

CITY OF SAN JUAN BAUTISTA

2020 WATER MASTER PLAN AMENDMENT NO. 1

Draft

August 2021





August 31, 2021

City of San Juan Bautista 319 Third Street San Juan Bautista, CA 95045

Attention: Mr. Don Reynolds

City Manager

Subject: 2020 Water Master Plan - Amendment No. 1 (Draft))

Dear Don:

We are pleased to submit this Amendment No. 1 to the City of San Juan Bautista's 2020 Water Master Plan, documenting the impact of the updated phased population projections. This amendment includes a section discussing revisions to each chapter in the 2020 Water Master Plan (2020 WMP).

The intent of this amendment is to add intermediate population projections for phasing infrastructure improvements. The population phases are summarized in this amendment document, with discussions on the impact to infrastructure construction triggers. It should be noted that since buildout population did not change, buildout improvements included in the 2020 WMP are generally not impacted. In addition, this amendment provides clarification on supply provisions through the Regional Transmission Main from West Hills Water Treatment Plant (WTP). The percentage of demands supplied by West Hills WTP is summarized in this amendment document, with discussion on the impact to buildout infrastructure needs.

We are extending our thanks to you and other city of San Juan Bautista staff whose courtesy and cooperation were integral to the success of this study. Should you need additional information, or have questions regarding this amendment, please do not hesitate to call me. I look forward to hearing from you.

Sincerely,

AKEL ENGINEERING GROUP, INC.

Tony Akel, P.E. Principal

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Enclosure: 2020 Water Master Plan – Amendment No. 1

1.0 BACKGROUND

The City of San Juan Bautista (City) completed a 2020 Water Master Plan (2020 WMP), and which was adopted in November 2020. The 2020 WMP evaluated the capacity adequacies of existing water facilities to service existing customers, and recommended facilities to service buildout growth identified in the 2035 General Plan (November 2015).

Additionally, the City faces water quality challenges including high levels of nitrate and hardness in the existing groundwater sources. The 2020 Water Master Plan recommended a regional transmission main to supplemental the local groundwater with water from the West Hills Water Treatment Plant in the City of Hollister.

Akel Engineering Group prepared the 2020 WMP as part of the integrated infrastructure master plan process for the water and wastewater master plans. The purpose of the 2020 WMP is to document the planned land use for the City, identify existing and future demands generated within the City, and to plan water infrastructure to provide adequate levels of service to the customers at the lowest lifecycle cost feasible.

After the finalization of the 2020 WMP, the City participated in a regional population study. This study suggested growth would be slower in the City than anticipated in the master planning process. Accordingly, the City initiated a master plan amendment to address the impacts of the slower growth, which included the impacts to the phasing of large-scale planned infrastructure.

This Master Plan Amendment No. 1 (Amendment) documents the impacts to the City's 2020 WMP based on the incorporation of findings from the regional population study. These impacts include updates to the population growth projections and the Regional Connection Alternative for connecting the City of San Juan Bautista to the West Hills Water Treatment Plant. The Master Plan Amendment includes the following sections:

- Previous Planning Documents
- Revised Population Projections
- Revised Regional Supply Availability
- Impacts to 2020 Water Master Plan

2.0 PREVIOUS PLANNING DOCUMENTS

The following documents were considered in the development of this Amendment to the 2020 Water Master Plan:

• 2020 Water Master Plan. The 2020 Water Master Plan documents planned land use for the City, identifies existing and future demand generated within the City's service area,

and plans water infrastructure to provide adequate levels of service for the existing and future customers.

- City of San Juan Bautista Source and Potable Water Improvements (Preliminary Engineering Report), November 2020. The Preliminary Engineering Report (PER) investigates alternatives solutions and develops a recommended program to reduce the potable water hardness as well as alternatives to provide a secure water source
- City of San Juan Bautista 2035 General Plan, November 2015. The 2035 General Plan
 represents the official adopted goals and policies of the City of San Juan Bautista, and
 addresses planning issues within the community such as historic preservation, economic
 development, and development of public facilities. This includes establishing a plan for
 municipal elements such as land use, housing, and economic development. Additionally,
 this plan describes the water system service area and population projections that were
 used in the WMP.
- Association of Monterey Bay Area Governments (AMBAG), San Juan Bautista Final 2022 Regional Growth Forecast. This document was used as the basis for defining alternate growth projections for the City. This included using the AMBAG projections, as well as alternatives based on the AMBAG information

