



BEFORE THE ARIZONA CORPORATION COMMISSION

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Commissioner

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OCT 28 2008

ARIZONA CORP. COMM
400 W CONGRESS STE 218 TUCSON AZ 85701

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IN THE MATTER OF THE APPLICATION
OF SPANISH TRAIL WATER CO. AND
SAGUARO WATER CO. TO MODIFY
THEIR EXISTING CERTIFICATES OF
CONVENIENCE AND NECESSITY

) Docket No. W-01816A-06-0177 and
) Docket No. W-01790A-06-0177
) **Filing of Revised Water System**
) **Master Plan, and Comments to Staff**
) **Report**

On December 6, 2007, the Spanish Trail Water Company (the "Applicant") docketed a Hook-Up Fee Tariff, in accordance with the requirements of the Commission's Decision No. 69646. Thereafter, the ACC Utilities Division Staff ("Staff") docketed a Motion To Suspend Tariff, filed on January 3, 2008, in order to analyze the Tariff in greater detail. On September 22, 2008, the Staff issued its Staff Report for Spanish Trail Water Company's Application for Establishment of a Hook-Up Fee Tariff. The Report directed interested parties to file comments by October 2, 2008, and subsequently, pursuant to a Stipulation entered into between the Staff and the Applicant, the date for comments was rescheduled to October 28, 2008.

As a consequence of a productive meeting held between Staff and Applicant on October 23, 2008, Applicant determined that the infrastructure master plan upon which its engineers relied, and upon which both the accountants and legal counsel for Applicant and

1 Staff relied, was easily misconstrued, resulting in higher population projections than are
2 warranted. Attached to this filing, at Exhibit "A", is a revised copy of the Spanish Trail
3 Water Company Water System Master Plan, dated October 2008 (the "Revised Master
4 Plan.")

5 The Revised Master Plan removes the description of the phasing of the Rocking K
6 South area, as Applicant's previous estimates were based upon the projections of growth
7 in the entire utility service area *added to* the projections of the Rocking K South area,
8 when in fact the Rocking K South projections are already included in the cumulative
9 projections. Consequently, the final chapter, the last appendix and the last figure have
10 been removed in the latest Revised Master Plan. In summary, the previous estimate of
11 11,834 future residential unit equivalents should instead be 6,229 residential units, an
12 elementary school, a small resort hotel and approximately 54 acres, totaling 6,877
13 residential unit equivalents.

14 Additionally, the Staff Report introduced several new concepts and incorporated
15 assumptions with which the Applicant disagrees.

16
17 A. Section IV(D) Refunds. Section IV(D) of Staff's proposed tariff requires the
18 payment of a refund by the Applicant of costs paid by developer of off-site
19 infrastructure that exceed the amount calculated by multiplying the HUF by the
20 number of lots in a given development. The Applicant is deeply concerned that
21 this could easily result in an unanticipated indebtedness that could far exceed the
22 utility's ability to pay. Applicant notes that this proposal is inconsistent with the
23 tariffs developed under Decision Nos. 68305 and 68246. In Decision No. 68305,
24 the Chaparral City Water Co HUF tariff, Section IV (D) provides that there shall
25 be no refunds. And in Decision No.68246, the Circle City Water Co HUF tariff,
26 Section IV (D) also provides that there shall be no refunds. Applicant argues that

1 the treatment of such costs should be consistent with the Commission's prior
2 findings.

3 B. Presumed Debt/Equity Ratio. Staff has made a determination of future rate base,
4 by requiring an equity investment of 70% in all future off-site improvements. The
5 likely effect of such a proposal is that the utility's customers will be subject to
6 excessive rate increases. The possibility that customers could end up assuming
7 some of the financial burden that developers would otherwise be expected to carry
8 is a grave concern. The Staff's recommendation, made outside the context of a
9 rate case, places too great a burden on the customers of the utility, and too modest
10 of a burden on the developers of new subdivisions. Applicant's original proposal
11 (for a 60% equity share of future infrastructure) is more defensible, more
12 pragmatic, and more protective of the utility's customers.

13 C. Data Inconsistencies.

- 14 1. Applicant has 403 active connections. WestLand Resources, Inc.
15 (Applicant's engineers) indicated that there are 538 existing units, which is
16 inclusive of sold but undeveloped and vacant lots in existing platted
17 subdivisions. The different numbers is not critical to this analysis, but it
18 helps to explain the differences in the ultimate figures.
- 19 2. The total number of residential dwelling units projected by WestLand is just
20 under 6,900, as described above. The Staff used a figure of 11,834 units,
21 which was in fact a number equating to the first phase of the Rocking K
22 master planned community added to the total build out projections. The fact
23 that the total projected units is considerably smaller than Staff estimated
24 materially impacts the projections.
- 25 3. WestLand projected the costs of the future off-site infrastructure to be
26 \$21,679,375. The Staff Report estimated those costs to be \$19,679,375,

1 which is exactly \$1.5 million less than WestLand projected. Applicant has
2 been unable to determine the reason for the differing assumptions.

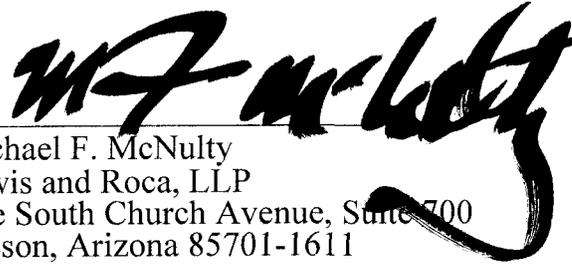
- 3 4. The Staff's estimates of the number of future connections to be used in the
4 HUF calculation, based upon the Applicant's projected well capacity.
5 Backing in to the statistics for the total build out of the project yielded the
6 staff's projection of 9,787 future connections. That number results from the
7 use of 4,600 gpm of new well capacity, assuming every well was used at
8 100% of capacity. Applicant's engineers do not design a water supply
9 system that is to be used at 100% of peak capacity – principally because it is
10 not in the interests of the public health or safety to do so. Using DEQ
11 criteria for emergency operations, WestLand calculated the costs of four
12 production wells assuming that three would be in production at build-out,
13 but that one would be permanently available as a back-up supply in the event
14 any of the production wells failed. If the Commission believes that a backup
15 well is unnecessary, the Applicant's capacity projections could be revised
16 assuming three production wells, but Applicant believes that such a design
17 approach is unwise and incautious.
- 18 5. The Staff Report calculated that the long term flow of HUF payments (at the
19 rate recommended by the Applicant) would be \$15 million, but that assumed
20 9,787 future new connections. The actual build out estimate, if no units are
double counted, is actually 7,594, nearly 25% fewer.

21 Rather than file yet another alternative proposed Hook-Up Fee Tariff, Applicant has
22 proposed to meet with Staff for further discussions of the Master Plan, and in an attempt to
23 find a consensus on the appropriate way to proceed from here. Pending further
24 discussions, should the Applicant and Commission Staff fail to find a mutually agreeable
25 proposal for a Hook-Up Fee tariff, Applicant continues to advocate the fees set forth in its
26 original filing.

