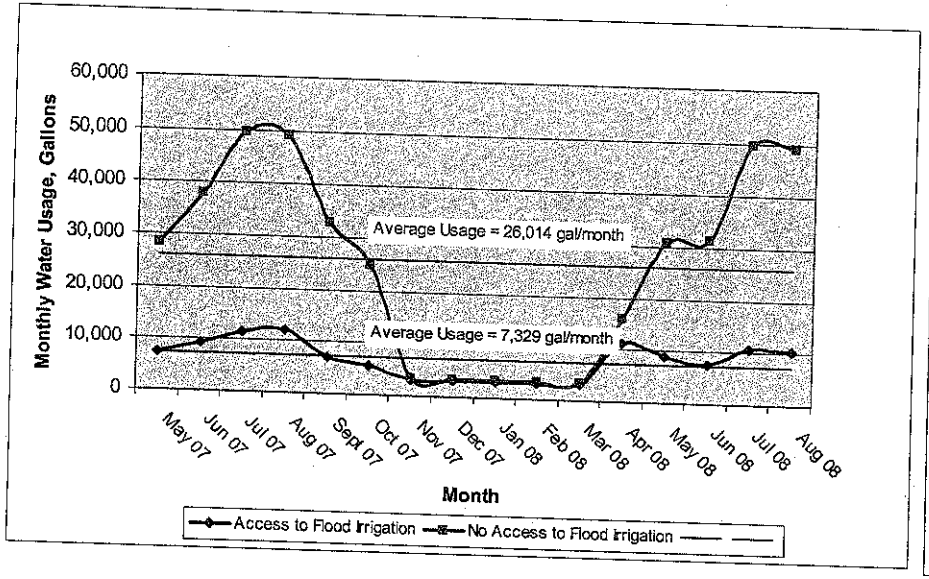
Alternatives:

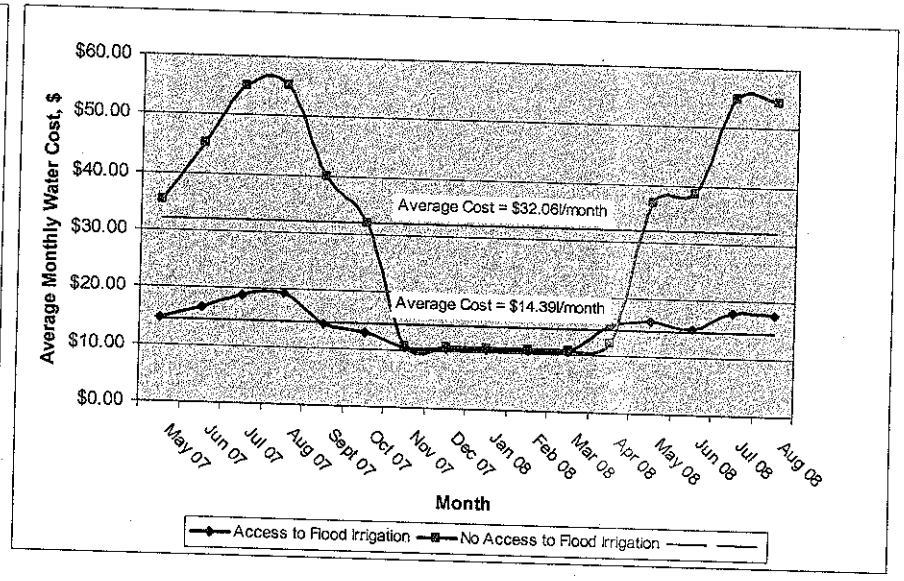
1. Maintain Existing Gravity Irrigation System
2. Install Pressurized Irrigation System
3. Abandon Existing Irrigation System and replace with
   a. Augment Potable Water System by Drilling Additional Well(s)
   b. Augment Potable Water System by Constructing Potable Water Treatment Plant
   c. Combination of a + b

Basis for Assumptions:

- 1305 Users have access to flood irrigation
- 145 Users do not have access to flood irrigation
- 1405 Users are connected to the potable water system
- Water usages represent average of 12 homes and do not take into account possible large users such as parks, industries, etc.
- Maximum Day Demand (MDD) is 1,900 gallons per minute