3.0 REVISED POPULATION PROJECTIONS

The City's 2035 General Plan assumed a buildout horizon of 2035 and a total service area population of 3,485 people. This projected population reflected an average annual growth rate of 2.9% per year. The 2022 AMBAG Regional Growth Forecast predicted an average annual growth rate of 1.1% per year for the City. Following a review of several growth alternatives City staff elected to amend the 2020 WMP based on an average annual growth rate of 1.9%, which approximately averages the annual population growth of the 2035 General Plan and the 2020 AMBAG Regional Growth Forecast. The projected populations included in the 2020 WMP Amendment are summarized on Table 1 and shown graphically on Figure 1. Based on these revised population projects this Amendment considers the following planning horizons.

- Intermediate Population Horizon (2035): The intermediate planning horizon reflects the planning horizon of the City's 2035 General Plan. The estimated population in 2035 is used to estimate the water supply requirements for the City as discussed in Section 4 Revised Regional Supply Availability.
- Buildout Demand Horizon (2060): The buildout demand horizon is based on the
 estimated water demands following the development of potential growth areas as identified
 in the City's General Plan. Assuming historical average per capita water use of 120 gallons

Table 1 Historical and Projected Population

Water Master Plan Amendment No. 1 City of San Juan Bautista

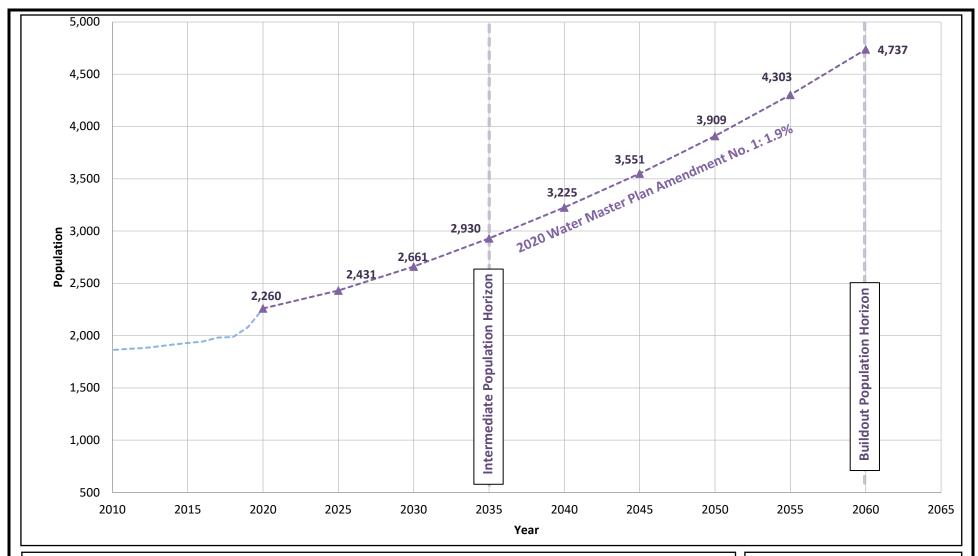
PRELIMINARY

		PRELIMINAI
	Year	Population ^{1,2}
Historical		
	2000	1,549
	2001	1,566
	2002	1,579
	2003	1,594
	2004	1,690
	2005	1,688
	2006	1,683
	2007	1,779
	2008	1,835
	2009	1,852
	2010	1,862
	2011	1,873
	2012	1,881
	2013	1,895
	2014	1,914
	2015	1,930
	2016	1,943
	2017	1,981
	2018	1,986
	2019	2,081
	2020	2,260
Projected		
.,	2021	2,235
	2022	2,284
	2023	2,333
	2024	2,382
	2025	2,431
	2026	
	2027	2,477
		2,523
	2028	2,569
	2029 2030	2,615
	2031	2,661
		2,715
	2032 2033	2,768
	2034	2,822
	2035	2,876
		2,930
	2036	2,986
	2037	3,044
	2038	3,103
	2039	3,164
	2040	3,225
	2041	3,288
	2042	3,352
	2043	3,417
	2044	3,483
	2045	3,551
	2046	3,619
	2047	3,690
	2048	3,761
	2049	3,834
	2050	3,909
	2051	3,985
	2052	4,062
	2053	4,141
	2054	4,221
	2055	4,303
	2056	4,387
	2057	4,472
	2058	4,559
	2059	4,647
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Note:

1. Historical Populations per California Department of Finance estimates.

2. Projected populations based on AMBAG population projection plus half the difference between AMBAG and General Plan population projections, equal to approximately 1.9%.