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RESPECTFULLY SUBMITTED this 28th day of October, 2008

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COPY of the foregoing hand-delivered
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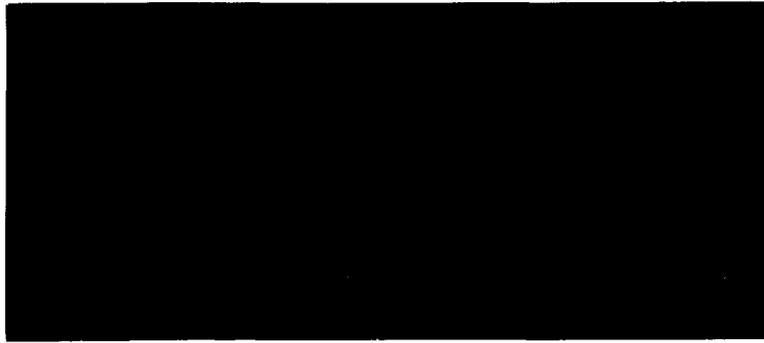
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6 COPY of the foregoing delivered via U. S. Mail
7 this 28th day of October, 2008, to:

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WestLand Resources, Inc.
Engineering and Environmental Consultants

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SPANISH TRAIL WATER COMPANY

**WATER SYSTEM MASTER PLAN
REVISED**

Prepared for:

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EXPIRES 3/31/2011

OCTOBER 2008
Project No. 218.49 A 8000

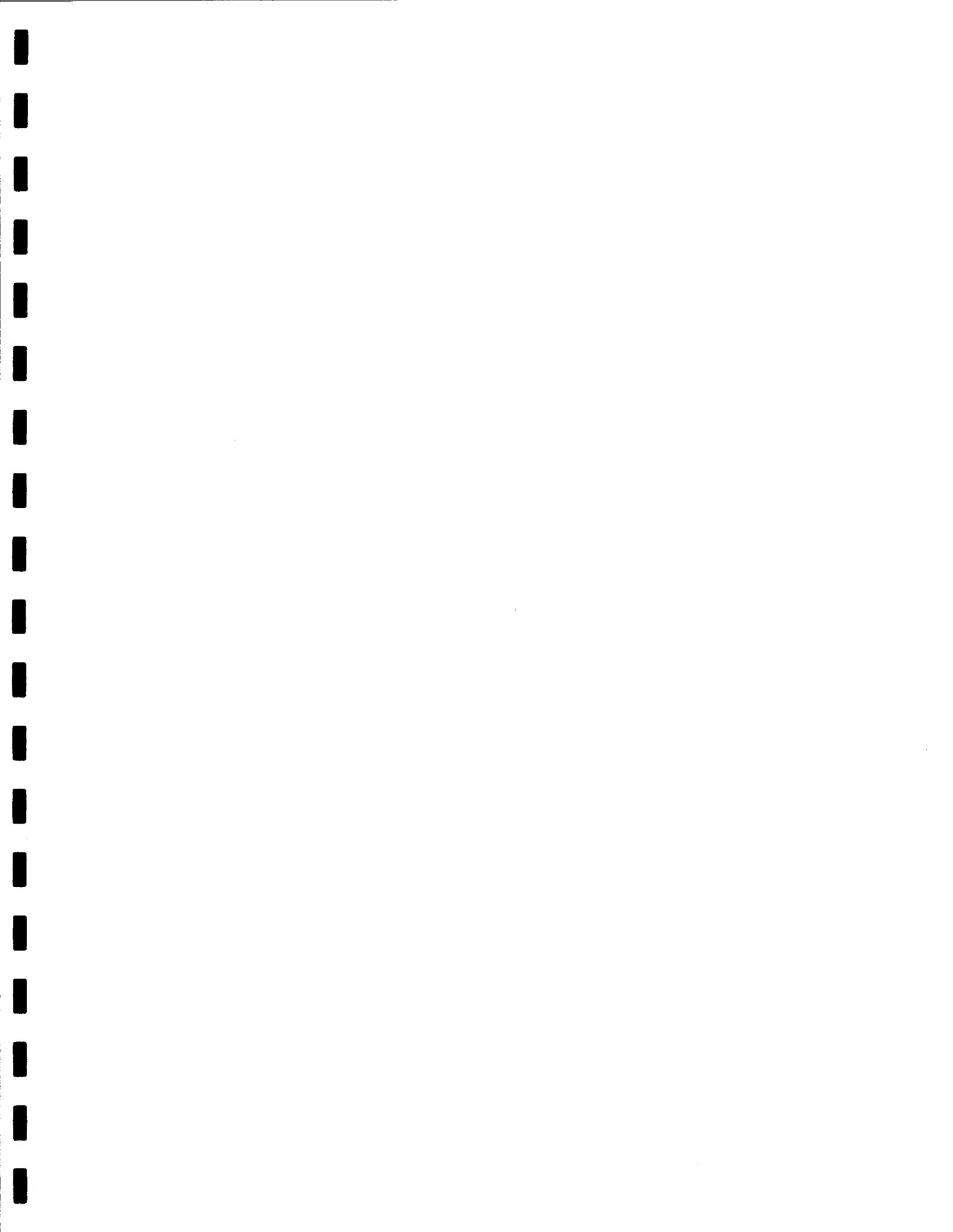


TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION.....	1
CHAPTER 2. SCOPE AND APPROACH	2
2.1. Define Key Issues	2
2.2. Water System Planning Horizon.....	2
2.3. Water Resources and Development	2
2.4. Water Source Capacity and Quality Requirements.....	2
2.5. Storage Requirements	3
2.6. Pressure Requirements.....	3
2.7. Fire Flow Policy.....	4
2.8. Water Main Requirements	4
2.9. Land Acquisition.....	5
2.10. System Upgrades	5
CHAPTER 3. ENGINEERING CRITERIA	6
3.1. Demand Criteria.....	6
3.2. Supply Criteria	6
3.3. Storage Criteria	6
3.4. Distribution System Criteria	7
CHAPTER 4. EXISTING SYSTEM ANALYSIS	8
4.1. Existing System Overview.....	8
4.2. Existing System Requirements	9
CHAPTER 5. FUTURE SYSTEM ANALYSIS.....	10
5.1. Population Projections	10
5.2. Future System Demands	11
5.3. Future System Sizing	15
5.3.1. Wells.....	15
5.3.2. Storage.....	16
5.3.3. Booster Capacity.....	16
5.4. Proposed Facilities – Future System Requirements.....	17
5.4.1. Well System Requirements	17
5.4.2. Reservoir System Requirements.....	18
5.4.3. Booster Station Requirements	19
5.4.4. Distribution System Requirements.....	19
CHAPTER 6. INFRASTRUCTURE COST ESTIMATES	20
6.1. Future System Cost Projections	20
6.2. Cost Projection Assumptions.....	20
6.2.1. Installation of Water Mains	20
6.2.2. Installation of Welded Steel Reservoirs	21
6.2.3. Well Installations.....	21
6.2.4. Booster Stations.....	21
6.2.6. Engineering and Contingencies	22
6.3. Existing Versus Future Breakdown	22

LIST OF TABLES
(within text)

Table 1. Spanish Trail Existing Water System Demands.....8
Table 2. Spanish Trail Existing Water System Requirements.....9
Table 3. Proposed Water System Pressure Zone Boundaries.....10
Table 4. G Zone Water Usage Demands11
Table 5. H Zone Water Usage Demands12
Table 6. I Zone South Water Usage Demands14
Table 7. I Zone North and J Zone North Water Usage Demands14
Table 8. Future Well Capacity Requirements15
Table 9. Future Reservoir Capacity Requirements.....16
Table 10. Future Booster Capacity Requirements.....17
Table 11. Summary of Spanish Trail Water System Master Plan Wells.....18

LIST OF EXHIBITS

- Exhibit 1. Spanish Trail Water System Master Plan
- Exhibit 2. Spanish Trail Water System Pressure Zones