	Peak Month Usage	Annual Average Usage	Average Wintertime Usage
No Access to Flood Irrigation – 12 home average	49,700 gal/month	26,014 gal/month	3,330 gal/month
Access to Flood Irrigation – 12 home average	11,950 gal/month	7,329 gal/month	3,200 gal/month





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Existing Potable Water Supply Summary <u>with</u> Secondary Irrigation System

Increase Rate 1.2%

Table 1 – Potable Supply and Demand Overview with Secondary Irrigation System

Year	Population[1]	Max Day Potable Demand[2] (gpm)	Total Redundant Potable Well Supply[3] (gpm)	Surplus Ground Water Supply (gpm)
2008	3,400	1,900	2,132	232
2013	3,609	2,255	2,132	**-124**
2018	3,831	2,633	2,132	**-501**
2028	4,316	3,457	2,132	**-1,325**

Notes:

1. Population projections based on a 1.2% growth rate.
2. Assumes commercial and industrial demands grow proportionately with domestic demands.
3. Calculated as total water right of 7.05 cfs (3,164 gpm) less largest well production of 2.3 cfs (4th Ave Well – 1,032 gpm)

<u>Concussions:</u>

1. Existing potable water supply not anticipated to be sufficient beyond 2018 even with the usage of secondary irrigation system.
2. An additional well will need to be drilled to make use of entire groundwater rights of 7.05 cfs (3,164 gpm) as shown in Table 2.

Table 2 – Potable Supply and Demand Overview with Secondary Irrigation System and Drill New Well similar to 4th Avenue Well (2.3 cfs)

Year	Population	Max Day Potable Demand (gpm)	Total Redundant Potable Well Supply (gpm)	Surplus Ground Water Supply (gpm)
2008	3,400	1,900	3,164	1,264
2013	3,609	2,255	3,164	909
2018	3,831	2,633	3,164	531
2028	4,316	3,457	3,164	**-293**

<u>Concussions:</u>

1. Existing potable water supply with an additional well of 2.3 cfs is anticipated to be sufficient through approximately 2024 with the continued usage of secondary irrigation system.

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Existing Potable Water System Supply and Demand Overview <u>without</u> Secondary Irrigation System

Table 3. Anticipated Water Supply and Maximum Day Demand without Secondary Irrigation System.

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Difference (gpm)
2008	3,400	5,780	2,132	**-3,648**
2013	3,609	6,135	2,132	**-4,004**
2018	3,831	6,513	2,132	**-4,381**
2028	4,316	7,337	2,132	**-5,205**

<u>Concussions:</u>

1. There is a large deficiency between demand and supply.

Alternative 3a – No Secondary Irrigation System: Augment Potable Water System by Drilling Additional Well(s)

Table 2 – Potable Supply and Demand Overview without Secondary Irrigation System and Drill New Well similar to 4th Avenue Well (2.3 cfs)

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Difference (gpm)
2008	3,400	5,780	3,164	**-2,616**
2013	3,609	6,135	3,164	**-2,971**
2018	3,831	6,513	3,164	**-3,349**
2028	4,316	7,337	3,164	**-4,173**

Concussions:

1. There is a large deficiency between demand and supply.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Pump station upgrades	EA	1	**$150,000**	$150,000
Well Construction	EA	1	**$500,000**	$500,000
Subtotal Construction				$2,600,000
Project Contingency/Inflation (20%)				$520,000
Engineering, Legal, Misc. (25%)				$650,000
Total Project				$3,770,000

Note: Inflation to 2010

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Alternative 3b - No Secondary Irrigation System: Augment Potable Water System by Constructing Potable Water Treatment Plant

Water Treatment plant construction costs typically range from $1.00 to $2.50 per gallon per day depending on water quality and needed treatment processes. For example, the construction of a plant to treat 1,000,000 gallons per day would cost between $1-million and $2.5-million. More accurate cost estimates could be further developed in the planning process which includes actual water quality sampling and further process analysis.