LEGEND

2020 Master Plan

Historical

Projected²

Notes: 1. Source: 2020 Infrastructure Master Plans

2. Projected populations based on AMBAG population projection plus half the difference between AMBAG and General Plan population projections, equal to approximately 1.9%.

PRELIMINARY

Figure 1 Historical and Projected Population

Water Master Plan Amendment No. 1 City of San Juan Bautista



June 23, 2021



per day per capita (gpdc) and an average annual growth rate of 1.9% it is estimated that the buildout demands will be achieved in the year 2060. The recommended water system improvements documented in the City's 2020 WMP are based on this planning horizon.

It should be noted the population projections do not impact the buildout water demands incorporated in the master plan. Population projections only impact the timing of demand and the corresponding supply and storage needs.

4.0 REVISED REGIONAL SUPPLY AVAILABILITY

The Water Master Plan evaluated various solutions to mitigate ongoing water quality issues. One of these solutions included source control by importing water from West Hills Water Treatment Plant (WTP). The 2020 WMP assumed the West Hills WTP would provide 100% of the buildout water demands, with the City's groundwater wells acting as potential sources of supply in the event of an emergency.

Following the adoption of the 2020 WMP, San Benito County Water District (SBCWD) determined that the overall supply commitment of the West Hills WTP to the City would be equal to 65% of the 2035 Maximum Day Demand (MDD). For Buildout Demand conditions it is assumed that 100% of the MDD will be supplied from the West Hills WTP, which is consistent with the 2020 WMP.

The following sections summarize the updated supply analysis and regional transmission main sizing based on the revised available supply from the West Hills WTP.

4.1 Regional Transmission Main Capacity Analysis

The 2020 WMP evaluated multiple transmission main sizes between the City and the West Hills WTP. The future transmission main was planned to convey 100% of the City's Buildout MDD. This Amendment revises the regional transmission main capacity analysis based on the updated West Hills WTP supply commitment. The results of the revised transmission main capacity analysis are shown on Table 2 and briefly summarized below

4.1.1 Intermediate Demands (2035)

Table 2 summarizes the results of the transmission main capacity analysis for the 2035 Demand Condition. Assuming 65% of the City's MDD is provided by the West Hills WTP the minimum required transmission main size is 8-inch, which does not require the use of a booster station.

4.1.2 Buildout Demands (2060)

Table 2 summarizes the results of the transmission main capacity analysis for the Buildout Demand Condition. Assuming 100% of the City's MDD is provided by the West Hills WTP the minimum required transmission main size is 10-inch, which requires the use of a booster station.

4.1.3 Recommended Transmission Main Size

This Amendment recommends the construction of a 10-inch transmission main and booster station to supply the City from the West Hills WTP. This recommendation is consistent with the .

Table 2 Pipe Size Alternatives for the Regional Transmission Main from West Hills WTP

Water Master Plan Amendment No. 1 City of San Juan Bautista

PRELIMINARY

	nds t Hills			Pipe Size Alternatives and Booster Station Requirements											
Existing/Future Demand	ema Wes 'P	Demands ¹		8-inch				(Approximate Length 33,420 LF) ²				12-inch			
Condition	Percent Demands Supplied by West Hills WTP			Velocity (ft/s)	Headloss (ft)	Booster	Transport Time (hours)	Velocity (ft/s)	Headloss (ft)	Booster	Transport Time (hours)	Velocity (ft/s)	Headloss (ft)	Booster	Transport Time (hours)
Existing System															
Minimum Month Demands ⁵	100%	110	0.16	0.7	10.3	No	13.3	0.4	3.5	No	20.7	0.3	1.4	No	29.9
Average Day Demands	100%	183	0.26	1.2	26.4	No	8.0	0.7	8.9	No	12.4	0.5	3.7	No	17.9
Maximum Day Demands ⁶	65%	267	0.38	1.7	53.3	No	5.4	1.1	18.0	No	8.5	0.8	7.4	No	12.2
Maximum Day Demands	100%	411	0.59	2.6	118.4	Yes	3.5	1.7	40.0	No	5.5	1.2	16.5	No	8.0
Intermediate Demands	(2035 Proje	ctions)		•				,				,			
Minimum Month Demands ⁵	100%	146	0.21	0.9	17.5	No	9.9	0.6	5.9	No	15.5	0.4	2.4	No	22.3
Average Day Demands	100%	244	0.35	1.6	45.2	No	6.0	1.0	15.2	No	9.3	0.7	6.3	No	13.4
Maximum Day Demands ⁶	65%	357	0.51	2.3	91.2	No	4.1	1.5	30.8	No	6.4	1.0	12.7	No	9.2
Maximum Day Demands	100%	549	0.79	3.5	202.4	Yes	2.6	2.2	68.3	No	4.1	1.6	28.1	Force	6.0
Buildout Demands															
Minimum Month Demands ⁵	100%	236	0.34	1.5	42.3	No	6.2	1.0	14.3	No	9.6	0.7	5.9	No	13.9
Average Day Demands	100%	393	0.57	2.5	108.8	No	3.7	1.6	36.8	No	5.8	1.1	15.1	No	8.3
Maximum Day Demands	100%	884	1.27	5.6	487.9	Yes	1.6	3.6	164.7	Yes	2.6	2.5	67.9	No	3.7
AKEL ENGINEERING GROUP, INC.															6/24/2021

