.00	68.37	2,504.92	20.06	6.12	3,190.00	3,368.25	77.24
J638	3.37	3,195.00	3,378.82	79.65	3.37	79.65	3,378.82	1,000.00	67.91	2,707.99	20.07	6.12	3,195.00	3,368.25	75.07
J64	3.37	3,284.00	3,379.45	41.36	3.37	41.36	3,379.45	1,000.00	34.04	2,005.17	20.04	6.12	3,284.00	3,370.14	37.32
J640	3.37	3,205.00	3,378.82	75.32	3.37	75.32	3,378.82	1,000.00	62.09	2,379.83	20.06	6.12	3,205.00	3,368.25	70.73
J642	3.37	3,195.00	3,378.82	79.65	3.37	79.65	3,378.82	1,000.00	67.86	2,699.73	20.07	6.12	3,195.00	3,368.25	75.07
J644	3.37	3,187.00	3,378.85	83.13	3.37	83.13	3,378.85	1,000.00	72.66	3,028.34	20.09	6.12	3,187.00	3,368.34	78.57
J646	3.37	3,187.00	3,378.86	83.13	3.37	83.13	3,378.86	1,000.00	71.98	2,882.72	20.08	6.12	3,187.00	3,368.37	78.59
J648	3.37	3,180.00	3,378.96	86.21	3.37	86.21	3,378.96	1,000.00	74.45	2,814.31	20.08	6.12	3,180.00	3,368.67	81.75
J650	3.37	3,177.00	3,378.86	87.46	3.37	87.46	3,378.86	1,000.00	54.5	1,503.91	20.02	6.12	3,177.00	3,368.35	82.91
J652	3.37	3,178.00	3,378.98	87.09	3.37	87.09	3,378.98	1,000.00	79.44	3,937.30	20.15	6.12	3,178.00	3,368.74	82.65
J654	3.37	3,179.00	3,379.03	86.67	3.37	86.67	3,379.03	1,000.00	78.87	3,837.19	20.15	6.12	3,179.00	3,368.86	82.27
J656	3.37	3,179.00	3,378.99	86.66	3.37	86.66	3,378.99	1,000.00	78.57	3,739.20	20.14	6.12	3,179.00	3,368.76	82.22
J658	3.37	3,189.00	3,378.99	82.32	3.37	82.32	3,378.99	1,000.00	75.12	3,963.94	20.16	6.12	3,189.00	3,368.76	77.89
J66	3.37	3,290.00	3,379.45	38.76	3.37	38.76	3,379.45	1,000.00	32.05	1,979.85	20.04	6.12	3,290.00	3,370.14	34.72
J660	3.37	3,188.00	3,378.97	82.75	3.37	82.75	3,378.97	1,000.00	73.33	3,212.01	20.1	6.12	3,188.00	3,368.69	78.29
J664	3.37	3,183.00	3,379.02	84.93	3.37	84.93	3,379.02	1,000.00	67.04	2,117.91	20.04	6.12	3,183.00	3,368.84	80.52
J666	3.37	3,179.00	3,379.02	86.67	3.37	86.67	3,379.02	1,000.00	62.3	1,779.51	20.03	6.12	3,179.00	3,368.84	82.26
J668	3.37	3,185.00	3,379.02	84.07	3.37	84.07	3,379.02	1,000.00	54.48	1,552.31	20.02	6.12	3,185.00	3,368.84	79.66
J672	3.37	3,220.00	3,379.23	68.99	3.37	68.99	3,379.23	1,000.00	59.94	2,818.24	20.08	6.12	3,220.00	3,369.48	64.77
J674	3.37	3,215.00	3,379.23	71.16	3.37	71.16	3,379.23	1,000.00	58.86	2,328.39	20.05	6.12	3,215.00	3,369.48	66.94
J676	3.37	3,213.00	3,379.27	72.04	3.37	72.04	3,379.27	1,000.00	63.73	3,089.14	20.1	6.12	3,213.00	3,369.60	67.86
J678	3.37	3,196.00	3,379.23	79.39	3.37	79.39	3,379.23	1,000.00	55.58	1,685.51	20.03	6.12	3,196.00	3,369.48	75.17
J68	3.37	3,290.00	3,379.45	38.76	3.37	38.76	3,379.45	1,000.00	32.02	1,970.38	20.04	6.12	3,290.00	3,370.14	34.73
J680	3.37	3,240.00	3,379.24	60.33	3.37	60.33	3,379.24	1,500.00	52.09	4,332.53	20.19	6.12	3,240.00	3,369.51	56.12
J682	3.37	3,245.00	3,379.12	58.11	3.37	58.11	3,379.12	1,000.00	51.9	3,301.05	20.11	6.12	3,245.00	3,369.14	53.79
J684	3.37	3,242.00	3,379.11	59.41	3.37	59.41	3,379.11	1,000.00	52.48	3,073.90	20.09	6.12	3,242.00	3,369.13	55.08
J686	3.37	3,242.00	3,379.11	59.41	3.37	59.41	3,379.11	1,000.00	52.4	3,042.63	20.09	6.12	3,242.00	3,369.12	55.08
J688	3.37	3,231.00	3,379.04	64.14	3.37	64.14	3,379.04	1,000.00	54.93	2,652.91	20.07	6.12	3,231.00	3,368.90	59.75
J690	3.37	3,201.00	3,379.01	77.13	3.37	77.13	3,379.01	1,000.00	67.37	2,969.10	20.09	6.12	3,201.00	3,368.83	72.72
J692	3.37	3,218.00	3,379.01	69.77	3.37	69.77	3,379.01	1,000.00	48.94	1,657.43	20.03	6.12	3,218.00	3,368.82	65.35
J694	3.37	3,198.00	3,379.01	78.43	3.37	78.43	3,379.01	1,000.00	67.38	2,752.37	20.08	6.12	3,198.00	3,368.82	74.02
J696	3.37	3,195.00	3,379.01	79.73	3.37	79.73	3,379.01	1,000.00	68.92	2,831.48	20.08	6.12	3,195.00	3,368.83	75.32
J698	3.37	3,202.00	3,379.01	76.7	3.37	76.7	3,379.01	1,000.00	67.41	3,071.49	20.09	6.12	3,202.00	3,368.81	72.28
J70	3.37	3,288.00	3,379.45	39.63	3.37	39.63	3,379.45	1,000.00	32.55	1,949.41	20.04	6.12	3,288.00	3,370.15	35.59
J700	3.37	3,202.00	3,379.01	76.7	3.37	76.7	3,379.01	1,000.00	67.37	3,063.29	20.09	6.12	3,202.00	3,368.81	72.28
J702	3.37	3,245.00	3,379.00	58.06	3.37	58.06	3,379.00	1,000.00	49.51	2,560.92	20.07	6.12	3,245.00	3,368.79	53.64
J704	3.37	3,251.00	3,379.00	55.46	3.37	55.46	3,379.00	1,000.00	45.86	2,249.57	20.05	6.12	3,251.00	3,368.79	51.04
J706	3.37	3,250.00	3,378.98	55.89	3.37	55.89	3,378.98	1,000.00	44.96	2,073.26	20.04	6.12	3,250.00	3,368.72	51.44
J708	3.37	3,245.00	3,378.98	58.05	3.37	58.05	3,378.98	1,000.00	48.25	2,319.92	20.05	6.12	3,245.00	3,368.72	53.61
J710	3.37	3,250.00	3,378.98	55.89	3.37	55.89	3,378.98	1,000.00	39.81	1,608.96	20.03	6.12	3,250.00	3,368.73	51.45
J712	3.37	3,250.00	3,378.98	55.89	3.37	55.89	3,378.98	1,000.00	45.15	2,100.24	20.04	6.12	3,250.00	3,368.73	51.45
J714	3.37	3,240.00	3,378.94	60.2	3.37	60.2	3,378.94	1,000.00	51.04	2,530.35	20.06	6.12	3,240.00	3,368.60	55.72
J716	3.37	3,240.00	3,378.93	60.2	3.37	60.2	3,378.93	1,000.00	51.02	2,527.66	20.06	6.12	3,240.00	3,368.59	55.72
J718	3.37	3,208.00	3,378.83	74.02	3.37	74.02	3,378.83	1,000.00	59.12	2,163.91	20.05	6.12	3,208.00	3,368.27	69.45
J72	3.37	3,278.00	3,379.45	43.96	3.37	43.96	3,379.45	1,000.00	37.18	2,280.11	20.05	6.12	3,278.00	3,370.15	39.93
J720	3.37	3,209.00	3,378.83	73.59	3.37	73.59	3,378.83	1,000.00	58.17	2,104.30	20.04	6.12	3,209.00	3,368.27	69.01
J722	3.37	3,195.00	3,379.00	79.73	3.37	79.73	3,379.00	1,000.00	68.34	2,727.94	20.07	6.12	3,195.00	3,368.79	75.3
J724	3.37	3,188.00	3,379.02	82.77	3.37	82.77	3,379.02	1,000.00	73.11	3,165.11	20.1	6.12	3,188.00	3,368.83	78.35
J726	3.37	3,188.00	3,379.02	82.77	3.37	82.77	3,379.02	1,000.00	73.2	3,186.84	20.1	6.12	3,188.00	3,368.84	78.36
J728	3.37	3,240.00	3,379.16	60.3	3.37	60.3	3,379.16	1,000.00	53.36	3,090.95	20.1	6.12	3,240.00	3,369.28	56.02
J730	3.37	3,244.00	3,379.16	58.57	3.37	58.57	3,379.16	1,500.00	39.07	2,255.87	20.05	6.12	3,244.00	3,369.28	54.28
J732	3.37	3,182.00	3,379.09	85.4	3.37	85.4	3,379.09	1,000.00	78.59	4,260.76	20.18	6.12	3,182.00	3,369.06	81.05
J734	3.37	3,168.00	3,379.09	91.47	3.37	91.47	3,379.09	1,000.00	83.48	3,916.99	20.15	6.12	3,168.00	3,369.06	87.12

