Appendix K:
Utilities and Service Systems Supporting Information

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K.1 - Water Supply Assessment

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Water Supply Assessment and Water Supply Verification for the City of Chico Barber Yard Specific Plan Project

February 2024
EKI C10117.01

EKI ENVIRONMENT & WATER, INC.

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Water Supply Assessment and Water Supply Verification

City of Chico Barber Yard Specific Plan Project
Chico-Hamilton City District, California Water Service

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CALIFORNIA WATER SERVICE
Water Resource Sustainability Department 1720 North First Street
San Jose, CA 95112

February 21, 2024

John Cornish
Chief Operating Officer
Gonzales Development Company
1811 Concord Avenue, Suite 200
Chico, CA 95928

Dear Mr. Cornish,

This letter serves as the California Water Service Company's (Cal Water) formal approval of the Water Supply Assessment (WSA) for the Barber Yard Specific Plan Project in the City of Chico, California. This approval is contingent on the developer's compliance with any conditions set forth in the WSA by Cal Water.

Authority for this approval is pursuant to Cal Water's "Resolution to Approve Water Supply Assessment and Related Documents for New Developments" dated October 27, 2021 (attached).

Should you have any questions, please contact Michael Bolzowski at mbolzowski@calwater.com or (408) 367-8338.

Sincerely,

Ken Jenkins
Chief Water Resource Sustainability Officer

1 INTRODUCTION

Included herein is a Senate Bill (SB) 610- compliant water supply assessment (WSA) and SB 221-compliant water supply verification (WSV) in support of the proposed Barber Yard Specific Plan Project (Proposed Project). The Proposed Project comprises approximately 133 acres within the City of Chico (BYSP Area) that is located northwest of Estes Road, southwest of Normal Avenue, and east of Overland Court. Per the Project Description (Cal Water, 2023d; City of Chico, 2023), the Proposed Project consists of a new mixed-use development within the BYSP Area that includes:

- A maximum of 1,250 residential units, conservatively assumed to consist of approximately 632 single-family residential (SFR) and approximately 618 multi-family residential (MFR) units; [1]
- A maximum of 210,000 square feet (or approximately 4.8 acres) of commercial land uses; and
- Approximately 43 acres of landscaping, which includes multiple parks, recreational, and open space amenities.

The Proposed Project also includes offsite improvements that would be located within approximately 15.6 acres, which are adjacent to and south of the BYSP Area within unincorporated Butte County (Off-Site Improvements Area), comprised of a combination water quality retention/detention basin (Stormwater Basin) and an associated storm drain alignment from the Stormwater Basin to a new outfall to Comanche Creek. As the Off-Site Improvements Area will not require any water supply for the proposed Stormwater Basin, storm drain alignment and outfall, for purposes of this WSA/WSV, this analysis considers and evaluates water service only to the proposed mixed-use residential and commercial uses, all of which will be constructed entirely within the BYSP Area.

The Proposed Project is located within the California Water Service (Cal Water) Chico-Hamilton City District (Chico District) service area (**Figures 1** and **2**). Cal Water will be the water service provider for the Proposed Project. The Chico District is divided into two separate public water systems (PWS): the Chico PWS and Hamilton City PWS (herein referred to as the Chico portion and the Hamilton City portion). The two PWSs are physically separated and water supplies available to the Hamilton City portion of the Chico District are not physically available to the Chico portion, and vice versa. The Proposed Project is located in the Chico portion of the Chico District.

[1] The Proposed Project will involve development of a maximum of 1,250 residential units, to be located across three different zoning districts, the final location of which will be confirmed as part of the subsequent mapping process. Of those zoning districts, the BYSP-R2 district allows both SFR and MFR units. For purposes of the California Environmental Quality Act (CEQA) review and this analysis, the Proposed Project is conservatively assumed to consist of approximately 632 SFR residential units within the BYSP-R2 district, since single-family residential uses generally consume more water than multi-family uses MFR; the remaining units within the Proposed Project are assumed to be multi-family in nature.

Because the scope of ultimate land uses and site plans are not currently known and there are various ways in which the subject lands could ultimately be developed under the Barber Yard Specific Plan (Specific Plan), in order to conduct the required environmental review, this WSA/WSV, consistent with the methodology applied throughout the Proposed Project's Draft Environmental Impact Report (EIR), evaluates the maximum reasonable development potential that could occur in light of reasonably available information, taking into consideration the size, potential mix of uses, and nature of the subject lands and other relevant factors.

The information provided in this WSA/WSV is in accordance with California Water Code (CWC or Water Code) §10910-10912 requirements, California Government Code (CGC) §66473.7 requirements, California Business and Professions Code (CBPC) §11010 requirements, and the California Department of Water Resources' (DWR's) *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001: To Assist Water Suppliers, Cities, and Counties in Integrating Water and Land Use Planning*, dated 8 October 2003. Relevant sections of the CWC, CGC, and CBPC are referenced throughout this document. The information presented in those respective sections, and the associated tables and figures, respond directly to CWC, CGC, and CBPC requirements.

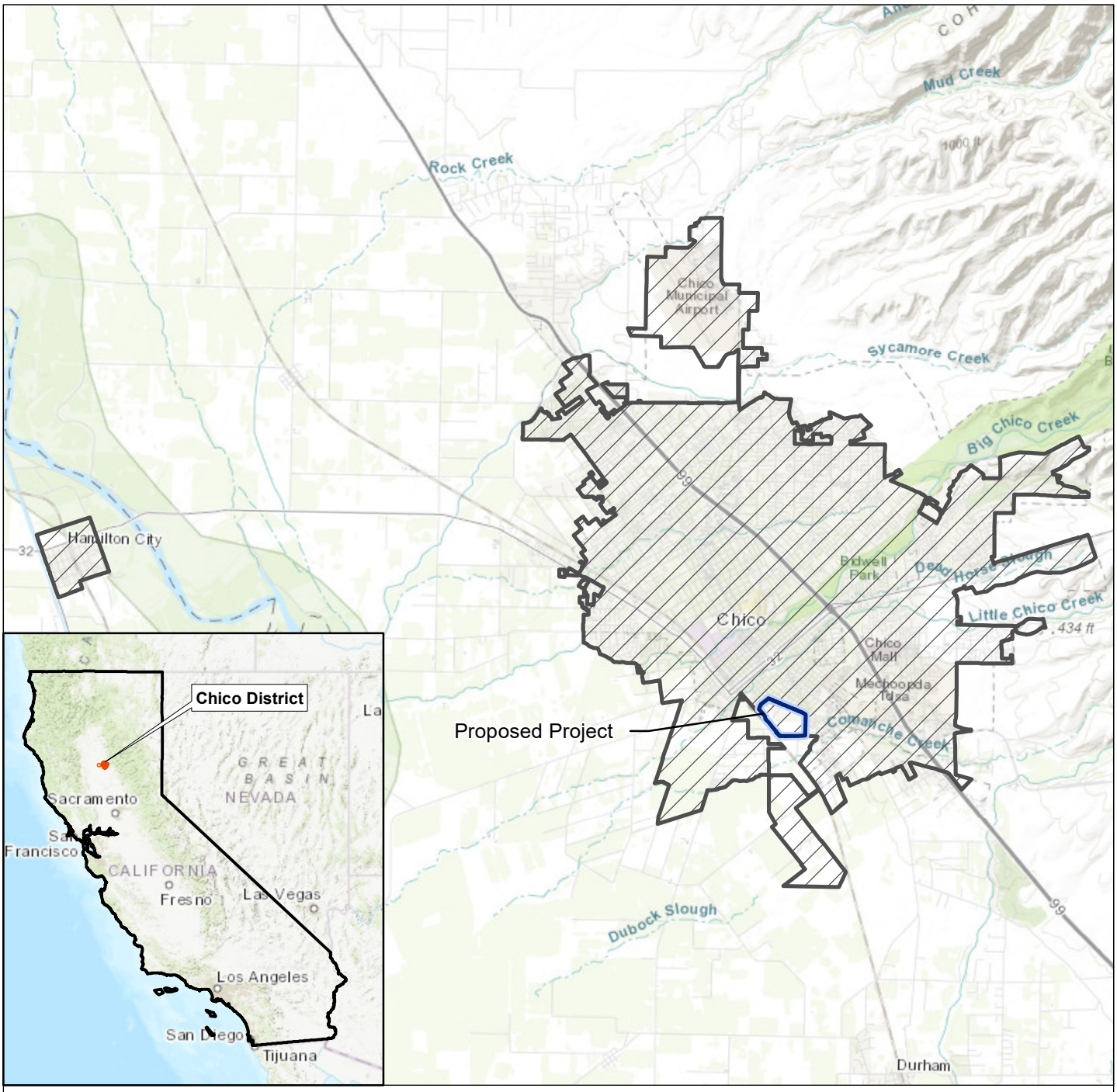
The purpose of this WSA/WSV is to evaluate whether sufficient water supplies are available to meet all existing and planned future demands within the Chico District service area, including demands associated with the Proposed Project, during normal, single dry, and multiple dry hydrologic years for a 20-year time horizon.[2] More specifically, this WSA/WSV includes:

- A summary of the WSA/WSV requirements articulated in CWC §10910-10912 and CGC §66473.7 and a description of how they apply to the Proposed Project;
- A description and analysis of the current and projected future water demands of the Proposed Project through the year 2045;
- A description and analysis of the historical, current, and projected future water demands for the Chico District service area through the year 2045;
- A description and analysis of the current and projected future water supplies for the Chico District service area through the year 2045; and
- A comparison of the water supplies and demands for the Chico District service area, including the projected water demands associated with the Proposed Project.

The information contained in this WSA/WSV is based primarily on the 2020 Urban Water Management Plan (UWMP) prepared for the Chico District, except where updated with relevant water demand and supply reliability and other information from sources including Cal Water, DWR, United States Geological Survey (USGS), Butte County Department of Water and Resource Conservation (BCDWRC), and others.

[2] The Water Code specifies that a WSA must look at supplies and demand on a 20-year horizon (i.e., to 2043), but given the available data, this WSA looks beyond that to 2045.

This WSA/WSV concludes and verifies that sufficient water supply is available to Cal Water to meet all existing and planned future demands within the Chico District service area including those associated with the Proposed Project in normal, single dry, and multiple dry years.



Legend

- Proposed Project
- Cal Water Chico-Hamilton City District Service Area

Abbreviations

Chico District = Chico-Hamilton City District

Notes

1. All locations are approximate.
2. Proposed project boundary per Source 2.

Sources

1. World Topographic Basemap provided by ESRI.
2. Information provided by Cal Water via email on 23 November 2021.

N

0 2 4

(Scale in Miles)

Chico District Service Area and Project Location

Barber Yard Project
Chico, CA
February 2024
C10117.01

Figure 1

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Legend

Proposed Project

Abbreviation

Cal Water = California Water Service

Notes

1. All locations are approximate.

Sources

1. World Imagery Basemap provided by ESRI, accessed on 8/17/2023

N

0 800 1,600

Feet

Proposed Project Location

Barber Yard Project
Chico, CA
February 2024
EKI C10117.01
Figure 2

eki environment & water

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2 GENERAL REQUIREMENTS FOR THE PREPARATION OF A WATER SUPPLY ASSESSMENT AND WATER SUPPLY VERIFICATION

The purpose of this section is to outline what types of projects require the preparation of a WSA and WSV, who is responsible for its preparation, and the necessary components of a WSA and WSV.

2.1 Applicability of Senate Bill 610 and 221 to the Project

The approximately 133-acre BYSP Area (**Figure 1**) is located within the City of Chico. Based on information included in the Project Description and shown in **Figure 2**, the Proposed Project consists of a new mixed-use development that includes a maximum of 1,250 residential units and a maximum of 210,000 square feet (approximately 4.8 acres) of commercial land uses, along with park, recreational, and open space amenities and related on- and off-site improvements (City of Chico, 2023). The Proposed Project satisfies the definition of "project" requiring a WSA pursuant to SB 610 (Water Code §10910(a) and 10912(a)(6)), as well as a "subdivision" [3] requiring a WSV pursuant to CGC §66473.7(a)(1).

2.2 Responsibility for Preparation of the Water Supply Assessment and Water Supply Verification

The Proposed Project is located within the Chico District service area, and the water for the Proposed Project will be supplied by Cal Water. Therefore, in accordance with Water Code §10910(b) and CGC §66473.7(b)(1), Cal Water is the entity responsible for the WSA/WSV for the Proposed Project.