Notes:

^{1.} Demands for 2035 Projections are estimated from AMBAG Population Growth Forecast and per capita demands of 120 gpdc.

^{2.} The length of the Regional Transmission Pipeline was calcualted based on the alignment between the West Hills WTP and the proposed connection point to the existing San Juan Bautista domestic water system.

^{3.} Existing System and 2035 Projections pump station requirements were based on expected headloss between ground elevations of the existing San Juan Bautista storage reservoir T-1 (395') and West Hills WTP (490').

^{4.} Buildout System pump station requirements were based on expected headloss between ground elevations of the proposed San Juan Bautista storage reservoir T1-A (365') and West Hills WTP (490').

^{5.} Minimum Month Demand = 0.6 x Average Day Demand

^{6.} Demand scenario assumes West Hills WTP will only provide supply to meet 65% of MDD, with San Juan Bautista wells responsible for making up remaining supply needs.

^{7. 2035} Projection (AMBAG + General Plan) population projection of 2,930 provided by City Staff on February 24, 2021.

2020 WMP and allows for surplus capacity within the Intermediate Demand horizon, should additional supply become available from the West Hills WTP.

4.2 Water Supply Capacity Analysis

The 2020 WMP assumed 100% of the City's Buildout MDD would be provided by the West Hills WTP, with the existing wells acting as a potential emergency source of supply. Based on the. This Amendment revises the water supply capacity analysis based on the updated West Hills WTP supply commitment. It should be noted that Well 6 is currently offline due to water quality concerns, which is reflected in the water supply capacity analysis.

The results of the revised water supply capacity analysis are shown on Table 3 and briefly summarized in the following sections.

4.2.1 Well Capacities and Design Criteria

The City currently maintains three groundwater wells, Well 1, Well 5, and Well 6, which have supply capacities of 175 gpm, 425 gpm, and 450 gpm respectively. Currently, only Well 1 and Well 5 are active, with Well 6 offline due to water quality concerns. The 2020 WMP required that the firm well capacity, defined as the total online well supply capacity with the largest unit out of service, must be able to meet the City's MDD. However, the 2020 WMP also accounted for supplemental supply from the West Hills WTP to provide a portion of this required supply capacity. As a part of this Amendment the supply capacity from the West Hills WTP is assumed equal to 65% of MDD for existing and 2035 demand conditions.

4.2.2 Supply Capacity Analysis

The City's supply capacity analysis is summarized as follows:

- Existing Conditions: Assuming 65% of the City's MDD is provided by the West Hills WTP and well 6 is offline the City's existing firm capacity is sufficient to supply the existing MDD.
- Intermediate Demand Conditions: Assuming 65% of the City's MDD is provided by the West Hills WTP and well 6 is offline, the City has a supply capacity deficiency of 17 gpm under MDD conditions.
- **Buildout Demand Conditions:** At this time the supply commitment from the West Hills WTP is through the intermediate planning horizon of 2035. Therefore, a supply capacity analysis is not provided for the buildout demand conditions. However, this is recommended for review as part of future master plan updates.

4.2.3 Recommended Supply Improvements

As shown on Table 3 the City has a minor supply deficiency under Intermediate Demand Conditions. In lieu of planning a new groundwater well to mitigate this minor deficiency, this Amendment recommends reevaluating the supply and demand conditions as part of a future master plan update.