J736	3.37	3,170.00	3,379.11	90.61	3.37	90.61	3,379.11	1,500.00	79.65	4,882.72	20.24	6.12	3,170.00	3,369.13	86.28
J738	3.37	3,118.00	3,379.10	113.13	3.37	113.13	3,379.10	1,000.00	106.2	5,190.04	20.27	6.12	3,118.00	3,369.08	108.79
J74	3.37	3,275.00	3,379.45	45.26	3.37	45.26	3,379.45	1,000.00	38.45	2,353.50	20.06	6.12	3,275.00	3,370.14	41.22
J740	3.37	3,112.00	3,379.09	115.73	3.37	115.73	3,379.09	1,000.00	108.57	5,126.77	20.26	6.12	3,112.00	3,369.07	111.39
J744	3.37	3,094.00	3,379.08	123.53	3.37	123.53	3,379.08	1,500.00	91.87	2,959.04	20.09	6.12	3,094.00	3,369.03	119.17
J748	3.37	3,118.00	3,379.09	113.13	3.37	113.13	3,379.09	1,000.00	105.62	4,841.27	20.23	6.12	3,118.00	3,369.07	108.79
J750	3.37	3,110.00	3,379.10	116.6	3.37	116.6	3,379.10	1,000.00	109.37	5,105.77	20.26	6.12	3,110.00	3,369.07	112.26
J752	3.37	3,079.00	3,379.09	130.03	3.37	130.03	3,379.09	1,000.00	122.13	5,092.35	20.26	6.12	3,079.00	3,369.07	125.69
J754	3.37	3,080.00	3,379.09	129.6	3.37	129.6	3,379.09	1,000.00	121.75	5,110.76	20.26	6.12	3,080.00	3,369.07	125.25
J756	3.37	3,229.00	3,378.81	64.91	3.37	64.91	3,378.81	1,000.00	52.92	2,262.27	20.05	6.12	3,229.00	3,368.21	60.32
J758	3.37	3,229.00	3,378.81	64.91	3.37	64.91	3,378.81	1,000.00	53.2	2,302.73	20.05	6.12	3,229.00	3,368.21	60.32
J76	3.37	3,268.00	3,379.46	48.29	3.37	48.29	3,379.46	1,000.00	41.67	2,572.33	20.07	6.12	3,268.00	3,370.17	44.27
J760	3.37	3,231.00	3,378.81	64.05	3.37	64.05	3,378.81	1,000.00	45.2	1,653.45	20.03	6.12	3,231.00	3,368.21	59.45
J762	3.37	3,210.00	3,378.81	73.15	3.37	73.15	3,378.81	1,000.00	58.86	2,210.70	20.05	6.12	3,210.00	3,368.21	68.55
J764	3.37	3,208.00	3,378.81	74.01	3.37	74.01	3,378.81	1,000.00	57.12	1,993.39	20.04	6.12	3,208.00	3,368.21	69.42
J766	3.37	3,224.00	3,378.81	67.08	3.37	67.08	3,378.81	1,000.00	47.28	1,666.87	20.03	6.12	3,224.00	3,368.21	62.48
J768	3.37	3,229.00	3,378.81	64.91	3.37	64.91	3,378.81	1,000.00	51.31	2,071.44	20.04	6.12	3,229.00	3,368.21	60.32
J770	3.37	3,229.00	3,378.82	64.92	3.37	64.92	3,378.82	1,000.00	51.19	2,054.41	20.04	6.12	3,229.00	3,368.24	60.33
J772	3.37	3,209.00	3,378.97	73.65	3.37	73.65	3,378.97	1,000.00	39.63	1,296.85	20.02	6.12	3,209.00	3,368.71	69.2
J776	3.37	3,184.00	3,379.08	84.53	3.37	84.53	3,379.08	1,000.00	77.17	3,954.49	20.16	6.12	3,184.00	3,369.02	80.17
J778	3.37	3,195.00	3,379.00	79.73	3.37	79.73	3,379.00	1,000.00	69.26	2,896.12	20.08	6.12	3,195.00	3,368.80	75.31
J78	3.37	3,264.00	3,379.45	50.02	3.37	50.02	3,379.45	1,000.00	42.93	2,531.26	20.06	6.12	3,264.00	3,370.14	45.99
J780	3.37	3,180.00	3,379.00	86.23	3.37	86.23	3,379.00	1,000.00	75.74	3,071.91	20.09	6.12	3,180.00	3,368.78	81.8
J782	3.37	3,244.00	3,379.18	58.58	3.37	58.58	3,379.18	1,500.00	48.39	3,546.21	20.13	6.12	3,244.00	3,369.34	54.31
J784	3.37	3,208.00	3,379.87	74.47	3.37	74.47	3,379.87	1,000.00	68	3,774.69	20.14	6.12	3,208.00	3,371.42	70.81
J786	3.37	3,254.00	3,381.78	55.37	3.37	55.37	3,381.78	1,000.00	52.98	6,000.70	20.36	6.12	3,254.00	3,377.24	53.4
J788	3.37	3,315.00	3,471.72	67.91	3.37	67.91	3,471.72	1,000.00	27.95	1,983.16	20.04	6.12	3,315.00	3,431.50	50.48
J796	3.37	3,320.00	3,471.72	65.74	3.37	65.74	3,471.72	1,000.00	21.33	1,090.44	20.01	6.12	3,320.00	3,431.49	48.31
