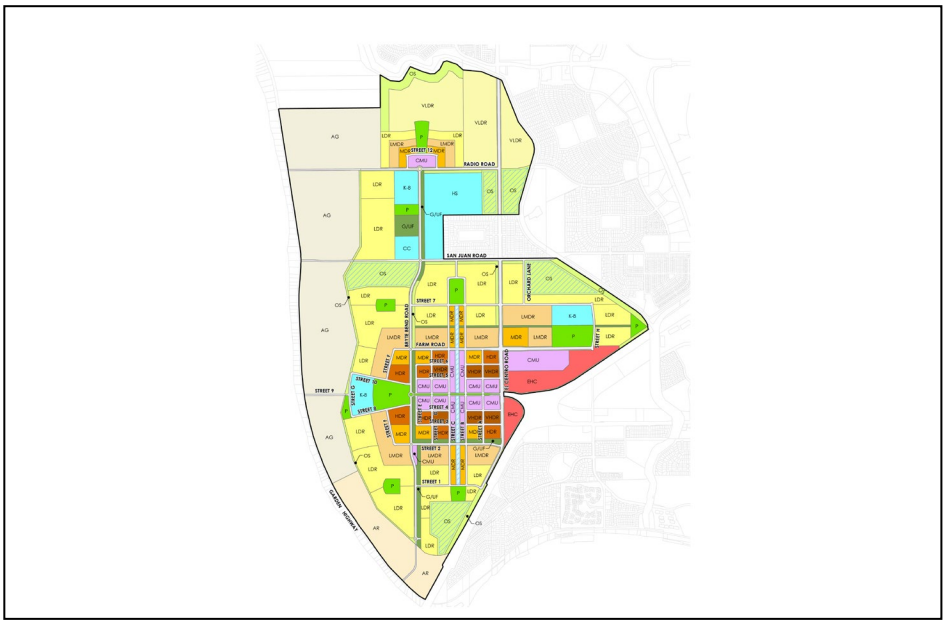
PARTIALLY RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT

UPPER WESTSIDE SPECIFIC PLAN



Control Number: PLNP2018-00284
State Clearinghouse Number: 2020100069
December 2025

COUNTY OF SACRAMENTO
DEPARTMENT OF COMMUNITY DEVELOPMENT
PLANNING AND ENVIRONMENTAL REVIEW DIVISION
827 7TH STREET, ROOM 225
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LIST OF ACRONYMS

ADT	average daily trips
AFY	acre-feet per year
CC	Community College land use designation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
DPS	distinct population segment
DWR	California Department of Water Resources
E/HC	Employment/Highway Commercial
EFH	Essential Fish Habitat
ESU	evolutionarily significant unit
FESA	federal Endangered Species Act
ITP	Incidental Take Permit
LDR	Low Density Residential
LOS	level of service
LTA	Local Transportation Analysis
MAF	million acre feet
MG	million gallons
mgd	million gallons per day
NCMWC	Natomas Central Mutual Water Company
NDD	North Delta Diversion
NMFS	National Marine Fisheries Service
PRC	Public Resources Code
PRDEIR	Partially Recirculated Draft EIR
RC	Regional Commercial
RCRA	Resource Conservation and Recovery Act of 1976
SCWA	Sacramento County Water Agency

SWRCB	State Water Resources Control Board
USBR	United States Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
UWSP	Upper Westside Specific Plan
VMT	vehicle miles traveled
WSCP	SCWA's Water Shortage Contingency Plan
WTP	water treatment plant
YOY	young-of-the-year

1 INTRODUCTION

PURPOSE AND LEGAL CONTEXT

As required by the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations [CCR], Title 14, Chapter 3, section 15000, et seq.), this Partially Recirculated Draft EIR (PRDEIR) discloses, analyzes, and considers the potential environmental impacts of a new alternative to the Upper Westside Specific Plan. The PRDEIR has been prepared in accordance with CEQA Guidelines Sections 15088.5 and 15132, necessitated by the addition of Alternative 5. The information contained in this PRDEIR will be reviewed and considered by the County and by any responsible agencies (as defined in CEQA) prior to a decision to approve, disapprove, or modify the proposed project.

BACKGROUND AND PROJECT OVERVIEW

The Draft Environmental Impact Report (Draft EIR) for the Upper Westside Specific Plan (UWSP) was originally published in August 2024 under State Clearinghouse Number 2020100069. The public review period for the Draft EIR lasted 45 days, from August 29, 2024, to October 14, 2024. During the public review period the County received 40 comment letters. In addition, during hearings before the Natomas Community Planning Advisory Council and Sacramento County Planning Commission on October 3, 2024, and October 21, 2024, respectively, the County received 75 oral comments and 124 written comments. Subsequently the County prepared written responses to all written and oral comments received, and on June 11, 2025, published a Final EIR containing all the comments and written responses related to the Draft EIR.

Following the publication of the Final EIR, the County received additional written comments pertaining to the merits of the project. Although there is no requirement under CEQA to address comments received following publication of a Final EIR, the County has carefully considered all comments received and has determined that potential further refinement of the proposed UWSP merits further consideration. Recirculation of the Draft EIR is prompted by the identification of a new project alternative, Alternative 5, as discussed further below. This PRDEIR provides further environmental analysis and updated information to assist the County, responsible and trustee agencies, and the public in understanding the impacts of the newly proposed changes.

This PRDEIR presents an analysis of a new Alternative 5: Revised Project Alternative, which alters the original proposed project in two key ways:

- Additional New Water Supply Source: Alternative 5 introduces Natomas Central Mutual Water District (NCMWD) as a potential domestic water supply source,

expanding the options for serving future development and potentially enhancing water supply reliability for the project area.

- Revised Circulation Network: Alternative 5 considers the removal of regular vehicular traffic connection on Radio Road between Bryte Bend Road and Garden Highway, and implementation of traffic calming on San Juan Road between Garden Highway and El Centro Road to discourage its use by through traffic. These revisions would be intended to reduce traffic volumes and related safety concerns associated with traffic levels along Garden Highway.

All other aspects of the proposed UWSP would remain unchanged, including land uses, densities, and plans for infrastructure and service delivery.

Scope of Recirculation

The RDEIR focuses chiefly on those environmental issues that would be substantially affected by the changes included in Alternative 5. It presents a description of Alternative 5, refined analyses of water supply and circulation impacts, and new or modified mitigation measures. All other portions of the original August 2024 Draft EIR and the June 2025 Final EIR remain valid and unchanged, except as otherwise revised herein.

Organization of the Document

The structure of this document is designed to highlight new and revised content, as follows:

- Introduction: Context and purpose of the recirculated Draft EIR for the Upper Westside Specific Plan.
- Description of Alternative 5: Detailed presentation of the specific differences between the proposed UWSP and Alternative 5.
- Evaluation of Environmental Issues: Evaluation of potential environmental impacts from implementation of Alternative 5, with emphasis on water supply and circulation modifications.
- Comparative Analysis of Environmental Effects: Side-by-side analysis of the proposed UWSP and Alternative 5.

Public Review and Comment

The RDEIR is being made available for a new 45-day public review and comment period, in accordance with CEQA. Interested parties are encouraged to examine the revised sections—particularly those related to Alternative 5's new water supply source and changes to the circulation network—and to submit their input regarding the

adequacy and thoroughness of the environmental analysis. All substantive comments received during this review will be considered prior to finalizing the EIR and making determinations regarding project approval.

The RDEIR is available for public review and comment as set forth in the Notice of Availability circulated by the County. During the review and comment period, written comments (including email) regarding the Revised Draft EIR may be submitted to the County at the address below.

Julie Newton, Environmental Coordinator
Department of Community Development
Division of Planning and Environmental Review
827 7th Street, Room 225, Sacramento, CA 95814
Email: CEQA@saccounty.gov

The RDEIR, Notice of Availability and other supporting documents, such as technical reports prepared by the County as part of the EIR process, are available for public review at the Division of Planning and Environmental Review at the address listed above.

