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SARATOGA SPRINGS

PRESSURIZED IRRIGATION IMPACT FEE FACILITY PLAN

(HAL Project No.: 360.07.600)

October 2022

HANSEN ALLEN & LUCE inc
ENGINEERS

CITY OF SARATOGA SPRINGS

PRESSURIZED IRRIGATION IMPACT FEE FACILITY PLAN

(HAL Project No.: 360.07.600)

Kai Krieger, P.E.

Project Engineer

HANSEN ALLEN & LUCE INC
ENGINEERS

OCTOBER 2022

IMPACT FEE CERTIFICATION

The Utah Impact Fee Act requires certifications for the Impact Fee Facilities Plan (IFFP). Hansen, Allen & Luce provides these certifications with the understanding that the recommendations in the IFFP are followed by City Staff and elected officials. If all or a portion of the IFFP are modified or amended, or if assumptions presented in this analysis change substantially, this certification is no longer valid. All information provided to Hansen, Allen & Luce, Inc. is assumed to be correct, complete, and accurate.

IFFP Certification

Hansen, Allen & Luce, Inc. certifies that the Impact Fee Facilities Plan (IFFP) prepared for the pressurized irrigation system:

1. includes only the costs of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities;
    b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and
3. complies in each and every relevant respect with the Impact Fees Act.

HANSEN, ALLEN & LUCE, INC.

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IMPACT FEE SUMMARY

The **purpose** of the Impact Fee Facilities Plan (IFFP) is to comply with the requirements of the Utah Impact Fees Act by identifying demands placed on the existing Pressurized Irrigation (PI) system by new development and by identifying the means by which the City will meet these new demands. This analysis is an update to the Secondary Water System IFFP prepared in 2020 to address changes in conditions and assumptions that result in an increase in the proposed PI impact fee.

The most significant **change** in this update is increased project costs. The City has constructed projects costing over $15 million to increase the capacity of the PI system. These projects added capacity to the system which has almost entirely been used by the new growth that has come into the system since 2020. The actual project costs have come in higher than the projected cost for the improvements identified in the previous IFFP. This has resulted in increased projected costs for future projects in this IFFP.

The PI system impact fee **service area** is the current city boundary. The existing system irrigated about 2,620 acres at the beginning of 2022. Projected **growth** adds 1,320 irrigated acres in the next 10 years for a total of 3,940 irrigated acres.

The three **components** of the PI impact fee are source, storage, and water rights. All capacities and costs are summarized into these components. The main transmission pipelines convey source and storage capacity to the developments, so each pipeline project has a calculated source and storage component assigned.

The City assigns irrigated area in acres to new development based on actual irrigated acres when the new development is platted or when a building permit is issued, whichever one comes first. Irrigated acres are the recommended **fee unit** for calculating the impact fee. The typical single-family residential PI water use includes irrigated area in park strips and parks in the development which for the purposes of this study is assumed to be 0.24 acres.

It is proposed that the **level of service** for the PI system does not change from the previous IFFP. The level of service is an annual volume of 3.13 acre-feet per irrigated acre while maintaining a pressure of at least 30 pounds per square inch (psi) at all connections under all peak flow conditions. Peak flow conditions are defined per irrigated acre as 7.5 gallons per minute (gpm) for Peak Day Average Flow (source flow capacity) and 15.0 gpm for Peak Instantaneous Flow Capacity (pipe flow capacity). Also, a level of service for storage volume per irrigated acre of 9,216 gallons is used to maintain the minimum pressure of 30 psi at all connections.

The PI system has no existing deficiencies. The costs calculated for the capacity required for growth in the next 10 years comes from the proportional historical buy-in costs of **excess capacity** and new projects required entirely to provide capacity for the new development.

CHAPTER 1
INTRODUCTION

1.1 Background

The City of Saratoga Springs has experienced significant growth since the early 2000's that has transformed the once largely agricultural community into an urbanized region of northern Utah County. Residential and commercial developments are being established at a rapid pace with additional undeveloped land available for future growth. As this growth continues additional PI facilities will be required to provide an adequate water system that meets the City's current level of service for outdoor watering.

The City has recognized the importance to plan for increased demands on its PI system from new development as a result of the rapid growth. The PI System Master Plan and Capital Facility Plan have also been updated to support this analysis.

1.2 Purpose

The purpose of the IFFP is to comply with the requirements of the Utah Impact Fees Act by identifying demands placed on the existing PI system by new development and by identifying the means by which the City will meet these new demands. This analysis is an update to the Secondary System IFFP prepared in 2020 was necessary due to significant growth in the City and increases in project costs. This report projects the need for new growth-related facilities for the 10-year planning range.

This report identifies those items that the Utah Impact Fees Act specifically requires including demands placed upon existing facilities by new development activity and the proposed means by which the municipality will meet those demands. In preparing this report a systematic approach was utilized to evaluate the existing and planned PI facilities identified in the City's master planning efforts. Each facility's capacity was evaluated in accordance with the selected level of service to determine the appropriate share between existing demand and future demands. This approach was taken to determine the "proportional share" of improvement costs between existing users and future development users. The basis for this report was to provide proposed project costs and the fractional cost associated with future development to be used within the impact fee analysis. The following analyses were performed to meet the study's objectives:

1) Identify the existing and proposed City PI facilities;
2) Identify the existing level of service for the system;
3) Identify a proposed level of service for the system;
4) Identify if any deficiencies are present in the existing system utilizing the proposed level of service;
5) Identify any excess capacity in the existing system facilities using the proposed level of service;

6) Identify the phasing of new development and the appropriate facilities needed to support the development;
7) Identify public facilities for which an impact fee may be charged or required for a school district or charter school if the local political subdivision is aware of the planned location of the school district facility or charter school;
8) Project growth in water demands attributable to new development within the existing system;
9) Determine projects required by the new water demands to provide the proposed level of service to future development without compromising the level of service provided to existing residents;
10) Establish construction phasing of proposed capital facilities;
11) Prepare detailed cost estimates for each proposed project;
12) Determine if proposed projects will provide capacity for growth beyond the IFFP planning period;
13) Separate and identify infrastructure costs to maintain the proposed level of service for existing residents versus infrastructure costs to provide capacity at the proposed level of service for future development, and then identify and subtract the proportionate cost of any excess capacity for growth that is projected to occur beyond the 10 year planning window for the IFFP.

1.3 Impact Fee Collection

Impact fees enable local governments to finance public facility improvements necessary to service new developments without burdening existing development with capital facility construction costs that are exclusively attributable to growth.

An impact fee is a one-time charge on new development to pay for that portion of a public facility that is required to support that new development.

In order to determine the appropriate impact fee, the cost of the facilities associated with future development must be proportionately distributed. As a guideline in determining the “proportionate share,” the fee must be found to be roughly proportionate and reasonably related to the impact caused by the new development.

1.4 Master Planning

This analysis is an update to the Secondary Water System IFFP prepared in 2020 to address changes in conditions and assumptions that result in an increase in the proposed PI impact fee. The IFFP identifies all capital facilities required of the PI system for the 10-year planning range including maintenance, repair, replacement, as well as growth related project recommendations. The recommendations made within the IFFP report are in compliance with current City policies and standard engineering practices.

A hydraulic model of the PI system was prepared to aid in the analyses performed to complete the IFFP and IFA. The model was used to assess existing performance, level of service, to establish a proposed level of service and to confirm the effectiveness of the proposed capital facility projects to maintain the proposed level of service over the next 10 years.