LIST OF APPENDICES

- Appendix A. Build-out Infrastructure Cost Projections

LIST OF ACRONYMS

ADD	Average Daily Demand
ADEQ	Arizona Department of Environmental Quality
afaa	acre-feet per acre per year
AMA	Active Management Area
CC&N	Certificate of Convenience & Necessity
EDU	Equivalent Dwelling Units
ft	feet
gpad	gallons per acre per day
gpcd	gallons per capita per day
gpm	gallons per minute
gpsd	gallons per student per day
HP	Horsepower
lf	lineal feet
MG	Million Gallon
PDD	Peak Day Demand
PHD	Peak Hour Demand
PRV	Pressure Reducing Valve
psi	pounds per square inch
UFC	Uniform Fire Code
SR Zone	Suburban Ranch Zone
MR	Resort

CHAPTER 1. INTRODUCTION

The purpose of this report is to prepare a potable water system Master Plan document for the Spanish Trail Water Company system to address current and future water system infrastructure needs. This document will provide a planning basis for present and future operation of the Spanish Trail water system in a manner consistent with the existing facilities, physical constraints, and resources of Spanish Trail water system. The infrastructure requirements will be developed based on Arizona Department of Environmental Quality (ADEQ) requirements and standard engineering practices.

This Master Plan is intended to be a flexible, working document allowing Spanish Trail Water Company staff to adjust planning and water system facilities to meet future conditions. However, this document cannot anticipate every future outcome and, as such, should be reviewed periodically to update the assumptions for water system boundaries, population growth, projected water usage, and infrastructure requirements. It is recommended that these updates be provided at three-year intervals, or as appropriate, to allow timely updates to the capital improvement program and funding issues.

The Spanish Trail Water Company is a private water utility located approximately ½ mile east of the Tucson City limits. The Spanish Trail Water Company's Certificate of Convenience and Necessity (CC&N) encompasses approximately 6,400 acres (Exhibit 1). The water company's service area is generally bisected by the Rincon Creek. The properties on both sides of the Rincon Creek generally slope downward toward the creek and to the northwest. Properties north of the Rincon Creek slope upward to the north and those properties south of the Rincon Creek slope upward to the southwest.

The Spanish Trail Water Company currently serves approximately 538 residential units that are within a few small isolated subdivisions. The majority of the properties within the company's service area are generally undeveloped. The most significant water use anticipated within the water company is the Rocking K Specific Plan.

The Rocking K Specific Plan is located within the Spanish Trail Water Company and the boundaries approximately coincide with the Water Company's CC&N. The Rocking K Specific Plan consists of approximately 3,878 acres in the Rincon Valley. The property straddles Rincon Creek and is located on both sides of Old Spanish Trail. The Rocking K Specific Plan consists of 6,229 residential units, an elementary school, a 200-room resort hotel, and approximately 54 acres of commercial area.

Approximately 110 residential units are projected for the undeveloped areas outside Rocking K Specific Plan area based on their acreage and approved zoning information. A total of 6,877 residential units are projected for the buildout of the Spanish Trail water system, including the existing residential units, and those projected for undeveloped areas within and outside Rocking K Specific Plan.

CHAPTER 2. SCOPE AND APPROACH

2.1. DEFINE KEY ISSUES

The development of a Master Plan requires defining a strategic approach, key issues, and policies early in the planning process. These key issues and policies, and their initial assumptions, are required to design the ultimate water system. The policies set within this section will affect the required water system layout, facility sizing, reliability, and costs of the required infrastructure.

2.2. WATER SYSTEM PLANNING HORIZON

The projected planning horizon for the population and water system demands will be build-out. Population projections and demands on a per-zone basis will be provided for the existing conditions and the build-out condition.

2.3. WATER RESOURCES AND DEVELOPMENT

The Spanish Trail water system currently relies solely on groundwater supplies for its production water source. It is anticipated that the water company will continue to develop new groundwater wells to serve drinking water needs. The planning of well locations must take into account a number of factors including the hydrologic availability of water and location of the demand.

2.4. WATER SOURCE CAPACITY AND QUALITY REQUIREMENTS

Engineering criteria require that the well system be capable of providing peak day demand (PDD) for the entire system with the largest well out of service. The Master Plan will develop the capacity requirements and locations for wells to meet this requirement. Irrigation demands for three golf courses are anticipated within the Rocking K Specific Plan, but wells will be provided specifically for these requirements and will not be part of the domestic water system. The irrigation demands for the three golf courses are estimated to be 1,290 acre-feet per year per Tucson Active Management Area (AMA) requirements.

It is the Spanish Trail Water Company's policy to provide future chlorination of the system to maintain adequate residual chlorine concentrations throughout the water system. This policy will help alleviate bacteriological contamination that may occur through airborne contamination of reservoirs or stagnant water lines and transmission mains. The water quality of certain wells may also require treatment with corrosion inhibitor when those wells are equipped for use.

2.5. STORAGE REQUIREMENTS

Storage capacity is a highly critical element in the design and operation of water systems. The storage will provide operational flexibility and system reliability. Reservoir storage is used primarily to accommodate hourly demand fluctuations, PDD fluctuations, fire flow requirements, and emergency reserve storage. Each of these requirements added together form the required storage capacity. Current ADEQ criteria typically require the average daily demand (ADD) of the peak month plus fire flow requirements to be the minimum storage capacity per zone. Under certain circumstances, in service areas with excess well capacities, the storage capacity may be lowered. Due to the excess available well capacity and the inclusion of fire flow capacity, this Master Plan will develop storage criteria using 1.0 times ADD plus fire flow, rather than ADD of the peak month plus fire flow.

Storage capacity may be based on existing consumption and phased as the water system expands. The storage should be provided in the zone where the usage is required or available to be readily transferred to the zone of use.

The goal of the Master Plan is to develop future reservoir capacity using floating storage wherever possible. The highest zones may be an exception, as an appropriate reservoir location may not be available. The water surface of the reservoir is set at the high water elevation for the zone, which is generally about 100 feet above the highest home in the zone. This allows the homes within the zone boundary to be served directly from the reservoir by gravity and the system pressure regulated by the reservoir water surface elevation. This method provides a highly reliable system with low pressure fluctuations. The system will also continue to operate during power outages using the remaining water in the reservoir system. Electrical power backup would only be needed at wells and booster stations that directly serve areas without floating storage.

2.6. PRESSURE REQUIREMENTS

Pressure extremes in water systems result in a potential for contamination to enter the system. Low pressures may allow polluted fluids to be forced into the system. High pressures may cause ruptures or breaks. Normal working pressure in the distribution system should not be less than 40 pounds per square inch (psi). System pressures under peak day conditions should not drop below 35 psi anywhere within the system. The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. This is generally understood to mean that the minimum residual pressure must be 20 psi for each customer in a fire flow event from any hydrant, during a flow condition of peak day plus fire flow. Maximum pressures of as much as 100 psi can be allowed in small, low-lying areas not subject to high flow rates and surge pressure. The Uniform Plumbing Code limits water pressure within the individual property owners' plumbing to 15 to 80 psi. Boosting or regulating the pressure from the meter to the customer is the responsibility of the customer.

2.7. FIRE FLOW POLICY

The Spanish Trail Water Company service area includes some older subdivisions that were developed prior to enforcement of the Uniform Fire Code (UFC). These areas do not necessarily have the currently required fire flow capacity per the UFC. Per the UFC, these areas are grandfathered and not required to be retrofitted to meet UFC standards.