In addition, electronic versions of these documents are available on the County's website at:

https://planning.saccounty.gov/PlansandProjectsIn-Progress/Pages/UpperWestsideSpecificPlan.aspx

Next Steps

Upon the conclusion of the public review period, all substantive comments will be evaluated and addressed in a Revised Final EIR. As lead agency, the County will then consider certification of the EIR and approval of the proposed UWSP, considering the updated environmental information and public input provided throughout the recirculation process.

2 ALTERNATIVE 5: REVISED PROJECT ALTERNATIVE

DESCRIPTION

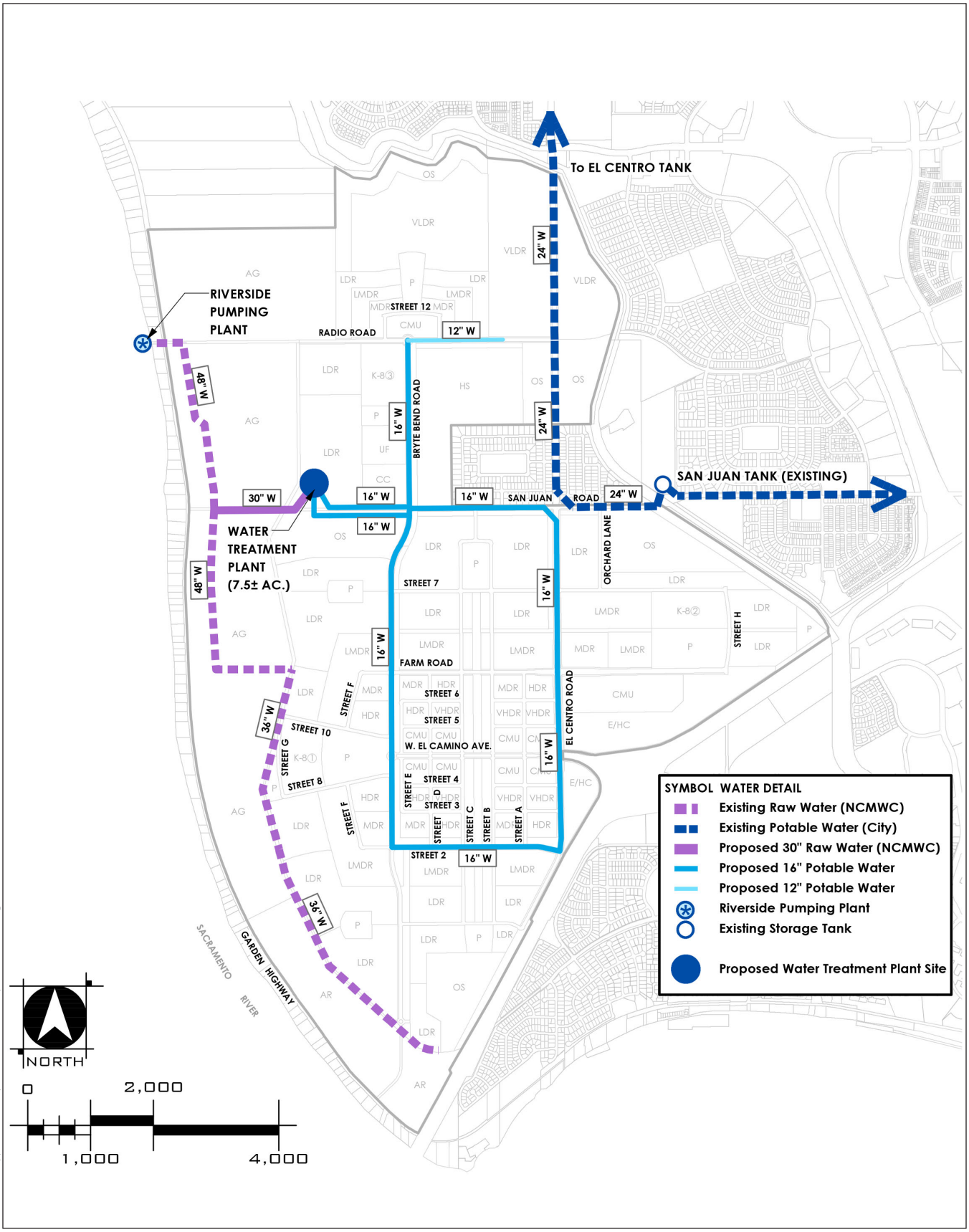
Alternative 5: Revised Project Alternative includes (i) an optional wholesale source for domestic water supply in the event that treated water from the City of Sacramento is not available, and (ii) potential changes to the circulation network intended to reduce traffic flow on Garden Highway. The Revised Project Alternative is identical to the proposed UWSP in all other respects. Land use configuration and densities, provision of infrastructure and public services, and all other characteristics of the proposed UWSP described in Draft EIR Chapter 2, *Project Description*, are the same under Alternative 5.

WATER SUPPLY OPTIONS

The proposed UWSP would be served by the Sacramento County Water Agency (SCWA) with potable water provided through a wholesale agreement with the City of Sacramento. Under Alternative 5, SCWA would instead enter into an agreement for wholesale purchase of raw water from the Natomas Central Mutual Water Company (NCMWC). The configuration and amount of residential and non-residential land uses developed under this alternative would remain the same as the proposed UWSP.

NCMWC sources its surface water supply from the Sacramento River, and NCMWC also has groundwater sources within its service area boundaries. NCMWC, through its Settlement Agreement with the United States Bureau of Reclamation (USBR) can divert and deliver up to 120,200 acre-feet (af) of surface water per year. NCMWC provides water services to 33,223 acres through pipelines, pumps and more than 50 miles of canals.

Under Alternative 5, raw water would be diverted via pumps from the existing NCMWC Riverside Pumping Plant, located on the Sacramento River adjacent to Garden Highway, immediately west of the UWSP area at Radio Road (see **Plate ALT 5-1**). Raw water would be delivered to the UWSP area via an existing 48-inch distribution main that runs along the western border of the development area. The UWSP would connect to this main where it crosses San Juan Road, approximately 600 feet east of Garden Highway, via a new 30-inch main that would extend east along San Juan Road to a proposed water treatment plant (WTP) located in the vicinity of San Juan Road and Bryte Bend Road. Construction of the new 30-inch main would occur within the San Juan Road right-of-way. After treatment and disinfection, potable water would be delivered to future uses in the UWSP area via the planned water distribution system for the UWSP presented in the Water Master Plan and described in Draft EIR Chapter 2, *Project Description*, page 2-45.



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SOURCE: Wood Rodgers, 2025

Upper Westside Specific Plan EIR

Plate ALT 5-1
Alternative 5 Water Plan

ESA

A more detailed description of the new water infrastructure required as part of Alternative 5 is presented below.

Surface Water Treatment Plant

Under Alternative 5, an approximately 7 million gallon per day WTP would be constructed on an approximately 8 acres (subject to subsequent engineering and design) on the north side of San Juan Road within the UWSP area on a parcel designated as Low Density Residential (LDR) as shown in Plate ALT 5-1. Utilities such as the proposed WTP are allowed under the LDR designation.