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Construct Water Treatment Plant (9 cfs / 4,040 gpm)	Difference (gpm)	Difference (mgd)	Difference (cfs)
2008	3,400	5,780	2,132	4,040	392	0.56	0.87
2013	3,609	6,135	2,132	4,040	37	0.05	0.08
2018	3,831	6,513	2,132	4,040	**-341**	**-0.49**	**0.76**
2028	4,316	7,337	2,132	4,040	**-1,165**	**-1.68**	**2.6**

Construction Costs for New Treatment Plant and Distribution System Repair.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Water Treatment Plant	Gal	5,820,000	**$1.50**	$8,730,000
Subtotal Construction				$10,680,000
Project Contingency/Inflation (20%)				$2,136,000
Engineering, Legal, Misc. (25%)				$2,670,000
Total Project				$15,486,000

Note: Inflation to 2010

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Alternative 3c - No Secondary Irrigation System: Augment Potable Water System by Constructing New Well and Potable Water Treatment Plant

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Construct Water Treatment Plant (9 cfs / 4,040 gpm)	Difference (gpm)	Difference (mgd)	Difference (cfs)
2008	3,400	5,780	3,164	4,040	1,424	2.05	3.24
2013	3,609	6,135	3,164	4,040	1,069	1.54	2.44
2018	3,831	6,513	3,164	4,040	691	1.00	1.57
2028	4,316	7,337	3,164	4,040	**-133**	**-0.19**	**-0.30**

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Water Treatment Plant	Gal	5,820,000	**$1.5**	$8,730,000
Pump station upgrades	EA	1	**$150,000**	$150,000
Well Construction	EA	1	**$500,000**	$500,000
Subtotal Construction				$11,330,000
Project Contingency/Inflation (20%)				$2,266,000
Engineering, Legal, Misc. (25%)				$2,832,500
Total Project				$16,428,500

Note: Inflation to 2010

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Financial Considerations

Alternatives:

1. Maintain Existing Gravity Irrigation System
2. Install Pressurized Irrigation System
3. Abandon Existing Irrigation System and replace with:
   a. Augment Potable Water System by Drilling Additional Well(s)
   b. Augment Potable Water System by Constructing Potable Water Treatment Plant
   c. Combination of a + b

Alternative	No of Users	Capital Costs	Annual Loan Payment (30 year 4%)	Annual Operation Costs	Total Annual Cost	Annual Cost per User	Monthly Cost per User
1	1305	$12,615,000	$729,525	$150,000	$879,525	$674	$56.16
2	1305	$11,672,500	$675,021	$50,000	$725,021	$556	$46.30
3							
3a	1450	$3,770,000	$218,019	$250,000	$468,019	$323	$26.90
3b	1450	$15,468,000	$894,514	$300,000	$1,194,514	$824	$68.65
3c	1450	$16,428,500	$950,060	$300,000	$1,250,060	$862	$71.84

Costs presented herein are order of magnitude concept level costs for comparison between different alternatives. Actual costs may vary substantially at the time of construction as unknown conditions may arise or may not be anticipated at this time.

Table 1 represents the mixed potable and irrigation demands for the city of Gooding based on well production logs:

Table 1

Existing Demand Scenario[1]	gpm
Maximum Day Demand	1,900

Note: gpcm = gallons per capita per minute

Based on ratios derived from winter and summer billing data for residential connections and an assumed 9/1 ratio for homes with flood access to homes without flood access, the breakdown of the current max day demand is shown in Table 2.

Table 2

Homes with Flood Access	1,291	gpm
Homes without flood access	609	gpm
Total Demand	1,900	gpm

Based on 2000 US census household densities of 2.5 people per home, and an assumed 145 homes without flood access, the average demand per person for a home without flood access is 1.7 gpcm (gallons per capita per minute).

Assuming the irrigation system remains in place, and all future units are required to irrigate with potable water, the following table applies:

Table 3

Year	Population[1]	Max Day Demand (gpm)	Redundant Supply (gpm)	Difference (gpm)
2008	3,400	1,900	2,132	232
2013	3,609	2,255	2,132	**-124**
2018	3,831	2,633	2,132	**-501**
2028	4,316	3,457	2,132	**-1,325**

Assuming the irrigation system is abandoned, and everyone is required to irrigate with potable water, the following table applies:

Year	Population[1]	Max Day Demand (gpm)	Redundant Supply (gpm)	Difference (gpm)
2008	3,400	5,780	2,132	**-3,648**
2013	3,609	6,135	2,132	-4,004
2018	3,831	6,513	2,132	**-4,381**
2028	4,316	7,337	2,132	**-5,205**

The surface water right would add 4000 gpm to the supply side of the picture.

Irrigation System Projected Costs for Continued Operation 2008

12/2/08

The following projected budget is based on an assumption we will continue operation of the flood irrigation system in a manner consistent with the present delivery method. This budget was generated by assuming the irrigation department will be ran as a separate and individual department and will not rely on the use of personnel and equipment from other city departments.