2.3 Components of a Water Supply Assessment and Water Supply Verification

As discussed in Section 1, the primary purpose of a WSA/WSV is to evaluate whether sufficient water supply is available to meet all existing and planned future demands (including manufacturing uses) within the water supplier's service area, including those associated with the Proposed Project, during normal, single dry, and multiple dry hydrologic years for a 20-year time horizon.[4] Therefore, the following information is included in this WSA/WSV:

- A description and analysis of the current and projected future water demands of the Proposed Project through the year 2045;

[3] Although the current entitlement applications for the Proposed Project do not involve a subdivision map, there will be a tentative subdivision map submitted as part of the anticipated subsequent approval process in order to implement the Proposed Project. Furthermore, pursuant to Government Code section 65867.5(c), the development agreement for the Proposed Project will include a provision that such subsequent tentative subdivision map will be required to comply with SB 221's requirements.

[4] The Water Code specifies that a WSA must look at supplies and demand on a 20-year horizon (i.e., to 2043), but given the available data, this WSA looks beyond that to 2045.

- A description and analysis of the historical, current, and projected future water demands for the Chico District service area through the year 2045;
- A description and analysis of the current and projected future water supplies for the Chico District service area through the year 2045; and
- A comparison of the water supplies and demands for Chico District's service area, including the projected water demands and supplies associated with the Proposed Project.

3 PROJECT DESCRIPTION

Based on the current Project Description provided in the City of Chico Barber Yard Specific Plan Administrative Draft EIR and information provided by Cal Water, and as shown on **Figure 2**, the Proposed Project that will be located within the approximately 133-acre BYSP Area will consist of the following: (1) a maximum of 1,250 residential units, conservatively assumed to consist of 632 SFR and 618 MFR units; (2) a maximum of 210,000 square feet (approximately 4.8 acres) of commercial land uses; and (3) approximately 43 acres of landscaping, including recreational and open space uses (Cal Water, 2023d; City of Chico, 2023). If approved, full buildout and occupancy of the Proposed Project is expected to occur over 17 years, between 2024 and 2041 (Cal Water, 2023b).[5] As shown in **Table 1**, the anticipated completion date and full buildout of the Proposed Project is 2041 (Cal Water, 2023b).

As shown on **Figure 3**, the BYSP Area currently consists of mostly abandoned structures and roadways, with one recreational vehicle (RV) storage facility located within the Proposed Project boundary. Cal Water currently serves water to the RV storage facility and historical water usage at the site has been minimal, ranging between 2.0 and 152 hundred cubic-feet (CCF; 0.046 and 0.35 acre-feet [AF]) over the last five years and averaging 76 CCF (0.17 AFY) over the past decade (Cal Water, 2022a; Cal Water, 2023c). The Proposed Project is located within the Chico portion of the Chico District service area and potable water service to the Proposed Project will be provided by Cal Water.

[5] The ultimate phasing will be within the Project proponent's discretion, and dependent on various market and other considerations. For purposes of this analysis, it is reasonable to conclude that the buildout of the Proposed Project will be complete within 10 to 20 years.

Notes

1. All locations are approximate.
2. Land use plan reproduced from Urban Design Associates (2023).

Sources

1. Basemap Imagery, ESRI, obtained 17 August 2023.
2. Urban Design Associates, 2023. Planning Areas, dated February 2023.

N 0 500 1,000 Feet

Proposed Land Use Plan

Barber Yard Project
Chico, CA
February 2024
EKI C10117.01

Figure 3

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Table 1

Project Buildout Conceptual Phasing Schedule

Barber Yard Specific Plan Project, City of Chico, California

Land Use	Total Buildout (approx. acres)					Notes (a)
	2025	2030	2035	2040	2045	
Mixed Use	4.8	13	15	15	15	Includes 180 dwelling units and non-residential land uses
Residential	0	50	70	101	105	Includes 1,070 dwelling units
Open Space	4.3	8.7	13	13	13	Includes parks, habitat areas, and other recreational areas
Total	**9**	**72**	**98**	**129**	**133**	

Notes:

(a) Estimated land use acreages and dwelling units per Reference 1 and buildout per Reference 2.

References:

1. City of Chico, 2023. Barber Yard Specific Plan Administrative Draft Environmental Impact Report (EIR).
2. Cal Water, 2023b. Information provided by Cal Water via email, obtained on 6 July 2023.

4 PROJECT WATER DEMAND

The City of Chico has adopted green building standards and water efficient landscaping ordinances consistent with previous versions of the CalGreen building standards and the California Model Water Efficient Landscape Ordinance (MWELO). As part of state requirements, all new developments must comply with these efficiency standards. As such, the Proposed Project development is expected to include a number of water-efficient features, including, but not limited to:

- Use of low-flow lavatory faucets, kitchen faucets, toilets, and urinals in accordance with CalGreen Code; and
- Inclusion of low-water use landscaping and high-efficiency irrigation systems to minimize outdoor water use in accordance with MWELO.

As described below, the average annual water demand for the Proposed Project was estimated based on: (1) the Cal Water WSA Water Factor Tool developed based on 2016-2018 water use data for the Chico District (Cal Water, 2019a); (2) water demand factors from various literature sources, and (3) information about the Proposed Project provided by the Project proponent (Cal Water, 2023d; City of Chico, 2023). Total water demands include water used by the Proposed Project for residential units, commercial land, irrigation of community landscape, and water that is lost during distribution (i.e., "distribution system losses" or "unaccounted for water").

Table 2 includes a summary of the water demand projections associated with the proposed land uses through buildout of the Proposed Project. Full buildout of the Proposed Project is anticipated to occur by 2041 (Cal Water, 2023b).

4.1 Residential Water Use

Water use factors for the proposed SFR and MFR units were developed by Cal Water based on customer-level metered water use records for 2016 through 2018 for the Chico District customers, referred to as the "*WSA Water Factor Tool*," (Cal Water, 2019a).[6] The *WSA Water Factor Tool* allows the user to select the most appropriate water use factors for a proposed development based on factors including the mean characteristics of the sample data (e.g., existing service area building stock) or to customize the water factors based on the expected characteristics of the proposed development.

Based on the *WSA Water Factor Tool*, the Proposed Project's SFR units are estimated to use 381 gallons per day per dwelling unit (gpd/du) and the MFR units are estimated to use 108 gpd/du. These water factors represent both indoor and outdoor water use. Applying these water factors, the SFR component of the Proposed Project is expected to use approximately 270 AFY and the MFR component is expected to use approximately 75 AFY as shown in **Table 2**. It should be noted that a portion of the water used for residential irrigation returns to the groundwater basin and thus, this portion of the estimated Proposed Project demand is not a true

[6] Cal Water WSA Water Factor Tool, Cal Water, developed by M.Cubed, received on 15 November 2019.

demand on the groundwater supply. However, for purposes of this WSA/WSV, all water used for residential purposes is conservatively considered to be a demand.

4.2 Non-Residential Water Use

The Proposed Project includes up to 210,000 square feet (approximately 4.8 acres) of commercial land uses (City of Chico, 2023). Specific types of uses for the commercial portions of the Proposed Project are assumed to include a fitness center, event center, restaurant, and retail shops.[7] The water demand factor for the fitness center, estimated at 0.021 gallons per day per square foot (gpd/sq ft), was developed by the City of Ventura as part of the City of Ventura's Water Demand Factor Study (City of Ventura, 2020). Restaurant demands are based on a water demand factor of 0.068 gpd/sq ft, retail shop demands are based on a water demand factor of 0.032 gpd/sq ft, and event center demands are based on a water demand factor of 0.070 gpd/sq ft, as calculated in the 2012 Commercial Buildings Energy Consumption Survey: Water Consumption in Large Buildings Summary (US Energy Information Administration, 2012). Commercial land uses and the associated water use factor are presented in **Table 2**.

Table 2 presents the projected commercial water use in five-year increments through 2045. As shown in **Table 2**, water use for the proposed commercial land uses is estimated to be 7.6 AFY at full buildout.

4.3 Community Landscaping Water Use

At full buildout, the Proposed Project will include future park, recreational, and open space amenities. This includes approximately 18 acres of spray turf irrigation and approximately 25 acres of drip landscaping irrigation. The projected water demand for the community landscaping included as part of the Proposed Project was estimated based on the Maximum Applied Water Allowance (MAWA; DWR, 2015). The MWELO requires that the annual estimated total water use for landscape irrigation not exceed the MAWA (DWR, 2015). As shown below, the MAWA is calculated based on the regional reference evapotranspiration rate, an evaporation adjustment factor, the total landscaped area, and the area of "special landscaped area."[8] It is conservatively assumed that water use for the Project landscaping irrigation will be equal to the MAWA, which is the upper limit of annual applied water for established landscaped areas. It is assumed that the activity fields associated with the fitness center will be considered special landscaped areas, and that the remaining landscaping will be considered non-residential landscaping.

[7] Users of the playing field space would be expected to utilize the indoor fitness center facility, and such uses (e.g., showers) would be expected to be a more intense water use than typical non-residential facilities. In order to more conservatively represent the demand associated with the fitness center, the non-residential demand factor was applied to the total square footage of the fitness center facility, inclusive of the activity fields, in addition to the irrigation water demand described in Section 4.3.

[8] Special Landscaped Area includes landscaping dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, or water features using recycled water.

The MAWA is calculated using the following equation:

$$MAWA = ETo \times [(ETAF \times LA) + (1\text{-}ETAF) \times SLA]$$

where:

ETo	=	The regional reference evapotranspiration rate
ETAF	=	Evapotranspiration Adjustment Factor For parks (SLAs) = 1.0 For landscape corridors = 0.45
LA	=	Total landscape area (including SLA)
SLA	=	Special Landscape Area

Based on the above methodology and information provided by the Project proponent, the total annual water use for the community landscaping is estimated to be 125 AFY at full buildout as shown in **Table 3** (excluding the distribution system losses discussed in Section 4.4). It should be noted that a portion of water used for outdoor irrigation purposes would return to the underlying groundwater basin and thus would not be a true demand on the groundwater supply. However, for purposes of this WSA/WSV, all outdoor landscaping water use is conservatively considered a demand.

4.4 Distribution System Losses

Water distribution systems experience a degree of water loss over the course of transmission from the source to the customer. Although distribution system losses from newly-constructed infrastructure would be expected to be minimal, it is conservatively assumed that distribution system losses associated with delivering water for the Proposed Project will ultimately be consistent with the proportion of both real and apparent water loss per the most recent (2021) validated water loss audit submitted to DWR for the Chico portion of the Chico District (i.e., 6.4%; DWR, 2022). It should be noted that while distribution system losses represent a demand on the system, water lost through the distribution system returns to the underlying groundwater basin and thus is not a true demand on the groundwater supply. However, for purposes of this WSA/WSV, all water loss is conservatively considered a demand. **Table 2** shows the distribution system losses for the Proposed Project, estimated at a total of 33 AFY at full buildout in 2041.

4.5 Existing Current Water Demand on the BYSP Area

A portion of the BYSP Area is currently developed as “Storage at The Yard”, an RV storage facility located in the northwest portion of the site (**Figure 2**). From 2018 to 2022, water use at the BYSP Area averaged 0.13 AFY (Cal Water, 2022a; Cal Water, 2023c). Water demand by the new development is considered incremental to this existing demand, and thus, as shown in **Table 2**, existing site demand is subtracted from the estimated demands associated with the Proposed Project.

4.6 Total Project Water Demand

Based on the above methodologies and assumptions, the total annual water demand for the Proposed Project at full buildout and occupancy is estimated to be 510 AFY, as shown in **Table 2**. It is conservatively assumed that full Project buildout will occur by 2041 (Cal Water, 2023b).

Table 2

Summary of Estimated Incremental Annual Project Water Demand

Barber Yard Specific Plan Project, City of Chico, California

Land Use (a)		Water Demand Factor (b)	Unit	Total Water Demand (AFY)				
				2025	2030	2035	2040	2045
Single Family Residential	632 DU	381	GPD/DU	0	148	178	256	270
Multi-Family Residential	618 DU	108	GPD/DU	0	45	75	75	75
Services/Shops	40,000 sq ft	0.032	GPD/sq ft	0.46	1.24	1.4	1.4	1.4
Restaurant	22,800 sq ft	0.068	GPD/sq ft	0.56	1.5	1.7	1.7	1.7
Event Center	17,200 sq ft	0.070	GPD/sq ft	0.43	1.2	1.4	1.4	1.4
Fitness Center	130,000 sq ft	0.021	GPD/sq ft	1.0	2.7	3.1	3.1	3.1
Irrigation (c)	--	--	--	125	125	125	125	125
Distribution System Losses (d)	--	6.4%	--	9	22	26	32	33
Existing Site Demand (e)	--	--	--	-0.13	-0.13	-0.13	-0.13	-0.13
Net Annual Water Demand (f)				**136**	**347**	**411**	**495**	**510**

Abbreviations:

"AFY" = acre-feet per year
"DU" = dwelling unit
"DWR" = California Department of Water Resources
"GPD" = gallons per day
"Proposed Project" = Barber Yard Specific Plan Project
"sq ft" = square feet

Notes:

(a) Land uses per Reference 1.
(b) Water demand factor residential uses per Reference 2, fitness center per Reference 3, and restaurant, services/shop, and event center per Reference 4.
(c) See Table 2 for estimated water use for landscaping.
(d) Estimated distribution system water loss associated with delivery of water to the Proposed Project is based on a rate of 6.4% per Reference 5 and includes both real and apparent losses.
(e) Existing site demands per Reference 6. Existing demands are subtracted from total projected water demands to show the incremental increase in demands associated with the Project.
(f) Total may not sum due to rounding.