Table 3 Supply Capacity Evaluation

Water Master Plan Amendment No. 1 City of San Juan Bautista

PRELIMINARY

PRELIMINARY						
Supply Capacity Evaluation						
Capacity Information	With Existing Wells	Well 6 Offline				
	(gpm)	(gpm)				
Supply Capacity Criteria						
Supply to meet Maximum Day Demand with largest unit out of service						
Existing Supply Capacity ¹						
Well 1	175	175				
Well 5	425	425				
Well 6	450	Offline				
Total Capacity	1,050	600				
Firm Capacity	600	175				
Supply vs Demand Evaluation						
Existing System ²						
Maximum Day Demands ³	411	411				
Available Firm Capacity	600	175				
Supplied by West Hills WTP (65% MDD) 4	267	267				
Capacity Surplus/Deficiency						
without West Hills WTP supply	189	-236				
with West Hills WTP supply	456	31				
Intermediate Demands (2035 Projections) ⁵						
Maximum Day Demands ³	549	549				
Available Firm Capacity	600	175				
Supplied by West Hills WTP (65% MDD) 4	357	357				
Capacity Surplus/Deficiency	408	-17				
Buildout Demands ⁶						
Maximum Day Demands ³	884	884				
Available Firm Capacity	600	175				
Supplied by West Hills WTP ⁴	TBD					
Capacity Surplus/Deficiency	T	BD				
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LAKEL ENGINEERING GROUP, INC.

7/15/2021

Notes:

- 1. Well capacities based on email provided by Stantec June 18, 2020.
- Existing demand based on Metered Water Deliveries documented in 2019
 Water Consumption Reports provided by City staff January 13, 2020.
- 3. Maximum Day Demand = 2.25 x Average Day Demand
- Assumes West Hills WTP will only provide supply to meet 65% of MDD, with San Juan Bautista wells responsible for making up remaining supply needs.
- 5. Demands for 2035 Projections are based on total population of 2,930 and per capita demands of 120 gpdc.
- 6. Buildout demand based on land use parcels and developed unit factors, as documented in 2020 WMP, Table 5.1.

5.0 REVISIONS TO 2020 WATER MASTER PLAN

The following sections document the changes to each chapter of the 2020 WMP, including any affected tables and figures. The Amended master plan tables and figures are also included in **Appendix A**.

5.1 Executive Summary

The Executive Summary of the 2020 WMP summarized the key elements of the master plan. This Master Plan Amendment revised the sections that are described as follows.

5.1.1 Section ES.6 - Regional Supply Alternatives

The 2020 Master Plan Amendment revises the supply planning assumptions for the regional water supply option. SBCWD has committed to supply up to 65% of the City's water demand from the West Hills WTP, with the remaining supply requirements to be provided by the City's groundwater wells. The 2020 WMP assumed 100% of the City's supply would be provided by the West Hills WTP, with the groundwater wells acting as a backup source of supply.

5.2 Chapter 1 – Introduction

This chapter summarized the background of the City's domestic water system and objectives of the Master Plan. No sections of this chapter are revised as part of this Amendment.

5.3 Chapter 2 – Planning Area Characteristics

This chapter summarized the master plan study area, water system service area, existing and future land use, as well as historical and projected population. This Amendment revises the following section:

5.3.1 Section 2.3 – Historical Population and Future Growth

This section previously reflected population projections that were consistent with the 2035 General Plan. As discussed in Section 3.0 of this Amendment a revised population projection was requested by City staff that would consider local AMBAG projections in addition to those documented in the 2035 General Plan. City staff elected to use an average annual growth rate of 1.9% per year, which approximately reflects an average between the 2035 General Plan and the 2022 AMBAG Regional Growth Forecast.

The 2020 WMP notes a 2035 population of approximately 3,500 people, which is extracted from the 2035 General Plan. This Amendment now estimates the 2035 population at approximately 2,900 people, based on the revised average annual growth rate, as shown in **Figure 1**. This Amendment also revises the following tables:

 Table 2.2 – The projected populations have been extended to 2060 and reflect an average annual growth rate of 1.9% per year. These updated populations are also documented on Table 1 in this Amendment.

5.4 Chapter 3 – System Performance and Design Criteria

This chapter summarized the water system performance and design criteria. No sections of this chapter are revised as part of this Amendment.

5.5 Chapter 4 – Existing Domestic Water Facilities

This chapter summarized the water system facilities and operational characteristics. No sections of this chapter are revised as part of this Amendment.