Based on this it will be necessary to hire a minimum of three full time employees and five seasonal irrigators to continue a route type delivery system. The three full time employees would provide maintenance on a daily basis and do larger scale repairs and maintenance during the non-irrigation season. The full time employees would also be required to learn all of the irrigation routes for training purposes and as backup irrigators. The following is a list of the equipment and vehicles that will need to be purchased to operate and maintain the system.

Equipment requirements:

1. Front end loader with backhoe
2. Dump Truck
3. Four Pickup Trucks

We have assumed the purchases of the necessary equipment will be done with good used equipment and vehicles. The values are based on current market prices and recent city purchases of like items.

Please bear in mind this projected budget is for one year only and does not reflect any repairs or infrastructure replacement other than what will be necessary to keep the system running on a day-to-day basis. Continuation of surface water flooding will require a large-scale replacement of the infrastructure and long-term debt. This debt will have a significant financial impact on property owners and yearly budgets.

Budget sheet #1 reflects estimated costs to continue the flood irrigation system as a stand-alone department without the capitol outlay for equipment. This scenario requires the addition of a minimum of three new full time employees and an increase in funds for maintenance and repairs. This does not reflect any costs that may be associated with large-scale replacement of infrastructure. This would require the per lot assessment be increased to $107.00

Budget sheet #2 reflects estimated costs to continue the flood irrigation as a stand-alone department, hire three new full time employees, and purchase the necessary equipment to operate and maintain the system. This does not reflect any costs that may be associated with large-scale replacement of infrastructure. This scenario will require the per lot assessment be increased to $156.00.

Alternatives:

1. Maintain Existing Gravity Irrigation System

2. Install Pressurized Irrigation System

3. Abandon Existing Irrigation System and replace with:

   a. Augment Potable Water System by Drilling an Additional Well

   b. Augment Potable Water System by Constructing Potable Water Treatment Plant to treat all surface water rights

   c. Augment Potable Water System by Constructing Potable Water Treatment Plant to treat surface water and by Drilling Additional Well

   a.1. Augment Potable Water System by Drilling an three additional Wells

   b.1. Augment Potable Water System by Constructing Potable Water Treatment Plant to meet demand of year 2028

   c.1. Augment Potable Water System by Constructing Potable Water Treatment Plant and additional well to meet demand of year 2028

Existing System

Table 1. City of Gooding Existing Water Supply Summary

Gooding Existing Water Supply		
Total Groundwater Water Right (gpm)	3,164	gpm
Combined Pumping Capacity of Wells[1]	3,543	gpm
Less Capacity of Largest Well	1,518	gpm
Total Redundant Supply	*2,025*	*gpm*

Notes:
1. Wells currently have the capacity to exceed water right of 3,164 gpm.

Idaho Rules for Public drinking water systems require that under normal operating conditions, with any source out of service, the remaining source or sources shall be capable of providing either the peak hour demand of the system or maximum day demand plus equalization storage (see: IDAPA 58.01.08.513)

Because the City reportedly has 1.18 MG of storage, the system likely has sufficient peaking storage. With adequate peaking storage, the total supply only needs to meet maximum day demands with any source out of service. The total supply available with the largest source out of service is referred to as the redundant supply.

Table 2 summarizes the total potable demands for the City of Gooding based on well production logs:

Table 2 – Total Maximum Day Demand based on well production logs.