Table 2

Summary of Estimated Incremental Annual Project Water Demand

Barber Yard Specific Plan Project, City of Chico, California

References:

1. City of Chico, 2023. Barber Yard Specific Plan Administrative Draft Environmental Impact Report (EIR).
2. Cal Water, 2019. Cal Water WSA Water Factor Tool, developed by M.Cubed, dated 22 October 2019.
3. City of Ventura, 2020. City of Ventura Water Demand Factor Study, dated 8 April 2020.
4. US Energy Information Administration, 2012. Commercial Buildings Energy Consumption Survey: Water Consumption in Large Buildings Summary, dated 2012.
5. DWR, 2022. California Water Service Water Audit Data Report for the Chico District, submitted 30 September 2022, accessed 13 November 2023 (https://wuedata.water.ca.gov/awwa_plans).
6. Cal Water, 2023c. Data provided by Cal Water via email on 7 August 2023.

Table 3

Estimated Project Community Landscaping Water Demand

Barber Yard Specific Plan Project, City of Chico, California

Landscaping Land Use (a)	[A] Area of Land Use (ac) (a)	[B] Percentage of Landscaped Area (%) (a)	[C] Landscaped Area (ac) C = A x B	[D] Annual Reference Evapotranspiration Rate (in) (b)	[E] Adjustment Based on ETAF (c)	[F] Maximum Applied Water Allowance (MAWA) (AFY) F = C x D x E (d)
Activity Fields and Turf	18	100%	18	51.7	1.0	77
Drip-Irrigated Landscaping	25	100%	25	51.7	0.45	48
Estimated Total Outdoor Water Use for Community Landscaping						**125**

Abbreviations:

"ac" = acre

"AFY" = acre-feet per year

"ETAF" = Evapotranspiration Adjustment Factor

"in" = inches

"MAWA" = Maximum Applied Water Allowance

Notes:

(a) Landscaping land uses and acres per Reference 1. Percentage of Irrigated Landscaped Area is conservatively assumed to be 100%.

(b) The annual reference evapotranspiration rate for the City of Chico area is from Reference 2.

(c) A total adjustment factor was set to be 1.0 for activity fields assuming 100% special landscape areas for recreational areas. An ETAF of 0.45 was used for drip-irrigated landscaping based on Reference 2.

(d) The Maximum Applied Water Allowance (MAWA) calculations are described in Reference 2.

References:

1. Cal Water, 2023d. Data provided by Cal Water via email on 17 August 2023.
2. California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance, 29 November 2019.

5 CAL WATER CHICO DISTRICT WATER DEMAND

Consistent with the UWMP Act (Water Code §10610-10656), the 2020 UWMP presents estimates of projected future water demand for the Chico District service area in five-year increments, between the years 2025 and 2045 (Cal Water, 2021a). Projected water demand is subdivided between the following seven customer sectors or use types: (1) residential single family, (2) residential multi-family, (3) commercial, (4) industrial, (5) institutional/governmental, (6) other, and (7) system losses. As discussed further below, the 2020 UWMP demand projections account for: (1) demands for the existing service area and accounts, (2) projected growth based on population and employment estimates, and (3) all anticipated new development based on information currently available to Cal Water, including the Proposed Project.

5.1 Current and Historical Water Demand Within the Chico District Service Area

The Hamilton City portion of the Chico District water system is physically separated from the Chico portion of the Chico District and located in a different groundwater basin (**Figure 4**). Thus, water supplies available to the Hamilton City portion of the Chico District are not physically available to the City of Chico portion, and vice versa. Given this, the projected demands for the two portions of the Chico District are presented separately herein, and the discussion below focuses on the demands associated with the Chico portion of the system, which will supply the Proposed Project.

Historical water demand within the Chico District service area from 2000 through 2022 is summarized in **Table 4**. Based on water use from 2018 to 2022, the majority of the water demand within the Chico portion of the Chico District is from the SFR sector, which represented 63% of the demand. The remainder of the demand was split between commercial (20% of overall demand), MFR (13% of overall demand), institutional (3.8%), industrial (0.24%), and other (0.17% of the overall demand) (Cal Water, 2023a).

Water use from 2000 to 2009 remained fairly consistent within the Chico portion of the Chico District, at an average of approximately 29,019 AFY. A slight decrease in water use occurred from 2008 to 2011, which generally corresponds with the 2007-2009 drought and the economic downturn. Then, a significant drop in water demand occurred in 2014 through 2016, corresponding with the historic drought and mandatory state-wide water use restrictions and water conservation targets, followed by a moderate rebound of demand from 2017 to 2022.

Total water demand within the Chico portion of the Chico District averaged 21,140 AFY from 2018 through 2022 (Cal Water, 2023a).

5.2 District Demand Projections

The 2020 UWMP water demand projections account for growth within the Chico District service area through 2045, and estimates of population growth based on population and employment forecasts for Butte County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model for the existing Chico District service area. Demands

for the Proposed Project were not explicitly included in the Chico District's 2020 UWMP demand projections: however, based on a review of the projected Chico District growth assumptions including those set forth in the City of Chico's 2010 General Plan, Cal Water has determined that the water demand associated with the Proposed Project is within the growth anticipated within the Chico portion of the Chico District and thus is accounted for in the 2020 UWMP projections.[9] Total water demands for the Chico portion of the Chico District are therefore considered inclusive of the demands associated with the Proposed Project, consistent with Water Code §10910(c)(1).

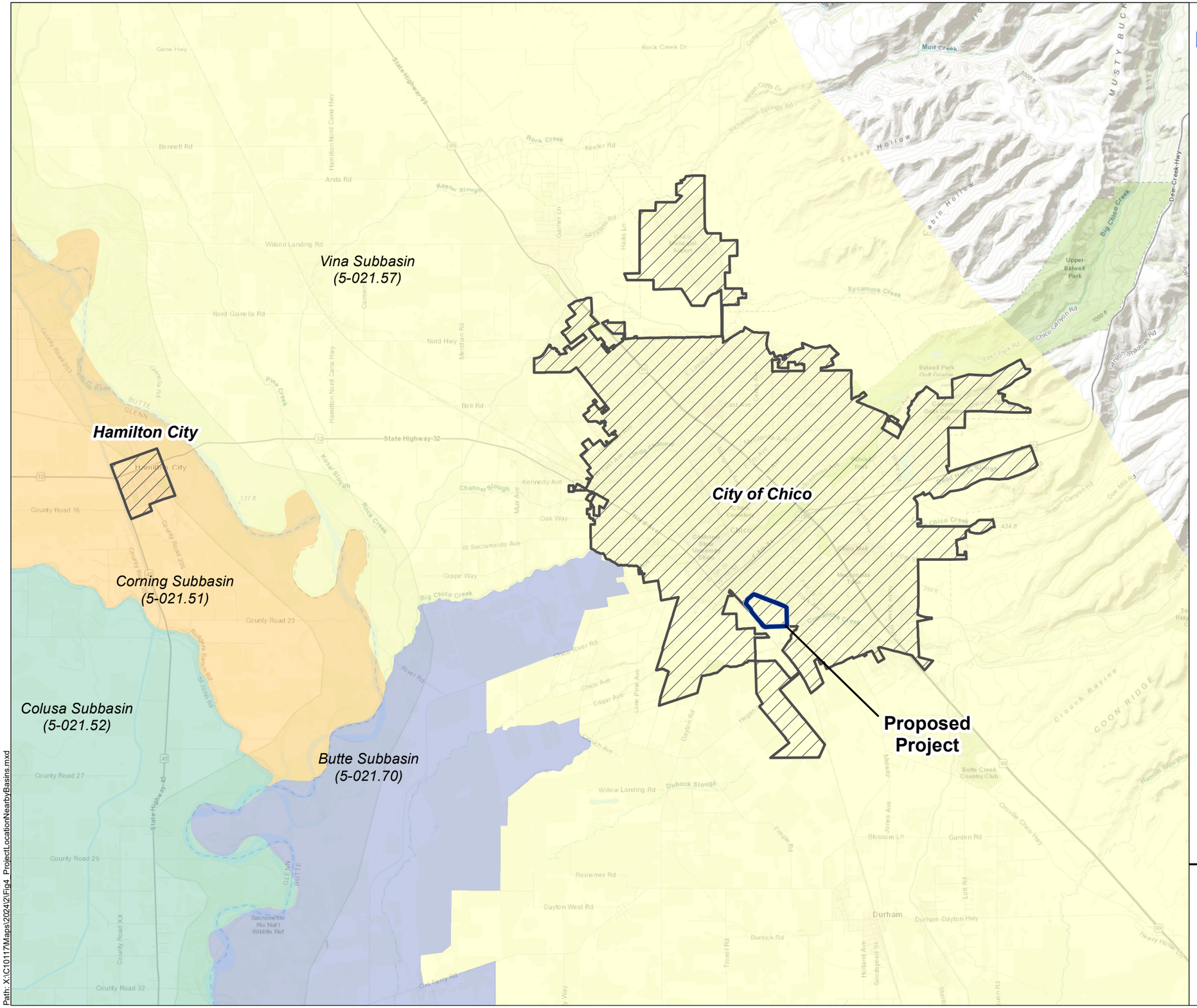
The demand projections for the Chico District are presented in **Table 5**, by water use sector and by portion of the system (i.e., the Chico portion of which the Proposed Project would be a part of, and the Hamilton City portion) in five-year increments through 2045. It is estimated that, inclusive of the Proposed Project, the total annual water demand for the Chico portion of the Chico District will be approximately 26,119 AFY in 2045.

5.3 Planned Development Projects within the Chico District

As discussed above, the 2020 UWMP demand projections include projections of growth within the existing service area based on Caltrans forecasts. While the Proposed Project is not explicitly included in these projections, Cal Water has determined, based on review of available data and other materials, that the water demand associated with the Proposed Project is within the anticipated growth of the Chico District. In addition to the Proposed Project, Cal Water recently completed a WSA for the Valley's Edge Specific Plan. Population growth and water demands associated with annexation and buildout of the Valley's Edge Specific Plan, which is an approximately 1,448-acre development located outside the Chico District's current service area,[10] were included in the demand projections for the Chico District (Section 3.5 of Cal Water, 2021a). Thus, the demand projections in the 2020 UWMP are conservative in nature and inclusive of all anticipated development based on information currently available to Cal Water.

[9] This conclusion is also consistent with the assumptions and growth forecasts utilized in the 2015 UWMP.

[10] Providing services to the Valley's Edge Specific Plan will necessitate an expansion of the Chico District service area, which will be accomplished pending approval by the California Public Utilities Commission (CPUC) of a Certificate of Public Convenience and Necessity.



Legend

- Proposed Project
- Cal Water Chico District Service Area

Groundwater Subbasin

- Butte (5-021.70)
- Colusa (5-021.52)
- Corning (5-021.51)
- Vina (5-021.57)

Abbreviations

Cal Water = California Water Service

Notes

1. All locations are approximate.

Sources

1. Basemap is ESRI's ArcGIS Online world topographic map, obtained 8 February 2024.
2. DWR groundwater basins are based on the boundaries defined in California's Groundwater, Bulletin 118 - 2018 Update.