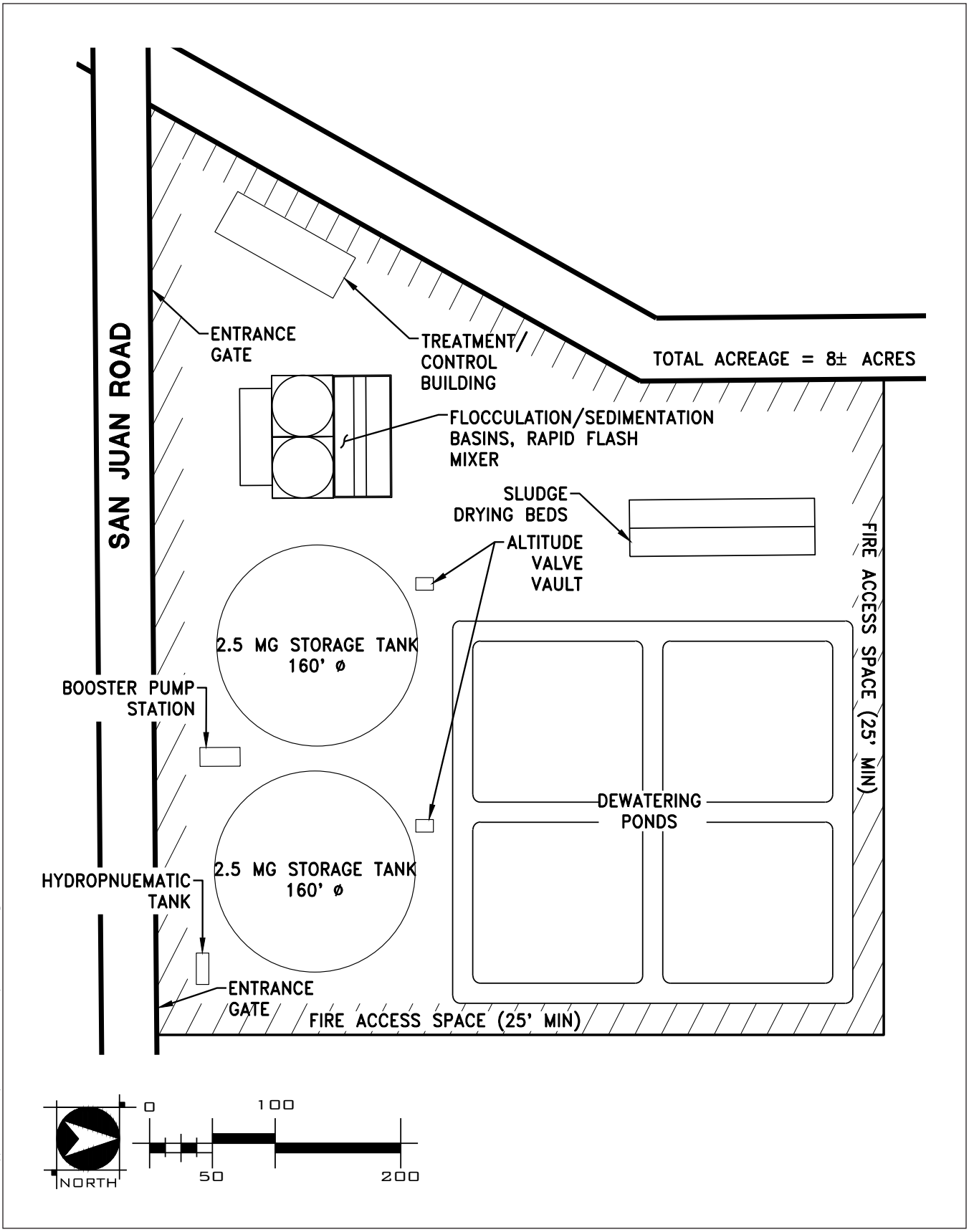
Surface water treatment plants typically consist of grit removal, followed by coagulation, flocculation, sedimentation, filtration and disinfection. In a water treatment facility, grit removal is the first step in the treatment process and reduces the solids loading of processes further downstream. A coagulant is added to the water after the grit basin and it is rapidly mixed, which is referred to as flash mix or rapid mix. This process ensures the coagulant is circulated throughout the water and relies on an injection pump for thorough dispersion. The coagulated water is either filtered directly through a medium filter (such as sand and gravel), a microfiltration or ultrafiltration membrane for higher quality waters, or it can be moved to a settling tank. In a settling tank, or clarifier, the heavy particles settle to the bottom and are removed, and then the water moves on to the filtration step of the treatment process.

It is anticipated that the UWSP WTP would include the following major aspects: raw water conveyance to water treatment plant, grit removal, rapid / flash mix, flocculation, sedimentation, filtration, disinfection, backwash storage and pumps, miscellaneous supporting electrical and site features, and other features deemed necessary to provide treated water to development allowed under the UWSP. System redundancies would be included where customary. Those redundancies would be identified in subsequent design efforts. **Plate ALT 5-2** presents a schematic layout of how the WTP may be configured.

Onsite Water Storage and Booster Pump Station

Under Alternative 5, the WTP site would include five million gallons of treated water storage and a booster pump station based on the factors shown in **Table ALT 5-1** below.

The treated water storage would be divided into two tanks of 2.5 million gallons each for redundancy and maintenance purposes. Redundancy of the booster pump station would be determined during subsequent design steps. Under Alternative 5 the booster pump would be located at or adjacent to the WTP. Proximity to the WTP would allow treated water to be discharged directly into the storage tank where it could then be pumped into the water transmission and distribution system for the UWSP. Placing the storage tank in line with the WTP would promote turnover of the treated water which maintains water quality.



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SOURCE: Wood Rodgers, 2025

Upper Westside Specific Plan EIR

Plate ALT 5-2
Schematic Water Treatment Plant Site Plan

ESA

Table ALT 5-1: Onsite Storage Sizing

Storage Criteria	Factor (gpm)	Storage (MG)
Operational Capacity: 20% of Maximum Day Demand for 24 hours	778	1.12
Fire Flow: 4,500 gpm for 4 hours[1]	4,500	1.08
Emergency: Average Day Demand[2]	1,946	2.80
Total Storage		**5.00**
Source: Wood Rogers October 15, 2025		

Transmission System Layout

The transmission and distribution system for Alternative 5 would remain largely unchanged from those described for the proposed UWSP. However, there would be two additional 16-inch transmission mains conveying water from the WTP to the distribution system. Two 16-inch transmission mains would be proposed to provide adequate capacity while simultaneously providing for redundancies that enhance reliability. The additional 16-inch transmission mains would convey potable water from the WTP to the transmission and distribution mains at the intersection of San Juan Road and Bryte Bend Road.

Circulation Options

Under Alternative 5 the UWSP circulation system would be revised to:

(1) Remove the Radio Road vehicular connection between the UWSP area and Garden Highway (other than continued access for emergency response)[3]; and

(2) Implement traffic calming on San Juan Road between Garden Highway and El Centro Road to discourage its use by through traffic.[4]

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[1] While SCWA fire flow is 3,000 gpm for 3 hours, the UWSP area is served by the Natomas Fire Protection District which contracts to the City of Sacramento for fire service. Therefore, the City's higher fire flow requirement is utilized.

[2] SCWA criteria is one third of average day demand based on the assumption that groundwater pumping is available. Since the water plan does not propose to utilize groundwater, it utilizes a more conservative demand of full average day demand.

[3] Radio Road would be a paved Emergency Vehicle Access (EVA) roadway with bike/pedestrian access. Bollards or a crash gate would be utilized to control access.

[4] Specific traffic calming measures would be determined when tentative maps are prepared. Traffic calming measures that could be implemented include vertical deflections such as speed bumps and raised intersections, horizontal shifts such as traffic circles, and roadway narrowing using bulb outs and chokers,

These revisions to the roadway network are depicted on **Plate ALT 5-3**. All other characteristics of the roadway network and plans for mobility within the UWSP area would remain as described in Draft EIR Chapter 2, *Project Description*, pages 2-39 through 2-43.

Evaluations of Environmental Issues

As described above, under Alternative 5 all characteristics of the proposed UWSP would remain unchanged except for the identification of a new source of water and minor modifications to the circulation network. As such, the analyses in the Draft EIR apply to this Alternative 5, with the exception of the following potential impacts:

- Aquatic Biological Resources: The potential effects of diverting water from the Sacramento River at the Riverside Pumping Plant on aquatic habitat and species that may be present in the river;
- Transportation: The potential effects of restricted traffic flows on Radio Road and San Juan Road that could occur under Alternative 5; and
- Utilities (water supply infrastructure and water supply): The potential effects of the UWSP on NCMWC and its water sources.