CHAPTER 2
EXISTING PI SYSTEM

2.1 General

The purpose of this section is to provide information regarding the existing PI system, identify the current level of service, identify a proposed level of service and analyze the capacity of the existing system's facilities to meet the proposed level of service. Public facilities including existing and future school districts and charter school developments were also identified. Specific impact fees for these public facilities have been included in the impact fee analysis.

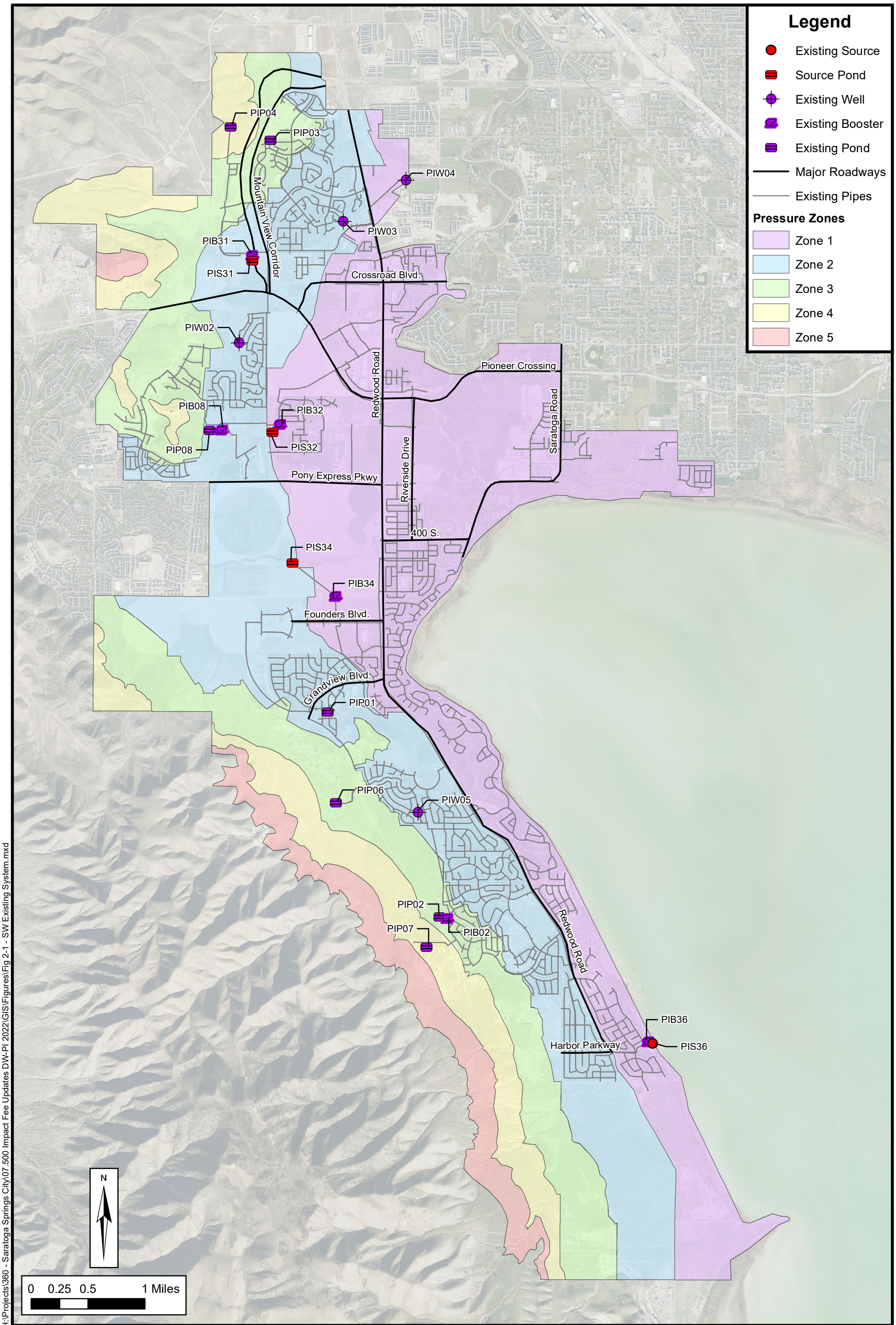
Saratoga Springs' existing PI system is comprised of a pipe network, water storage ponds, and water sources. The system is master planned to be an independent system, however, is supplemented by excess capacity in the drinking water system. As the excess capacity in the drinking water system is needed for future growth, PI system facilities will be constructed to increase the capacity of the PI system, thus freeing up capacity for future drinking water demands. For both the Drinking Water System Master Plan and the Secondary Water System Master Plan each system was analyzed with no sharing of capacity for future projections. Figure 2-1 illustrates the existing PI system.

2.2 Pressure Zones

Currently, the PI distribution system serving Saratoga Springs has three pressure zones, though the upper two pressure zones are split between the north and south as they are not interconnected yet. Only Zone 1 is currently interconnected. Pressure zones are identified on Figure 2-1.

2.3 PI Meters

The PI system has individual meters at all connections. The City bills residents according to water use. Before the meters were installed in 2014, most connections used water in excess of the City's adopted level of service. The recently installed meters along with a fee schedule that promotes conservation of water have led to residents using close to the selected level of service.



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HANSEN ALLEN & LUCE INC ENGINEERS

SARATOGA SPRINGS PRESSURIZED IRRIGATION SYSTEM

EXISTING SYSTEM

FIGURE 2-1

2.4 Irrigated Acreage

Outdoor water demands are based on irrigated acreage. Irrigated acre is the unit used for the PI System Impact Fee. For typical single-family residential developments, irrigable acreage is 64% of the land being developed. The amount of irrigated acres for multi-family and non-residential developments are based on actual landscaped areas. The percentage of irrigated acres is 90% for land used for irrigated open space and parks. For new development Title 19 of City Code defines the amount of landscaped area for each land use type.

Data in this report is presented by impact fee unit (irrigated acres) and typical single-family residential connection for reference. A typical single-family residential connection is defined in this report as 0.24 irrigated acres which includes the proportional amount per residence of irrigated area outside of the parcel including park strips and neighborhood parks.

The total number of existing irrigated acres as of this analysis is 2,620 acres, which requires an annual irrigation volume of 8,201 acre-feet. This includes all development that has been platted and assumes the recommended irrigated acres of 64% of land developed and 3.13 acre-feet per irrigated acre. It is the City's policy to receive impact fees and water rights at plat recordation for the PI system. Therefore, the existing system provides capacity for these recorded developments whether or not building permits have been issued.

2.5 School Related Infrastructure

As part of the noticing and data collection process for this plan, information was gathered regarding existing and future school district and charter school development. Where the City is aware of the planned location of a school, required public facilities to serve the school have been included in the impact fee analysis. Table 2-1 shows the existing schools and the irrigated acreage of each school. Table 2-2 shows the best available information regarding planned schools. Each table will be updated as additional schools are planned and constructed.