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Miles

Regional Setting and Groundwater Subbasins

Barber Yard Project
Chico, CA
February 2024
EKI C10117.01
Figure 4

eki environment & water

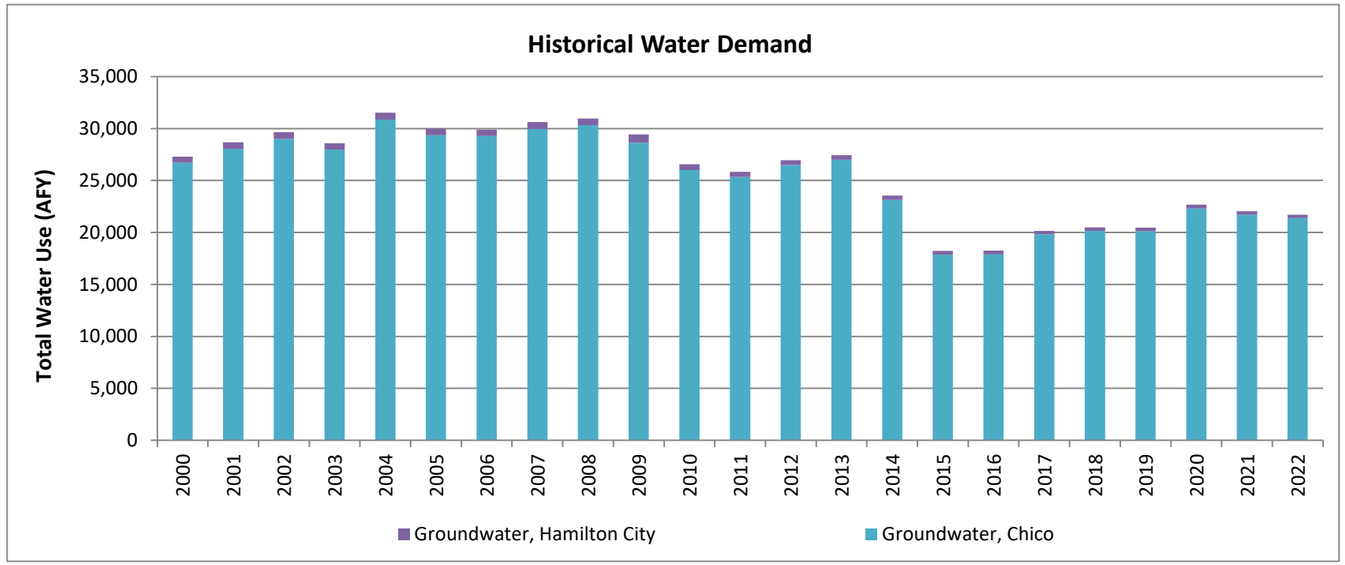
Path: X:\C10117Maps\2024\2\Fig4_ProjectLocationNearbyBasins.mxd

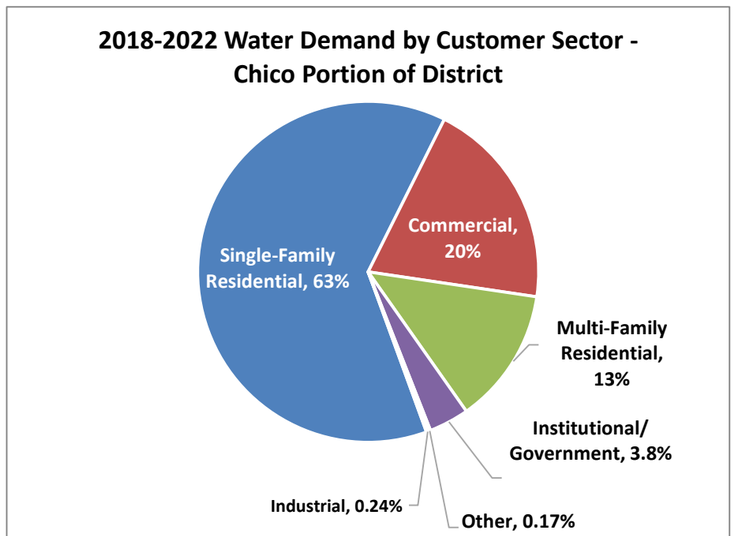
Table 4

Historical Water Demand for Cal Water

Barber Yard Specific Plan Project, City of Chico, California

Category	Cal Water Historical Annual Water Demand (AFY) (a)																						
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Groundwater, Chico	26,706	28,055	28,991	27,972	30,873	29,372	29,284	29,971	30,324	28,643	26,008	25,345	26,486	27,006	23,139	17,864	17,888	19,820	20,148	20,135	22,320	21,707	21,392
Groundwater, Hamilton City	596	634	670	602	656	620	613	655	645	784	564	484	472	440	405	363	356	323	330	327	346	334	308
Total Water Demand	**27,302**	**28,689**	**29,661**	**28,574**	**31,529**	**29,992**	**29,897**	**30,626**	**30,970**	**29,427**	**26,572**	**25,829**	**26,958**	**27,446**	**23,544**	**18,227**	**18,244**	**20,143**	**20,478**	**20,462**	**22,667**	**22,040**	**21,700**





Abbreviations:

"AFY" = acre feet per year

"Cal Water" = California Water Service, Chico-Hamilton City District

Notes:

(a) Historical water demands from 2000-2007 per Worksheet 10, Appendix F in Reference 1, from 2008-2020 per Reference 2, and for 2021-2022 per Reference 3. The 2020 water use by customer sector was provided in Reference 2.

References:

1. 2015 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2016.
2. Cal Water, 2021b. Historical Demand and Production Data, Provided by Cal Water in support of 2020 UWMP, 2021.
3. Cal Water, 2023a. Historical Demand Data provided by Cal Water via email, obtained on 11 May 2023.

Table 5

Projected Future Water Demand for the Chico District

Barber Yard Specific Plan Project, City of Chico, California

Customer Category	Projected Annual Water Demand (AFY) (a)(b)				
	2025	2030	2035	2040	2045
Chico Portion of System (c)					
Single Family Residential	12,933	13,875	14,530	14,824	15,030
Multi-family Residential	3,136	3,295	3,489	3,612	3,699
Commercial	4,528	4,665	4,796	4,853	4,893
Industrial	62	64	65	67	68
Institutional/Governmental	827	826	841	856	872
Other	39	39	39	39	39
Losses (Non-Revenue Water)	1,502	1,394	1,457	1,493	1,520
Total Water Demand (Chico Portion)	**23,027**	**24,158**	**25,217**	**25,744**	**26,119**
Hamiton City Portion of System (c)					
Single Family Residential	224	224	224	222	222
Multi-family Residential	3.4	3.3	3.2	3.2	3.2
Commercial	36	36	36	36	36
Industrial	0	0	0	0	0
Institutional/Governmental	43	43	44	44	45
Other	0	0	0	0	0
Losses (Non-Revenue Water)	42	48	48	48	48
Total Water Demand (Hamilton City Portion)	**349**	**354**	**354**	**354**	**355**

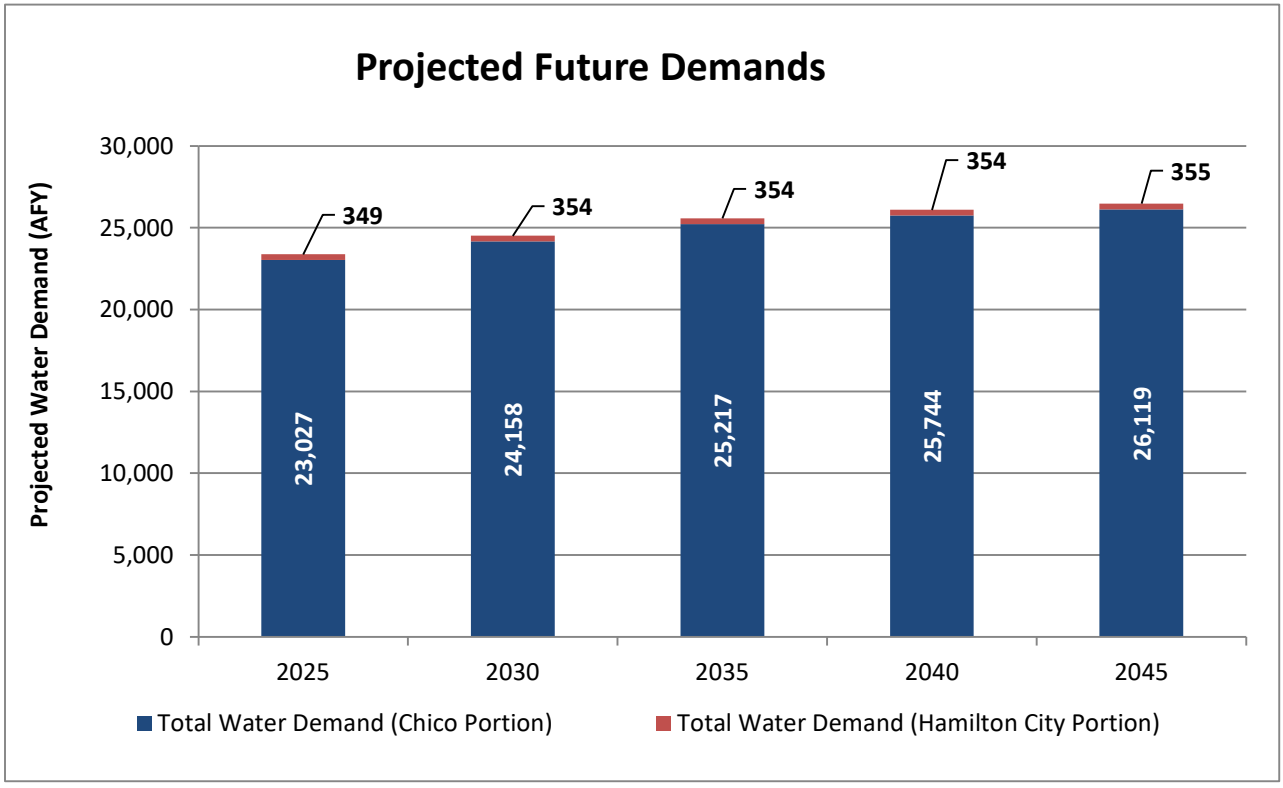


Table 5

Projected Future Water Demand for the Chico District

Barber Yard Specific Plan Project, City of Chico, California

Abbreviations:

"AFY" = acre feet per year

"Cal Water" = California Water Service, Chico-Hamilton City District

"Proposed Project" = Barber Yard Specific Plan Project

"UWMP" = Urban Water Management Plan

Notes:

(a) Projected annual water demand per Reference 1.

(b) The Hamilton City portion of the District water system is physically separated from the Chico portion of the District. Thus, water supplies available to the Hamilton City portion of the District are not physically available to the City of Chico portion, and vice versa. The Proposed Project would be a part of the Chico portion of the District.

(c) The total water demand is the sum of total water use and distribution system losses.

References:

1. Cal Water, 2021a. 2020 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2021.

6 CAL WATER CHICO DISTRICT WATER SUPPLY

This section identifies the water supplies for the Chico District and discusses the vulnerability of the various supplies to drought and other factors affecting water supply reliability. The Hamilton City portion of the Chico District water system is physically separated from the Chico portion of the Chico District and is located in a separate groundwater basin (**Figure 4**). Thus, water supplies available to the Hamilton City portion of the Chico District are not physically available to the City of Chico portion, and vice versa. The Chico portion of the Chico District overlies the Vina Subbasin and the Hamilton City portion of the Chico District overlies the Corning Subbasin. Given this, the tables and discussion below focus on the Chico portion of the Chico District, which would be the sole supply source through Cal Water for the Proposed Project.

6.1 Identification of Water Supply Rights

Pursuant to Water Code §10910(d)(1) and CGC §66473.7(h), a WSA/WSV is required to include identification of all water supply entitlements, water rights, and water service contracts relevant to the identified water supply for the Proposed Project. In accordance with these requirements, this WSA/WSV includes a summary of Cal Water's water supply sources in the Chico District service area.

6.1.1 Surface Water Supplies

The Chico District has not historically used, and does not currently use, surface water as a source of supply within its service area, according to its 2020 UWMP (Cal Water, 2021a) and subsequent discussions with Cal Water staff. However, several recent and current efforts by BCDWRC and other water managers have been undertaken to evaluate the feasibility of bringing surface water supplies into the Chico District area to serve district demands. These efforts include: (1) a study of the potential use of excess State Water Project (SWP) water to which Butte County holds an entitlement in the Chico District area (Cal Water, 2021a); and (2) feasibility evaluation of a potential intertie between the Paradise Irrigation District surface water system and the Chico District system which could potentially bring new surface water supplies into the Chico District's service area (Vina Subbasin Board Meeting Agenda, 10 October 2019). However, as Cal Water currently has no specific and firm plans to develop surface water supplies, for the purposes of this WSA/WSV, surface water is not considered to be an available source of supply to the Chico District.

6.1.2 Potential Recycled Water Development

Recycled water is not currently used as a source of supply within the Chico District (Cal Water, 2021a). Wastewater collection and treatment service within the Chico District area is provided by the City of Chico in the Chico portion of the service area and by the Hamilton City Community Services District in the Hamilton City portion of the service area. Currently, treated wastewater from the Chico Wastewater Treatment Plant is discharged to the Sacramento River, and treated wastewater from the Hamilton City treatment facility is discharged to ponds where it either

evaporates or infiltrates into the subsurface. The combined total volume of wastewater collected in these areas was approximately 10,337 AF in 2020 (Cal Water, 2021a).

Cal Water is actively seeking to identify and evaluate opportunities to use recycled water as a source of supply within the Chico District for certain purposes (e.g., landscape irrigation, cooling tower or other industrial and commercial reuse, and groundwater recharge) in its service area (Cal Water, 2021a). However, because Cal Water currently has no specific and firm plans to develop recycled water supplies, for the purposes of this WSA/WSV, recycled water is not considered to be an available source of supply to the Chico District.

6.1.3 Groundwater Supply

6.1.3.1 Basin Description

Pursuant to Water Code §10910(f)(2), the following is a description of the groundwater basin from which the Proposed Project will be supplied, with a particular focus on the portion of the basin near the BYSP Area. The discussion is based on review of relevant information contained within the 2020 UWMP, pursuant to Water Code §10910(f)(1), as well as other sources reasonably available to Cal Water.