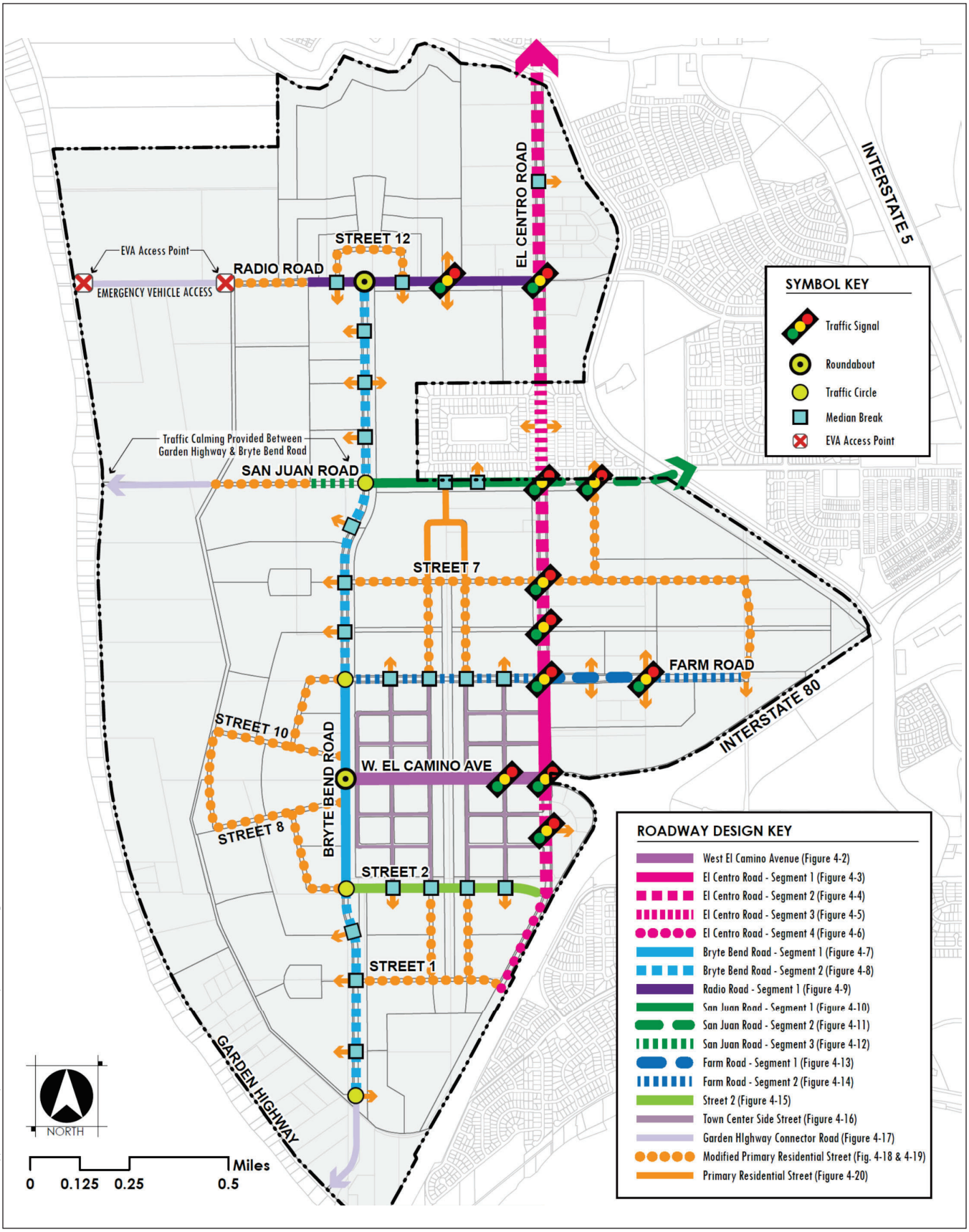
Aquatic Biological Resources

Introduction

The following discussion addresses the potential aquatic biological resource impacts associated with delivery of raw water from NCMWC to the UWSP as provided for under Alternative 5. The source of NCMWC's surface water supply would come from the Sacramento River at NCMWC's Riverside Pumping Plant. Water supply in excess of the existing water demand for agricultural purposes that is currently diverted at the Riverside Pumping Plant would be delivered for municipal uses for the UWSP. This change in the use of diverted water at the Riverside Pumping Plant would lead to an increase in annual diversions and a change in seasonality of diversions compared to existing conditions.

The terrestrial biological resources that could be affected by the proposed UWSP were addressed in Draft EIR Chapter 7, *Biological Resources*. The effects analysis herein evaluates the impact of changes in the operation of the Riverside Pumping Plant to special-status fish species in the Sacramento River in the vicinity of or adjacent to the plant, including an evaluation of direct effects (entrainment) and indirect effects (habitat changes due to reduced flows).

The analysis below is comprised of an Environmental Setting that includes descriptions of existing conditions relevant to aquatic biological resources. The Regulatory Setting presents existing regulations, plans, and policies relevant to aquatic biological resources



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SOURCE: Wood Rodgers, 2025

Upper Westside Specific Plan EIR

Plate ALT 5-3
Alternative 5 Conceptual Roadway Plan

ESA

associated with implementation of Alternative 5. Finally, the Impact discussion presents thresholds of significance and evaluates potential impacts on aquatic biological resources that could result from implementation of Alternative 5.

A review of pertinent literature and database queries were conducted for the UWSP area and surrounding area. The sources of reference data reviewed for this evaluation include the following:

- Sacramento County 2030 General Plan (2011);
- CDFW California Natural Diversity Database (CNDDB) List of Regionally Occurring Special-Status Species (CDFW 2025); and
- U.S. Fish and Wildlife Service (USFWS) List of Federally Threatened and Endangered Species that May Occur in the Project Location (USFWS 2023).

Environmental Setting

A general description of the Sacramento River in the vicinity of the Riverside Pumping Plant, along with fisheries resources in the river is presented below.

Sacramento River and Delta

The Sacramento River is the largest river system in California. It originates near the slopes of Mount Shasta in northern California and flows southward to Suisun Bay in the Delta in central California. The lower Sacramento River is defined as the reach south of the Sacramento and Yolo Bypass, near the American River confluence downstream through to the City of Freeport. The lower Sacramento River is highly channelized and leveed and bordered by agricultural lands. Aquatic habitat in the lower Sacramento River is characterized by slow-water glides and pools, and has reduced water clarity and habitat diversity, compared to the upper Sacramento River. The Sacramento River is a major migration corridor that supports numerous anadromous fish species including green sturgeon, Chinook salmon, and steelhead.

The Delta lies at the confluence of the Sacramento and San Joaquin Rivers and is one of the largest estuaries in the United States. The Delta boundary extends north along the Sacramento River terminating just south of the American River, south along the San Joaquin River terminating just north of the Stanislaus River, east to the City of Stockton, and west to Suisun Bay. Runoff from Central Valley streams accounts for approximately 95 percent of Delta inflows. The Riverside Pumping Plant, a potential raw water source for the proposed USWP under Alternative 5, is located approximately six river miles upstream of the Delta boundary.

Special-Status Species

Special-status species relevant to the UWSP area are discussed and presented in Draft EIR, Chapter 7, *Biological Resources*, pages 7-10 through 7-27, including Table BR-2, *Special-Status and NBHCP and MAP HCP Covered Species Evaluated for Potential Occurrence in the UWSP Area*. The following discussion addresses aquatic special-status species that may be present in the vicinity of the Riverside Pumping Plant.

Special-status species are regulated under the federal Endangered Species Act (FESA) and California Endangered Species Act (CESA) or other regulations or are species that are considered sufficiently rare by the scientific community to qualify for such listing. These species are classified in the following categories:

- Species listed or proposed for listing as threatened or endangered under the FESA (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species])
- Species that are candidates for possible future listing as threatened or endangered under the FESA (61 FR 40, February 28, 1996)
- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (California Code of Regulations, Title 14, Section 670.5)
- Animal species of special concern to CDFW
- Species that meet the definitions of rare and endangered under CEQA; a plant or animal species may be treated as "rare or endangered" even if not on one of the official lists (CEQA Guidelines, Section 15380)

A list of special-status fish species that have the potential to occur in the vicinity of Riverside Pumping Plant was compiled based on data contained in the CNDDB (CDFW 2025); the USFWS List of Threatened and Endangered Species that May Occur in your Proposed Project Location or May Be Affected by Your Proposed Project (USFWS 2025); and the National ESA Critical Habitat Mapper (NMFS 2025). **Table ALT 5-2** provides a list of special-status fish species, their general habitat requirements, and an assessment of their potential to occur in the vicinity of the Riverside Pumping Plant.