TABLE 2-1
EXISTING SCHOOLS

School Name	Location / Address	Irrigated Acreage	Type of School
Harvest Elementary	2105 N Providence Dr	6.09	Elementary School
Riverview Elementary	273 Aspen Hills Blvd	7.46	Elementary School
Thunder Ridge Elementary	264 N 750 W	*N/A	Elementary School
Sage Hills Elementary	3033 W Swainson Ave	2.44	Elementary School
Saratoga Shores Elementary	1415 S Parkside Dr	*N/A	Elementary School
Springside Elementary	694 S Highpoint Dr	4.83	Elementary School
Lake Mountain Middle School	1058 S Old Farm Rd	19.85	Junior High School
Vista Heights Middle School	484 Pony Express Pkwy	*N/A	Junior High School
West Lake High School	99 N 200 W	12.31	High School
Lakeview Academy	527 W 400 N	2.30	Charter
Horizon Special Needs School	682 W 210 N, Marie Way	*N/A	Special Purpose
Mountain Sunrise Academy	1802 E 145 N	1.45	Charter

*Irrigated acreage is not applicable because Alpine School District provides all PI water to school.

TABLE 2-2
PLANNED SCHOOLS

School Name	Location / Address
Planned Junior High	Parcel 58:023:0274
Planned Charter School	Wildflower Development; Parcel 58:033:0544
Planned Elementary School	Mt Saratoga Development; Parcel 58:034:0737
Planned Elementary School	Jordan Promenade Development; Parcel 58:035:0112
Planned High School	Parcel 58:041:0234
Harbor Point Elementary	Parcel 16:003:0043

Currently, Saratoga Springs provides PI water to eight schools located within the city limits. Each existing and new school connected to the Saratoga Springs PI system directly results in the need for additional improvements to public facilities. Therefore, impact fees for new schools will be calculated based on the irrigated acreage served by the Saratoga Springs PI water system.

2.6 Level of Service

The level of service for the PI water system is an annual volume of 3.13 acre-feet per irrigated acre while maintaining a pressure of at least 30 pounds per square inch (psi) at all connections under all peak flow conditions. Peak flow conditions have been defined per irrigated acre as 7.5 gpm for Peak Day Average Flow (source flow capacity) and 15.0 gpm for Peak Instantaneous Flow Capacity (pipe flow capacity). Also, a level of service for storage volume per irrigated acre of 9,216 gallons is used to maintain the minimum pressure of 30 psi at all connections. Table 2-3 provides the level of service for the PI system per irrigated acre. Table 2-4 provides the level of service per typical residential connection. The level of service represents the historic level of service the system has been designed to serve and is consistent with recent measured use. The level of service also represents the capacity needed to irrigate turf in Saratoga Springs and accounts for factors such as the quality of water available to the City and unavoidable system losses. PI water sources within Saratoga Springs are high in dissolved salts, which require residents to use more water than other areas of the state.

TABLE 2-3
LEVEL OF SERVICE (PER IRRIGATED ACRE)

Average Yearly Demand (Source Volume) ac-ft/yr per irrigated acre	**3.13**
Peak Day Demand (Source Flow) gpm/irrigated-acre	**7.50**
Peak Instantaneous Demand (Transmission) gpm/irrigated-acre	**15.00**
Storage gal/irrigated-acre	**9,216**

TABLE 2-4
LEVEL OF SERVICE (PER TYPICAL RESIDENTIAL CONNECTION)

Irrigated Acres	**0.24**
Average Yearly Demand (Source Volume) ac-ft/yr per connection	**0.75**
Peak Day Demand (Source Flow) gpm/connection	**1.8**
Peak Instantaneous Demand (Transmission) gpm/connection	**3.6**
Storage gal/connection	**2,212**

2.7 Methodology Used to Determine Existing System Capacity

The method for determining the remaining capacity in the system was based on the proposed level of service in terms of irrigated acres. Each component of the PI system was assessed a capacity in terms of irrigated acres. The components include the following: Source (wells, pump stations and transmission lines), Storage (reservoirs and associated transmission lines), and Water Rights. Each component was also assigned a number of existing irrigated acres using each component. The difference between the capacity and existing demand for each component is the remaining capacity. For example, to calculate the remaining capacity for source, the required source for existing users in irrigated acres is subtracted from the capacity of the wells in irrigated acres. For storage, the required storage for existing users is subtracted from the capacity of the reservoirs to calculate the remaining capacity for storage.

In addition to the level of service presented in the tables above, pipelines are considered at capacity when velocities reach 5 feet per second (fps) at peak instantaneous demand using the extended period hydraulic model representing the system under typical peak demand conditions. In the engineering industry, it is generally recognized that flows above 5 fps produced unacceptable pressure losses.

2.8 Water Source & Remaining Capacity

Saratoga Springs is currently adding additional water sources to their system to keep up with increasing demands. The projects contained in this report will reduce the need of the PI system to borrow water from the drinking water system in areas where the PI system is not yet connected. In the coming years, the PI system will become self-sustaining and will not need to borrow capacity from the drinking water system. The canal source capacity is represented by the capacity of pump stations at the canals. Table 2-5 summarizes the information of each PI source.

TABLE 2-5

EXISTING PI WATER SOURCES

Name	Map ID	Flow Capacity (gpm)	Capacity (IA)	Notes
Well No. 1	PIW01	800	106.7	Currently needs to be replaced
Well No. 2	PIW02	900	120	Sunrise Meadows Well
Well No. 3	PIW03	500	66.7	Zone 2 North Source
Well No. 4	PIW04	800	106.7	Zone 2 North Source
Well No. 5	PIW05	3,500	466.7	Zone 2 South Source
Church Booster – ULDC	PIS34	1,100	146.7	Tickville Wash Pump Station
Marina PS	PIS36	4,000	533.3	Zone 2 South Source
400 N. - ULDC PS	PIS32	5,000	666.7	Zone 1 North Source
Welby Jacob PS	PIS31	1,200	160.0	Zone 1 North Source
Total		**17,800**	**2,373.3**	

2.9 Distribution System & Remaining Capacity

Pipe diameters range from 6 inches to 30 inches, with the majority being 6 inches within subdivisions. The larger pipes in the system serve as transmission lines to deliver water from storage ponds during peak scenarios and to deliver water from sources. All pipes have been constructed in the last 20 years and are in good condition. The City's current standard allows for Ductile Iron Pipe (DIP) for pipe diameters of 24 inches and larger and Polyvinyl Chloride (PVC) pipe is allowed for pipes up to 24 inches.

2.10 Storage Facilities & Remaining Capacity

Saratoga Springs currently operates seven water storage ponds serving the City. Storage requirements are determined on a per irrigable acre basis. The total storage capacity is 77.1 acre-feet. All ponds were constructed in the last 20 years and are in good condition.

The capacity of each pond was analyzed in respect to the zone it serves. The storage was analyzed as requiring 9,216 gallons per irrigable acre. Table 2-6 summarizes the storage facility information. Some of the ponds are not used for equalization but for pump operation. These ponds do not have usable equalization capacity.

TABLE 2-6
EXISTING STORAGE POND SUMMARY

Service Zone	Pond ID	Map ID	Capacity (Acre-feet)
Zone 1 South	Pond 1 (Grandview Blvd)	PIP01	2.1
Zone 2 South	Pond 2 (The Villages)	PIP02	1.5
Zone 2 North	Pond 3 (Harvest Hills)	PIP03	9.0
Zone 1 South	Pond 4 (Church Pond) *	N/A	10.0
Zone 2 North	Pond 5 (Sunrise) *	N/A	N/A
Zone 1 North	Pond LL (Loch Lomond) *	N/A	N/A
Zone 2 South	Pond 6 (Israel Canyon)	PIP06	38.0
Zone 3 South	Pond 7 (Fox Canyon)	PIP07	4.0
Zone 1 North	Pond 8 (Evans Lane)	PIP08	17.0
Zone 3 North	Z3N (Wildflower)	PIP04	5.5
Total			**77.1**

*Storage/staging pond for pump station.