Existing Demand Scenario	gpm
Maximum Day Demand	1,900

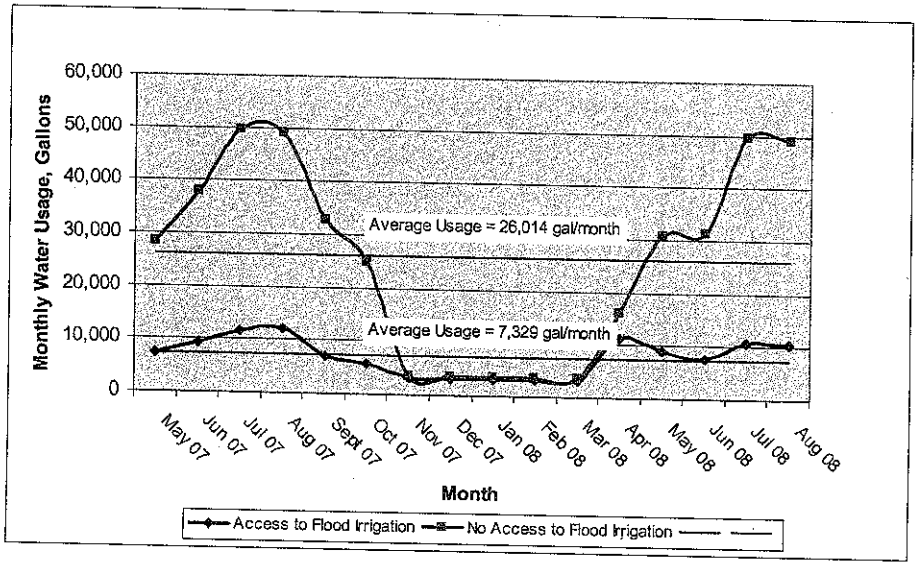
There is currently an excess of 125 gpm. (2025 gpm – 1900 gpm = 125 gpm)

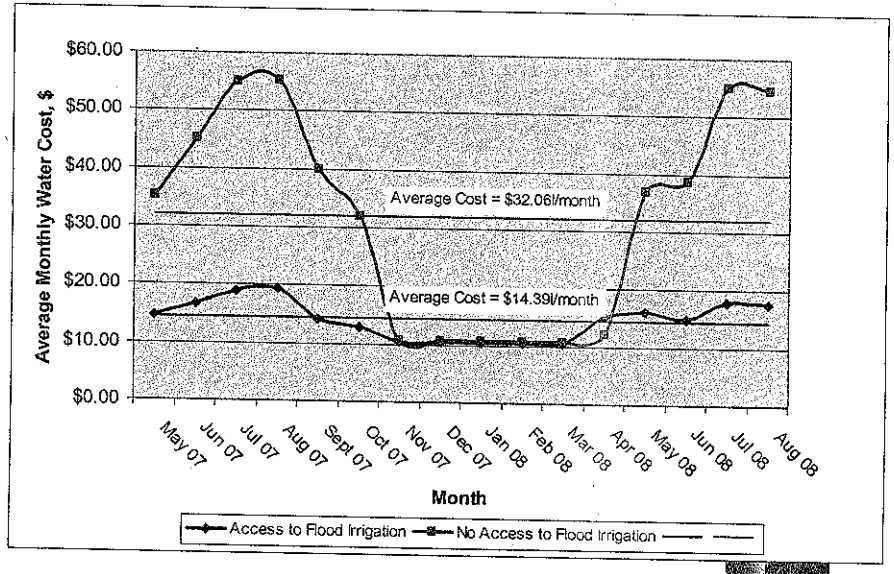
Water Usage Determinations

Basis for Assumptions:

- 1305 Users have access to flood irrigation and are sent bills
- 75% of Users that have access to flood irrigation use flood irrigation – 25% do not use flood irrigation as reported by Public Works Director.
- 145 Users do not have access to flood irrigation as reported by City Clerk.
- 1450 Users are connected to the potable water system
- Water usages represent average of 12 homes and do not take into account possible large users such as parks, industries, etc.
- Current Maximum Day Demand (MDD) is 1,900 gallons per minute as measured by existing well production.

	Peak Month Usage	Annual Average Usage	Average Wintertime Usage
No Access to Flood Irrigation – 12 home average	49,400 gal/month	26,014 gal/month	3,330 gal/month
Access to Flood Irrigation – 12 home average	11,100 gal/month	7,329 gal/month	3,200 gal/month





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Calculation of Unit Demands

Based on ratios derived from billing data, homes irrigating with potable water use 7.4 times more potable water than homes irrigating with surface water. The relationship is shown in Table 3.

Table 3

Irrigation Access Status	Max Month Potable Demand (2007-2008)	Units
Average demand for Homes irrigating with surface water	5,729	gal/month/home
Average demand for Homes irrigating with potable water	42,337	gal/month/home
Potable Demand Ratio	7.4	-

The estimates provided by the city pertaining the number of homes using potable water or surface water for irrigation are shown in Table 4.

Table 4

Irrigation Source Estimates for Homes in Gooding	
Homes Irrigating with Surface Water	979
Homes Irrigating with Potable	471
Total Homes	*1,450*

Based on a current population estimate of 3,400 people and approximately 1,450 homes, the household density is approximately 2.3 people per household.