The "Potential to Occur" categories are defined as follows:

- **None:** A species is determined to have no potential to occur if (1) its specific habitat requirements are not present; **AND/OR** (2) it is outside the range or presumed to be extirpated from the area or region; **AND/OR** (3) a survey has been conducted according to agency protocol and the species was not found.
- **Low**: A species is determined to have a low potential to occur if (1) its known current distribution or range is outside of but near the study area; **AND/OR** (2) only limited or marginally suitable habitat is present.
- **Moderate**: A species is determined to have a moderate potential to occur if (1) habitat is present in the study area or immediately adjacent areas; **AND** (2) the study area is in the known range of the species, even if the species was not observed during general biological surveys.
- **High:** A species is determined to have a high potential to occur or be present if (1) habitat is present in the study area or immediately adjacent areas; **AND** (2) the study area is in the known range of the species; **AND/OR** (3) there are recent and reliable records of the species on or near the site.

Table ALT 5-2: Special-Status Species with the Potential to be Affected by Changes in Water Supply

Scientific Name	Common Name	Listing Status: Federal/ State/Other	Habitat Description	Potential for Occurrence within the Vicinity of the Riverside Pumping Plant
FISH				
Acipenser medirotris pop. 1	Green sturgeon – southern DPS	FT/SSC/--	Spawning occurs primarily in cool (11-15 C) sections of mainstem rivers in deep pools (8-9 meters) with substrate containing small to medium-sized sand, gravel, cobble, or boulder.	High. Green sturgeon could occur in the vicinity of the Riverside Pumping Plant year-round. Spawning occurs in the upper portions of the Sacramento River and sturgeon use the lower river, adjacent to the Project, as a migration corridor.
Acipenser transmontanus	White sturgeon	--/SC/--	Spawning occurs primarily in cool (11-15 C) sections of mainstem rivers in deep pools (8-9 meters) with substrate containing small to medium-sized sand, gravel, cobble, or boulder. Primarily reside in the San Francisco Estuary.	High. Adult white sturgeon could occur in the vicinity of the Riverside Pumping Plant during upstream migration to spawning areas on the Sacramento River. Juveniles could also occur while rearing and during their outmigration in the Project area on way to the the Delta.
Spirinchus thaleichthys	Longfin smelt	FP/ST/--	Euryhaline, nektonic & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15–30 parts per thousand but can be found in completely freshwater to almost pure seawater.	Low. While historically longfin smelt have been found as far north as Colusa, CA, the species has been experiencing rapid decline. Today, longfin smelt are known to spawn in the lower Sacramento River near or downstream of Rio Vista and are not expected to be in the Project area.
Hypomesus transpacificus	Delta smelt	FT/SE/--	Occurs in open surface waters in the Sacramento/San Joaquin Delta. Occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Found in Delta estuaries with dense aquatic vegetation and low occurrence of predators. May be affected by downstream sedimentation.	Low. While historically delta smelt have been found as far north as the Feather River, the species has been experiencing rapid decline. Recently their distribution is restricted to Suisun Bay and the north, east, and west Delta and their presence is unlikely upstream of the Delta boundary. Critical habitat for delta smelt extends upstream in the Sacramento River to just below the American River confluence, downstream of the Project area.

Scientific Name	Common Name	Listing Status: Federal/ State/Other	Habitat Description	Potential for Occurrence within the Vicinity of the Riverside Pumping Plant
Oncorhynchus mykiss irideus pop. 11	Steelhead – Central Valley DPS	FT/--/--	This DPS enters the Sacramento and San Joaquin rivers and their tributaries from July to May; spawning from December to April. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.	High. Primarily present during in-migration (adults) and out-migration (juveniles) periods. Spawning occurs on the upper Sacramento River. Upstream migrating adults and outmigrating juveniles would be expected to be present seasonally in the Project area,
Oncorhynchus tshawytscha pop. 7	Chinook salmon – Sacramento River winter-run ESU	FE/SE/--	Anadromous species using riverine, estuarine, and saltwater habitat. Adult migration potentially occurs from January through May. Juvenile outmigration occurs from November through mid-March.	**High.** Primarily present during in-migration (adults) and out-migration (juveniles) periods. Spawning occurs in the upper reaches of the Sacramento River. Upstream migrating adults and outmigrating juveniles would be expected to be present seasonally in the Project area
Oncorhynchus tshawytscha pop. 11	Chinook salmon – Central Valley spring-run ESU	FT/ST/--	Anadromous species using riverine, estuarine, and saltwater habitat. Adult migration potentially occurs from March through May. Juvenile outmigration occurs from November through April.	**High.** Primarily present during in-migration (adults) and out-migration (juveniles) periods. Spawning occurs in tributaries of the upper Sacramento River. Upstream migrating adults and outmigrating juveniles would be expected to be present seasonally in the Project area
Oncorhynchus tshawytscha pop. 13	Chinook salmon – Central Valley fall-/late fall-run ESU	SC/SSC/--	Anadromous species using riverine, estuarine, and saltwater habitat. Adult migration potentially occurs from June through December. Juvenile outmigration occurs from March through July.	**High.** Primarily present during in-migration (adults) and out-migration (juveniles) periods. Spawning occurs in the Upper Sacramento River. Upstream migrating adults and outmigrating juveniles would be expected to be present seasonally in the Project area
Lampetra tridentata	Pacific lamprey	SC/SSC/--	Adults need clean, gravelly riffles in permanent streams to spawn successfully. Ammocoetes live in silty backwaters and eddies with muddy or sandy substrate into which they burrow.	**Moderate.** Can occur in lower Sacramento, and San Joaquin rivers, including the Delta and is expected to be present in the Sacramento River in the Project area.

Scientific Name	Common Name	Listing Status: Federal/ State/Other	Habitat Description	Potential for Occurrence within the Vicinity of the Riverside Pumping Plant
Lampetra ayresii	River lamprey	--/SSC/--	Adults need clean, gravelly riffles in permanent streams to spawn successfully. Ammocoetes live in silty backwaters and eddies with muddy or sandy substrate into which they burrow.	**Low.** Can occur in lower American, lower Sacramento, and San Joaquin rivers, including the Delta, but are rarely captured in the Sacramento River in the Project area.
Pogonichthys macrolepidotus	Sacramento splittail	--/SSC/--	Splittail spawn in shallow water over flooded vegetated habitat with a detectable water flow. Splittail larvae and juveniles remain in riparian or annual vegetation along shallow edges on floodplains.	**Moderate.** Historically, Sacramento splittail were found as far north as Redding, CA but they are now largely confined to the Delta, Suisun Bay, Suisun Marsh, and the Napa and Petaluma rivers. Both adults and juveniles occur in the Sacramento River in the Project area.
Lavinia symmetricus spp.	Sacramento hitch	--/SSC/--	Sacramento hitch inhabit warm lowland waters including clear streams, turbid sloughs, lakes, and reservoirs.	**Low.** In the Sacramento River, hitch appear to be spread across much of their native range including the Delta, but are rarely captured in the Sacramento River in the Project area.
Archoplites interruptus	Sacramento perch	--/SSC/--	Historically found in the sloughs, slow moving rivers, and lakes of the Central Valley. Prefer warm water. Aquatic vegetation is essential for young.	**None.** Extirpated from native range.
Mylopharodon conocephalus	Hardhead	--/SSC/--	Hardhead are often found at low to mid elevations in relatively undisturbed habitats of larger streams with high water quality (clear, cool).	**Moderate.** In the Sacramento River, they are common and may be present in the Delta and is expected to be present in the Sacramento River in the Project area.
Lavinia exilicauda exilicauda	Central California roach	--/SSC/--	Occurs in small, warm tributaries to larger streams that flow through open foothill woodlands of oak and foothill pine. Located in the foothills in much of the same region that contains the pikeminnow-hardhead-sucker assemblage.	**Moderate.** Occurs upstream of large reservoirs or in tributary streams and is expected to be present in the Sacramento River in the Project area.
KEY: DPS = distinct population segment; ESU = evolutionarily significant unit				

Scientific Name	Common Name	Listing Status: Federal/ State/Other	Habitat Description	Potential for Occurrence within the Vicinity of the Riverside Pumping Plant
Federal: (NMFS, USFWS) FE = Listed as Endangered by the Federal Government FT = Listed as Threatened by the Federal Government FP = Proposed for listing by the Federal Government SC = Species of Concern SOURCES: CDFW, 2025; NMFS, 2025; and USFWS, 2025.			State: (CDFW) SE = Listed as Endangered by the State of California ST = Listed as Threatened by the State of California SC = Candidate for listing by the State of California SSC = California Species of Special Concern	

Conclusions regarding habitat suitability and species occurrence are based on the analysis of existing literature and databases described previously and known habitats occurring within the vicinity of the Riverside Pumping Plant and regionally. Six special-status species have high potential to occur, and one special-status species has moderate potential to occur in the vicinity of the Riverside Pumping Plant. Eight species have low or no potential to occur in the vicinity of the Riverside Pumping Plant. Only species classified as having a moderate or high potential for occurrence were considered in the impact analysis.