The capacity of the system is summarized in Table 2-7. Currently, there is an overall excess capacity of 3.0 ac-ft of storage.

TABLE 2-7
EXISTING STORAGE SUMMARY

Service Zone	Irrigated Acreage	Storage Requirement (ac-ft)	Existing Capacity (ac-ft)	Surplus (+) (ac-ft)
Total	2,620	74.1	77.1	+ 3.0

2.11 Water Rights & Remaining Capacity

The City owns a total of 13,150 acre-feet of water rights based on diversion that can be used between the drinking and PI water systems. The existing demand at the proposed level of service of 3.13 acre-feet per irrigated acre is 8,201 acre-feet. The existing supply of water rights attributed to the PI water system are 8,761 acre-feet. This leaves a surplus in capacity of 560 acre-feet. Also, the City has collected water right impact fees over the last few years which the City is

working on purchase agreements to buy water rights when change applications have been approved. All water right volumes are annual diversions in acre-feet.

2.12 Capital Facilities to Meet System Deficiencies

Combined with the drinking water system, the existing PI system meets the proposed level of service. The PI system is master planned to be an independent system, but currently the PI system is supplemented by excess capacity in the drinking water system to serve isolated areas of the system. PI system facilities will be constructed to connect all the isolated areas. A Drinking Water System Master Plan was prepared in conjunction with the PI System Master Plan. For both the Drinking Water System Master Plan and the PI System Master Plan each system was analyzed with no sharing of capacity for future projections. Additional information regarding the drinking water system may be found in the Drinking Water System Master Plan.

The City has several capital projects planned to improve existing system operation and provide capacity for future growth. The capital projects are presented in the PI Master Plan. Only projects that add capacity for future growth in the next 10 years are eligible to be included in the calculation of the impact fee.

CHAPTER 3
CAPITAL FACILITIES TO MEET FUTURE GROWTH

1. Growth Projections

Outdoor water demands are based on irrigated acreage. Future irrigated acreage was calculated by starting with the existing irrigated acreage and adding to it the area of land that is expected to be irrigated at projected build-out (2060), or the maximum development under current zoning and densities. Build-out projections were based on the future land use plans.

The existing system irrigates approximately 2,620 acres. Growth projections for the next 13 years were provided by Zions Public Finance Inc. and have been included in Appendix A. Total growth projections for the City through 2035 are summarized in Table 3-1. The projections include the number of incoming equivalent residential connections (ERUs) expected each year. These ERUs have been converted into irrigated acres using 0.24 irrigated acres per ERU. Table 3-1 shows that at the end of 10 years, the expected irrigated acreage will increase to 3,940 acres. This is an increase of 1,320 irrigated acres over the 10-year window. The irrigated acreage at the time of the previous impact fee was 2,397 acres. Therefore, 223 irrigated acres have been added since the previous plan.

TABLE 3-1
GROWTH PROJECTIONS

Year	ERU Growth	Irrigated Acre Growth	Total Projected Irrigated Acres
2022	-	-	2,620
2023	550	132	2,752
2024	550	132	2884
2025	550	132	3,016
2026	550	132	3,148
2027	550	132	3,280
2028	550	132	3,412
2029	550	132	3,544
2030	550	132	3,676
2031	550	132	3,808
2032	550	132	3,940
2033	550	132	4,072
2034	550	132	4,204
2035	550	132	4,336

2. Cost of Future Facilities

The projects presented in Table 3-2 are proposed projects essential to maintain the proposed level of service while accommodating future growth. The table lists the project type, description, and estimated cost. All projects have sufficient capacity for the 10-year growth projections. The

facility sizing was based on City planning data and modeling. All projects have a design life greater than 10 years, as required by the Impact Fee Act. See Appendix B for cost estimate details of future projects.

TABLE 3-2
COST OF FUTURE FACILITIES

TYPE	MAP ID	RECOMMENDED PROJECT	COST
Source & Storage	SW01	Northgate Pipeline	$455,000
Source & Storage	SW02	Zone 1 Willow Park Source	$3,394,900
Source	SW03	Zone 1 Well #7 Equipping	$2,190,800
Source	SW04	Zone 1 16-inch & 10-inch Pipelines	$2,496,100
Source & Storage	SW05	Zone 4 North Wildflower Pump Station, 12-inch Pipeline, & 2.5 Ac-ft Pond	$6,842,000
Source	SW06	Zone 3 North Wildflower 8-inch to 12-inch Pipeline Upsize	$345,200
Source & Storage	SW07	Zone 3 North Mt Saratoga Pump Station, Pipeline Upsizes, & 5.6 Ac-ft Pond	$5,923,700
Source & Storage	SW08	Zone 2 North Mt Saratoga 16-inch Pipeline & 6 Ac-ft Pond	$4,906,600
Source	SW09	Zone 1 Pioneer Crossing 16-inch Pipeline	$646,200
Source & Storage	SW10	Zone 1 SLR 8 Ac-ft Pond & 24-inch, 18-inch, & 16-inch Pipelines	$11,714,300
Storage	SW11	Zone 1 Evans Lane Pond Expansion	$6,785,700
Source & Storage	SW12	Zone 1 Tickville ULDC Pump Station & 10 Ac-ft Pond	$6,900,100
Source	SW13	Zone 2 South Jacobs Ranch Well #9	$2,498,600
Source & Storage	SW14	Zone 2 South Lake Mtn 12-inch Pipeline & 10 Ac-ft Pond	$3,400,600
Source & Storage	SW15	Zone 1 Lake Mtn Increase Capacity of Marina PS, 5.5 Ac-ft Pond, & 30-inch & 18-inch Pipelines	$8,430,800
TOTAL			**$66,930,600**

Note: See Figure 3-1 for map of projects on the next page

Only those costs attributed to the new growth in the next 10 years can be included in the impact fee. Interest for bonds used to pay for existing facilities is included in the impact fee eligible project costs. The City only uses impact fees to pay bond payments for bonds used to pay for impact fee eligible projects. Financing costs are not included in the projected cost of future projects. Table 3-3 is a summary of the existing and future facility costs by PI system component and by time

[SW05]
ZONE 4 NORTH (WILDFLOWER)
1500 GPM PUMP STATION
11,500 LF 12-INCH PIPELINE
2.5 AC-FT POND

[SW01]
ZONE 2 NORTH (WILDFLOWER)
UPSIZE 2,000 LF 6-INCH TO 8-INCH PIPELINE

[SW06]
ZONE 3 NORTH (WILDFLOWER)
UPSIZE 4,700 LF 8-INCH TO 12-INCH PIPELINE

[SW02]
ZONE 1 (WILLOW PARK)
WELL #8 EQUIPPING
2,150 LF 12-INCH PIPELINE

[SW07]
ZONE 3 NORTH (MT. SARATOGA)
5.6 AC-FT POND
1,500 GPM PUMP STATION
1,500 LF 16-INCH PIPELINE
UPSIZE 3,100 LF 8-INCH TO 12-INCH PIPELINE
UPSIZE 1,800 LF 10-INCH TO 12-INCH PIPELINE