The existing 1,900 gpm Max Day Demand consists of 471 homes irrigating with potable water, and 979 homes irrigating with surface water. Using these values, the per capita demands for each type of household is calculated as shown in Table 5.

Table 5

Per Capita Demands (gpcm)	
Homes Irrigating with Surface Water (gal/person/minute)	0.18
Homes Irrigating with Potable (gal/person/minute)	1.34

Note:
Eqn: 979(x) +471(y) = 1900 gpm, where x = household potable demand for homes with flood access, y = household potable demand for homes without flood access, and y = 7.4x as derived from the billing data in shown in Table 3

The unit demands presented in Table 5 are used to project future potable demands as the City's population grows. For example, 100 new people using 1.34 gpcm would add 134 gpm to the existing potable demand.

Existing Potable Water Supply Summary with Secondary Irrigation System

Assuming the existing surface water irrigation system remains in place, and all future units are required to irrigate with potable water, Table 6 applies:

Table 6 – Potable Supply and Demand Overview with Secondary Irrigation System

Year	Population[1]	Max Day Potable Demand[2] (gpm)	Total Redundant Potable Well Supply[3] (gpm)	Surplus Ground Water Supply (gpm)
2008	3,400	1,900	2,025	125
2013	3,609	2,145	2,025	-156
2018	3,831	2,405	2,025	-454
2028	4,316	2,974	2,025	-1,104

Notes:

1. Population projections based on a 1.2% growth rate.
2. Assumes commercial and industrial demands grow proportionately with domestic demands.
3. Calculated as total supply of 7.05 cfs (3,164 gpm) less largest well production of 2.3 cfs (4th Ave Well – 1,032 gpm)

Conclusions:

1. Existing potable water supply not anticipated to be sufficient beyond 2013 even with the usage of secondary irrigation system.
2. An additional well be needed in order make full use of the groundwater rights when considering redundant supply. (See Table 7)

Table 7 – Potable Supply and Demand Overview with Secondary Irrigation System in place and Drill New Well similar to ~~4th~~ Senior Avenue Well (1,518 gpm)

Year	Population	Max Day Potable Demand (gpm)	Total Redundant Potable Well Supply (gpm)	Surplus Ground Water Supply (gpm)
2008	3,400	1,900	3,543	1,643
2013	3,609	2,145	3,543	1,363
2018	3,831	2,405	3,543	1,065
2028	4,316	2,974	3,543	414

Conclusions:

1. Existing potable water supply with an additional well of 2.3 cfs is anticipated to be sufficient until population reaches approximately 4,400 with the continued usage of secondary irrigation system.

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Existing Potable Water System Supply and Demand Overview <u>without</u> Secondary Irrigation System

Table 8. Anticipated Water Supply and Maximum Day Demand without Secondary Irrigation System – Everyone is required to irrigate with potable water.

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Deficiency (gpm)
2008	3,400	4,564	2,025	**-2,539**
2013	3,609	4,844	2,025	**-2,819**
2018	3,831	5,142	2,025	**-3,117**
2028	4,316	5,793	2,025	**-3,768**

Conclusions:

1. The City's current supply is inadequate to support the existing needs of a combined potable and irrigation system.

Alternative 3a – No Secondary Irrigation System: Augment Potable Water System by Drilling One Additional Well

Table 9 – Potable Supply and Demand Overview without Secondary Irrigation System and Drill New Well similar to 4th Avenue Well (1,518 gpm)

Year	Population	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Deficiency (gpm)
2008	3,400	4,564	3,543	**-1,021**
2013	3,609	4,844	3,543	**-1,301**
2018	3,831	5,142	3,543	**-1,599**
2028	4,316	5,793	3,543	**-2,250**

Conclusions:

1. There is a large deficiency between demand and supply. More wells would be needed. See Alternative 3a.1

Table 10. Concept Level Opinion of Probable Project Cost for Alternative 3a.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Pump station upgrades	EA	1	**$150,000**	$150,000
Well Construction	EA	1	**$500,000**	$500,000
Subtotal Construction				$2,600,000
Project Contingency/Inflation (30%)				$780,000
Engineering, Legal, Misc. (25%)				$650,000
Total Project				$4,030,000

Note: Inflation to 2010

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Alternative 3b - No Secondary Irrigation System: Augment Potable Water System by Constructing Potable Water Treatment Plant using all surface water rights

Water Treatment plant project costs typically range from $1.00 to $2.50 per gallon per day depending on water quality and needed treatment processes. For example, the construction of a plant to treat 1,000,000 gallons per day would cost between $1-million and $2.5-million. More accurate costs could be further developed in the planning process which includes actual water quality sampling and further process analysis.