SPECIAL-STATUS FISH

GREEN STURGEON

The southern distinct population segment (DPS) of green sturgeon is found in North America, from Ensenada, Mexico to Southeast Alaska. Green sturgeon was classified as a Class 1 Species of Special Concern by CDFW in 1995 (Moyle et al., 1995). Class 1 Species of Special Concern are those that conform to State definitions of threatened or endangered and could qualify for addition to the official list. On April 7, 2006, National Marine Fisheries Service (NMFS) determined that the southern DPS of green sturgeon was threatened under the federal ESA (NMFS, 2006b). On October 9, 2009, NMFS designated critical habitat for the green sturgeon southern DPS throughout most of its occupied range (NMFS, 2009), including the Sacramento and American rivers.

Green sturgeon are widely distributed in the Delta and estuary areas. Historical and recent information confirms that green sturgeon occur in the Sacramento River and a few of its tributary (Feather, Yuba, and Bear) rivers. Historic and present records indicate that spawning of green sturgeon is limited exclusively to the Sacramento River watershed (NMFS, 2018). Adults typically migrate upstream into rivers between late February and late July. Spawning occurs from March to July, with peak spawning from mid-April to mid-June. Green sturgeon are believed to spawn every three to five years, although recent evidence indicates that spawning may be as frequent as every two years (NMFS, 2005c). Adult green sturgeon broadcast their eggs in deep, fast water over large cobble substrate, where the eggs settle into the interstitial spaces (Moyle, 2002). Larvae hatch from eggs between six to eight days after spawning if temperature conditions are optimal. Larvae and young-of-the-year (YOY) use riverine areas to forage and rear until they gain the ability to tolerate higher salinity concentrations.

Juvenile green sturgeon are known to live in freshwater for up to three years using riverine, subtidal, and intertidal habitats in the lower Sacramento River and Delta (Radtke, 1966; Klimley et al., 2015). Post-spawn fish behavior varies between holding for several months in the Sacramento River then out-migrating in the fall or winter or moving out of the river quickly during the spring or summer months (Heublein et al., 2009). Post-spawn outmigration through the Delta Estuary is also variable with some adults traveling to the Pacific Ocean in 2 to 10 days and others remaining in the estuary for months. Juvenile and adult green sturgeon can be present within the vicinity of the Riverside Pumping Plant year-round.

WHITE STURGEON

As with green sturgeon, white sturgeon are found from Ensenada, Mexico to Southeast Alaska. The San Francisco Estuary population of white sturgeon – the only reproducing population of white sturgeon in California – was previously classified as a Species of Special Concern by CDFW. On July 12, 2024, CDFW approved white sturgeon as a candidate species for listing as threatened under CESA. Candidate species for listing under CESA are granted full protections during the review process. Presently, there is no federal ESA listing for white sturgeon.

White sturgeon primarily inhabit estuaries of large river systems, migrating to fresh water to spawn. Spawning success has been hindered by the construction of dams, such as Shasta Dam on the Sacramento River and Oroville Dam on the Feather River. Spawning in the California Central Valley is now limited to the Sacramento River between Knights Landing and Colusa (Moyle, 2002; Moyle et al., 2015) with observations of periodic spawning occurring in the Feather and San Joaquin rivers (Beamesderfer et al., 2004; Jackson et al., 2015). Prior to spawning, white sturgeon move into the lower reaches of rivers during the winter and migrate upstream to spawning areas between December and early June (Moyle et al., 2015). Like green sturgeon, white sturgeon broadcast their eggs in deep, fast water over large cobble substrate, where the eggs settle into the interstitial spaces (Moyle, 2002). Larvae hatch from eggs between 4-12 days after spawning if temperature conditions are optimal (Wang, 1986). Larvae and YOY use riverine areas to forage and rear until they gain the ability to tolerate higher salinity concentrations (McCabe and Tracy, 1994). Recruitment success of juvenile white sturgeon is correlated with high spring flows and Delta outflow. High spring flows during juvenile rearing (i.e., between April and July) assist in moving larval sturgeon downstream into suitable rearing habitat quicker than years with low spring flows (Stevens and Miller, 1970).

White sturgeon typically inhabit deep water over soft bottom substrates, feeding on or near the bottom (Moyle, 2002). White sturgeon remain in the San Francisco Estuary throughout most of their life (Klimley et al., 2015), but more evidence is showing that white sturgeon may move into marine environments as well (Sellheim et al., 2022; Scott and Crossman, 1973). Adult and juvenile white sturgeon primarily occur in the San Francisco Estuary but can be present in the vicinity of the Riverside Pumping Plant during upstream migration as adults and downstream migration as rearing juveniles.

CENTRAL VALLEY STEELHEAD

Central Valley steelhead was federally listed as threatened on March 19, 1998 (NMFS, 1998b). The threatened status of Central Valley steelhead was reaffirmed in NMFS's final listing determination on January 5, 2006 (NMFS, 2006a). Critical habitat for Central Valley steelhead was designated by NMFS on September 2, 2005 (NMFS, 2005b) and includes the entire Sacramento River upstream to Keswick Dam and the lower American river to Folsom Dam.

Steelhead have highly variable and complex life history patterns but are broadly categorized into winter and summer reproductive ecotypes. Winter-run steelhead are the most widespread reproductive ecotype and the only type currently present in Central

Valley streams (McEwan, 2001). Winter steelhead become sexually mature in the ocean and enter fresh water from August through April, typically spawning from December through April (NMFS, 2014). Individual steelhead may spawn more than once, returning to the ocean between each spawning migration.

Juvenile steelhead typically rear one to two years in fresh water before migrating to the ocean as smolts. Juvenile migration to the ocean generally occurs from December through August, with peak outmigration from January to May (McEwan, 2001). However, some juveniles may stay and mature in fresh water without migrating to the ocean (i.e., resident rainbow trout). Resident rainbow trout can shift back to anadromy if conditions are appropriate. Juvenile steelhead tend to use bank habitat more frequently than the main channel, because bank habitat provides increased protection, shade, and food.

Central Valley steelhead occur in the vicinity of the Riverside Pumping Plant as adults migrating upstream to their spawning habitat, or as juveniles rearing and migrating toward the ocean.

SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON ESU

The Sacramento River winter-run Chinook salmon evolutionarily significant unit (ESU) was listed as threatened under FESA on August 4, 1989 (NMFS, 1989). NMFS subsequently upgraded the federal listing to endangered on January 4, 1994 (NMFS, 1994). NMFS designated critical habitat for Sacramento River winter-run Chinook salmon on June 16, 1993 (NMFS, 1993) and includes the entire Sacramento River upstream to Keswick Dam.

Winter-run Chinook salmon spend one to three years in the ocean. Adult winter-run Chinook salmon leave the ocean and migrate through the Delta into the Sacramento River from December through July with peak migration in March. Adults spawn from mid-April through August (Moyle, 2002). Egg incubation continues through October. Downstream movement of juvenile winter-run Chinook salmon begins in August, soon after fry emerge.