[SW03]
ZONE 1 (NORTHSHORE)
WELL #7 EQUIPPING

[SW08]
ZONE 2 NORTH (MT. SARATOGA)
6 AC-FT POND
1,500 LF 16-INCH PIPELINE
LAND FOR 11 AC-FT POND

[SW04]
ZONE 1 (NORTHSHORE)
4,000 LF 16-INCH PIPELINE
3,000 LF 10-INCH PIPELINE

[SW12]
ZONE 1 (TICKVILLE)
3,500 GPM PUMP STATION
10 AC-FT POND

[SW11]
ZONE 1 (EVANS LANE)
POND 8 EXPANSION

[SW10]
ZONE 1 (SLR)
8 AC-FT POND 5
9,500 LF 24-INCH PIPELINE
3,800 LF 18-INCH PIPELINE
3,200 LF 16-INCH PIPELINE
LAND FOR 21 AC-FT POND

[SW09]
ZONE 1 (PIONEER CROSSING)
1,600 LF 16-INCH PIPELINE

[SW13]
ZONE 2 SOUTH (JACOBS RANCH)
NEW JACOBS RANCH WELL (WELL #9)

[SW15]
ZONE 1 (LAKE MOUNTAIN)
INCREASE MARINA PUMP STATION TO 7,750 GPM
5.5 AC-FT POND
4,500 LF 30-INCH PIPELINE
4,500 LF 18-INCH PIPELINE

[SW14]
ZONE 2 SOUTH (LAKE MTN)
10 AC-FT POND 20
2,200 LF 12-INCH PIPELINE

PIB04
PIS31
PIS32
PIB05
PIS34
PIS33
PIP05
PIP20
PIS36
PIP19
PIB19
DWW07

Mountain View Corridor
Crossroad Blvd.
Redwood Road
Pioneer Crossing
Saratoga Road
400 S.
Founders Blvd.
Grandview Blvd.
Harbor Parkway

Legend

- Source Pond
- Existing Source
- Existing Well
- Existing DW and PI Well
- Future Well
- Future DW and PI Well
- Existing Pond
- Future Pond
- Existing Booster
- Future Booster
- Existing Pipes
- Major Roadways

N

0 0.25 0.5 1 Miles

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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HANSEN ALLEN & LUCE INC ENGINEERS

SARATOGA SPRINGS PRESSURIZED IRRIGATION SYSTEM

IMPACT FEE IMPROVEMENTS

FIGURE 3-1

period. Existing costs are those costs attributed to capacity currently being used and paid for by existing connections since the last IFA. Costs attributed to the next 10 years are costs for the existing capacity or new capacity for the assumed growth in the next 10 years. Costs attributed to beyond 10 years are costs for the existing capacity or new capacity for the assumed growth beyond 10 years. There is a total of $29,723,571 attributed to source with a capacity of 1,320 irrigated acres, a total of $22,640,892 for storage with a capacity of 1,214 irrigated acres, and a total of $14,491,960 for water rights with a capacity of 1,320 irrigated acres anticipated over the next 10 years. The total anticipated cost for the next 10 years is $66,856,424. There are still several developments that can only receive PI source water through the drinking water system. Costs for connecting these developments will be recouped in the future when source capacity from the drinking water system becomes available permanently.

TABLE 3-3
FACILITY COSTS BY TIME PERIOD

	Existing	Next 10 Years	Beyond 10 Years	TOTAL
Source Conveyance	$0	$29,723,571	$4,953,929	**$34,677,500**
Storage	$1,976,882	$22,640,892	$8,094,026	**$32,711,800**
Water Rights	$0	$14,491,960	$0	**$14,491,960**
TOTAL COST	**$1,976,882**	**$66,856,424**	**$13,047,954**	**$81,881,260**

APPENDIX A

Growth Projections Memo

ZIONS PUBLIC FINANCE, INC.

GROWTH PROJECTIONS MEMORANDUM

Historic Growth

Saratoga Springs has been experiencing extremely rapid growth over the past 20 years, growing by an average of 429 Equivalent Residential Units (ERUs) per year since 2000. Growth has been even more rapid in recent years, with an average increase of 551 ERUs since 2015. In 2019, the City increased by 642 ERUs; and in the first half of 2020 alone the City has seen 550 ERUs. Interestingly, there has been no discernible slowdown yet from COVID-19.

TABLE 1: HISTORIC GROWTH IN ERUS

Year	Historic ERUs	AAGR*	ERU Increase per Year
7/1/2000	235		
7/1/2001	582	148%	347
7/1/2002	896	54%	315
7/1/2003	1,223	36%	326
7/1/2004	1,655	35%	432
7/1/2005	2,109	27%	454
7/1/2006	2,656	26%	548
7/1/2007	3,167	19%	511
7/1/2008	3,938	24%	771
7/1/2009	4,238	8%	301
7/1/2010	4,399	4%	160
7/1/2011	4,569	4%	170
7/1/2012	4,771	4%	202
7/1/2013	5,097	7%	325
7/1/2014	5,630	10%	534
7/1/2015	6,097	8%	467
7/1/2016	6,603	8%	506
7/1/2017	7,150	8%	547
7/1/2018	7,743	8%	593
7/1/2019	8,385	8%	642

*AAGR = average annual growth rate

Projected Growth

Based on trends over the past two years, a sensitivity analysis of future growth has been projected first based on an average of 550 and then 600 ERUs per year. The recommended approach then uses a blend of these two assumptions, plus actual anticipated growth of 650 ERUs in 2020 (based on the record number of permits pulled halfway through 2020). Even though the City has seen increasing numbers of ERUs over the past few years, this model conservatively assumes somewhat smaller growth in 2021 and

2022 (600 ERUs per year) followed by growth of 550 ERUs per year through 2035. While the effects of the COVID-19 pandemic event are not known at this time, the growth projections included in this document reflect our best current estimate of the impact COVID-19 will have on system growth to reflect the expected slowdown in the economy associated with current conditions.

TABLE 2: PROJECTED GROWTH IN ERUS

Projected Growth	550 ERU Growth	600 ERU Growth	Recommended Growth Projections	AAGR, Recommended Growth Projections
7/1/2019	8,385	8,385	8,385	
7/1/2020	8,935	8,985	9,035	8%
7/1/2021	9,485	9,585	9,635	7%
7/1/2022	10,035	10,185	10,235	6%
7/1/2023	10,585	10,785	10,785	5%
7/1/2024	11,135	11,385	11,335	5%
7/1/2025	11,685	11,985	11,885	5%
7/1/2026	12,235	12,585	12,435	5%
7/1/2027	12,785	13,185	12,985	4%
7/1/2028	13,335	13,785	13,535	4%
7/1/2029	13,885	14,385	14,085	4%
7/1/2030	14,435	14,985	14,635	4%
7/1/2031	14,985	15,585	15,185	4%
7/1/2032	15,535	16,185	15,735	4%
7/1/2033	16,085	16,785	16,285	3%
7/1/2034	16,635	17,385	16,835	3%
7/1/2035	17,185	17,985	17,385	3%

Other Considerations

As part of this analysis, we have reviewed the availability of vacant land in Saratoga Springs and have found that there is sufficient land available that there are no constraints to development taking place or that would slow the historic growth experienced in the City.