There are generally two considerations to providing adequate fire flow. The first consideration includes offsite requirements such as the volume of fire flow storage available in reservoirs, adequately designed pressure zones, and the size of transmission mains. The second factor is the internal distribution system within the neighborhood, including main sizes, adequate looping, and fire-hydrant placement. The goal of the Master Plan is to develop adequately sized reservoirs, properly designed pressure zones, and water transmission mains sized to provide as much fire flow as practical to existing areas, and to provide adequate fire flow for new development.

Fire flow requirements for homes typically vary from 500 to 1,500 gallons per minute (gpm), depending on the size of the home and the requirements of the fire district. The typical residential subdivision will have a fire flow requirement of 1,000 gpm for a two hour duration, although required flows can be 1,500 gpm or higher for homes larger than 3,600 square foot under roof. Higher flows can often be reduced through the use of residential sprinkler systems. Commercial facility fire flow requirements also vary depending on the square footage of the commercial building, occupancy type, building material type, exposure distance to other buildings, and whether the structure is sprinklered. Typical commercial facilities will have fire flow requirements from 1,500 to 2,500 gpm for a two to three hour duration. Fire flows can be adjusted by the local fire district, if the nature of the system or the rural nature of the area precludes the full fire flow per the UFC. For purposes of the Master Plan, the fire flow will be assumed to be 1,000 gpm for two hours for residential developments and 1,500 gpm for two hours for commercial. It is assumed that larger residential homes and commercial facilities will be equipped with a fire sprinkler system.

2.8. WATER MAIN REQUIREMENTS

The goal for the Master Plan is to describe a water transmission system that will tie together areas within a pressure zone to create a single integrated zone that can take advantage of the floating storage. The transmission and distribution systems should be sized and arranged to minimize friction-generated line losses and provide the required fire flows. The policy of Spanish Trail Water Company will be to require looped water transmission and distribution systems for the water main grid system wherever possible. In addition, appropriate valving locations and intervals should be required to isolate small sections of main during breakages and reduce the number of residences out of service.

2.9. LAND ACQUISITION

The Master Plan will help to provide locations and sizes for future wells, reservoirs, booster stations, and major transmission mains to serve the water system. These facilities will be generally located on water system maps. Many factors and constraints will be required to determine the final location for each site. These factors include the proximity to existing water transmission mains, the proximity to three-phase power, access to local public streets, specific elevation requirements for floating reservoirs, hydrologic requirements for well sites, noise and buffer requirements for booster stations and wells, aesthetic screening requirements for aboveground facilities, and the cost of land acquisition and/or the availability of other preferable sites.

2.10. SYSTEM UPGRADES

The Master Plan will develop the system design criteria to guide the water company in designing water facilities. The system design criteria will include methods for demand calculations, peaking factors, water supply requirements, the number and capacity of wells required, reservoir storage and booster station capacity requirements, emergency backup systems, and distribution system sizing.

The Master Plan will identify upgrade requirements for the water system at build-out, and specify the required new facilities and/or facility upgrades. These facilities may include additional or upgraded wells, booster station upgrades, reservoir capacity additions, and transmission and distribution main augmentations. The projected cost estimates will be provided for these facilities, and a priority schedule and timeline will be provided for infrastructure development.

CHAPTER 3. ENGINEERING CRITERIA

Based on the information presented in Chapter 2, the system design criteria for the Master Plan are described below in terms of demand, supply, storage, and distribution system assumptions.

3.1. DEMAND CRITERIA

Demand, residency estimates, and peaking factors are based on the typical criteria for similar systems in southern Arizona area.

- Average daily per capita water usage for single-family residential 125 gpcd
- Average daily per acre water usage for commercial/mixed use/recreation 1,200 gpad
- Average daily per student water usage for elementary school..... 25 gpsd
- Average number of persons per single-family dwelling unit.....2.4
- Average number of guests per resort room.....2
- Turf usage 4.6 afaa
- Low water use vegetation usage 1.5 afaa
- Ratio of peak day to average-day use for residential/commercial/resort2.0
- Ratio of peak hour to average-day use for residential/commercial/resort3.5
- Ratio of peak day to average-day use for irrigation.....1.7
- Ratio of peak hour to average-day use for irrigation5.1

gpcd – gallons per capita per day
 gpad – gallons per acre per day
 gpsd – gallons per student per day
 afaa – acre-feet per acre per year

3.2. SUPPLY CRITERIA

- Well capacity to meet PDD with the largest well out of service.
- Minimum supply from well and boosters pumping to elevated storage to meet PDD.
- Minimum booster capacity to zones without elevated storage to meet peak-hour demand or PDD plus fire flow, whichever is larger.

3.3. STORAGE CRITERIA

- Provide storage volume equal to a minimum of 1.0 times the ADD.
- Provide additional storage volume required to provide 1,000 gpm or 1,500 gpm fire flow for residential and commercial development, respectively, for two-hour duration.
- Provide valving at reservoirs to allow the direction of supply to lower zones if required for fire flow.

3.4. DISTRIBUTION SYSTEM CRITERIA

- System design and construction to meet Spanish Trail Water Company and ADEQ requirements.
- Maximum friction head loss for lines up to and including 8-inches in size to be 8 feet per 1,000 feet or less. Head loss for lines over 8-inches in size to be 5 feet per 1,000 feet or less, according to pipe size.
- Distribution lines to be sized and arranged to provide required fire flows.
- The Spanish Trail water system pressure zones and zone boundaries are at 100-foot elevation differences for most of the system.
- Provide a line-size valve, normally closed, at all pipelines crossing zone boundaries.
- Water will be supplied at the customer's meter within a static pressure range of 35 to 85 psi. Due to localized conditions, certain locations may receive water pressure slightly less or greater.

CHAPTER 4. EXISTING SYSTEM ANALYSIS

The purpose of this chapter is to provide information about the existing water system facilities. Spanish Trail water system currently consists of three small, isolated systems that serve several subdivisions including Ranchos Pequeños/Rocking K Estates, Academy Village, and Caserio Viejo. The goal of this Master Plan is to incorporate the existing water system facilities within each subdivision into the new, integrated Spanish Trail water system according to phasing of the Spanish Trail water system.

4.1. EXISTING SYSTEM OVERVIEW

Table 1 provides a summary of the water demand from each subdivision based upon the demand criteria presented in Chapter 3.

Table 1. Spanish Trail Existing Water System Demands

Service Area	Units Served	Average Day Demand (gpd)	Average Day Demand (gpm)	Peak Day Demand (gpm)	Maximum Instantaneous Flow (gpm)
Ranchos Pequeños/Rocking K Estates	256	76,800	53	106	186
Academy Village	264	79,200	55	110	193
Caserio Viejo	18	5,400	4	8	56
TOTAL	538	161,400	112	224	435

The majority of the Ranchos Pequeños/Rocking K Estates subdivision is served by two 20 horse power (HP) booster pumps, delivering water directly from a 10,000 gallon storage tank to the system. The elevation of the booster pump is approximately 2,910 feet (ft), and the pressure at the booster station is maintained at approximately 120 psi, which results in a high water elevation of approximately 3,187 for the system. The Ranchos Pequeños/Rocking K Estates subdivision has an elevation ranging from approximately 2,900 to 3,060 feet, and the static pressure is in the range of 55-124 psi. The 400 gpm Rocking K well and 300 gpm Barn well feed to the storage tank based on water level in the tank. The Rocking K well also directly serves about 10 houses in the lowest elevation of the subdivision. The well head pressure is set at approximately 60 psi to provide adequate service pressure. No fire flow protection is available for the subdivision.