J798	3.37	3,195.00	3,379.59	79.98	3.37	79.98	3,379.59	1,000.00	71.47	3,260.82	20.11	6.12	3,195.00	3,370.59	76.08
J80	3.37	3,260.00	3,379.45	51.76	3.37	51.76	3,379.45	1,000.00	45.1	2,755.09	20.08	6.12	3,260.00	3,370.15	47.73
J800	3.37	3,197.00	3,379.28	78.98	3.37	78.98	3,379.28	1,500.00	71.13	5,695.74	20.32	6.12	3,197.00	3,369.64	74.8
J802	3.37	3,189.00	3,378.96	82.31	3.37	82.31	3,378.96	1,000.00	75.17	4,021.19	20.16	6.12	3,189.00	3,368.67	77.85
J804	3.37	3,219.00	3,378.89	69.28	3.37	69.28	3,378.89	1,000.00	58.8	2,601.31	20.07	6.12	3,219.00	3,368.44	64.75
J806	3.37	3,185.00	3,378.82	83.98	3.37	83.98	3,378.82	1,000.00	72.64	2,892.57	20.08	6.12	3,185.00	3,368.25	79.4
J808	3.37	3,192.00	3,379.26	81.14	3.37	81.14	3,379.26	1,500.00	72.94	5,622.01	20.32	6.12	3,192.00	3,369.57	76.94
J810	3.37	3,085.00	3,379.08	127.43	3.37	127.43	3,379.08	1,000.00	110.69	2,936.04	20.09	6.12	3,085.00	3,369.03	123.07
J812	3.37	3,094.00	3,379.09	123.53	3.37	123.53	3,379.09	1,000.00	116.07	5,175.45	20.27	6.12	3,094.00	3,369.07	119.19
J814	3.37	3,230.00	3,379.17	64.63	3.37	64.63	3,379.17	1,000.00	50.98	2,014.40	20.04	6.12	3,230.00	3,369.29	60.35
J816	3.37	3,191.00	3,379.41	81.64	3.37	81.64	3,379.41	1,000.00	52.12	1,516.35	20.02	6.12	3,191.00	3,370.02	77.57
J818	3.37	3,186.00	3,379.29	83.75	3.37	83.75	3,379.29	1,000.00	71.97	2,723.99	20.07	6.12	3,186.00	3,369.67	79.58
J82	3.37	3,259.00	3,379.45	52.19	3.37	52.19	3,379.45	1,000.00	45.32	2,708.17	20.07	6.12	3,259.00	3,370.15	48.16
J820	3.37	3,188.00	3,379.29	82.89	3.37	82.89	3,379.29	1,000.00	66.71	2,200.48	20.05	6.12	3,188.00	3,369.67	78.72
J822	3.37	3,260.00	3,379.74	51.88	3.37	51.88	3,379.74	1,000.00	46.76	3,388.71	20.11	6.12	3,260.00	3,371.02	48.1
J824	3.37	3,310.00	3,379.73	30.22	3.37	30.22	3,379.73	1,000.00	22.2	1,171.65	20.01	6.12	3,310.00	3,371.01	26.44
J826	3.37	3,256.00	3,380.13	53.79	3.37	53.79	3,380.13	1,000.00	49.43	4,010.09	20.16	6.12	3,256.00	3,372.21	50.35
J832	3.37	3,245.00	3,379.17	58.14	3.37	58.14	3,379.17	1,500.00	47.12	3,320.97	20.11	6.12	3,245.00	3,369.30	53.86
J834	3.37	3,250.00	3,379.19	55.98	3.37	55.98	3,379.19	1,500.00	47.05	3,790.49	20.14	6.12	3,250.00	3,369.36	51.72
J836	3.37	3,118.00	3,379.09	113.13	3.37	113.13	3,379.09	1,500.00	97.12	4,309.88	20.19	6.12	3,118.00	3,369.06	108.78
J838	3.37	3,096.00	3,379.09	122.66	3.37	122.66	3,379.09	1,500.00	100.39	3,663.22	20.13	6.12	3,096.00	3,369.04	118.31
J84	3.37	3,259.00	3,379.22	52.09	3.37	52.09	3,379.22	1,000.00	27.41	1,166.36	20.01	6.12	3,259.00	3,369.44	47.85
J86	3.37	3,252.00	3,379.22	55.12	3.37	55.12	3,379.22	1,000.00	33.12	1,313.41	20.02	6.12	3,252.00	3,369.44	50.89
J88	3.37	3,259.00	3,379.22	52.09	3.37	52.09	3,379.22	1,000.00	29.73	1,235.63	20.02	6.12	3,259.00	3,369.44	47.85
J90	3.37	3,260.00	3,379.46	51.76	3.37	51.76	3,379.46	1,000.00	45.6	2,935.84	20.09	6.12	3,260.00	3,370.18	47.74
J92	3.37	3,257.00	3,379.47	53.07	3.37	53.07	3,379.47	1,000.00	47.1	3,083.83	20.09	6.12	3,257.00	3,370.21	49.05
J94	3.37	3,253.00	3,379.51	54.82	3.37	54.82	3,379.51	1,000.00	50.05	3,869.06	20.15	6.12	3,253.00	3,370.33	50.84
J96	3.37	3,252.00	3,380.31	55.6	3.37	55.6	3,380.31	1,500.00	42.79	2,777.65	20.08	6.12	3,252.00	3,372.77	52.33
J98	3.37	3,238.00	3,379.72	61.41	3.37	61.41	3,379.72	1,500.00	42.22	2,363.37	20.06	6.12	3,238.00	3,370.96	57.61