APPENDIX B

Cost Estimates

CITY OF SARATOGA SPRINGS
IRRIGATION WATER - COST OPINIONS
2022-2031

ID# SW01

ZONE 2 NORTH - WILDFLOWER
UPSIZE 2,000 LF 6-INCH TO 8-INCH PIPELINE
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY		UNIT COST		TOTAL COST
1	Mobilization/Demobilization	LS	10%	$	350,000	$	35,000
2	Construction Surveying	LS	2%	$	350,000	$	7,000
3	SWPPP	LS	3%	$	350,000	$	11,000
4	Relocate existing utilities	LS	1	$	112,500	$	112,500
5	30-inch Jack & Bore casing installation	LF	140	$	575	$	80,500
6	8-inch HDPE Pipe installed in casing	LF	120	$	150	$	18,000
7	Upsize 6" to 8" PVC Pipeline	LF	2,000	$	21	$	42,000
8	Fittings & valves	LS	1	$	20,000	$	20,000
9	Pipeline connections	EA	2	$	20,000	$	40,000
10	Flushing, disinfecting, pressure testing	LS	1	$	10,000	$	10,000
					Sub-Total Construction	$	376,000
					Contingency and Unknowns: 10%	$	37,600
					TOTAL CONSTRUCTION	$	413,600
					Engineering Design and Construction Services 10%	$	41,400
					Preliminary Opinion of Probable Cost	**$**	**455,000**

SW02

ZONE 1 - WILLOW PARK
WELL #8 EQUIPPING, 2,150 LF 12-INCH PIPELINE
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY		UNIT COST		TOTAL COST
1	Mobilization/Demobilization	%	10%	$	3,430,000	$	343,000
2	Construction Surveying	LS	2%	$	3,430,000	$	69,000
3	SWPPP	LS	3%	$	3,430,000	$	103,000
4	Pump House Structure	LS	1	$	150,000	$	150,000
5	Generator Screening Walls & Concrete Pad	LS	1	$	20,000	$	20,000
6	Pump, shaft and motor	LS	1	$	200,000	$	200,000
7	Pump Station Piping & Valving System	LS	1	$	125,000	$	125,000
8	15-in RCP Pump-to-Waste Pipeline	LF	500	$	165	$	82,500
9	12-in yard piping and connections to existing	LF	1	$	60,000	$	60,000
10	Site Improvements	LS	1	$	100,000	$	100,000
11	Landscaping	LS	11,000	$	5	$	55,000
12	Fencing	LF	600	$	60	$	36,000
13	Extend Electric Power Supply to Well Site	LS	1	$	75,000	$	75,000
14	Electrical Systems	LS	1	$	150,000	$	150,000
15	HVAC System	LS	1	$	50,000	$	50,000
16	Control Panel, SCADA Programming	LS	1	$	40,000	$	40,000
17	Instrumentation	LS	1	$	50,000	$	50,000
18	Generator and transfer switch	LS	1	$	125,000	$	125,000
19	12-inch PVC Pipeline	LF	2,150	$	247	$	531,050
22	Valves and fitting	LS	1	$	40,000	$	40,000
23	Flushing, disinfecting, pressure testing	LS	1	$	15,000	$	15,000
24	Connections to existing pipelines	EA	2	$	10,000	$	20,000
25	Pipeline easment	ACRES	1.9	$	125,000	$	241,047
26	Land Acquisition	ACRES	0.5	$	250,000	$	125,000
					Sub-Total Construction	$	2,805,600
					Contingency and Unknowns: 10%	$	280,600
					TOTAL CONSTRUCTION	$	3,086,200
					Engineering Design and Construction Services 10%	$	308,700
					Preliminary Opinion of Probable Cost	**$**	**3,394,900**

SW03

ZONE 1 - NORTHSHORE
WELL #7 EQUIPPING
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 1,580,000	$ 158,000
2	Construction Surveying	LS	2%	$ 1,580,000	$ 32,000
3	SWPPP	LS	3%	$ 1,580,000	$ 48,000
4	Pump House Structure	LS	1	$ 150,000	$ 150,000
5	Generator Screening Walls & Concrete Pad	LS	1	$ 20,000	$ 20,000
6	Pump, shaft and motor	LS	1	$ 200,000	$ 200,000
7	Pump Station Piping & Valving System	LS	1	$ 140,000	$ 140,000
8	15-in RCP Pump-to-Waste Pipeline	LF	500	$ 165	$ 82,500
9	12-in yard piping and connections to existing	LF	1	$ 60,000	$ 60,000
10	Site Improvements	LS	1	$ 100,000	$ 100,000
11	Landscaping	LS	11000	$ 5	$ 55,000
12	Off site piping	LS	1	$ 250,000	$ 250,000
13	Extend Electric Power Supply to Well Site	LS	1	$ 100,000	$ 100,000
14	Electrical Systems	LS	1	$ 150,000	$ 150,000
15	HVAC System	LS	1	$ 50,000	$ 50,000
16	Control Panel, SCADA Programming	LS	1	$ 40,000	$ 40,000
17	Instrumentation	LS	1	$ 50,000	$ 50,000
18	Generator and transfer switch	LS	1	$ 125,000	$ 125,000
				Sub-Total Construction	$ 1,810,500
				Contingency and Unknowns: 10%	$ 181,100
				TOTAL CONSTRUCTION	$ 1,991,600
				Engineering Design and Construction Services 10%	$ 199,200
				Preliminary Opinion of Probable Cost	**$ 2,190,800**

SW04

ZONE 1 - NORTHSHORE
4,000 LF 16-INCH PIPELINE, 3,000 LF 10-INCH PIPELINE
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 1,970,000	$ 197,000
2	Construction Surveying	LS	2%	$ 1,970,000	$ 40,000
3	SWPPP	LS	3%	$ 1,970,000	$ 60,000
4	Connections to existing pipelines	EA	2	$ 10,000	$ 20,000
5	16" PVC Transmission Pipeline	LF	4,000	$ 270	$ 1,080,000
6	10-inch PVC Pipeline	LF	3,000	$ 234	$ 702,000
6	Valves and fittings	LS	1	$ 125,000	$ 125,000
7	Connections to existing pipelines	EA	4	$ 10,000	$ 40,000
				Sub-Total Construction	$ 2,264,000
				Contingency and Unknowns: 5%	$ 113,200
				TOTAL CONSTRUCTION	$ 2,377,200
				Engineering Design and Construction Services 5%	$ 118,900
				Preliminary Opinion of Probable Cost	**$ 2,496,100**

SW05

ZONE 4 NORTH - WILDFLOWER
1,500 GPM PUMP STATION, 11,500 LF 12-INCH PIPELINE, 2.5 AC-FT POND
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 4,920,000	$ 492,000
2	Construction Surveying	%	2%	$ 4,920,000	$ 99,000
3	SWPPP	%	3%	$ 4,920,000	$ 148,000
4	Materials Testing	LS	1	$ 10,000	$ 10,000
5	Pump Station Structure	LS	1	$ 150,000	$ 150,000
6	Pumps, Valves, and Piping	LS	1	$ 100,000	$ 100,000
7	Yard Piping & Valving	LS	50%	$ 100,000	$ 50,000
8	Electrical Systems	LS	1	$ 150,000	$ 150,000
9	HVAC Systems	LS	1	$ 30,000	$ 30,000
10	Fencing	LF	500	$ 25	$ 12,500
11	Landscaping	SF	8,000	$ 5	$ 40,000
12	Pump Station Site Improvements	LS	1	$ 100,000	$ 100,000
13	12-inch PVC Pipeline	LF	11,500	$ 247.00	$ 2,840,500
14	Connections to existing pipelines	EA	2	$ 10,000	$ 20,000
15	2.5 ac-ft Pond	AC FT	2.5	$ 375,000	$ 937,500
16	Yard Piping & Valving	LS	1	$ 100,000	$ 100,000
17	Land Acquisition	ACRES	1.5	$ 250,000	$ 375,000
				Sub-Total Construction	$ 5,654,500
				Contingency and Unknowns: 10%	$ 565,500
				TOTAL CONSTRUCTION	$ 6,220,000
				Engineering Design and Construction Services 10%	$ 622,000
				Preliminary Opinion of Probable Cost	**$ 6,842,000**