Academy Village is currently served by the Saguaro Water Company H Zone floating reservoir. Saguaro Water Company sells water for this purpose to Spanish Trail Water Company. The H Zone floating reservoir has a high water elevation of 3,212 ft. The elevation for Academy Village ranges from 2,980 to 3,115 feet, resulting in the static pressure in the range of 42 to 100 psi. The current water system is capable of providing 1,000 gpm fire flow to Academy Village while maintaining a pressure of at least 20 psi throughout the distribution system. Spanish Trail Water Company will begin serving the Academy Village area following the construction of a proposed H Zone reservoir adjacent to the Saguaro Water Company reservoir.

A 35 gpm well (York well) directly serves the 18 homes within Caserio Viejo subdivision. The elevation of this small community is approximately 3,020 to 3,060 ft. The well head pressure is set at approximately 50 psi. A new 10,000 gallon storage tank and 100 gpm booster station is under construction for this area. No fire flow protection is provided in this area.

4.2. EXISTING SYSTEM REQUIREMENTS

The water system design criteria, as described in Chapter 3, was used to develop the existing capacity upgrade requirements for the Spanish Trail Water Company, including the capacity of wells, storage, and boosters. The main purpose of this section is to determine what portion of the water system upgrades cannot be attributed to future growth and, therefore, would not be included in the calculation of a development or hook-up fee.

Table 2 provides a summary of the existing and required well, reservoir, and booster capacity. Although the three service areas are currently separated, the overall capacity requirement for the existing system is calculated considering the future interconnections between these service areas. This will allow the water company to split out the cost of the proposed future upgrades that should be allocated to existing customers. The data in Table 2 indicate that the well and booster capacity is sufficient for the existing Spanish Trail water system, and the storage capacity is approximately 141,400 gallon in shortage for the existing system.

Table 2. Spanish Trail Existing Water System Requirements

Service Area	Well Capacity (gpm)		Storage Capacity (gallon)		Booster Capacity (gpm)	
	Required	Existing	Required	Existing	Required	Existing
Ranchos Peuenos/ Rocking K Estates	106	700	76,800	10,000	186	400
Academy Village	110	0	79,200	0	N/A**	0
Caserio Viejo	8	35	5,400	10,000*	56	100*
TOTAL	224	735	161,400	20,000	242	500
Excess (shortage) Capacity	511 gpm excess		(141,400 gallons shortage)		258 gpm excess	

*under construction

**floating reservoir

CHAPTER 5. FUTURE SYSTEM ANALYSIS

The water system design criteria were used to develop the future water system capacity requirements. Future system requirements include the capacity of wells, storage, boosters, and water mains to serve future demand and the existing demand, as it is the intention of this Master Plan to integrate the existing water system into the new, integrated Spanish Trail water system. Certain of the existing service wells, storage tanks, and booster pumps will be replaced by the new facilities due to age and condition.

Four distinct water system pressure zones have been developed to provide service to the existing and proposed development. The water pressure zones will be interconnected through booster stations or pressure reducing valve (PRV) stations so that water can be moved between zones as needed. The existing systems will be split into the G and H Zones. Table 3 provides a summary of the proposed pressure zone boundaries.

Table 3. Proposed Water System Pressure Zone Boundaries

Zone	Theoretical High water (ft)	Service Area Boundaries (ft)	Service Area Pressures (psi)	Change in Elevation (ft)
G (includes F)	3,125	2,840 – 3,025	43 – 123	185
H	3,212	3,025 – 3,120	40 – 81	95
I South	3,317	3,120 – 3,225	40 – 85	105
J North (includes I North)	3,422	3,120 – 3,330	40 – 131	210

5.1. POPULATION PROJECTIONS

The water system analysis is based on the approximate number and type of units at build-out for the water system. The Rocking K Conceptual Land Use Plan covers the majority of the Spanish Trail Water Company service area, and provides the location and type of future development projects. For the undeveloped areas outside of the Rocking K Conceptual Land Use Plan, the number and type of units were estimated based on approved zoning.

It is estimated that a total of 6,877 residential dwelling units will be present in the service area at build-out. The total population to be served by the Spanish Trail Water Company will be approximately 16,500 people.

5.2. FUTURE SYSTEM DEMANDS

The demand criteria presented in Chapter 3 were used to calculate the build-out demands for the water system by zone, as shown in Tables 4, 5, 6, and 7. The north and south pressure zones have been divided by the Rincon Creek. The equivalent dwelling units (EDU) are calculated based on the ratio of total projected water demands to the water demands of single family dwelling units.

Table 4. G Zone Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
G-Zone South					
Ranchos Pequeños	Existing	20	4	8	15
Rocking K Estates II	Existing	30	6	13	22
FD3	SR Zoned	28	6	12	20
19	LDR	212	44	88	155
27	MDR	68	14	28	50
31	MDR	194	40	81	141
44	HDR	118	25	49	86
47	C	35.32 ac	29	59	103
A	VLDR	36	8	15	26
B	LDR	11	2	5	8
D	MDR	137	29	57	100
E	MDR	88	18	37	64
Park (1/2 area of turf)	PARK	1.25 ac	4	6	18
Park (1/2 area of low water use)	PARK	1.25 ac	1	2	6
Subtotal of G-Zone South	-	942	230	459	814
G-Zone South EDU's	-	1,106	-	-	-
G-Zone North					
FD1 (F-Zone)	SR Zoned	51	11	21	37
FD2 (partial)	SR Zoned	11	2	5	8
1	VLDR	1	0.2	0	1
6	LDR	126	26	53	92
7	LDR	27	6	11	20
8	LDR	39	8	16	28
26	MDR	143	30	60	104
28	MDR	138	29	58	101
30	MDR	237	49	99	173
32	MDR	112	23	47	82
33	MDR	41	9	17	30
71	MDR	17	4	7	12
ES5	LDR	126	26	53	92
ES6	LDR	56	12	23	41

Table 4. G Zone Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
ES7	MDR	4	1	2	3
ES8	MDR	58	12	24	42
ES9	LDR	123	26	51	90
ES10	MDR	36	8	15	26
ES11	LDR	22	5	9	16
Subtotal of G-Zone North	-	1,368	285	570	998
G-Zone North EDU's	-	1,368	-	-	-
TOTAL G ZONE	-	2,310	515	1,029	1,812
TOTAL G ZONE EDU'S	-	2,474	-	-	-

Table 5. H Zone Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
H Zone South					
Rocking K Estates III	Existing	88	18	37	64
Rocking K Estates IV	Existing	118	25	49	86
The Academy Village	Existing	264	55	110	193
C	VLDR	39	8	16	28
F	MDR	103	21	43	75
G	MDR	117	24	49	85
H	MDR	93	19	39	68
H	MU	3.5 ac	3	6	10
I	LDR	64	13	27	47
J	LDR	47	10	20	34
K	LDR	46	10	19	34
L	LDR	104	22	43	76
M	LDR	58	12	24	42
N	REC	15	13	25	44
O	LDR	208	43	87	152
P	LDR	23	5	10	17
Q	LDR	193	40	80	141
R	VLDR	24	5	10	18
S	LDR	7	1	3	5
T	LDR	26	5	11	19
U	VLDR	44	9	18	32
V	VLDR	35	7	15	26
W	LDR	55	11	23	40
X	VLDR	9	2	4	7
Y	VLDR	46	10	19	34