The Vina Subbasin of the Sacramento Valley Groundwater Basin (California Department of Water Resources [DWR] Basin No. 5-021.57) underlies the BYSP Area and the remainder of the Chico portion of the Chico District service area, as shown on Figure 4.[11] The Vina Subbasin (Basin) covers an area of approximately 184,918 acres (289 square miles) and is bounded on the north by the Butte County/Tehama County line, on the east by the Chico Monocline, on the northwest by the Sacramento River and Big Chico Creek, and on the southwest and south (generally) by the northern boundary of the Western Canal Water District. The Basin's extent was revised in 2018 through the Sustainable Groundwater Management Act (SGMA) Basin Boundary Modification process. Prior to the modification, the Basin was defined with the northern boundary further north along Deer Creek and the southern boundary further north along Big Chico Creek. The modification brought portions of the former West Butte and East Butte Subbasins (DWR basins 5-021.58 and 5-021.59) into the Basin.

The water-bearing formations within the Basin are continental deposits ranging in age from Recent/Holocene to late Tertiary (Pliocene). From shallowest/youngest to deepest/oldest, these formations include Holocene Stream Channel Deposits and Basin Deposits, Pleistocene Modesto Formation, and Riverbank Formation, and the Pliocene Tuscan Formation (DWR, 2004). These deposits constitute the upper section of Sacramento Valley fill materials that unconformably overlie older marine deposits of early Miocene and older age (Harwood and Helley, 1987). The geologic units dip gently to the west/southwest towards the axis of the Sacramento Valley.

[11] The Hamilton City portion of the Chico District overlies the Corning Subbasin. However, these two portions of the District are physically separate and water supplies available to the Hamilton City portion of the District are not physically available to the City of Chico portion, and vice versa. Thus, only the Vina Subbasin would be a supply the Proposed Project.

The surficial geologic unit in the vicinity of the BYSP Area is the Tuscan Formation, which at this location is approximately 800 to 1,000 feet thick (Olmsted and Davis, 1961). The Tuscan Formation consists of volcanic and volcaniclastic rocks of andesitic or basaltic composition, including beds of breccia, tuff, sandstone, conglomerate, and tuffaceous silt and clay. The Tuscan Formation is considered to be moderately permeable and is a major water-bearing unit in the northeastern Sacramento Valley area (Olmsted and Davis, 1961). Further west, underlying the City of Chico, the surficial geologic units are Pleistocene and Recent alluvial fan deposits of highly variable permeability.

The BYSP Area overlies portions of six Public Land Survey System (PLSS) sections, which include, but extend beyond, the boundaries of the BYSP Area. The BYSP Area comprises approximately 37% of the total area of these six sections. Information on groundwater wells drilled within these six sections was compiled from DWR's Well Completion Report Mapping Application, and indicates that a large number of domestic wells (144) and a total of 18 production wells, which includes four public supply wells, are or were present within these PLSS sections (but not necessarily within the BYSP Area). The domestic wells are generally shallower, with average depths by section ranging between 155 feet and 239 feet. The production wells are typically deeper with average depths by section ranging from 119 feet to 501 feet. The four public supply wells in these sections range from 560 to 704 feet in depth. It should be noted that the current status of these wells is unknown, and some may be inactive. Based on information provided by the City of Chico and Proposed Project proponent, only agricultural supply wells that have never been utilized are present on the BYSP Area; therefore, it is likely that most of the wells identified within the six sections are located outside of the BYSP Area.

6.1.3.2 Groundwater Management

Pursuant to Water Code §10910f(2)(C), the Basin is not adjudicated and, in its recent evaluation of California groundwater basins, DWR determined that the Basin was not in a condition of critical overdraft (DWR, 2019).

The Basin is, however, designated as a high priority basin under DWR's 2019 Phase 2 Basin Prioritization (DWR, 2019). The main factors driving this designation include population growth (4 out of 5 possible ranking points), production well density (5 out of 5 possible points), irrigated acreage per square mile (4 out of 5 possible points), and groundwater reliance (5 out of 5 possible points). Additional factors include population density (2 out of 5 possible points), public supply well density (3 out of 5 possible points), documented impacts including declining water levels and water quality impacts (2 out of 5 possible points), and habitat and streamflow impacts (2 out of 2 possible points).

6.1.3.2.1 Non-SGMA Groundwater Management Program

Prior to the passage of SGMA in 2014, the Basin was included in the Butte County Assembly Bill (AB) 3030 Groundwater Management Plan (GMP) (CDM, 2004). Section 3 of the 2004 GMP describes the groundwater management goal and management objectives and also outlined the various components (i.e., implementation activities). The stated goal of the 2004 GMP is "to

maintain efficient and effective groundwater management, quantity and quality, thereby providing a sustainable, high quality supply for agricultural, environmental, and urban use into the future that remains protective of residents' health, welfare, and safety."

Seven management objectives were defined and used to develop Basin Management Objectives (BMOs) for 16 sub-inventory units (SIUs) within the County. The BMOs were formally adopted in 2006 as Chapter 33A of the Butte County Code of Ordinances (Butte County, 2011) and then amended in 2011 (BCDWRC, 2020). The BYSP Area is located within the Durham Dayton SIU, just west of the Chico Urban Area SIU. There are no BMO key wells within one mile of the BYSP Area (BCDWRC, 2019).[12]

6.1.3.2.2 SGMA Groundwater Management

In 2014, the California State Legislature enacted SGMA with subsequent amendments in 2015. SGMA requires the formation of Groundwater Sustainability Agencies (GSAs) and the development and implementation of Groundwater Sustainability Plans (GSPs) for groundwater basins that are designated by DWR as medium or high priority. As a high priority, non-critically overdrafted and non-adjudicated basin (see previous discussion), the Basin is subject to the requirements of SGMA, including the requirement to be covered by one or more GSAs and to prepare and submit to DWR one or more GSPs by 31 January 2022.

Pursuant to these SGMA requirements, two GSAs were formed in the Basin – the Vina GSA and the Rock Creek Reclamation District GSA. The BYSP Area is located in the portion of the Basin covered by the Vina GSA, which was formed under a Joint Powers Agreement, dated 9 April 2019, by and between the County of Butte, the City of Chico, and Durham Irrigation District. The Vina GSA is governed by a five-member Board that includes one member for each of the three GSA member entities, one non-agricultural stakeholder, and one agricultural stakeholder. The Vina GSA Board is advised by a Stakeholder Advisory Committee that includes up to 10 members appointed by the Board. The Stakeholder Advisory Committee includes a representative from the Chico District, ensuring that the Chico District has an opportunity to provide formal input to the SGMA process.

The two Basin GSAs jointly developed and adopted a GSP for the Vina Subbasin and submitted the GSP to DWR by the statutory deadline of 31 January 2022. The GSP was approved by DWR on 27 July 2023. The GSP defined groundwater conditions within the Basin and established Sustainable Management Criteria (SMCs) to maintain or achieve sustainable groundwater management within 20 years of GSP adoption under the six Sustainable Indicators: (1) chronic lowering of groundwater levels, (2) reduction of groundwater storage, (3) degraded water quality, (4) land subsidence, (5) depletion of interconnected surface water, and (6) seawater intrusion. The GSP outlined the need to address overdraft and related conditions and has identified 15 projects for potential development that either replace groundwater use (offset) or

[12] Based on monitoring network maps presented in Appendix B of the BCDWRC Groundwater Status Report for the 2018 Water Year (BCDWRC, 2019).

supplement groundwater supplies (recharge) to meet current and future water demands. In addition, the GSP identified seven management actions that could be implemented to reduce groundwater demand. Groundwater allocations were identified as one of the potential management actions; however, the GSP states that it will be implemented as a last resort, in the event that the proposed projects fail to achieve IMs [Interim Milestones] and the Vina Subbasin is projected to not be able to achieve sustainability goals by 2042 and based on an evaluation by the Joint Management Committee (Geosyntec, 2021). The Vina Basin GSP and DWR approval letter are available on the DWR SGMA Portal: https://sgma.water.ca.gov/portal/gsp/all

6.1.3.3 Groundwater Use

Pursuant to Water Code §10910(f)(3) and CGC §66473.7(2)(A), the amount of groundwater pumped by Cal Water within the Chico District for the past twenty years from the Basin from which the Proposed Project will be supplied is provided in **Table 6**. The groundwater pumping data shown in **Table 6** extends beyond the required period of five years and includes data from 2000 through 2022. The annual pumping volumes are based on information contained in the Chico District's 2015 UWMP (Appendix F, Worksheet 10) and additional data provided by Cal Water for the years 2008 through 2022.

As can be seen from the data shown on **Table 6**, the groundwater pumping volumes from the Vina Subbasin in recent years (an average of 20,159 AFY from 2015 through 2022) are lower than they were in previous years (an average of 28,049 from 2005 through 2013), reflecting Cal Water's successful implementation of water conservation measures and continued efficiency due to passive conservation and demand hardening.

The groundwater pumping by Cal Water in the amounts shown in **Table 6** was pumped from the Chico District's network of supply wells which are located in and around the City of Chico. **Appendix A** includes a figure from the Butte County Groundwater Inventory Analysis (DWR, 2005) that shows the locations of the Cal Water municipal supply wells as of 2005. The District rotates its pumping throughout its network of 55 supply wells (Cal Water, 2019b).

6.1.3.4 Analysis of Sufficiency of Groundwater Supply

As described in Section 6.1.3, the sole source of supply for the Chico portion of the Chico District (i.e., the portion of the Chico District that will supply the Proposed Project) is groundwater pumped from the Basin. Pursuant to Water Code §10910(f)(5), given that demands associated with the Proposed Project were included in the 2020 UWMP demand projections for the Chico District, and that the 2020 UWMP anticipates sufficient groundwater supply under all conditions for the Chico District, a separate analysis of the sufficiency of the groundwater from the Vina Subbasin to meet Proposed Project demands is not required. However, given that the Vina Subbasin GSP was completed and adopted following the 2020 UWMP, key information in the GSP was reviewed in context of this WSA/WSV. Based on the review, summarized below, implementation of the GSP is not expected to change the availability of groundwater to meet the projected Chico District demands.

From a regional or Basin-wide standpoint, it is notable that the Chico District pumping is only a small fraction of the total groundwater pumping within the Basin, the majority of which is pumped for agricultural use. According to the Basin's 2022 Annual Report, groundwater pumping for water year 2022 in the Vina Subbasin was approximately 24,900 AFY for urban and industrial use, 253,800 AFY for agriculture use, and 76,000 AFY for native vegetation use (BCDWRC, 2023). These data show that urban and industrial pumping accounts for less than 8% of total pumping in the Basin, and the Proposed Project would only represent approximately 0.18% of total pumping. It is therefore likely that management of agricultural groundwater use, rather than urban and industrial use, will be a much larger determining factor in achieving and maintaining groundwater sustainability in the Basin in the future.

The Vina Subbasin GSP evaluated the Basin water budget for three projected future scenarios, including: (1) a no climate change scenario, (2) a 2030 climate change scenario, and (3) a 2070 climate change scenario (Geosyntec, 2021). All three future water budget scenarios incorporated, among other demands, the urban and industrial demands from the Chico District's 2020 UWMP which, as stated in Section 5 of this WSA/WSV, included demands associated with the anticipated growth that will occur as a result of the Proposed Project. Therefore, projected water demand for the Proposed Project (as well as the other portions of the existing Chico portion of the Chico District service area) is understood to be captured within the Vina GSP water budget analyses.

6.2 Total Projected Potable Supply in Normal, Single Dry, and Multiple Dry Years

As discussed above, groundwater constitutes the sole source of supply for the Chico District. The Chico District operates a network of 55 wells for which it has been able to pump up to 30,324 AFY (in 2008) from the Basin and has been able to consistently provide sufficient supply to meet its demands (Cal Water, 2019b; Cal Water 2021b). Historical (five years from 2018 through 2022) and projected (every five years from 2025 through 2045) groundwater pumping rates are presented in **Table 7**.