SW06

ZONE 3 NORTH - WILDFLOWER
UPSIZE 4,700 LF 8-INCH TO 12-INCH PIPELINE
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 240,000	$ 24,000
2	Construction Surveying	%	7%	$ 240,000	$ 17,000
3	SWPPP	%	3%	$ 240,000	$ 8,000
4	Upsize 8" to 12" PVC Pipeline	LF	4,700	$ 46.00	$ 216,200
5	Connections to existing pipelines	EA	2	$ 10,000	$ 20,000
				Sub-Total Construction	$ 285,200
				Contingency and Unknowns: 10%	$ 28,600
				TOTAL CONSTRUCTION	$ 313,800
				Engineering Design and Construction Services 10%	$ 31,400
				Preliminary Opinion of Probable Cost	**$ 345,200**

SW07

ZONE 3 NORTH - MT SARATOGA
5.6 AC-FT POND, 1,500 GPM PUMP STATION, 1,500 LF 16-INCH PIPELINE
UPSIZE 3,100 LF 8-INCH TO 12-INCH PIPELINE
UPSIZE 1,800 LF 10-INCH TO 12-INCH PIPELINE
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY		UNIT COST		TOTAL COST
1	Mobilization/Demobilization	%	10%	$	1,520,000	$	152,000
2	Construction Surveying	%	2%	$	1,520,000	$	31,000
3	SWPPP	%	3%	$	1,520,000	$	46,000
4	Materials Testing	LS	1	$	10,000	$	10,000
5	Pump Station Structure	LS	1	$	225,000	$	225,000
6	Pumps, Valves, and Piping	LS	1	$	175,000	$	175,000
7	Yard Piping & Valving	LS	50%	$	175,000	$	88,000
8	Electrical Systems	LS	1	$	200,000	$	200,000
9	HVAC Systems	LS	1	$	75,000	$	75,000
10	Fencing	LF	500	$	25	$	12,500
11	Landscaping	SF	8,000	$	5	$	40,000
12	Pump Station Site Improvements	LS	1	$	100,000	$	100,000
13	16" PVC Transmission Pipeline	LF	1,500	$	270	$	405,000
14	Upsize 8" to 12" PVC Transmission Pipeline	LF	3,100	$	46	$	142,600
15	Upsize 10" to 12" PVC Transmission Pipeline	LF	1,800	$	13	$	23,400
16	16" valves and connections to existing	EA	2	$	10,000	$	20,000
17	5.6 ac-ft Pond	AC FT	5.6	$	375,000	$	2,100,000
18	Yard Piping & Valving	LS	1	$	100,000	$	100,000
19	Land Acquisition	ACRES	3.8	$	250,000	$	950,000
					Sub-Total Construction	$	4,895,500
					Contingency and Unknowns: 10%	$	489,600
					TOTAL CONSTRUCTION	$	5,385,100
					Engineering Design and Construction Services 10%	$	538,600
					Preliminary Opinion of Probable Cost	**$**	**5,923,700**

SW08

ZONE 2 NORTH - MT SARATOGA
6 AC-FT POND, 1,500 LF 16-INCH PIPELINE, LAND FOR 11 AC-FT POND
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY		UNIT COST		TOTAL COST
1	Mobilization/Demobilization	%	10%	$	3,530,000	$	353,000
2	Construction Surveying	%	2%	$	3,530,000	$	71,000
3	SWPPP	%	3%	$	3,530,000	$	106,000
4	16-in PVC Pipeline	LF	1500	$	270	$	405,000
5	Connections to existing pipelines	EA	2	$	10,000	$	20,000
6	6 ac-ft Pond	AC FT	6.0	$	375,000	$	2,250,000
7	Yard Piping & Valving	LS	1	$	100,000	$	100,000
8	Land Acquisition	ACRES	3.0	$	250,000	$	750,000
					Sub-Total Construction	$	4,055,000
					Contingency and Unknowns: 10%	$	405,500
					TOTAL CONSTRUCTION	$	4,460,500
					Engineering Design and Construction Services 10%	$	446,100
					Preliminary Opinion of Probable Cost	**$**	**4,906,600**

SW09

ZONE 1 - PIONEER CROSSING
1,600 LF 16-INCH PIPELINE
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 470,000	$ 47,000
2	Construction Surveying	%	2%	$ 470,000	$ 10,000
3	SWPPP	%	3%	$ 470,000	$ 15,000
4	16-inch PVC Pipeline	LF	1,600	$ 270	$ 432,000
5	Connections to existing pipelines	EA	2	$ 15,000	$ 30,000
				Sub-Total Construction	$ 534,000
				Contingency and Unknowns: 10%	$ 53,400
				TOTAL CONSTRUCTION	$ 587,400
				Engineering Design and Construction Services 10%	$ 58,800
				Preliminary Opinion of Probable Cost	**$ 646,200**

SW10

ZONE 1 - SLR
8 AC-FT POND #5, 9,500 LF 24-INCH PIPELINE, 3,800 LF 18-INCH PIPELINE, 3,200 LF 16-INCH PIPELINE, LAND FOR 21 AC-FT POND
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 8,420,000	$ 842,000
2	Construction Surveying	%	2%	$ 8,420,000	$ 169,000
3	SWPPP	%	3%	$ 8,420,000	$ 253,000
4	24-in PVC Pipeline	LF	9500	$ 365	$ 3,467,500
5	18-in PVC Pipeline	LF	3800	$ 287	$ 1,090,600
6	16-in PVC Pipeline	LF	3200	$ 270	$ 864,000
7	Connections to existing pipelines	EA	2	$ 10,000	$ 20,000
8	8 ac-ft Pond	AC FT	8.0	$ 250,000	$ 2,000,000
9	Yard Piping & Valving	LS	1	$ 100,000	$ 100,000
10	Land Acquisition	ACRES	3.5	$ 250,000	$ 875,000
				Sub-Total Construction	$ 9,681,100
				Contingency and Unknowns: 10%	$ 968,200
				TOTAL CONSTRUCTION	$ 10,649,300
				Engineering Design and Construction Services 10%	$ 1,065,000
				Preliminary Opinion of Probable Cost	**$ 11,714,300**

SW11

ZONE 1 - EVANS LANE
POND 8 EXPANSION
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 4,880,000	$ 488,000
2	Construction Surveying	%	2%	$ 4,880,000	$ 98,000
3	SWPPP	%	3%	$ 4,880,000	$ 147,000
4	Pond Expansion from 16.7 ac-ft to 29 ac-ft	AC FT	13	$ 375,000	$ 4,875,000
				Sub-Total Construction	$ 5,608,000
				Contingency and Unknowns: 10%	$ 560,800
				TOTAL CONSTRUCTION	$ 6,168,800
				Engineering Design and Construction Services 10%	$ 616,900
				Preliminary Opinion of Probable Cost	**$ 6,785,700**