Table 5. H Zone Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
Z	LDR	52	11	22	38
AA	LDR	35	7	15	26
BB	LDR	93	19	39	68
CC	LDR	12	3	5	9
DD	LDR	375	78	156	273
EE	LDR	99	21	41	72
FF	LDR	38	8	16	28
GG	LDR	27	6	11	20
HH	LDR	36	8	15	26
II (1000 students)	ES	1000 students	17	35	61
II (1/2 area of turf)	ES	7.5 ac	21	36	109
OO	MDR	79	16	33	58
PP	LDR	36	8	15	26
Park (1/2 area of turf)	PARK	14.4 ac	41	70	209
Park (1/2 area of low water use)	PARK	14.4 ac	13	23	68
Subtotal of H Zone South	-	2,693	670	1,317	2,465
H Zone South EDU's	-	3,214	-	-	-
H Zone North					
Caserio Viejo (York system)	existing	18	4	8	13
FD2 (partial)	SR Zoned	20	4	8	15
2	VLDR	32	7	13	23
3(partial)	VLDR	20	4	8	15
5(partial)	VLDR	28	6	12	20
9	LDR	37	8	15	27
10	LDR	41	9	17	30
11	LDR	32	7	13	23
12	MDR	28	6	12	20
13 (partial)	LDR	7	1	3	5
15	LDR	37	8	15	27
16	LDR	52	11	22	38
17	LDR	29	6	12	21
18	LDR	75	16	31	55
29	MDR	24	5	10	18
34	MDR	136	28	57	99
ES1	MDR	90	19	38	66
ES2	MDR	149	31	62	109
ES3	VLDR	36	8	15	26
ES4	VLDR	22	5	9	16
ES12	VLDR	8	2	3	6

Table 5. H Zone Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
ES13	VLDR	13	3	5	9
ES14	VLDR	38	8	16	28
ES15	LDR	33	7	14	24
ES16 (partial)	MDR	30	6	13	22
ES17 partial	VLDR	4	1	2	3
Subtotal of H Zone North	-	1,039	216	433	758
H Zone North EDU's	-	1,039	-	-	-
TOTAL H ZONE	-	3,732	886	1,750	3,223
TOTAL H ZONE EDU'S	-	4,253	-	-	-

Table 6. I Zone South Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
FF	LDR	38	8	16	28
JJ	LDR	65	14	27	47
KK	LDR	91	19	38	66
LL	LDR	165	34	69	120
MM	MDR	117	24	49	85
NN	LDR	141	29	59	103
PP	LDR	37	8	15	27
Park (1/2 area of turf)	PARK	14.75 ac	42	72	215
Park (1/2 area of low water use)	PARK	14.75 ac	14	23	70
TOTAL I ZONE SOUTH	-	654	192	367	761
I ZONE SOUTH EDU'S	-	922	-	-	-

Table 7. I Zone North and J Zone North Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
3(partial)	VLDR	29	6	12	21
5(partial)	VLDR	14	3	6	10
13 (partial)	LDR	34	7	14	25
ES16(partial)	MDR	43	9	18	31
ES17(partial)	VLDR	3	1	1	2
4	VLDR	10	2	4	7
14	LDR	48	10	20	35
46	MR	200 rooms	35	69	122

Table 7. I Zone North and J Zone North Water Usage Demands

Parcel No.	Use Type	# Units	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
TOTAL I ZONE NORTH AND J ZONE NORTH	-	181	72	145	254
I ZONE NORTH AND J ZONE NORTH EDU's	-	348	-	-	-

5.3. FUTURE SYSTEM SIZING

The water system design criteria, as previously provided, were used to develop the future water system capacity requirements for the Spanish Trail water system. Future system requirements include the capacity of wells, storage, boosters, and mains to serve future demands. The proposed future system upgrades are shown in Exhibit 1. A schematic of the proposed water system is provided in Exhibit 2.

5.3.1. Wells

Well production requirements are based on meeting PDD with the largest well out of service. For purposes of the calculation, it is assumed that the reserve well capacity is 1,200 gpm, which is approximately equal to the largest projected new well capacity. A summary of the required well capacities and the future additional well capacity required by Spanish Trail potable water system is presented in Table 8.

Based on projected build-out conditions, the Spanish Trail water system requires approximately 4,191 gpm in well capacity including reserve capacity to meet the source requirements. This will equate to four new wells at approximately 1,000 to 1,200 gpm. Each well will pump directly to the pressurized water system and will be level controlled by the floating reservoir in the pressure zone. One of the existing wells, Barn Well with a capacity of approximately 300 gpm, will continue to be utilized.

Table 8. Future Well Capacity Requirements

Zone	Well Requirement (PDD-gpm)	Existing Well Capacity (gpm)	Shortage Well Capacity (gpm)
G	1,029	300	729
H	1,749	0	1,749
I South	367	0	367
J North	145	0	145
Reserve Capacity*	1,200	0	1,200
TOTAL	4,491	300	4,191
REQUIRED CAPACITY			4,191 gpm

* Equal to the anticipated capacity of the largest well.

5.3.2. Storage

Storage sizing requirements are based on meeting 1.0 times the ADD plus fire flow. Fire flow demands will either be served from the reservoir that floats the zone or from the reservoir that serves the zone through boosters or PRVs.

The storage requirements per zone are presented in Table 9. The primary storage facilities for the Spanish Trail water system are planned for the G and H Zones. The Spanish Trail water system requires a total of 2.7 million gallons of storage distributed throughout the system to meet the storage criteria.

Table 9. Future Reservoir Capacity Requirements

Zone	Potable Storage Requirement (1.00 ADD/gal)	Fire flow Storage Requirement (gal)	Total Storage Requirement (gal)	Existing Storage Capacity (gal)	Shortage Storage Capacity (gal)
G*	742,191	180,000	922,191	10,000	912,191
H*	1,276,016	180,000	1,456,016	10,000	1,446,016
I South	276,523	0	276,523	0	276,523
J North	104,300	0	104,300	0	104,300
TOTAL	2,399,030	360,000	2,759,030	20,000	2,739,030
REQUIRED CAPACITY				2,739,030 gallons	

* Zones with floating storage.

5.3.3. Booster Capacity

Booster station facility sizing is based upon conveying the PDD from zones with excess supply capacity to the zones within the water system with deficient supply capacity when floating storage is provided. In zones that are not currently served by floating reservoirs, the booster stations must provide PDD plus fire flow or peak hour demand (PHD), whichever is greater. A summary of the booster capacity requirement for each zone is provided in Table 10.

To evaluate the booster station capacity requirements, a schematic of the proposed water system is shown in Exhibit 2. This schematic shows the interconnection of zones including production requirements, booster station facility capacities, and reservoir sizes. This schematic also shows the flow of water through the system under PDD conditions.

Table 10. Future Booster Capacity Requirements

Zone	Total Booster Capacity Requirement* (gpm)	Existing Booster Capacity (gpm)	Shortage Booster Capacity (gpm)
G to H Transfer Booster	1,062*	0	1,062
I South	1,867**	0	1,867
J North	1,645**	0	1,645
TOTAL	4,574	0	4,574
REQUIRED CAPACITY		4,574 gpm	

* G to H transfer booster capacity equals H, I, and J Zone PDD minus well capacity with the largest well out of service

** I south and J North booster capacity equals PDD plus fire flow

5.4. PROPOSED FACILITIES – FUTURE SYSTEM REQUIREMENTS

The facilities proposed to meet the future system requirements are described below. These facilities are also shown on Exhibit 1.

5.4.1. Well System Requirements

In accordance with Table 8, the build-out well capacity requirement of the Spanish Trail water system is approximately 4,491 gpm including 1,200 gpm reserve capacity. In order to meet this build-out capacity requirement, Spanish Trail Water Company requires approximately four wells of 1,000-1,200 gpm each in addition to the 300 gpm Barn Well in the existing system.