APPENDIX C

OPINION OF PROBABLE COST

SUNRISE ENGINEERING, INC.

11 North 300 West, Washington, Utah 84780
Tel: (435) 652-8450 Fax: (435) 652-8416

Engineer's Opinion of Probable Cost

Recommendation 1 17-Sep-09

City of LaVerkin

JKP/msn

NO.	DESCRIPTION	Estimated Quantity	Units	Unit Price	TOTAL COST
1	Mobilization	1	LS	$ 11,500.00	$ 11,500
2	Pre-Construction DVD	1	LS	$ 650.00	$ 650
3	Traffic Control	1	LS	$ 30,000.00	$ 30,000
4	Subsurface Investigation	20	HR	$ 125.00	$ 2,500
5	Misc, Connections, Fittings, Tie-ins & Capping	1	LS	$ 10,000.00	$ 10,000
6	Material Sampling & Testing	1	LS	$ 6,000.00	$ 6,000
7	8" PVC Line & Fittings	2,970	Ln. Ft.	$ 16.00	$ 47,520
8	8" Gate Valve Assembly	10	Each	$ 1,500.00	$ 15,000
9	Fire Hydrant Reconnection	8	Each	$ 2,000.00	$ 16,000
10	10" PVC Line & Fittings	760	Ln. Ft.	$ 19.00	$ 14,440
11	10" Gate Valve Assembly	2	Each	$ 1,800.00	$ 3,600
12	12" PVC Line & Fittings	6,700	Ln. Ft.	$ 23.00	$ 154,100
13	12" Gate Valve Assembly	31	Each	$ 2,200.00	$ 68,200
14	Import Pipe Bedding	1,000	Cu. Yd.	$ 15.00	$ 15,000
15	Untreated Base Course	600	Cu. Yd.	$ 15.00	$ 9,000
16	Bituminous Surface Course	400	Cu. Yd.	$ 250.00	$ 100,000
17	Leak Detection Equipment	1	LS	$ 2,000.00	$ 2,000
18					
19	**Sub-Total**				$ 505,500
20	**Contingency**	15%			$ 75,800
21	**Total Construction**				**$ 581,300**
22					
23	**INCIDENTALS**				
24	Funding & Administrative Services	1.75%	HR		$ 10,200
25	Legal and Fiscal	0.66%	Est.		$ 5,000
26	Engineering Design	5.96%	L.S.		$ 45,300
27	Engineering Construction Services	6.12%	Hourly		$ 46,500
28	Miscellaneous Engineering Services		Hourly		$ 10,000
29	SWPPP (Storm Water Pollution Protection Plan)		Est.		$ 4,000
30	Geotechnical		Est.		$ 7,500
31	Environmental		Est.		$ 7,500
32	Survey & GIS Mapping		Est.		$ 30,000
33	Loan Origination Fee		L.S.		$ 13,000
34					
		TOTAL PROJECT COST			**$ 760,300**

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

SUNRISE ENGINEERING, INC.

11 North 300 West, Washington, Utah 84780
Tel: (435) 652-8450 Fax: (435) 652-8416

Engineer's Opinion of Probable Cost

Future Improvements 17-Sep-09

City of LaVerkin

JKP/msn

NO.	DESCRIPTION	Estimated Quantity	Units	Unit Price	TOTAL COST
1	Mobilization	1	LS	$ 8,000.00	$ 8,000
2	Pre-Construction DVD	1	LS	$ 750.00	$ 750
3	Traffic Control	1	LS	$ 5,000.00	$ 5,000
4	Subsurface Investigation	20	HR	$ 150.00	$ 3,000
5	Misc, Connections, Fittings, Tie-ins & Capping	1	LS	$ 5,000.00	$ 5,000
6	12" PVC Line & Fittings	4,000	Ln. Ft.	$ 34.00	$ 136,000
7	12" Gate Valve Assembly	5	Each	$ 3,000.00	$ 15,000
8	Jacking and Boring	55	Each	$ 800.00	$ 44,000
9	2" Air/Vac	2	Each	$ 4,500.00	$ 9,000
10	Import Pipe Bedding	400	Cu. Yd.	$ 20.00	$ 8,000
11	Untreated Base Course	140	Cu. Yd.	$ 32.00	$ 4,480
12	Bituminous Surface Course	100	Cu. Yd.	$ 300.00	$ 30,000
13					
14	**Sub-Total**				$ 268,200
15	**Contingency**	15%			$ 40,200
16	**Total Construction**				**$ 308,400**
17					
18	**INCIDENTALS**				
19	Funding & Administrative Services	1.75%	HR		$ 5,400
20	Legal and Fiscal	1.24%	Est.		$ 5,000
21	Engineering Design	6.90%	L.S.		$ 27,900
22	Engineering Construction Services	5.94%	Hourly		$ 24,000
23	Miscellaneous Engineering Services		Hourly		$ 10,000
24	SWPPP (Storm Water Pollution Protection Plan)		Est.		$ 4,000
25	Survey & GIS Mapping		Est.		$ 5,000
26	Loan Origination Fee		L.S.		$ 2,500
27	Envirmental Study		L.S.		$ 12,000
		TOTAL PROJECT COST			**$ 404,200**

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

APPENDIX D

BUILD-OUT CALCULATION

LaVerkin Zones

	Acres	Density	ERU/Zone
R-1-8	404.49	0.18	2247
R-1-10	213.90	0.23	930
R-3-6	18.67	0.14	133
R-A-1	517.88	0.5	1036
R-1-14	52.26	0.32	163
OSMU,OSMU-C	6563.54	20	328
MH	23.54	0.14	168
C	250.06	0.5	500
I	0.00	0	0