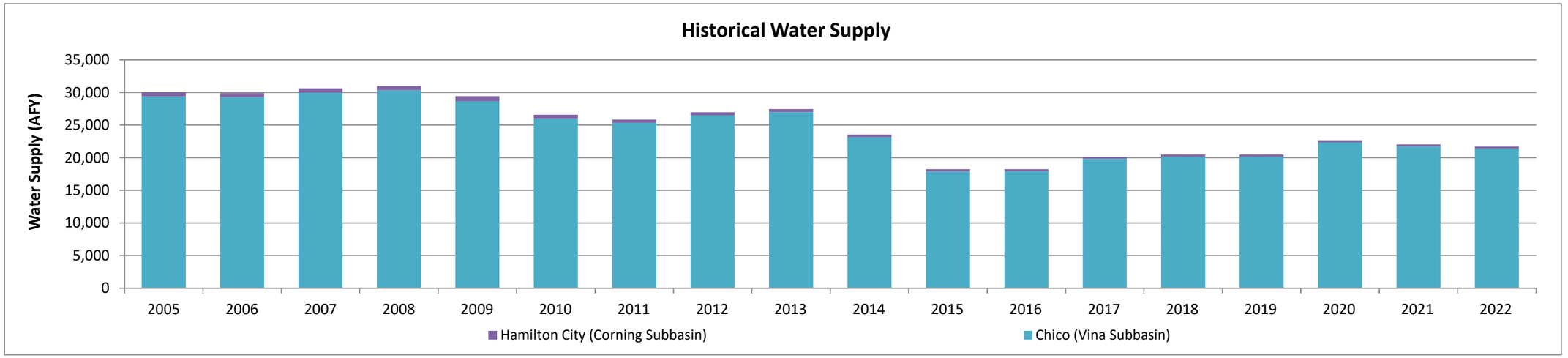
The Chico District has demonstrated its ability to meet historical demands from the Basin that are even greater than the projected demands. In addition, based on information provided in the Vina Subbasin GSP, no limitations on groundwater pumping are anticipated in the near future. Therefore, consistent with the Chico District's 2020 UWMP, the available supplies to the Chico portion of the Chico District are considered to be equal to demands under all conditions (i.e., current and projected, and for normal, single dry, and multiple dry years including a 5-year drought period). The total projected potable supplies for the Chico portion of the Chico District for normal, single dry, and multiple dry years are presented in **Tables 8, 9,** and **10**, respectively.

Table 6

Historical Water Supply for Cal Water

Barber Yard Specific Plan Project, City of Chico, California

Water Supply Source	Historical Water Supply (a) (AFY)																						
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Chico (Vina Subbasin)	26,706	28,055	28,991	27,972	30,873	29,372	29,284	29,971	30,324	28,643	26,008	25,345	26,486	27,006	23,139	17,864	17,888	19,820	20,148	20,135	22,320	21,707	21,392
Hamilton City (Corning Subbasin)	596	634	670	602	656	620	613	655	645	784	564	484	472	440	405	363	356	323	330	327	346	334	308
Total Water Supply	27,302	28,689	29,661	28,574	31,529	29,992	29,897	30,626	30,969	29,427	26,572	25,829	26,958	27,446	23,544	18,227	18,244	20,143	20,478	20,462	22,667	22,040	21,700



Abbreviations:

"AFY" = acre feet per year

"Cal Water" = California Water Service, Chico-Hamilton City District

Notes:

(a) Historical water supply values from 2005-2007 per Worksheet 10, Appendix F in Reference 1, from 2008-2020 per Reference 2, and for 2021-2022 per Reference 4.

(b) Groundwater subbasin boundaries were modified by the Department of Water Resources (DWR) in 2018. Indicated subbasins are per Reference 3.

References:

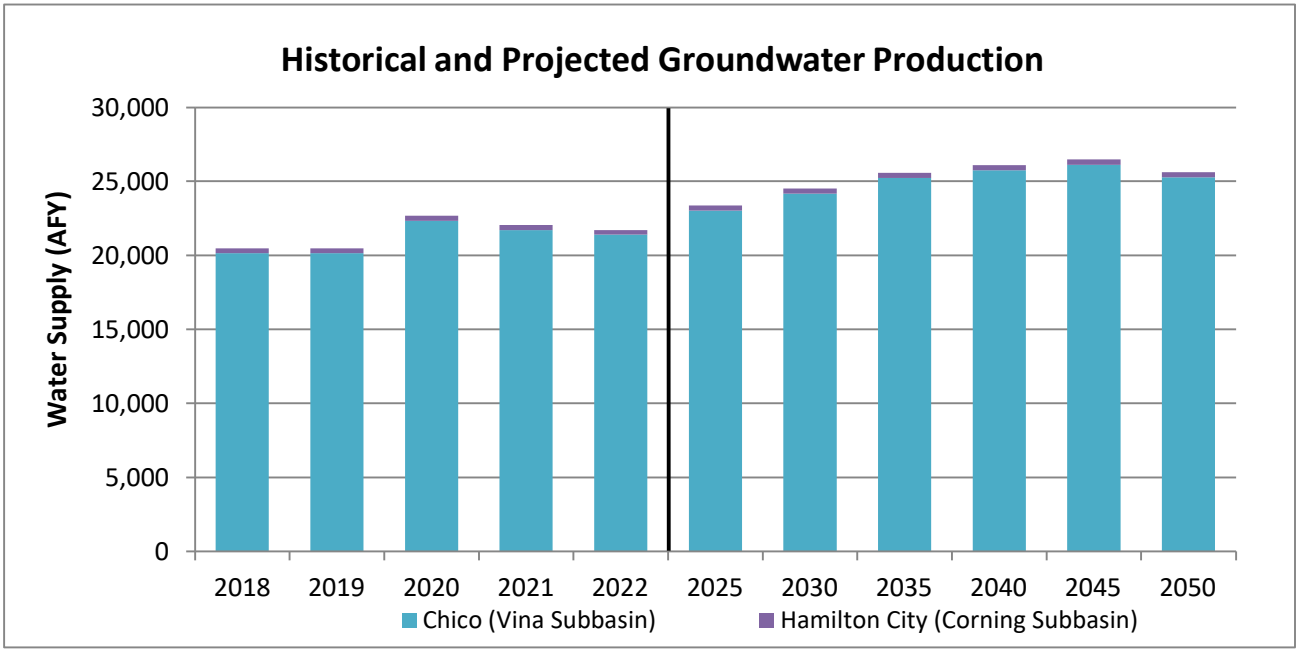
1. 2015 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2016.
2. Cal Water, 2021b. Historical Demand and Production Data Provided by Cal Water in Support of 2020 UWMP, 2021.
3. SGMA Basin Boundary Modification Request System. https://sgma.water.ca.gov/basinmod/modrequest/preview/227
4. Cal Water, 2023a. Historical Demand Data provided by Cal Water via email, obtained on 11 May 2023.

Table 7

Historical and Projected Groundwater Pumping

Barber Yard Specific Plan Project, City of Chico, California

Water Supply Source (b)	Historical Groundwater Production (a) (AFY)					Projected Groundwater Production (a) (AFY)				
	2018	2019	2020	2021	2022	2025	2030	2035	2040	2045
Chico (Vina Subbasin)	20,148	20,135	22,320	21,707	21,392	23,027	24,158	25,217	25,744	26,119
Hamilton City (Corning Subbasin)	330	327	346	334	308	349	354	354	354	355
Total Groundwater Supply	20,478	20,462	22,667	22,040	21,700	23,376	24,511	25,571	26,098	26,474



Abbreviations:

"AFY" = acre feet per year

"Cal Water" = California Water Service, Chico-Hamilton City District

Notes:

(a) Historical groundwater pumping from 2018-2020 per Reference 1 and for 2021-2022 per Reference 4. Projected groundwater pumping per Reference 2.

(b) Groundwater subbasin boundaries were modified by the Department of Water Resources (DWR) in 2018. Indicated subbasins are per Reference 3.

References:

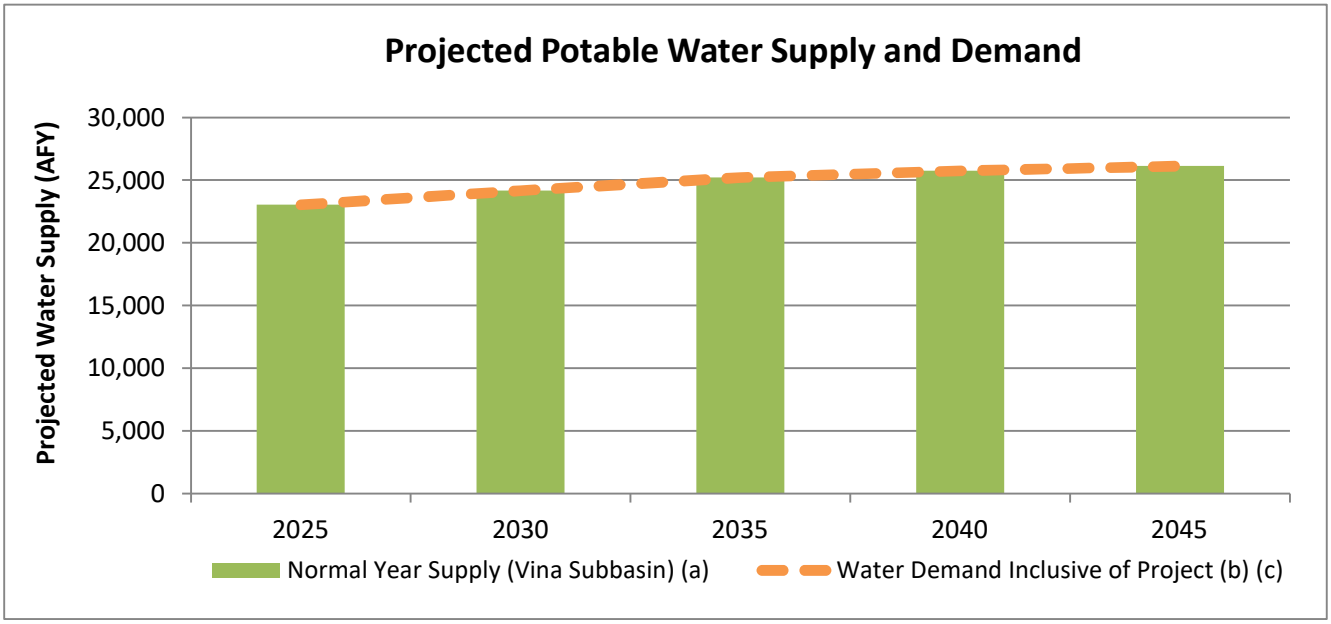
1. Cal Water, 2021b. Historical Demand and Production Data Provided by Cal Water in Support of 2020 UWMP, 2021.
2. Cal Water, 2021a. 2020 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2021.
3. SGMA Basin Boundary Modification Request System. https://sgma.water.ca.gov/basinmod/modrequest/preview/227.
4. Cal Water, 2023a. Historical Demand Data provided by Cal Water via email, obtained on 11 May 2023.

Table 8

Projected Normal Year Water Supply and Demand for the Chico Portion of the Chico District

Barber Yard Specific Plan Project, City of Chico, California

Water Demand and Supply Source	Projected Normal Year Supply and Demand (AFY)				
	2025	2030	2035	2040	2045
Normal Year Supply (Vina Subbasin) (a)	23,027	24,158	25,217	25,744	26,119
Water Demand Inclusive of Project (b) (c)	23,027	24,158	25,217	25,744	26,119
Supply Shortfall (% demand)	***0%***	***0%***	***0%***	***0%***	***0%***



Abbreviations:

"AFY" = acre feet per year

"Cal Water" = California Water Service, Chico-Hamilton City District

"Proposed Project" = Barber Yard Specific Plan Project

Notes:

(a) Based on the demonstrated ability of the Chico District to meet historical demands that are even greater than the projected system demands, the available supplies are considered equal to the demands under all conditions. See Section 6.1.3.4 of the text for additional information.

(b) Water demand shown is limited to the Chico portion of the Chico District, which is supplied by groundwater from the Vina Subbasin.

(c) Water demand projections for the Chico District are presented per Reference 1. As discussed in Section 5 of this WSA, the demands associated with the Proposed Project are within the projected demands and growth included in the Chico District 2020 UWMP.