Historically, winter-run Chinook salmon occupied and spawned in the upper reaches of the Sacramento River including Little Sacramento, McCloud, and Pit rivers and Battle Creek (Moyle et al., 1989; Lindley et al., 2007). After construction of the Shasta and Keswick dams, those habitats became unavailable due to the impassable dams and hydroelectric operations. Currently, winter-run Chinook salmon is known to occur only in the mainstem of the Sacramento River, with spawning occurring between Keswick Dam near Redding and Red Bluff Diversion Dam (Lindley et al., 2007; NMFS, 2016). The Sacramento River is the main migration route through the Delta. However, juveniles occasionally may stray into the central Delta and lower San Joaquin River system during outmigration because of entrainment into diversion channels.

Winter-run Chinook salmon adults have the potential to occur in the vicinity of the Riverside Pumping Plant during their upstream migration to spawn in the Sacramento

River near Redding. Juveniles have the potential to occur in the vicinity of the Riverside Pumping Plant during their downstream migration through the Sacramento River.

CENTRAL VALLEY SPRING-RUN CHINOOK SALMON ESU

The Central Valley spring-run Chinook salmon ESU was federally listed as threatened on September 16, 1999 (NMFS, 1999). Their threatened status was reaffirmed in NMFS's final listing determination issued on June 28, 2005 (NMFS, 2005a). Critical habitat for Central Valley spring-run Chinook salmon was designated by NMFS on September 2, 2005 (NMFS, 2005b) and includes the entire Sacramento River upstream to Keswick Dam.

Historically, spring-run Chinook salmon occupied the upstream reaches of all major river systems in the Central Valley where no natural barriers existed. By the 1950s, however, populations in the San Joaquin River had been extirpated (Yoshiyama et al., 1998). Loss of access and holding areas due to the construction of dams was a major contributing factor. Similarly, abundance of spring-run in the Sacramento River has been in decline, with only remnant runs occurring in Butte, Mill, and Deer creeks of the upper Sacramento River (Williams et al., 2016).

Adult spring-run Chinook salmon begin their upstream migration in March, with peak upstream migration occurring from May through June, and ending in September. Spring-run Chinook salmon are sexually immature during upstream migration, and adults hold in deep, cold pools near spawning habitat until spawning commences in late summer and fall. Spring-run Chinook salmon spawn in the upper reaches of the mainstem Sacramento River and tributary streams (USFWS, 2001). Spawning typically begins in late August and may continue through October. Juveniles emerge in November and December in most locations but may emerge later when water temperature is cooler. Newly emerged fry remain in shallow, low-velocity edgewater (CDFG, 1998).

A small portion of an annual year-class of juvenile spring-run Chinook salmon may emigrate as post-emergent fry (less than 1.8 inches long) and reside in the Delta undergoing smoltification. However, most are believed to rear in the upper river and tributaries during winter and spring, emigrating as juveniles (more than 1.8 inches long). Rearing takes place in their natal streams, the mainstem of the Sacramento River, inundated floodplains (including the Sutter and Yolo bypasses), and the Delta. Downstream migration of yearlings typically coincides with the onset of the winter storm season, and migration may continue through March (CDFG, 1998).

Spring-run Chinook salmon adults have the potential to occur in the vicinity of the Riverside Pumping Plant during their upstream migration to spawn in tributaries of the Sacramento River. Juveniles have the potential to occur in the vicinity of the Riverside Pumping Plant during their downstream migration from tributaries and through the Sacramento River.

CENTRAL VALLEY FALL-/LATE FALL-RUN CHINOOK SALMON ESU

Central Valley fall-/late fall–run Chinook salmon ESU are currently the most abundant and widespread salmon runs in California (Mills et al., 1997). This species is not listed under the FESA. On March 9, 1998, NMFS issued a proposed rule to list fall-run Chinook salmon as threatened (NMFS, 1998a). However, on September 16, 1999, NMFS determined that the species did not warrant listing (NMFS, 1999). On April 15, 2004, NMFS classified Central Valley fall-/late fall–run Chinook salmon as a species of concern (NMFS, 2004). However, Essential Fish Habitat (EFH) is designated for this species. EFH is defined as those waters and substrate necessary for spawning, breeding, feeding, or growth to maturity. EFH includes currently and historically accessible habitat. This species is also designated as a California Species of Concern by CDFW.

Adult fall-run Chinook salmon migrate into the Sacramento River and its tributaries from June through December in mature condition and spawn from late September through December, soon after arriving at their spawning grounds (Yoshiyama et al., 1998). The spawning peak occurs in October and November. Emergence occurs from December through March, and juveniles migrate downstream to the ocean soon after emerging, rearing in fresh water for only a few months. Smolt outmigration typically occurs from March through July (Yoshiyama et al., 1998).

Late fall–run Chinook salmon migrate upstream before they are sexually mature and hold near spawning grounds for one to three months before spawning. Upstream migration takes place from October through April and spawning occurs from late January through April, with peak spawning in February and March (Yoshiyama et al., 1998). Fry emerge from April through June. Juvenile late fall–run Chinook salmon rear in their natal streams during the summer, and they remain in some streams throughout the year. Smolt outmigration can occur from November through May (Yoshiyama et al., 1998).

Fall-/late fall-run Chinook salmon adults have the potential to occur in the vicinity of the Riverside Pumping Plant during their upstream migration to spawn in tributaries of the Sacramento River. Juveniles have the potential to occur in the vicinity of the Riverside Pumping Plant during their downstream migration through the Sacramento River.

PACIFIC LAMPREY

The Pacific lamprey is a relatively large anadromous and parasitic fish that reaches more than 80 centimeters in length (Goodman and Reid 2012). Adult Pacific lampreys enter fresh water and reside there for a few months to a few years before spawning, although spawning generally occurs in the spring after migration into fresh water, often in low-gradient stream reaches, in gravel, and at the tailouts of pools and riffles (Goodman and Reid 2012).

Pacific lampreys were historically widespread along the West Coast of the United States; because they overlap with several FESA-listed salmonids, they may be vulnerable to many of the same threats (Goodman and Reid 2012). In particular, they appear to be declining in numbers because of the reduced quantity and quality of spawning and rearing habitats; passage issues associated with hydropower and

irrigation diversion such as obstruction, entrainment, and mortality; a propensity for high predation risks; and a vulnerability to contaminants based on their life history (Goodman and Reid 2012). Pacific lamprey are designated as a Species of Special Concern in California and a Species of Concern by the USFWS due to their declining populations and restricted distribution (Moyle et al. 2015).

Pacific Lamprey have the potential to occur in the waters in the vicinity of the Riverside Pumping Plant as migrating adults or rearing juveniles.

SACRAMENTO SPLITTAIL

Sacramento splittail are not listed under the CESA or FESA but are considered a California Species of Special Concern. Sacramento splittail are a relatively large, long-lived cyprinid, endemic to the sloughs, lakes, and rivers of the Central Valley (Moyle, 2002) and most typically is found in tidally influenced freshwater and estuarine habitats (e.g., the Delta and Suisun Bay) with salinities as high as 10 to 18 ppt (Moyle et al., 2004). Nonbreeding splittail can survive wide fluctuations in temperature and low dissolved oxygen levels (less than 1 milligram of oxygen per liter), allowing them to live in slow-moving sections of rivers and sloughs (Moyle et al., 2004). Adults begin a gradual upstream migration toward spawning areas sometime between late November and late January. The migration is associated with flow events from February through April that inundate floodplains and riparian areas used for spawning and rearing (Moyle et al., 2004). Spawning is associated with conditions such as changing water levels, lower water temperatures, and increasing length of day (Moyle et al., 2004).

In the Sacramento River basin, the most important spawning areas appear to be the Yolo and Sutter Bypasses, which are extensively flooded during wet years. In the San Joaquin drainage, spawning apparently takes place in wet years where the San Joaquin River is joined by the Tuolumne and Merced rivers (Moyle et al., 2004). There are two genetically distinct populations of Sacramento splittail in the greater Estuary; a Napa and Petaluma rivers population and a Central Valley population (Baerwald et al., 2007). It is thought that current data is biased toward the Central Valley population, which consists of individuals from the Cosumnes, Sacramento, and San Joaquin rivers and their tributaries. Threats to Sacramento splittail include habitat loss and degradation, loss of access to seasonally inundated floodplains, introduction of nonnative species, entrainment in the CVP and SWP water export facilities, and harvest by recreational anglers.