Several factors will determine the probable locations of the new wells. These factors include well-spacing analysis, proximity to the greatest and most efficient hydrologic aquifer supply, and proximity to the distribution system. It is the intention of Spanish Trail Water Company to equip its two existing wells for potable water use, the Gusher Well and Well No. 1 (Los Reales). The two other wells considered for Spanish Trail water system are the proposed Well No. 3 and a replacement of the existing Diesel Well. The four new wells will be connected to the system with new 12 and 16-inch pipelines. Disinfection and telemetry systems will be provided at each of these well sites. Table 11 provides a summary of the wells considered for the domestic water system in this Master Plan.

Irrigation demands for the three golf courses anticipated within the Rocking K Specific Plan will be provided by two 1,200 gpm wells, Well No. 2 and Well No. 4 (existing Pioneer Trust Well No. 1). These two wells will serve specifically for the golf course irrigation demand.

Table 11. Summary of Spanish Trail Water System Master Plan Wells

Well Name	ADWR # 55-	Existing or Future Capacity (gpm)	Casing Diameter (in)	Well Depth (ft)	Date Drilled	Water Level (ft)	Surface Elevation (Approx.)	Zone
Barn Well (existing)	536560	300	12	400	4/93	53	2,910	G
York Well (existing)	622249	35	N/A	<233	1974	N/A	3,040	H
Diesel Well (replacement)	622259	1,000	N/A	N/A	N/A	N/A	2,955	G
Gusher Well	564331	1,200	16(0-721') 12(729'- 1,000')	1,000	9/98	140	2,945	G
Well No.1	591952	1,200	16	1,000	9/02	340	3,030	H
Well No.3	TBD	1,200	TBD	TBD	TBD	TBD	3,055	H
TOTAL		4,935						

* TBD = to be determined

5.4.2. Reservoir System Requirements

Based upon Table 9, it is anticipated that approximately 2.7 million gallons of reservoir capacity will be required to provide 1.0 times the ADD plus fire flow. The two main floating zone storage systems within the Spanish Tail water system will provide service to approximately 90 percent of the homes in the service area. The remaining 10 percent will be served through pumped storage. The following new reservoirs are proposed:

- The first reservoir will be a new 1.1 million gallon (MG) H Zone reservoir. The preferred location for this reservoir is adjacent to the existing 500,000-gallon Saguaro Water Company reservoir at Camino Loma Alta site, and the 1.1 MG is the largest reservoir that can be accommodated at that site. This reservoir will serve H Zone, provide forbay storage for the south I-Zone booster pumps, and provide 200,000-gallons of storage for Saguaro Water Company. A two-way metering system between this new 1.1 MG reservoir and the existing Saguaro Water Company 500,000 gallon reservoir is proposed to provide facility-sharing and emergency-backup between Spanish Trail and Saguaro water systems. Of the 1.1 MG storage capacity, 900,000 gallons will be allocated to Spanish Trail Water Company, and 200,000 gallons will be allocated to Saguaro Water Company.
- The second reservoir is a new 900,000-gallon G Zone reservoir. This reservoir will serve G Zone. The preferred location is located at the school site in Rocking K Conceptual Plan (Exhibit 1).
- The third reservoir will be a new 900,000-gallon H Zone reservoir located at north portion of Spanish Trail service area. This reservoir will float H Zone and will provide a source for booster stations to north J Zone. It is recommended that this reservoir be constructed to conform to the high water elevation of the first H Zone reservoir.

5.4.3. Booster Station Requirements

The booster station locations, zone boundaries, and capacities are as follows:

- To transport water from G to H Zone to meet the PDD of all upper zones with the largest well out of service, the H Zone transfer booster station at G Zone reservoir site should be able to provide 1,000 gpm
- A new south I Zone booster station will be required to provide PDD plus fire flow, approximately 1,900 gpm. This booster station will require a backup generator due to the pumped storage nature of the facility.
- A new north J Zone booster station will be required. A capacity of 1,800 gpm will meet PDD plus fire flow requirements. The capacity of this booster station will be examined in detail once the peak demands of the proposed resort site are determined. A backup generator at this booster station will be required to provide a backup power supply.

5.4.4. Distribution System Requirements

This Master Plan provides a concept distribution system that consists of mains required to interconnect separate sub-zones, provide transport capacity between wells and reservoirs, and provide capacity to serve each development parcel for PDD plus fire flow. The water system layout within each parcel is not discussed in this report. The following transmission mains are anticipated (Exhibit 1):

- Approximately 12,100 lineal feet (lf) of 16-inch G Zone water main and 35,500 lf of 12-inch G Zone water main for G Zone distribution system.
- Approximately 5,900 lf of 16-inch H Zone water main and 83,900 lf of 12-inch H Zone water main for H Zone distribution system.
- Approximately 9,100 lf 12-inch water main to distribute water through I Zone from I Zone south booster station.
- Approximately 10,400 lf of 12-inch water main to distribute water through J Zone north from the J Zone north booster station.

CHAPTER 6. INFRASTRUCTURE COST ESTIMATES

6.1. FUTURE SYSTEM COST PROJECTIONS

In order to meet future system requirements, cost projections have been provided to predict the ultimate infrastructure costs. Spanish Trail Water Company will need to construct distribution mains, booster stations, wells, and reservoirs. The total cost to construct these facilities to meet current standards is estimated to be approximately \$21.2 million. The \$21.2 million will facilitate the construction of 138,900 lf of 12 and 18,000 lf of 16-inch transmission mains, 2.7 million gallons of reservoir storage capacity, 4,600 gpm of well capacity, and three booster stations. The cost allocation of the \$21.2 million of infrastructure will include approximately \$13.4 million for distribution mains, \$2.8 million for reservoir storage, \$1.5 million for booster stations, and \$3.5 million for wells. Appendix A lists the proposed projects in detail with cost projections for each project.

6.2. COST PROJECTION ASSUMPTIONS

A major component in compiling the Master Plan is the cost projections for the recommended facilities. Appendix A provides a list of the proposed infrastructure projects. Due to the fact that the Master Plan planning document shows conceptual layouts for proposed facilities, assumptions were made to predict probable construction costs. Standard assumptions were made for several categories of improvements. The assumptions made for the infrastructure proposed in the Master Plan are listed in Section 6.2. The costs as described below have been used to calculate the cost projections in Section 6.1.

6.2.1. Installation of Water Mains

Projections in the Master Plan indicate that approximately 138,900 lf of 12-inch and 17,300 lf of 16-inch transmission mains will need to be installed at build-out. Recent bids in other water utilities, and applying standard assumptions for soil conditions, the following cost were used:

- \$65 per lf of 12-inch water main
- \$95 per lf of 16-inch water main

This cost assumption includes valves, fittings, and appurtenances required for the installation of the proposed water mains. The cost assumption does not include easement acquisition.