5.6 Chapter 5 – Domestic Water Demands

This chapter summarized the existing and buildout domestic water demands. While the revised population projections affect the timing of the buildout water demand the total demand is unchanged from the 2020 WMP. Therefore, no sections of the chapter are revised as part of this Amendment.

5.7 Chapter 6 – Hydraulic Model Development

This chapter summarized the development of the City's water system hydraulic model. No sections of this chapter are revised as part of this Amendment.

5.8 Chapter 7 – Evaluation and Proposed Improvements

This chapter summarized the evaluation of the domestic water system and identified improvements needed to mitigate deficiencies or service future growth. This Amendment revises the following section:

5.8.1 Section 7.6 – Water Supply Requirements

This section previously evaluated supply requirements for existing and buildout demand conditions, taking into account that Well 6 was taken offline due to water quality concerns.

The 2020 WMP identified a supply deficit of over 200 gpm under existing conditions, and over 700 gpm under buildout conditions. This deficit was intended to be mitigated through one of several regional supply alternatives as evaluated by Stantec Consulting, and it was recommended that the supply deficit should be addressed by importing water from West Hills WTP. However, based on the revised West Hills WTP supply commitment, supply requirements for different demand scenarios have been revised as follows:

- Existing Demand Projections. With 65% of MDD supplied by the West Hills WTP, the City will have a capacity surplus of approximately 30 gpm. No additional improvements will be required to meet existing supply requirements.
- Intermediate Demand Projections. With 65% of MDD supplied by West Hills WTP, the City will have a supply deficit of approximately 20 gpm. It is recommended that the City reevaluate the 2035 supply and demand projection as part of a future master plan update.
- Buildout Demand Projections. Supply commitments for buildout demands have yet to be agreed upon, and the buildout supply deficit is yet to be determined.

This Amendment also revises the following tables:

• Table 7.3 – This table has been updated to reflect the revised supply planning assumptions regarding the SBCWD commitment of 65% of MDD from the West Hills WTP.

5.9 Chapter 8 – Capital Improvement Program

This chapter summarized the recommended domestic water system improvements and presented cost criteria and methodology. No sections of this chapter are revised as part of this Amendment.

APPENDIX A

Amended 2020 Water Master Plan Tables and Figures

Table 2.2 Historical and Projected Population

Water Master Plan City of San Juan Bautista

PRELIMINARY

	PRELIMINARY
Year	Population ^{1,2}
	· · · · · · · · · · · · · · · · · · ·
Historical	
2000	1,549
2001	1,566
2002	1,579
2003	1,594
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2008	1,835
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2014	1,914
2015	1,930
2016	1,943
2017	1,981
2018	1,986
2019	2,081
2020	2,260
Projected	
	2 225
2021 2022	2,235 2,284
2023	2,333
2024	2,333
2025	2,431
2026	2,477
2027	2,523
2028	2,569
2029	2,615
2030	2,661
2031	2,715
2032	2,768
2033	2,822
2034	2,876
2035	2,930
2036	2,986
2037	3,044
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2042	3,352
2043	3,417
2044	3,483
2045 2046	3,551 3,619
2046	3,619 3,690
2047	3,761
2049	3,834
2050	3,909
2051	3,985
2052	4,062
2053	4,141
2054	4,221
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2056	4,387
2057	4,472
2058	4,559
2059	4,647
2060	4,737
ENGINEERING GROUP, INC.	7/15/2021
ENGINEERING GROUP, INC. Note:	,,13/2023

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Note:

1. Historical Populations per California Department of Finance estimates.

2. Projected populations based on AMBAG population projection plus half the difference between AMBAG and General Plan population projections, equal to approximately 1.9%.

Table 7.3 Supply Capacity Evaluation

Water Master Plan City of San Juan Bautista

PRELIMINARY

PRELIMINARY Supply Capacity Evaluation							
With Fristing							
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	(gpm)	(gpm)					
Supply Capacity Criteria							
Supply to meet Maximum Day Demand w	vith largest unit ou	t of service					
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Well 1	175	175					
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Buildout Demands ⁶							
Maximum Day Demands ³	884	884					
Available Firm Capacity	600	175					
Supplied by West Hills WTP ⁴	TBD						
Capacity Surplus/Deficiency	Т	BD					
LAKEL		7/15/2021					

AKEL ENGINEERING GROUP, INC.

7/15/2021

Notes:

- 1. Well capacities based on email provided by Stantec June 18, 2020.
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- 5. Demands for 2035 Projections are based on total population of 2,930 and per capita demands of 120 gpdc.
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