Table 11. Potable Supply and Demand Overview by Constructing Surface Water Treatment Plant to treat all of City's Surface Water Rights.

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Construct Water Treatment Plant (9 cfs / 4,040 gpm)	Surplus (gpm)
2008	3,400	3,986	2,025	4,040	2,079
2013	3,609	4,231	2,025	4,040	1,834
2018	3,831	4,491	2,025	4,040	1,574
2028	4,316	5,060	2,025	4,040	1,005

Table 12. Concept level opinion of probable project costs for Alternative 3b.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Water Treatment Plant	Gal	5,820,000	**$1.50**	$8,730,000
				$0
				$0
Subtotal Construction				$10,680,000
Project Contingency/Inflation (30%)				$3,204,000
Engineering, Legal, Misc. (25%)				$2,670,000
Total Project				$16,554,000

Note: Inflation to 2010

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Alternative 3c - No Secondary Irrigation System: Augment Potable Water System by Constructing New Well and Potable Water Treatment Plant using all surface water rights.

Table 13. Potable Supply and Demand Overview by New Well and by Constructing Surface Water Treatment Plant to treat all of City's Surface Water Rights.

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Construct Water Treatment Plant (9 cfs / 4,040 gpm)	Surplus (gpm)
2008	3,400	3,986	3,543	4,040	3,597
2013	3,609	4,231	3,543	4,040	3,352
2018	3,831	4,491	3,543	4,040	3,092
2028	4,316	5,060	3,543	4,040	2,523

Table 14. Concept level opinion of probable project costs for Alternative 3c.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Water Treatment Plant	Gal	5,820,000	**$1.50**	$8,730,000
Pump station upgrades	EA	1	**$150,000**	$150,000
Well Construction	EA	1	**$500,000**	$500,000
Subtotal Construction				$11,330,000
Project Contingency/Inflation (30%)				$3,399,000
Engineering, Legal, Misc. (25%)				$2,832,500
Total Project				$17,561,500

Note: Inflation to 2010

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Alternative 3a.1 – No Secondary Irrigation System: Augment Potable Water System by Drilling Three Additional Well(s)

Table 15. Potable Supply and Demand Overview without Secondary Irrigation System and Drill Three New Wells each similar to 4th Avenue Well (1,518 gpm)

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Surplus (gpm)
2008	3,400	4,564	**6,579**	2,015
2013	3,609	4,844	**6,579**	1,735
2018	3,831	5,142	**6,579**	1,437
2028	4,316	5,793	**6,579**	786

Table 16. Concept level opinion of probable project costs for Alternative 3a.1.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Water Rights (4.6 cfs)	LS	1	**$400,000**	$400,000
Pump station upgrades	EA	3	**$150,000**	$450,000
Well Construction	EA	3	**$500,000**	$1,500,000
Subtotal Construction				$4,300,000
Project Contingency/Inflation (30%)				$1,290,000
Engineering, Legal, Misc. (25%)				$1,075,000
Total Project				$6,665,000

Note: Inflation to 2010

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Alternative 3b.1 - No Secondary Irrigation System: Augment Potable Water System by Constructing a Potable Water Treatment Plant to meet 2028 Demand

Table 17. Potable Supply and Demand Overview by Constructing Surface Water Treatment Plant to treat surface water to meet demands through 2028.

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Construct Water Treatment Plant (8.4 cfs / 3,768 gpm)	Surplus (gpm)
2008	3,400	4,564	2,025	3,768	1,229
2013	3,609	4,844	2,025	3,768	949
2018	3,831	5,142	2,025	3,768	651
2028	4,316	5,793	2,025	3,768	0

Table 18. Concept level opinion of probable project costs for Alternative 3b.1.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Water Treatment Plant	Gal	5,430,000	**$1.50**	$8,145,000
Pump station upgrades	EA	1	**$150,000**	$150,000
Well Construction	EA	1	**$500,000**	$500,000
Subtotal Construction				$10,745,000
Project Contingency/Inflation (30%)				$3,223,500
Engineering, Legal, Misc. (25%)				$2,686,250
Total Project				$16,654,750

Note: Inflation to 2010

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Alternative 3c.1 - No Secondary Irrigation System: Augment Potable Water System by Constructing New Well and Potable Water Treatment Plant to meet 2028 Demand

Table 19. Potable Supply and Demand Overview by Constructing a new well and a Surface Water Treatment Plant to treat surface water to meet demands through 2028.