Build Out Total Lots 5505

APPENDIX E

PROJECTED CASH FLOW

CASHFLOW PROJECTION
CULINARY WATER MASTER PLAN

	Annual Population Growth Rate	3.00%													
	Annual Rate Increase	3.25%			Interest Rate										
	Annual Inflation Rate	3.50%			3.50%										
	Fiscal Year Beginning July 1	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
	Ending June30	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
1	Average Rate ERU	$30.21	$31.22	$32.27	$33.36	$34.48	$35.60	$36.75	$37.95	$39.18	$40.46	$41.77	$43.13	$44.53	$45.98
2	Connection Fee	$325	$337	$349	$362	$375	$388	$402	$416	$430	$445	$461	$477	$494	$511
3	Impact fee	$1,478	$1,478	$1,478	$1,478	$836	$836	$836	$836	$836	$836	$836	$836	$836	$836
4	**System Users:**														
5	Total Existing ERU's	1,300	1,356	1,410	1,465	1,507	1,551	1,596	1,642	1,689	1,738	1,788	1,840	1,893	1,948
6	New ERU's:	50	56	54	55	42	43	45	46	47	49	50	52	53	55
7															
8	**REVENUES:**														
9	User Fees (Water Sales)	531,681	569,860	595,247	582,102	632,370	671,754	713,601	758,067	805,315	855,521	908,869	965,558	1,025,797	1,089,810
10	Connection Fees	16,260	18,885	18,939	4,875	15,834	16,869	17,973	19,149	20,402	21,737	23,160	24,676	26,292	28,014
11	Late Fees & Penalties	27,139	31,952	32,306	52,384	54,217	56,115	58,079	60,112	62,216	64,393	66,647	68,980	71,394	73,893
12	Miscellaneous	32,602	13,865	8,893	0	0	0	0	0	0	0	0	0	0	0
13	Impact Fees	255,816	119,988	85,322	19,214	35,315	36,353	37,422	38,522	39,655	40,821	42,023	43,260	44,533	45,845
14	Interest Income/Bond Discount	9,831	24,818	17,813	10,434	10,799	11,177	11,568	11,973	12,392	12,826	13,275	13,740	14,220	14,718
15	***TOTAL REVENUE:***	**$873,329**	**$779,368**	**$758,520**	**$669,009**	**$748,536**	**$792,269**	**$838,644**	**$887,823**	**$939,980**	**$995,298**	**$1,053,974**	**$1,116,214**	**$1,182,237**	**$1,252,279**
16															
17	**EXPENSES:** (Inc. O&M & Debt Serv.)														
18	Salaries and Wages	231,147	216,368	325,673	363,071	375,778	388,931	402,543	416,632	431,214	446,307	461,928	478,095	494,829	512,148
19	Supplies, Tools,&Vehicle Cost	24,172	49,313	72,736	158,267	163,806	169,540	175,473	181,615	187,972	194,551	201,360	208,407	215,702	223,251
20	Water Charges	62,340	101,880	112,140	0	0	0	0	0	0	0	0	0	0	0
21	Other Expenses	31,670	48,953	32,413	34,390	35,594	36,839	38,129	39,463	40,845	42,274	43,754	45,285	46,870	48,510
22	Interest Expense	5,600	5,390	5,180	6,788	7,026	7,271	7,526	7,789	8,062	8,344	8,636	8,938	9,251	9,575
23	***Sub-Total Operation & Maintainance***	**$354,929**	**$421,904**	**$548,142**	**$562,516**	**$582,204**	**$602,581**	**$623,672**	**$645,500**	**$668,093**	**$691,476**	**$715,677**	**$740,726**	**$766,652**	**$793,484**
24															
25	**EXISTING DEBT SERVICE (810-820)**														
26	1999 Water Revenue	31,650	31,650	31,650	31,650	31,650	31,380	31,110	31,840	31,560	31,508	31,508	31,508	31,508	31,508
27															
28	***Sub-Total Existing Debt Service***	**$31,650**	**$31,650**	**$31,650**	**$31,650**	**$31,650**	**$31,380**	**$31,110**	**$31,840**	**$31,560**	**$31,508**	**$31,508**	**$31,508**	**$31,508**	**$31,508**
29															
30	**NEW DEBT SERVICE (810-820)**														
31	2009 Loan	0	0	0	0	0	18,494	18,494	18,494	18,494	18,494	18,494	18,494	18,494	18,494
32	Loan Reserve (Payment/10)	0	0	0	0	0	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
33															
34	***Sub-Total New Debt Service***	**0**	**0**	**0**	**0**	**0**	**$20,294**	**$20,294**	**$20,294**	**$20,294**	**$20,294**	**$20,294**	**$20,294**	**$20,294**	**$20,294**
41	***Total Debt Service***	**$31,650**	**$31,650**	**$31,650**	**$31,650**	**$31,650**	**$51,674**	**$51,404**	**$52,134**	**$51,854**	**$51,802**	**$51,802**	**$51,802**	**$51,802**	**$51,802**
35															
36	**OTHER SERVICE**														
37	Renewal and Replacement Fund (590)	0	0	0	0	0	30,129	31,184	32,275	33,405	34,574	35,784	37,036	38,333	39,674
38															
39	***Total Renewal and Replacement Fund***	0	0	0	0	0	$30,129	$31,184	$32,275	$33,405	$34,574	$35,784	$37,036	$38,333	$39,674
40															
####	***TOTAL EXPENSES:***	**$386,579**	**$453,554**	**$579,792**	**$594,166**	**$613,854**	**$684,384**	**$706,259**	**$729,909**	**$753,351**	**$777,852**	**$803,263**	**$829,564**	**$856,786**	**$884,961**
####															
####	***Net Cashflow***	**$486,750**	**$325,814**	**$178,728**	**$74,843**	**$134,682**	**$107,884**	**$132,385**	**$157,914**	**$186,629**	**$217,447**	**$250,711**	**$286,649**	**$325,450**	**$367,319**
####															
####	**CASH ON HAND**														
####	*Fund Balance	0	0	178,728	68,701	123,383	231,267	363,652	521,566	708,195	925,641	772,152	1,058,801	1,384,252	1,751,570
####	Renewal and Replacement Account Balance:	0	0	0	0	0	30,129	61,313	93,588	126,992	161,566	197,350	234,386	272,719	312,393
####	New Bond Reserves	0	0	0	0	0	1,800	3,600	5,400	7,200	9,000	10,800	12,600	14,400	16,200
####	***Total***	**$0**	**$0**	**$178,728**	**$68,701**	**$123,383**	**$263,196**	**$428,564**	**$620,553**	**$842,387**	**$1,096,207**	**$980,302**	**$1,305,787**	**$1,671,370**	**$2,080,163**
####	**Fund Balance is obtained by adding the previous year's*														
####	*balance to the net cash flow, minus any self funded portion*														
####	*of future projects. Fund Balance includes Impact Fees.*														
####	**Total Project Amount**	**0**	**0**	**0**	**0**	**420,150**	**0**	**0**	**0**	**0**	**0**	**404,200**	**0**	**0**	**0**