References:

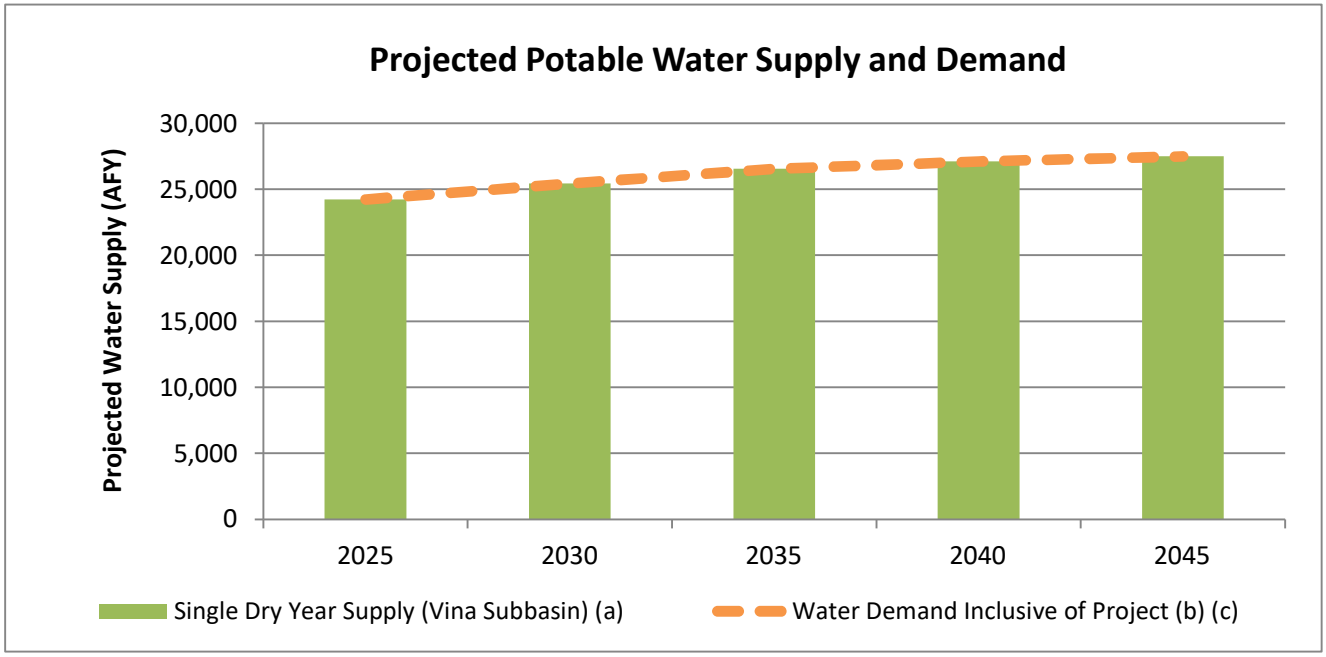
1. Cal Water, 2021a. 2020 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2021.

Table 9

Projected Single Dry Year Water Supply and Demand for the Chico Portion of the Chico District

Barber Yard Specific Plan Project, City of Chico, California

Water Demand and Supply Source	Projected Water Supply and Demand (AFY)				
	2025	2030	2035	2040	2045
Single Dry Year Supply (Vina Subbasin) (a)	24,230	25,426	26,541	27,094	27,488
Water Demand Inclusive of Project (b) (c)	24,230	25,426	26,541	27,094	27,488
Supply Shortfall (% demand)	***0%***	***0%***	***0%***	***0%***	***0%***



Abbreviations:

"AFY" = acre feet per year

"Cal Water" = California Water Service, Chico-Hamilton City District

"Proposed Project" = Barber Yard Specific Plan Project

Notes:

(a) Based on the demonstrated ability of the Chico District to meet historical demands that are even greater than the projected system demands, the available supplies are considered equal to the demands under all conditions. See Section 6.1.3.4 of the text for additional information.

(b) Water demand shown is limited to the Chico portion of the Chico District, which is supplied by groundwater from the Vina Subbasin.

(c) Water demand projections for the Chico District are presented per Reference 1. As discussed in Section 5 of this WSA, the demands associated with the Proposed Project are within the projected demands and growth included in the Chico District 2020 UWMP.

References:

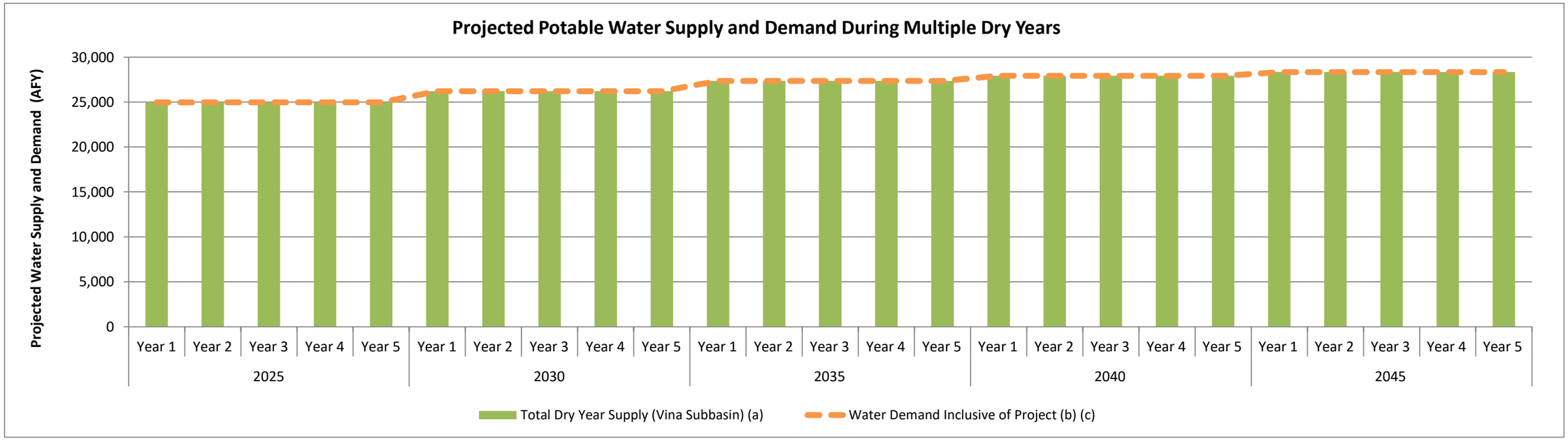
1. Cal Water, 2021a. 2020 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2021.

Table 10

Projected Multiple Dry Year Water Supply and Demand for the Chico Portion of the Chico District

Barber Yard Specific Plan Project, City of Chico, California

Water Demand and Supply Source	Projected Water Supply and Demand During Multiple Dry Years (AFY)																								
	2025					2030					2035					2040					2045				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Total Dry Year Supply (Vina Subbasin) (a)	24,973	24,973	24,973	24,973	24,973	26,210	26,210	26,210	26,210	26,210	27,360	27,360	27,360	27,360	27,360	27,930	27,930	27,930	27,930	27,930	28,335	28,335	28,335	28,335	28,335
Water Demand Inclusive of Project (b) (c)	24,973	24,973	24,973	24,973	24,973	26,210	26,210	26,210	26,210	26,210	27,360	27,360	27,360	27,360	27,360	27,930	27,930	27,930	27,930	27,930	28,335	28,335	28,335	28,335	28,335
Supply Shortfall (% demand)	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***



Abbreviations:

"AFY" = acre feet per year

"Cal Water" = California Water Service, Chico-Hamilton City District

"Proposed Project" = Barber Yard Specific Plan Project

Notes:

(a) Based on the demonstrated ability of the Chico District to meet historical demands that are even greater than the projected system demands, the available supplies are considered equal to the demands under all conditions. See Section 6.1.3.4 of the text for additional information.

(b) Water demand shown is limited to the Chico portion of the Chico District, which is supplied by groundwater from the Vina Subbasin (Table 5).

(c) Water demand projections for the Chico District are presented per Reference 1. As discussed in Section 5 of this WSA, the demands associated with the Proposed Project are within the projected demands and growth included in the Chico District 2020 UWMP.

References:

1. 2020 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2021.

7 COMPARISON OF SUPPLY AND DEMAND

As discussed in Section 5, while the Proposed Project was not explicitly included in the Chico District's 2020 UWMP demand projections, demands associated with the Proposed Project are within the projected growth anticipated for the Chico portion of the Chico District based on Caltrans forecasts and are thus considered to be included within projected Chico District demands.

Pursuant to CWC §10910(c)(3) and CGC §66473.7(a)(2), this WSA/WSV includes an estimate of the projected water supplies available to the Chico District under normal, single dry, and multiple dry years, and a discussion of whether those supplies will meet the projected demand associated with the Proposed Project, in addition to the water system's existing and planned future uses. This assessment is parallel to the multiple-dry year supply reliability analysis required for UWMPs under CWC §10635. In 2018, CWC §10635 was revised to require UWMPs to extend this analysis to consider "a drought lasting five consecutive water years." Although CWC §10910c(3) has not yet been updated to require this for WSAs, a five-year drought scenario is also evaluated herein for purposes of a conservative analysis.

Tables 8, 9, and **10** provide a comparison of the demands and supplies, inclusive of the Proposed Project, in normal year, single dry year, and multiple dry year hydrologic scenarios respectively for the Chico portion of the Chico District. As discussed above, consistent with the Chico District's 2020 UWMP, total projected supplies for the Chico portion of the Chico District are assumed to be equal to the projected demands under all conditions (i.e., current and projected, and for normal, single dry, and multiple dry years).

While supply shortfalls are not projected for the reasons described herein, any shortfalls that could occur in the future would be managed through the implementation of the Chico District's Water Shortage Contingency Plan (WSCP). The overall reduction goals in the WSCP are established for six drought stages ranging from 10% to greater than 50% shortfalls. With implementation of its WSCP during the historic five-year 2013-2017 drought, the Chico portion of the Chico District achieved a demand reduction of 34% (2015 water demand compared to 2013 water demand; Cal Water, 2021b). On 8 July 2021, in response to the recent drought conditions, Governor Newsom signed EO N-10-21 calling Californians to voluntarily reduce water use by 15% compared to 2020 levels. The Chico District enacted Stage 2 of its WSCP on 22 May 2022 and implemented numerous drought response actions, including, but not limited to, irrigation day restrictions, obligations to fix leaks, community outreach, rebates, and penalties (Cal Water, 2022b). Given that all uses that are part of the Proposed Project are within the Chico District service area, they would be obligated to comply with the future demand reduction efforts imposed by Cal Water through implementation of the WSCP (as may be amended from time to time) in any future water shortage conditions and would therefore contribute a proportionate share of the reduction in water demands during dry years.

In 2016, Governor Brown signed Executive Order (EO) B-37-16 *Making Water Conservation a California Way of Life* and subsequently SB 606 and AB 1668 were passed. SB 606/AB 1688 set

new requirements for urban water agencies to continue to increase water efficiency beyond the 2020 water use targets developed under the Water Conservation Act of 2009 (Senate Bill X7-7). Beginning in 2024, agencies are required to report on "annual water use objectives". The urban water use objective is based on an aggregate estimate of efficient urban water use for the previous year and local service area characteristics for that year. In addition, SB 606/AB 1668 added new requirements related to drought planning and WSCPs, including requirements for agencies to: (1) conduct a drought risk assessments part of their future UWMPs to assess water supply reliability for a period of drought lasting five consecutive water years (CWC §10635(b)), and (2) conduct annual water supply and demand assessments to determine its water supply reliability for the current year and one dry year (CWC §10632(a)). These elements are included in the Chico District's 2020 WSCP.

Therefore, given (1) that the Chico District's 2020 UWMP projections are considered inclusive of the anticipated growth that will occur as a result of the Proposed Project and do not identify supply shortfalls under any hydrologic conditions evaluated, (2) the demonstrated effectiveness of the Chico District's WSCP in the case of supply shortages, and (3) the increasing efficiency and drought planning requirements from the State, this WSA/WSV demonstrates and verifies that sufficient water supply is estimated to be available to Cal Water to meet all existing and planned future demands within the Chico District service area including those associated with the Proposed Project.

8 CONCLUSIONS

As stated in Water Code §10910(c)(4) and CGC 66473.7(a), the primary purpose of this WSA/WSV is to evaluate whether sufficient water supply is available to meet all existing and planned future water demands within the water supplier's service area, including those associated with the Proposed Project, during normal, single dry, and multiple dry hydrologic years for a 20-year time horizon.

As described in Section 4, the water demand of the Proposed Project (i.e., approximately 510 AFY at buildout) has been conservatively estimated. As discussed in Section 5, these demands are within the projected water demand growth that form the basis of Cal Water's updated demand projections in the adopted 2020 UWMP. In addition, Cal Water, through local and regional efforts, is striving to increase its water supply portfolio for the Chico District (Sections 6.1.1 and 6.1.2), and due to new requirements by the State, will be required to continue to increase water efficiency in its service area into the future (Section 7).

Therefore, this WSA/WSV concludes that sufficient water supply is available to Cal Water to meet all existing and planned future demands within the Chico District service area including those associated with the Proposed Project, in normal, single dry, and multiple dry years.

9 REFERENCES

Butte County, 2011. Butte County Code of Ordinances, Chapter 33A - Basin Management Objectives, amendment adopted 13 September 2011: http://www.buttecounty.net/Portals/26/Chapter33A091311.pdf, accessed 8 January 2020.

Butte County Department of Water and Resource Conservation (BCDWRC), 2016. *Butte County Water Inventory and Analysis, Final Report*, dated June 2016.

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BCDWRC, 2020. Butte County Basin Management Objectives website: https://www.buttecounty.net/waterresourceconservation/basinmanagementobjectives accessed 7 February 2020.

BCDWRC, 2023. Vina Subbasin Groundwater Sustainability Plan Annual Report – 2022, Submitted by the Vina and Rock Creek Reclamation District GSAs, prepared under contract with Butte County Department of Water and Resource Conservation, dated April 2023.

Cal Water, 2019a. Cal Water WSA Water Factor Tool, developed by M.Cubed, dated 22 October 2019.