SW12

ZONE 1 - TICKVILLE
3,500 GPM PUMP STATION, 10 AC-FT POND
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY		UNIT COST		TOTAL COST
1	Mobilization/Demobilization	%	10%	$	4,960,000	$	496,000
2	Construction Surveying	%	2%	$	4,960,000	$	100,000
3	SWPPP	%	3%	$	4,960,000	$	149,000
4	Materials Testing	LS	1	$	20,000	$	20,000
5	Pump Station Structure	LS	1	$	425,000	$	425,000
6	Pumps Complete	LS	1	$	200,000	$	200,000
7	Amiad Filters Complete	LS	1	$	175,000	$	175,000
8	Pump Station Piping System Complete	LS	50%	$	250,000	$	125,000
9	Electrical and HVAC System Complete	LS	1	$	300,000	$	300,000
10	Pump Station Site Improvement & Pond Access Road	LS	1	$	60,000	$	60,000
11	Fencing	LF	500	$	25	$	12,500
12	Landscaping	SF	8,000	$	5	$	40,000
13	10 ac-ft Pond	AC FT	10.0	$	250,000	$	2,500,000
14	Yard Piping & Valving	LS	1	$	100,000	$	100,000
15	Land Acquisition	ACRES	4.0	$	250,000	$	1,000,000
					Sub-Total Construction	$	5,702,500
					Contingency and Unknowns: 10%	$	570,300
					TOTAL CONSTRUCTION	$	6,272,800
					Engineering Design and Construction Services 10%	$	627,300
					Preliminary Opinion of Probable Cost	**$**	**6,900,100**

SW13

ZONE 2 SOUTH - JACOBS RANCH
NEW JACOBS RANCH WELL (WELL #9)
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY		UNIT COST		TOTAL COST
1	Mobilization/Demobilization	%	10%	$	1,770,000	$	177,000
2	Construction Surveying	%	2%	$	1,770,000	$	36,000
3	SWPPP	%	3%	$	1,770,000	$	54,000
4	Exploratory borehole (800 feet deep)	LS	1	$	200,000	$	200,000
5	Drill production well (800 feet deep, 20-inch casing)	LS	1	$	300,000	$	300,000
6	Develop production well	LS	1	$	85,000	$	85,000
7	Pump test production well	LS	1	$	100,000	$	100,000
8	Pump House Structure	LS	1	$	100,000	$	100,000
9	Generator Screening Walls & Concrete Pad	LS	1	$	20,000	$	20,000
10	Pump, shaft and motor	LS	1	$	165,000	$	165,000
11	Pump Station Piping & Valving System	LS	1	$	125,000	$	125,000
12	Site Improvements	LS	1	$	100,000	$	100,000
13	Landscaping	LS	1	$	30,000	$	30,000
14	Fencing	LF	800	$	120	$	96,000
15	Extend Electric Power Supply to Well Site	LS	1	$	20,000	$	20,000
16	Electrical Systems	LS	1	$	135,000	$	135,000
17	HVAC System	LS	1	$	35,000	$	35,000
18	Control Panel, SCADA Programming	LS	1	$	35,000	$	35,000
19	Instrumentation	LS	1	$	15,000	$	15,000
20	Generator and transfer switch	LS	1	$	125,000	$	125,000
21	Land Acquisition	ACRES	0.5	$	150,000	$	75,000
					Sub-Total Construction	$	2,028,000
					Contingency and Unknowns: 12%	$	243,400
					TOTAL CONSTRUCTION	$	2,271,400
					Engineering Design and Construction Services 10%	$	227,200
					Preliminary Opinion of Probable Cost	**$**	**2,498,600**

SW14

ZONE 2 SOUTH - LAKE MTN
10 AC-FT POND, 2,200 LF 12-INCH PIPELINE
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 2,450,000	$ 245,000
2	Construction Surveying	%	2%	$ 2,450,000	$ 49,000
3	SWPPP	%	3%	$ 2,450,000	$ 73,500
4	Materials Testing	LS	1	$ 10,000	$ 10,000
5	Clear and Grub Site & stockpile topsoil	ACRES	10.81	$ 5,000	$ 54,050
6	Pond Excavation & Material Disposal	CY	16300	$ 9	$ 146,700
7	Embankment placement, compaction & final grading	LS	9000	$ 20	$ 180,000
8	18" site piping, inlet, outlet, across pond	LF	320	$ 150	$ 48,000
9	Reinforced Concrete Floor, SS, & Ramp	SY	5,600	$ 75	$ 420,000
10	Underdrain system	LS	1	$ 80,000	$ 80,000
11	Pond inlet/outlet/control valves 18"	EA	3	$ 6,000	$ 18,000
12	Pond Outlet Structure	LS	1	$ 32,000	$ 32,000
13	Flow Meter Vault Complete	LS	1	$ 25,000	$ 25,000
14	Black Vinyl Chain Link Fence	LF	1,300	$ 40	$ 52,000
15	SCADA (Solar Panels)	LS	1	$ 20,000	$ 20,000
16	Topsoil/surface restoration	ACRES	5.19	$ 6,000	$ 31,140
17	Landscaping around pond only	SF	65,000	$ 2.50	$ 162,500
18	12-in PVC Pipeline	LF	2200	$ 247.00	$ 543,400
19	Connections to existing pipelines	EA	2	$ 10,000	$ 20,000
20	Land Acquisition	ACRES	4	$ 150,000	$ 600,000
				Sub-Total Construction	$ 2,810,300
				Contingency and Unknowns: 10%	$ 281,100
				TOTAL CONSTRUCTION	$ 3,091,400
				Engineering Design and Construction Services 10%	$ 309,200
				Preliminary Opinion of Probable Cost	**$ 3,400,600**

SW15

ZONE 1 - LAKE MOUNTAIN
INCREASE MARINA PUMP STATION TO 7,750 GPM, 5.5 AC-FT POND, 4,500 LF 30-INCH PIPELINE, 4,500 LF 18-INCH PIPELINE,
Preliminary Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
1	Mobilization/Demobilization	%	10%	$ 6,060,000	$ 606,000
2	Construction Surveying	%	2%	$ 6,060,000	$ 122,000
3	SWPPP	%	3%	$ 6,060,000	$ 182,000
4	Materials Testing	LS	1	$ 10,000	$ 10,000
5	Replace All 6 Pumps	EA	6	$ 70,000	$ 420,000
6	Electrical Motor Starters (VFDs for 4 Pumps)	EA	4	$ 100,000	$ 400,000
7	Soft Start Motor Controller for 2 Pumps	EA	2	$ 75,000	$ 150,000
8	Surge Tank	EA	1	$ 150,000	$ 150,000
9	Amiad Filters Complete	LS	1	$ 250,000	$ 250,000
10	30-inch PVC Pipeline	LF	4,500	$ 438.00	$ 1,971,000
11	18-inch PVC Pipeline	LF	4,500	$ 287.00	$ 1,291,500
12	Connections to existing pipelines	EA	4	$ 10,000	$ 40,000
13	5.5 ac-ft Pond	AC FT	5.5	$ 250,000	$ 1,375,000
				Sub-Total Construction	$ 6,967,500
				Contingency and Unknowns: 10%	$ 696,800
				TOTAL CONSTRUCTION	$ 7,664,300
				Engineering Design and Construction Services 10%	$ 766,500
				Preliminary Opinion of Probable Cost	**$ 8,430,800**