CASHFLOW PROJECTION
CULINARY WATER MASTER PLAN

	Annual Population Growth Rate											
	Annual Rate Increase											
	Annual Inflation Rate											
	Fiscal Year Beginning July 1	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
	Ending June30	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
1	Average Rate ERU	$47.47	$49.01	$50.61	$52.25	$53.95	$55.70	$57.51	$59.38	$61.31	$63.31	$65.36
2	Connection Fee	$529	$547	$567	$586	$607	$628	$650	$673	$697	$721	$746
3	Impact fee	$836	$836	$836	$836	$836	$836	$836	$836	$836	$836	$836
4	**System Users:**											
5	Total Existing ERU's	2,004	2,062	2,122	2,184	2,247	2,312	2,380	2,449	2,520	2,593	2,669
6	New ERU's:	56	58	60	62	63	65	67	69	71	144	149
7												
8	**REVENUES:**											
9	User Fees (Water Sales)	1,157,832	1,230,118	1,306,933	1,388,564	1,475,313	1,567,501	1,665,471	1,769,586	1,880,234	2,024,867	2,151,540
10	Connection Fees	29,848	31,803	33,887	36,106	38,472	40,993	43,680	46,543	49,593	104,174	111,003
11	Late Fees & Penalties	76,479	79,156	81,926	84,794	87,761	90,833	94,012	97,303	100,708	104,233	107,881
12	Miscellaneous	0	0	0	0	0	0	0	0	0	0	0
13	Impact Fees	47,195	48,586	50,018	51,492	53,011	54,574	56,185	57,842	59,550	120,857	124,426
14	Interest Income/Bond Discount	15,233	15,766	16,318	16,889	17,481	18,092	18,726	19,381	20,059	20,761	21,488
15	***TOTAL REVENUE:***	**$1,326,588**	**$1,405,429**	**$1,489,082**	**$1,577,846**	**$1,672,038**	**$1,771,994**	**$1,878,074**	**$1,990,655**	**$2,110,145**	**$2,374,893**	**$2,516,339**
16												
17	**EXPENSES:** (Inc. O&M & Debt Serv.)											
18	Salaries and Wages	530,073	548,625	567,827	587,701	608,271	629,560	651,595	674,400	698,004	722,435	747,720
19	Supplies, Tools,&Vehicle Cost	231,065	239,152	247,523	256,186	265,152	274,433	284,038	293,979	304,269	314,918	325,940
20	Water Charges	0	0	0	0	0	0	0	0	0	0	0
21	Other Expenses	50,208	51,966	53,784	55,667	57,615	59,632	61,719	63,879	66,115	68,429	70,824
22	Interest Expense	9,910	10,257	10,616	10,988	11,372	11,770	12,182	12,609	13,050	13,507	13,979
23	***Sub-Total Operation & Maintainance***	**$821,256**	**$850,000**	**$879,750**	**$910,542**	**$942,411**	**$975,395**	**$1,009,534**	**$1,044,867**	**$1,081,438**	**$1,119,288**	**$1,158,463**
24												
25	**EXISTING DEBT SERVICE (810-820)**											
26	1999 Water Revenue	31,638	31,638	31,638	31,638	31,638	32,320	0	0	0	0	0
27												
28	***Sub-Total Existing Debt Service***	**$31,638**	**$31,638**	**$31,638**	**$31,638**	**$31,638**	**$32,320**	**0**	**0**	**0**	**0**	**0**
29												
30	**NEW DEBT SERVICE (810-820)**											
31	2009 Loan	18,494	18,494	18,494	18,494	18,494	18,494	18,494	18,494	18,494	18,494	18,494
32	Loan Reserve (Payment/10)	1,800	0	0	0	0	0	0	0	0	0	0
33												
34	***Sub-Total New Debt Service***	**$20,294**	**$18,494**	**$18,494**	**$18,494**	**$18,494**	**$18,494**	**$18,494**	**$18,494**	**$18,494**	**$18,494**	**$18,494**
41	***Total Debt Service***	**$51,932**	**$50,132**	**$50,132**	**$50,132**	**$50,132**	**$50,814**	**$18,494**	**$18,494**	**$18,494**	**$18,494**	**$18,494**
35												
36	**OTHER SERVICE**											
37	Renewal and Replacement Fund (590)	41,063	42,500	43,988	45,527	47,121	48,770	50,477	52,243	54,072	55,964	57,923
38												
39	***Total Renewal and Replacement Fund***	$41,063	$42,500	$43,988	$45,527	$47,121	$48,770	$50,477	$52,243	$54,072	$55,964	$57,923
40												
####	***TOTAL EXPENSES:***	**$914,251**	**$942,632**	**$973,870**	**$1,006,201**	**$1,039,663**	**$1,074,979**	**$1,078,504**	**$1,115,605**	**$1,154,004**	**$1,193,746**	**$1,234,880**
####												
####	***Net Cashflow***	**$412,337**	**$462,797**	**$515,213**	**$571,645**	**$632,375**	**$697,015**	**$799,569**	**$875,050**	**$956,141**	**$1,181,146**	**$1,281,459**
####												
####	**CASH ON HAND**											
####	*Fund Balance	2,163,907	2,626,704	3,141,917	3,713,562	4,345,937	5,042,952	5,842,521	6,717,571	7,673,712	8,854,858	10,136,317
####	Renewal and Replacement Account Balance:	353,456	395,956	439,943	485,470	532,591	581,361	631,837	684,081	738,153	794,117	852,040
####	New Bond Reserves	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
####	***Total***	**$2,535,363**	**$3,040,660**	**$3,599,860**	**$4,217,032**	**$4,896,528**	**$5,642,313**	**$6,492,359**	**$7,419,652**	**$8,429,865**	**$9,666,976**	**$11,006,358**
####	**Fund Balance is obtained by adding the previous year's*											
####	*balance to the net cash flow, minus any self funded portion*											
####	*of future projects. Fund Balance includes Impact Fees.*											
####	**Total Project Amount**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

APPENDIX F

WATER RIGHT

LaVerkin City Water Right Report

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Page 4	**Table B - POD Matrix**
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Page 10	**Water Right Compliance Recommendations**
Page 11-12	**Water Right Acquisition Management**
	Documents Section

Water Right Report for LaVerkin City
Composed by Sunrise Engineering, Inc.

The following information has been taken from the Document Files located at the Utah Division of Water Rights. Sunrise Engineering, Inc. has summarized the water right file information for the water rights shown in Table A and B. A portion of the various public file documents for the respective water rights have been published for the City's immediate review of the respective water rights researched in this report. Sunrise Engineering Inc. makes no claim as to the accuracy of the Document Files (since the Division doesn't guarantee their accuracy). The Document Files have been used in this report to evaluate the various elements of the underlying rights.

Wherever copies of actual documents have been printed and analyzed, accuracy is improved.

The purpose of this report is to analyze the various LaVerkin City water rights and make recommendations as to compliance issues, action items needing attention and water right protection in particular as of March of 2009.

Water Right Report for LaVerkin City

Composed by Sunrise Engineering, Inc.

Table A

WR #	Type of Right	Acre Feet	Flow/CFS	Status	Uses	Priority	Remarks
81-1073	Decree	72	0.3	Cert	Municipal	1880	Upper Ash Creek Springs
81-1602	Decree	330	1	Cert	Municipal	1890	Ash Creek Spring and Upper Ash Creek Spring
81-2287	Decree	241	0.333	Cert	Municipal	1862	Toquerville Springs
81-687	Diligence Claim	71.35	0.491	Cert	Municipal	1980	Ash Creek Springs
	Total Municipal	**714.3**	**2.124**				
81-2477		1641	4.97		Irrigation	1890	Quail Creek Reservoir
81-2481		20	.0297		Irrigation/ Industrial	1890	Test Facility
81-4334		997	3		Irrigation	1900	Quail Creek Reservoir
	Total Irrigation	**2651**	**8**				
	Grand Total	**3365.3**	**10.12**				

Year 2008 Reported Water Use		
1686	Connections	
663.35	Acre Feet Reported Used	
Well	Source Used	

Water from WCWCD

Acre Feet/ Yr.	Irrigation Available	Culinary Available

Table B – Points of Diversion

WR#	Approved Points of Diversion (POD's)	Desription
81-1073	S 4020 ft W 234 ft from N4 cor, Sec 11, T 41S, R 13W, SLBM	Upper Ash Creek Spring
		Collection Box and Pipeline
81-1602	N 899 ft W 717 ft from S4 cor, Sec 11, T 41S, R 13W, SLBM	Ash Creek Spring
81-2287	S 1208 ft W 2 ft from NE cor, Sec 18, T 9N, R 7E, SLBM	Toquerville Springs
Re-diversion	N 1989 ft E 635 ft from S4 cor, Sec 35, T 40S, R 13W, SLBM	Flow Division Device
81-687	S 4020 ft W 234 ft from N4 cor, Sec 11, T 41S, R 13W, SLBM	Ash Creek Springs
81-2477	S 170 ft W 979 ft from NW cor, Sec 29, T 41S, R 12W, SLBM	Concrete dam & ditches
Re-diversion	N 1604 ft W 131 ft from SE cor, Sec 26, T 41S, R 13W, SLBM	LaVerkin Canal Control Station
Re-diversion	S 1806 ft W 621 ft from N4 cor, Sec 36, T 41S, R 14W, SLBM	Quail Creek Dam
81-2481	S 234 ft W 625 ft from N4 cor, Sec 28, T 41S, R 12W, SLBM	Turbine & high pressure pumps
81-4334	S 170 ft W 979 ft from NW cor, Sec 29, T 41S, R 12W, SLBM	Concrete dam & ditches
Re-diversion	N 1604 ft W 131 ft from SE cor, Sec 26, T 41S, R 13W, SLBM	LaVerkin Canal Control Station
Re-diversion	S 1806 ft W 621 ft from N4 cor, Sec 36, T 41S, R 14W, SLBM	Quail Creek Dam

Water Right Report for LaVerkin City
Composed by Sunrise Engineering, Inc.