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Cal Water, 2021a. 2020 Urban Water Management Plan, Chico-Hamilton City District, prepared by California Water Service, dated June 2021.

Cal Water, 2021b. Historical Demand and Production Data Provided by Cal Water in Support of 2020 UWMP, 2021.

Cal Water, 2022a. Information provided by Cal Water via email, obtained on 10 February 2022.

Cal Water, 2022b. California Water Service Advice Letter No. 2448, dated 22 April 2022.

Cal Water, 2023a. Historical Demand Data provided by Cal Water via email, obtained on 11 May 2023.

Cal Water 2023b. Information provided by Cal Water via email, obtained on 6 July 2023.

Cal Water, 2023c. Information provided by Cal Water via email, obtained on 7 August 2023.

Cal Water, 2023d. Information provided by Cal Water via email, obtained on 17 August 2023.

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City of Chico, 2023. Barber Yard Specific Plan Administrative Draft Environmental Impact Report (EIR) Project Description, provided by Cal Water on 6 July 2023.

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DWR, 2022. California Water Service Water Audit Data Report for the Chico District, submitted 30 September 2022, accessed 13 November 2023 (https://wuedata.water.ca.gov/awwa_plans).

Geosyntec, 2021. Vina Groundwater Subbasin Groundwater Sustainability Plan, prepared for Vina and Rock Creek Reclamation District Groundwater Sustainability Agencies, dated December 2021. https://www.vinagsa.org/groundwater-sustainability-plan-gsp-for-adoption, accessed 20 January 2022.

Harwood, D.S., and Helley, E.J., 1987. *Late Cenozoic Tectonism of the Sacramento Valley, California*, U.S. Geological Survey Professional Paper 1359, 46 pp.

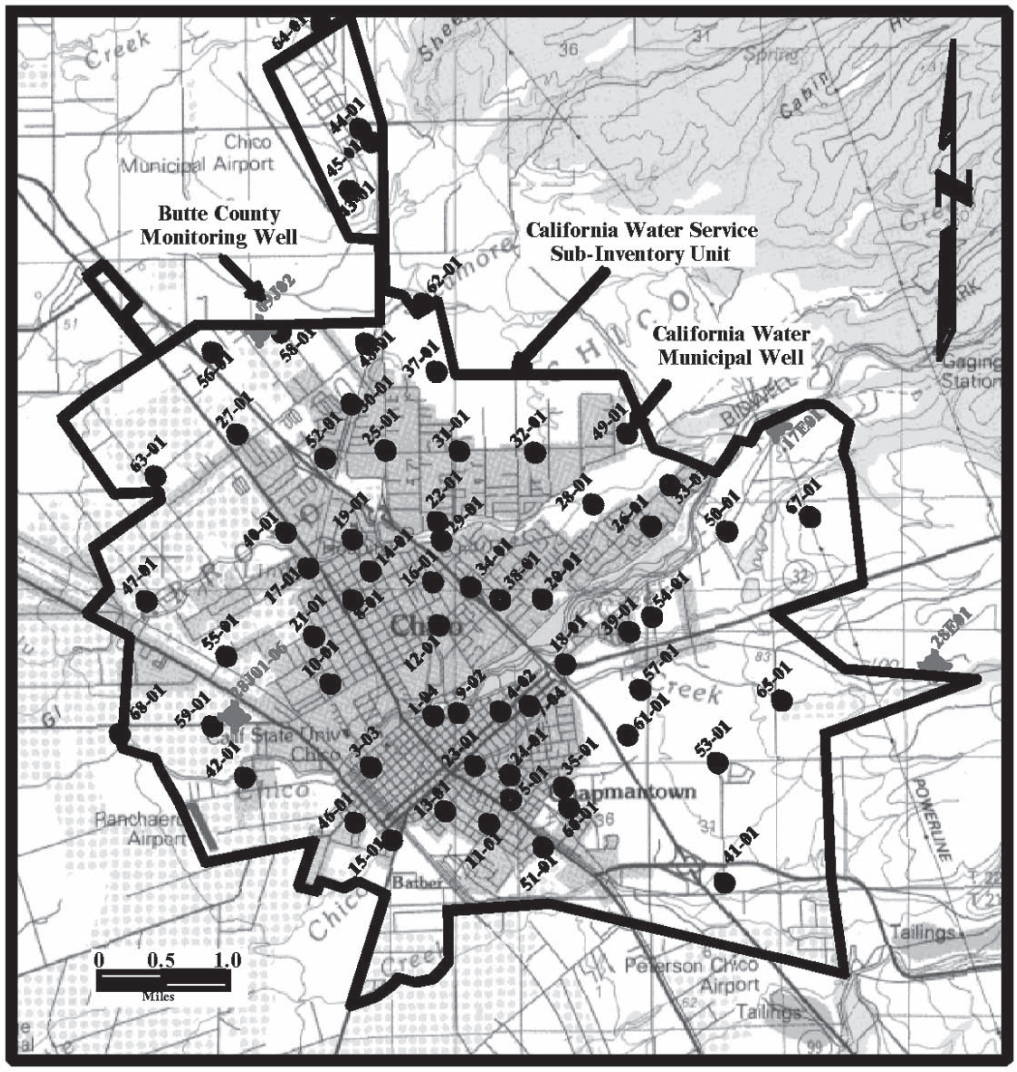
Olmsted, F.H., and Davis, G.H., 1961. *Geologic features and ground-water storage capacity of the Sacramento Valley, California*, U.S. Geological Survey Water Supply Paper 1497, 241p.

US Energy Information Administration, 2012. Commercial Buildings Energy Consumption Survey: Water Consumption in Large Buildings Summary, dated 2012.

Appendix A

Figure 24 from the Butte County Groundwater Inventory Analysis (DWR, 2005) entitled "Municipal and Monitoring Well Locations, California Water Service Sub-Inventory Unit"

Figure 24.
Municipal and Monitoring Well Locations,
California Water Service Sub-inventory Unit



There are about 1,600 wells in the California Water Service Sub-inventory Unit. Table 1, Appendix B, lists the number of wells according to five well types: domestic, irrigation, municipal, monitoring, and other. Table 1 shows that 907 wells are listed as domestic, 149 are listed as irrigation, 66 are listed as municipal, 252 are listed as monitoring, and 228 are listed as other. Figure 25 illustrates the breakdown of wells by use for the California Water Service Sub-inventory Unit.

Groundwater Level

DWR and BCDWRC currently monitor groundwater levels in 7 wells within the California Water Service Sub-inventory Unit. The monitoring wells consist of domestic and observation wells. Table 5 lists the current monitoring wells along with the annual fluctuations in groundwater levels during normal and drought years. Table 5 also lists the well use, the aquifer system that is being monitored, and the monitoring period of record.

Data from the Butte County monitoring grid in Table 5 shows that the annual fluctuations in groundwater levels in the unconfined portion of the aquifer system are

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K.2 - Sewer Generation Memorandum

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NORTHSTAR

Architecture
Civil Engineering
Environmental
Planning
Surveying
Water Resources

Date: April 8, 2022

RE: Barber Yard Sewer Generation Memo (Specific Plan Separate Support)

Please find the following sewer generation calculations to confirm that the proposed development is within the reviewed parameters of the Cities current Sewer Master Plan.

The June 2013 City of Chico Sewer Master Plan identifies the Barber area as one of five Special Planning Areas (SPA) within the city and assigns it an expected sewer flow for plant and sewer main sizing. Table 5.4 for master plan (attached) shows an Average Dry Weather Flow (ADWF) value of 1,200 gpd/acre for the SPA zone.

To ensure the Barber Specific Plan is in accordance with the master plan calculations the proposed land use areas form the SPA have been reviewed individually identified. The ADWF coefficients from Table 5.4 have been applied and the total checked against the allotted amount from the study. See below table.

Anticipated Sewerage Generation for Barber Yard		Approximate Gross Acreage	ADWF Coefficient (gpd/acre)	Buildout ADWF (gpd)
Medium Density Residential	MDR	81	1,050	85,050
Medium-High Density Residential	MDHR	27	2,000	54,000
Residential Mixed Use	RMU	13	1,200	15,600
Open Spaces	OS1-2	12	0	0
		133	1,163	154,650
2013 Sewer Master Plan Allotment	SPA	133	1,200	159,600

Conclusion:

The proposed development generates about 97% of its allowed wastewater levels and is thus in compliance with the City's Sewer Master Plan.

Sincerely,

Ross Simmons, PE 68511
Senior Managing Engineer

111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113
info@NorthStarEng.com | www.NorthStarEng.com

Table 5.4 Wastewater Flow Coefficients and Projected ADWF
Sewer System Master Plan Update
City of Chico

	Existing Sewer Service Area							Build Out Sewer Service Area				Average Dry Weather Flow		
	Developed Area			Vacant Area										
Land Use Category	Non-Opportunity Area (acres)	Opportunity Area (acres)	Developed Area Subtotal (acres)	Non-Opportunity Area (acres)	Opportunity Area (acres)	Vacant Area Subtotal (acres)	Total Area (acres)	Non-RCO/ Opportunity Area (acres)	Resource Constraint Overlay (acres)	Opportunity Area (acres)	Total Buildout Area (acres)	ADWF Coefficient (gpd/acre)	Existing ADWF (mgd)	Buildout ADWF (mgd)
VLDR Very Low Density Residential	214.9	0.0	214.9	89.8	0.0	89.8	304.7	1,545.6	186.3	0.0	1,731.9	200	0.04	0.309
LDR Low Density Residential	3,718.1	22.1	3,740.1	578.3	1.1	579.4	4,319.5	5,018.0	551.3	23.2	5,592.5	800	2.99	4.036
MDR Medium Density Residential	640.5	77.8	718.3	212.7	13.7	226.4	944.6	1,005.7	41.9	91.5	1,139.0	1,050	0.75	1.166
MHDR Medium-High Density Residential	481.3	88.2	569.4	102.0	4.4	106.3	675.7	680.8	24.5	92.5	797.9	2,000	1.14	1.574
HDR High Density Residential	4.7	1.6	6.3	4.4	0.0	4.4	10.6	9.0	0.0	1.6	10.6	3,600	0.02	0.039
CS Commercial Services	109.3	5.7	115.0	13.6	4.5	18.2	133.2	194.0	0.0	10.2	204.2	900	0.10	0.185
NC Neighbhorhood Commerical	26.7	16.4	43.2	22.3	5.0	27.3	70.5	73.3	0.0	21.5	94.7	1,200	0.05	0.118
RC Regional Commercial	71.3	242.3	313.6	67.5	36.0	103.5	417.1	138.9	0.0	278.3	417.2	1,000	0.31	0.459
MW Manufacturing and Warehousing	448.2	3.1	451.3	219.8	0.0	219.8	671.2	1,301.1	482.3	3.1	1,786.5	400	0.18	0.522
IOMU Industrial/Office Mixed Use	0.0	70.0	70.0	60.5	2.1	62.6	132.6	41.6	0.0	91.0	132.6	700	0.05	0.102
OMU Office Mixed Use	280.0	55.7	335.8	49.3	7.0	56.2	392.0	324.3	5.0	62.7	392.0	800	0.27	0.317
CMU Commercial Mixed Use	199.4	260.3	459.7	52.3	15.5	67.8	527.5	336.2	3.3	275.8	615.3	1,000	0.46	0.653
RMU Residential Mixed Use	0.5	49.2	49.7	0.0	18.9	18.9	68.6	0.1	0.0	68.1	68.2	1,200	0.06	0.094
SMU Special Mixed Use	4.3	0.0	4.3	192.5	0.0	192.5	196.8	196.8	0.0	0.0	196.8	1,200	0.01	0.236
PFS Public Facilities and Services	665.3	15.0	680.3	296.1	0.0	296.1	976.4	2,037.3	0.0	15.0	2,052.3	600	0.41	0.815
SPA Special Planning Area	11.0	0.0	11.0	133.8	0.0	133.8	144.8	2,733.4	0.0	0.0	2,733.4	1,200	0.01	3.280
POS Primary Open Space	1,112.5	3.7	1,116.2	0.2	0.0	0.2	1,116.4	5,202.0	0.0	3.7	5,205.7	0	0.00	0.000
SOS Secondary Open Space	401.0	8.4	409.4	31.5	0.4	32.0	441.3	1,704.8	0.0	8.8	1,713.6	0	0.00	0.000
Streets, Canals, etc.	2,369.5	300.7	2,670.2	0.0	0.0	0.0	2,670.2	2,909.1	0.0	300.7	3,209.8	0	0.00	0.000
Agriculture	175.5	0.0	175.5	0.0	0.0	0.0	175.5	0.0	0.0	0.0	0.0	0	0.00	0.000
Total	10,934.0	1,220.3	12,154.2	2,126.7	108.5	2,235.2	14,389.5	25,451.9	1,294.7	1,347.7	28,094.2	--	6.86	13.91