6.2.2. Installation of Welded Steel Reservoirs

Projections of Spanish Trail Water System storage requirements indicate that 2.7 million-gallons of storage will be required at build-out. The two most commonly used types of storage facilities are welded steel reservoirs and below-ground concrete reservoirs. Welded steel reservoirs are generally less expensive to install than concrete reservoirs. It is estimated that all of the storage required for the Spanish Trail water system can be accomplished with welded steel reservoirs. A cost of \$0.75 per gallon of storage is estimated using the information from recent bid openings and standard assumptions for the G Zone and H Zone south reservoirs. This cost assumption includes the steel reservoir, required site work, site piping, telemetry, site grading, and fencing. A cost of \$0.95 per gallon was used for the H Zone north reservoir due to anticipated site conditions which will require substantial grading, landscaping and block wall. This cost assumption does not include site acquisition. The proposed 1.1 MG H Zone storage reservoir at Saguaro Water Company Camino Loma Alta reservoir site will provide 200,000- gallon storage capacity for Saguaro Water Company. Saguaro Water Company has allocated \$150,000 (\$187,500 after Engineering and Contingencies) to contribute to the construction of this reservoir. The remaining 900,000 gallons of storage capacity will include 141,400-gallon storage capacity for the existing Spanish Trail Water Company customers, with the remaining storage for future customers.

6.2.3. Well Installations

The Master Plan estimates that four wells with an approximate capacity of 1,000 to 1,200 gpm each will be required to meet the supply demands of Spanish Trail water system. Using recent bids, and applying standard assumptions for drilling rig requirements for access, a cost of \$850,000 was assumed to drill and equip a new well, and a cost of \$550,000 was assumed to rehab and equip an existing well. This cost projection includes standard drilling operations, well casing, sanitary seal, well column tube and shaft, motor, and pump bowl assembly, assuming the wells are to be drilled using the reverse-circulation, air-rotary drilling rig. The cost assumption also includes components for site piping and equipment, site grading, block walls, telemetry, and site acquisition.

6.2.4. Booster Stations

The Master Plan includes three new booster stations that will need to be installed to meet build-out demands. Using bids recently received, and applying standard assumptions, a cost of \$400,000 for the new large booster station facilities was assumed, and \$200,000 was used for the small transfer booster station. A backup generator is estimated to cost \$100,000. This cost assumption includes site piping and equipment, site grading, block walls, and telemetry.

6.2.6. Engineering and Contingencies

Due to the planning nature of the locations of the facilities proposed in the Master Plan, contingencies are added to reflect unforeseen conditions that may affect the individual projects. Unforeseen conditions can range from environmental issues that may need to be addressed on individual projects, to easements that may need to be acquired for pipeline construction. This cost component also includes engineering fees, permits, inspection, and project management. For the cost estimates in Section 6.1, engineering and contingencies of 25 percent have been included.

6.3. EXISTING VERSUS FUTURE BREAKDOWN

The proposed infrastructure upgrades will be addressed based on which portion of the new facilities will benefit the existing system and which will benefit future developments, as the funding mechanisms for these two groups of customers differs. Facilities required to serve the existing system requirements will be paid for by the water company rates. Facilities required for future growth will be paid for by development through a proposed hook-up fee tariff.

The Spanish Trail Water System requires 141,400 gallons of additional storage for the existing system. This represents approximately 16 percent of the 900,000 gallons of storage that will be provided for the Spanish Trail Water Company system in the 1.1 million gallon H Zone reservoir. Out of the \$843,800 cost for construction of the new H Zone reservoir, including engineering and contingencies, approximately \$132,600 will be contributed by the existing system and the remaining \$711,200 will be contributed by future growth.

The total number of new EDU's served by the proposed future system infrastructure upgrades is 7,459, which includes both new residential units and the new commercial demands calculated according to the equivalent demand of residential units.

EXHIBITS

SOUTH

NORTH

3330

3330

J

J NORTH
PDD = 94
PHD = 164
FF = 1,500

94 GPM

NEW H-ZONE SOUTH RESERVOIR

NEW H-ZONE NORTH RESERVOIR

3225

3225

1.1 MG



I SOUTH
PDD = 367
PHD = 761
FF = 1,500

I BOOSTER
1,900 GPM

I NORTH
PDD = 51
PHD = 90
FF = 1,500



J BOOSTER
1,800 GPM

900,000 GALLONS

367 GPM

145 GPM

I

NEW G-ZONE SOUTH RESERVOIR

512 GPM

3120

3120

900,000 GALLONS



H SOUTH
PDD = 1,317
PHD = 2,465
FF = 1,500

G TO H BOOSTER
1,000 GPM

H NORTH
PDD = 433
PHD = 758
FF = 1,500

2262 GPM

H

WELL NO. 3
1,200 GPM

3025

3025

LOS REALES
WELL NO. 1
1,200 GPM

REPLACEMENT
DIESEL WELL
1,000 GPM

G SOUTH
PDD = 459
PHD = 814
FF = 1,500

G NORTH
PDD = 570
PHD = 998
FF = 1,500

1029 GPM

G

GUSHER WELL
1,200 GPM

2910

2910

ROCKING K
WELL-400 GPM

BARN WELL
300 GPM

F

LEGEND



RESERVOIR



BOOSTER PUMP STATION



WELL

SPANISH TRAIL
CONCEPT WATER

SYSTEM MASTER PLANNING

EXHIBIT 2

APPENDIX A

**BUILD-OUT
INFRASTRUCTURE
COST PROJECTIONS**

SPANISH TRAIL WATER SYSTEM MASTER PLAN

COST SUMMARY

MASTER PLAN REQUIREMENTS		COST SUMMARY													
Project No.	Project Identification	Service Zone	12 Inch Main (LF)	12 Inch Main Sub-Total	16 Inch Main (LF)	16 Inch Main Sub-Total	Steel Reservoirs (GAL)	Steel Reservoirs Sub-Total	Rehab & Equip Existing Wells	New Wells	New Booster Stations	Backup Generators	Project Sub-Totals	25% Eng. & cont.	Total
1	Diesel Well	G								\$850,000			\$850,000	\$217,500	\$1,062,500
2	Gusher Well	G							\$550,000				\$550,000	\$137,500	\$687,500
3	Well No.1	H							\$550,000				\$550,000	\$137,500	\$687,500
4	Well No.3	H								\$850,000			\$850,000	\$217,500	\$1,062,500
5	G-Zone Reservoir	G	35,500	\$2,307,500		\$1,149,500	950,000	\$675,000		\$850,000			\$675,000	\$168,750	\$843,750
6	G-Zone Main	G			12,100								\$3,457,000	\$864,250	\$4,321,250
7	South H-Zone Reservoir*	H					1,100,000	\$675,000					\$675,000	\$168,750	\$843,750
8	North H-Zone Reservoir	H			5,900		900,000	\$655,000					\$855,000	\$213,750	\$1,068,750
9	H-Zone Main	H	83,900	\$5,453,500		\$560,500							\$6,014,000	\$1,503,500	\$7,517,500
10	G to H Transfer Booster	H									\$200,000		\$200,000	\$50,000	\$250,000
11	South I-Zone Main	I	9,100	\$591,500									\$591,500	\$147,875	\$739,375
12	South I-Zone Booster	I										\$100,000	\$500,000	\$125,000	\$625,000
13	North J-Zone Main	J	10,400	\$676,000									\$676,000	\$169,000	\$845,000
14	North J-Zone Booster	J										\$100,000	\$500,000	\$125,000	\$625,000
	Total		138,900	\$9,028,500	18,000	\$1,710,000	2,900,000	\$2,205,000	\$1,100,000	\$1,700,000	\$1,000,000	\$200,000	\$16,943,500	\$4,235,875	\$21,179,375

* 200,000 gallons of this reservoir capacity are allocated to Saguaro Water Company, and the \$150,000 cost has been deducted from the anticipated project cost of \$825,000 before engineering and contingencies

* 140,000 gallons of this reservoir capacity and cost are allocated to the existing Spanish Trail Water Company customers, at a cost of \$132,600 after engineering and contingencies