Individual Water Right Research Summaries

Water Right 81-1073, Decree, 27 documents researched.

This water right originates from Upper Ash Creek Springs. It was filed for in 1964 and has an excellent Priority of 1880. The water is diverted all year round by means of a collection box constructed at the spring POD. From there it is piped to the residents of LaVerkin City for Municipal use. This water right is evidenced by Award 154A, Virgin River Decree.
The right originated as a right in LaVerkin Creek and was moved to Ash Creek Springs by Application for Permanent Change a5999, Certificate No. a772. The diversion for this right is .3 second feet and has been limited to 72 acre feet by beneficial use year round.

Water Right 81-1602, Decree, 74 documents researched.

This water right comes from Ash Creek Springs. It was segregated from 81-2477 in 1985 and has excellent Priority of 1890. The water is diverted all year round by means of a collection box constructed at the spring POD. From there it is piped to the residents of LaVerkin City for Municipal use. The diversion for this right is for 1 second feet, which has been limited to 330 acre feet used year round. It originates from the Virgin River Decree Award #86, Class 1.

Water Right 81-2287, Decree, 35 documents researched.

This water right has a priority of 1862, so the priority is also very good. It has a flow of .333 cfs or 241 acre feet. The water right is shared with the City of Toqerville by way of a flow division device. The water originates from a Decree Award 141, Virgin River Decree, Class 1. At one point this water right had an approved change application to add an emergency use well, but it was allowed to lapse back in 1991. The water is available only from the surface POD since the application with the well was allowed to lapse. I have to assume that the well was never drilled or this change application would not have been allowed to lapse. The water use records indicate that this right has not been recently utilized by LaVerkin, but since 2004 has been allowed to overflow to Washington County Water Conservancy District.

Water Right Report for LaVerkin City
Composed by Sunrise Engineering, Inc.

Water Right 81-687, Certificated, 53 documents researched.

This water right was filed for in 1958, with a priority of 1890 so it also has good priority. The water right has a max flow of .491 cfs or 72.41 acre feet. It was acquired from a private citizen and changed to municipal use. It was then later certificated to be used as part of the town's culinary spring water.

Water Right 81-2477, Certificated, 71 documents researched.

This water right was acquired from LaVerkin Bench Canal Company in October 2008. It has a priority of 1890. This is the parent right from which several other LaVerkin Water Rights were segregated. (81-1602, 81-4334, and 81-2481) The water right has a max flow remaining of 4.97 cfs or 1640 acre feet. It has not yet been changed to municipal, so at the present time can only be used for irrigation. This right also originates from the Virgin River Decree Award #86, Class 1. The source of the water is Quail Creek Dam where it is stored, the LaVerkin Canal Control Station and a series of diversion ditches.

Water Right 81-2481, Certificated, 35 documents researched.

This water right was acquired from LaVerkin Bench Canal Company in October, 2008. It has a priority of 1890. This right was segregated from 81-2477. The water right has a max flow remaining of .0297 cfs or 20 acre feet. It has dual uses listed as industrial for the Hurricane Mesa test site and irrigation. After researching this water, it is not clear from the scanned records why this right is owned by the City, but still services the testing site. I'm guessing that there is an agreement in place where the City uses the water while the test site is not active. It has not yet been changed to municipal, so at the present time can only be used for irrigation by the City. It is diverted by means of a turbine and high pressure pumps up to the top of the mesa.

Water Right 81-4334, Decree, 6 documents researched.

This water right was also acquired from LaVerkin Bench Canal Company in October, 2008. It has a priority of 1900. This right was also segregated from the parent right 81-2477. The water right has a max flow remaining of 3 cfs or 990 acre feet. It has not yet been changed to municipal, so at the present time can only be used for irrigation. This right originates from the Virgin

River Decree Award #86, Class 2. This means that the water is only available after all class 1 rights from the same source are fulfilled. There is a possibility that this water would not be available to the City in years of severe drought. The source of the water is Quail Creek Dam where the water is stored, the LaVerkin Canal Control Station and a series of diversion ditches.

Water Right Capacity

LaVerkin City water right capacities are totaled on Table A, included in this report. There has been no effort of the water right specialist to quantify the source capacities and evaluate where the City is in the development of the paper water rights. It is becoming increasingly difficult to move and develop unused water rights. If development is possible at the current location then the City can work with it without a change application. The City has a total of 473.3 acre feet in the City's Ash Creek spring rights.
The City has 241 acre feet in the City's share of Toquerville Springs. The City's water use report for the year 2007 indicates that the City used 663.35 acre feet from the Ash Creek Spring Point of Diversion. The City either has a reporting problem to correct or needs to file a change application to take the Toquerville Springs water right from the Ash Creek spring POD. Another plan would be to file for a well POD which the City could put the Toquerville Springs water right into, plus some of the water right recently acquired from LaVerkin Bench Canal Company. This needs to be done as a backup to the City's current sources and to provide for future growth.

The City has also been using some water supplied by the Washington County Water Conservancy District. A query to them indicated that the City used 2,429 acre feet through the canal company for irrigation and a very small amount to supplement culinary use. Now that the City owns the Canal Company rights, perhaps the City will not be required to use as much of this water.

We highly recommend development of unused water rights as a water right management strategy as soon as possible by perhaps using the water in a secondary system for the City's irrigation needs, or leasing the water to farmers for irrigation purposes.

Water Right Report for LaVerkin City
Composed by Sunrise Engineering, Inc.

Water Right Protection Strategies Summary

Protection of the City's water rights is an increasingly important topic as the population of our state increases and our limited water resources are tapped on an ever increasing scale. The best protection for any water right application is to put the water to beneficial use and then submit proof. Past Division of Water Rights policy dictates the water rights that have not been used in the last five years may be subject to partial or full forfeiture, however, the new water right law dictates that a water right must be substantially used within a seven year period. This has changed. The Division policies for change applications now state that Non-Use may not be considered in the change process. This current change in the State Engineers policies will affect most municipalities across Utah. The City's right to develop the water may be partially blocked if the source capacity of the City's current right is undeveloped and requires approval of a change application. We have good reason to believe the new law will have a positive change on the current policies of the State Engineer.

A well can be drilled and is an additional source development possibility when increased capacity is required. Approved Non-use Applications may protect water rights that are currently not in use and not projected to be needed within 40 years. Non perfected applications have an extension approval process of their own.

The newly passed house bill gives some protection to municipality water users out to 40 years of growth and maximum build-out during that time. We therefore have included in this report several possible scenarios to extend the City's current needs assessment out to 40 years. Water rights that are owned by a municipality are now protected and exempted from non-use losses under the new law (73-1-4 Utah Code) if the water right was titled to the municipal before May 8, 2008. This would include the LaVerkin City Water Rights out of Ash Creek and Toquerville springs, but not the water from Quail Creek Reservoir.