Year	Population[1]	Max Day Demand (gpm)	Redundant Well Supply (gpm)	Construct Water Treatment Plant (5.0 cfs / 2,250 gpm)	Surplus (gpm)
2008	3,400	4,564	3,543	2,250	1,229
2013	3,609	4,844	3,543	2,250	949
2018	3,831	5,142	3,543	2,250	651
2028	4,316	5,793	3,543	2,250	0

Table 20. Concept level opinion of probable project costs for Alternative 3c1.

	Unit	Quantity	Unit Price	Total Price
Corridor Transmission Lines	LF	30,000	**$25**	$750,000
Excavation/Backfill	LF	30,000	**$20**	$600,000
Fittings, Valves	LF	30,000	**$10**	$300,000
Asphalt Repair	LF	30,000	**$10**	$300,000
Water Treatment Plant	Gal	3,240,000	**$1.50**	$4,860,000
Pump station upgrades	EA	1	**$150,000**	$150,000
Well Construction	EA	1	**$500,000**	$500,000
Subtotal Construction				$7,460,000
Project Contingency/Inflation (30%)				$2,238,000
Engineering, Legal, Misc. (25%)				$1,865,000
Total Project				$11,563,000

Note: Inflation to 2010

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Financial Considerations

Alternatives:

1. Maintain Existing Gravity Irrigation System
2. Install Pressurized Irrigation System
3. Abandon Existing Irrigation System and replace with:
   a. Augment Potable Water System by Drilling Additional Well(s)
   b. Augment Potable Water System by Constructing Potable Water Treatment Plant
   c. Augment Potable Water System by Constructing Potable Water Treatment Plant and by Drilling Additional Well
   b.1. Augment Potable Water System by Constructing Potable Water Treatment Plant to meet demand of year 2028
   c.1. Augment Potable Water System by Constructing Potable Water Treatment Plant and additional well to meet demand of year 2028

Table 21 Concept level financial analysis and average monthly rate comparison for each alternative.

		New Facilities						Existing Facilities		
Alternative	No. of Users	Capital Costs	Annual Loan Payment (30 year 4%)	Annual Operation Costs	Total Annual Cost	Annual Cost per User	Monthly Cost per User	Annual Operation Costs	Monthly Potable Water Cost	Total Average Water Bill
1	1305	$12,615,000	$729,525	$150,000	$879,525	$674	$56.16	$350,000	$20.11	$76.28
2	1305	$11,672,500	$675,021	$100,000	$775,021	$594	$49.49	$350,000	$20.11	$69.61
3										
~~3a~~	~~1450~~	~~$4,030,000~~	~~$233,055~~	~~$200,000~~	~~$433,055~~	~~$299~~	~~$24.89~~	~~$350,000~~	~~$20.11~~	~~$45.00~~
3b	1450	$16,554,000	$957,318	$200,000	$1,157,318	$798	$66.51	$350,000	$20.11	$86.63
3c	1450	$17,561,500	$1,015,582	$200,000	$1,215,582	$838	$69.86	$350,000	$20.11	$89.98
3a.1	**1450**	**$6,665,000**	**$385,437**	**$200,000**	**$585,437**	**$404**	**$33.65**	**$350,000**	**$20.11**	**$53.76**
3b.1	1450	$16,654,750	$963,144	$200,000	$1,163,144	$802	$66.85	$350,000	$20.11	$86.96
3c.1	**1450**	**$11,563,000**	**$668,688**	**$200,000**	**$868,688**	**$599**	**$49.92**	**$350,000**	**$20.11**	**$70.04**

Costs presented herein are order of magnitude concept level costs for comparison between different alternatives. Actual costs may vary substantially at the time of construction as unknown conditions may arise or may not be anticipated at this time.

* Costs presented in Draft Irrigation System Study dated November 2008