Water Right Action Recommendations

1. Preparation of "Group contribution forms" for all water rights should be completed if possible. This is a declaration of how much water the City believe the City have in each water right. These must then be recorded with the County recorder before submission to the Division of Water Rights.
2. The City need a Permanent Change Application that places more water right in Upper Ash Creek Springs. The City can accomplish this by segregating a portion of the City's large irrigation right and changing the source, use, POD, and area of use to match the City's other Upper Ash Creek Spring water rights.

2. We recommend a Permanent Change Application to place some of the City's water rights in a well source. We can help the City write the application, locate a good place for the well, apply for a drilling permit if necessary and we can help the City find a well driller.
3. Thought should be given to changing some of the City's recently acquired irrigation water to municipal use. This will give the City the flexibility the City need in the future to use this water for culinary purposes or continue to use it as irrigation water.

We have the experience, and are available, to do these forms and applications for the City.

40 Year Water Use projection Analysis

The new House Bill pertaining to Water Rights protection for Municipals (HB-51which updates 73-1-4 Utah Code) states that municipal water rights are protected for the future use of Cities' out to a 40 year projection. The state census of 2008 stated that the population of LaVerkin City was 4,624 with an estimated 1294 connections. Based on a projected 4% growth rate the 40 year population projection equals an estimated 23,088 people with a commensurate connection total of 6,408.

In 2007 the City reported indoor use of 663.35 acre feet of water with 1,686 Connections. This averages .39 acre feet per connection. This is very conservative. State regulations allow .45 acre feet per connection for indoor use.

The City's engineers have estimated the City's total build out potential to be 20,477 people or about 5,505 connections. If the City use the water at the City's present average per connection of .39 acre foot, the City will be using 2,147 acre feet of water by the year 2049 (40 years) for culinary purposes. If we assume that the City use a secondary irrigation system for watering lawns, gardens and other outdoor uses, we need to factor in about .5 acre feet per connection. We calculated .39 for indoor and

.5 for outdoor use totals to .89 acre feet per connection (**.89 x 5,505 = 4,899 acre feet)**. This means that the City's 40 year projection more than protects all of the City's water rights.

Since the City's current water rights total an estimated 3,365 acre feet, the City have by this projection protected all of the City's city water rights. The City will definitely need to acquire more water rights or count on purchasing water from the Washington County Water Conservancy District when the City's growth exceeds the City's present water right inventory.

Water Right Report for LaVerkin City
Composed by Sunrise Engineering, Inc.

Water Right Compliance

Water right compliance has been evaluated with the various on-line documents available. Non-compliance issues have been found. The City's water use reporting may be the problem, as it is not reporting any use out of Toquerville Springs. If the City follows our recommendations for change applications above, this should not be a problem for the City in the future.

The State has a compliance division within the Division of Water Rights. They will investigate over productions and other illegal use of all sources. We highly recommend that only approved water quantities and sources be used for their approved beneficial uses, for approved periods of time. Penalties for illegal use can reach $10,000 per day and the water used illegally must be replaced. According to usage reports filed with the state, LaVerkin City has over extended their Ash Creek spring water right use as far as we can see with this level of research. This means the City reported using more water than the City have the right to use. We can fix this situation by a change application where we add more water right to the spring.

Water Right acquisition is a subject that the City needs to consider. The City have recently acquired some good water rights from the canal company although one of them is class 2 water which might not be available during times of severe drought. This potential loss further compounds the City's need to acquire more good water rights. Sometimes farmers in the area retire and want to sell water for their retirement. We can assist LaVerkin City in finding water rights that might be on the market for purchase. Another way to approach this problem is to amend town ordinances so that when a contractor wants to develop within the City's service area, he must bring water right with his proposal. Over time, the City will be approached to have some additional rights/shares dedicated to LaVerkin. A clear water right dedication policy should be formulated for all to understand.

This year a new law was passed to make it mandatory that if a city has sufficient water rights for the 40 year period then the city could not require the developer or industry to bring water right to the city. The City's projection makes the City exempt from this new law because the City need more water to meet the needs of the City's projected growth.

At times the City should require money in lieu of water right instead of actual water right dedications. It is our recommendation that LaVerkin City require one or the other, the dedication or money-in-lieu at their discretion, to maintain control of water right inventory. We recommend that the acre-feet that are protected by the 40 year plan be maintained (the 4,881 a-f covered by projected growth).

Water Right Report for LaVerkin City
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The City should have any water right that is proposed to be dedicated, checked out and quantified by a water right specialist before the dedication agreement is signed. The water right dedication agreement should be written by the City attorney with input from the water right specialist every time a water right dedication is proposed. If money-in-lieu of water right is decided by the Council for a specific project, the City attorney should also prepare a “water right money-in-lieu agreement” to be signed by both parties to legalize and define the City requirements (a water banking concept) and City dedication of current water right inventory to the project. This will officially help to update the 40 year plan inventories.

Water right banking has been used successfully in Utah by various communities. We suggest the creation of a LaVerkin Water Right Bank. The bank would facilitate the water right dedication policies as they are implemented. If a dedication is proposed by the City Council to a developer once the water right was checked out and accepted for banking, temporary credits could be issued and used by the developer until an “Approval Order” from the State Engineer is issued that quantifies the right and it is approved for City use. At that point in time, permanent acre-feet Credit Certificates can be issued to the developer. Extra credits over and above the project requirements may be sold and traded by the developer to be redeemed to fulfill the water right requirement for any project by the City when an actual original credit certificate is presented to the City. No money changes hands from the City from the beginning of the transaction and facilitation of the banking agreement. This type of water right banking has been proven to work and facilitate the acceptance of water right when and if the City Council decides it is appropriate. Implementation of the banking concept also frees future capital outlays for new water right acquisitions.

We recommend that when large industrial or comparable developers that require large amounts of water right for their projects, including a portion of the protected 40 year inventory and quantities above and beyond the current 40 year inventories, the developers are required to purchase additional water rights to maintain the 40 year inventories as much as possible.

If any individual water right owner of record would like to dedicate water right to the bank, the City could have the water right checked out (some junior priorities would be rejected upfront), and require an approved change application from the applicant for a LaVerkin municipal use at the owners’ expense. In the mean time, the owner would continue his use of the water right. The City would then promote/wait for a large developer or industry that needs to purchase this right. As the developer and the owner finalize their deal, with the City as a third party advocate, (the city has preapproved the water right, along with the state engineer), and then the proceeds would go to the owner of record. The owner of record would have already, through the title company deeded in escrow the water right to the City. This process would allow the City to pick and choose the more senior

rights over time and help eliminate the possibility of the priority cut of the future and its effects on the 40 year plan water right inventories. This category of banked water right as stated would stay in the owner of record's name and he would have the sole responsibility of water right protection until the City approved the water right banking agreement, and issued the acre-foot credit certificates. The water right banking is a way to several means, including screening of undesirable water rights purchased by developers who want to dedicate the rights to the City regardless of past beneficial use or priority.

We strongly suggest the creation of a "money in lieu of water right" fee, not the creation of a water right impact fee. This would free up capital invested in the water rights in the past without the strings of the impact fee type. A water infrastructure impact fee is also required.