HARDHEAD

The hardhead is not listed under the FESA or CESA but is considered a California Species of Special Concern. Hardhead is a native species that is widely distributed in low- to mid-elevation streams in the Sacramento and San Joaquin drainages. Although hardhead is still common, populations are generally in decline, similar to other California native species (Moyle 2002). The cause of this decline appears to be habitat loss and predation by non-native fishes (Moyle 2002).

Hardhead have the potential to occur in the waters in the vicinity of the Riverside Pumping Plant as adults or rearing juveniles.

CENTRAL CALIFORNIA ROACH

The Central California Roach is not listed under the FESA or CESA but is considered a California Species of Special Concern. Central California roach are small, stout-bodied minnows (cyprinids) that are found in tributaries to the Sacramento and San Joaquin rivers and tributaries to San Francisco Bay (Moyle 2002). Although roach are primarily benthic feeders, Moyle (2002) observed roach feeding in the Tuolumne River in swift current on drift organisms, including terrestrial insects. Juvenile roach consume large quantities of crustaceans and small chironomid midge larvae, while adult roach are more opportunistic feeders, feeding both off the substrate and from drifting insects in the water column (Moyle 2002). Roach spawn in large groups over coarse substrates where each female repeatedly deposits eggs, a few at a time, into the interstices between rocks which are immediately fertilized by one or more attendant males (Moyle 2002).

Roach are most abundant in mid-elevation streams in the Sierra Nevada foothills and in lower reaches of some San Francisco Bay streams but they may also be found in the main channels of some rivers (Moyle 2002). Although Central California Roach is still common, populations are generally in decline, similar to other California native species (Moyle 2002). The cause of this decline appears to be habitat loss and predation by non-native fishes (Moyle 2002).

Central California Roach have the potential to occur in the waters in the vicinity of the Riverside Pumping Plant as adults or rearing juveniles.

CRITICAL HABITAT

Draft EIR, Chapter 7, *Biological Resources*, discusses critical habitat as defined in Section 3(5)A of the FESA as a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. While no critical habitat was identified that is relevant to the UWSP area, there are four designated critical habitats present in the vicinity of the Riverside Pumping Plant, and are described below.

NORTH AMERICAN GREEN STURGEON CRITICAL HABITAT

Designated critical habitat for the southern DPS of green sturgeon includes the Sacramento River, the Delta, and Suisun, San Pablo, and all of San Francisco Bay (NMFS, 2009).

SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON CRITICAL HABITAT

Designated critical habitat for winter-run Chinook salmon includes the Sacramento River from Keswick Dam, Shasta County (River mile 302) to Chipps Island (River mile 0) at the westward margin of the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge (NMFS, 1993).

CENTRAL VALLEY SPRING-RUN CHINOOK SALMON CRITICAL HABITAT

Designated critical habitat for spring-run Chinook salmon includes all river reaches accessible in the Sacramento River and its tributaries in California, all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge (NMFS, 2005b).

CENTRAL VALLEY STEELHEAD CRITICAL HABITAT

Designated critical habitat for Central Valley steelhead includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high-waterline or bank-full elevation in the Sacramento and San Joaquin rivers, their tributaries, and the Delta (NMFS, 2005b).

REGULATORY SETTING

FEDERAL

Draft EIR Chapter 7, *Biological Resources*, pages 7-28 to 7-29, includes federal regulations that address the protection of biological resources, including aquatic biological resources, including the Federal Endangered Species Act, the Migratory Bird Treaty Act, and the Clean Water Act. In addition, the following laws and regulatory instruments are relevant to the protection of aquatic biological resources in the vicinity of the Riverside Pumping Plant.

BIOLOGICAL OPINIONS ON THE COORDINATED LONG-TERM OPERATION OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT

On August 2, 2016, Reclamation, the lead federal agency, and the California Department of Water Resources (DWR), the applicant, jointly requested the reinitiation of FESA consultation on the coordinated long-term operation of the CVP and SWP. The USFWS accepted the re-initiation request on August 3, 2016, and NMFS accepted the re-initiation request on August 2, 2019. On January 31, 2019, Reclamation transmitted their Biological Assessment to USFWS and NMFS. Both USFWS and NMFS finalized their biological opinions on the coordinated long-term operation of the CVP/SWP on October 21, 2019.

In February 2019, state agencies announced that they would for the first time pursue a separate state Incidental Take Permit (ITP) to ensure the SWP's compliance with the CESA. In November 2019, DWR issued a draft document prepared under CEQA that identified potential operational changes to protect species and manage the SWP based on real-time conditions in the Delta ecosystem, including additional flows dedicated to the environment. After a public comment period, DWR developed an application for an ITP and submitted the application to CDFW in December 2019. DWR certified its final environmental document on March 27 and CDFW issued the ITP on March 31, 2020.

In fall 2021, Reclamation and DWR collaborated with the USFWS, NMFS, and CDFW to develop revised operating rules for the CVP and SWP (the proposed action) and

evaluate how the anticipated modifications may cause effects to ESA-listed species and/or designated critical habitat not analyzed in the 2019 biological opinions. The updated rules align operations for the Sacramento-San Joaquin River Delta and present a drought-resilient framework for operating Delta facilities and Shasta Reservoir that will provide more certainty for water users and fish and wildlife. The plan also includes a new winter-run action plan to improve viability over the next 10 years, an adaptive management approach to incorporate new science, and a federal strategy to evaluate impacts of new water infrastructure (Reclamation, 2024a). Reclamation and DWR analyzed impacts of the proposed action and alternatives under National Environmental Policy Act and CEQA, respectively. The fish and wildlife agencies also analyzed this proposed action consistent with the FESA and CESA (Reclamation, 2024a). On December 20, 2024, Reclamation signed the Record of Decision signaling approval of the revised operating rules (Reclamation, 2024b).

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (16 USC 1801 et seq.), NMFS, fishery management councils, and federal agencies are required to cooperatively protect EFH for commercially important fish species such as Pacific coast groundfish, Pacific salmon, highly migratory species, and coastal pelagic fish and squid. As defined by the U.S. Congress, EFH includes “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”[5]

CENTRAL VALLEY PROJECT IMPROVEMENT ACT

The Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) includes Title 34, the Central Valley Project Improvement Act (CVPIA). The CVPIA amended the CVP’s authorization to include fish and wildlife protection, restoration, and mitigation as project purposes of the CVP having equal priority with irrigation and domestic uses of CVP water, and it elevated fish and wildlife enhancement to a level having equal purpose with power generation. Among the changes mandated by the CVPIA was the dedication of 800 thousand acre-feet of CVP yield annually to fish, wildlife, and habitat restoration.

The U.S. Department of the Interior’s May 9, 2003, decision on the implementation of Section 3406(b)(2) of the CVPIA explains how Section 3406(b)(2) water will be dedicated and managed. Dedication of CVPIA 3406(b)(2) water occurs when Reclamation takes a fish and wildlife habitat restoration action based on the recommendations of USFWS (and in consultation with NMFS and CDFW), pursuant to Section 3406(b)(2). Water exports at the CVP pumping facilities have been reduced using “(b)(2) water” to decrease the risk of fish entrainment at the salvage facilities and to augment river flows.

STATE

Draft EIR Chapter 7, *Biological Resources*, pages 7-30 to 7-31, includes State regulations that address the protection of biological resources, including aquatic biological resources,

[5] 16 USC 1802 – Definitions (10)

including the California Endangered Species Act, the California Fish and Game Code, the Porter-Cologne Water Quality Control Act, and the State Wetland Definition and Procedures for Discharges of Fill Materials to Waters of the State.

LOCAL

SACRAMENTO COUNTY 2030 GENERAL PLAN

Draft EIR Chapter 7, *Biological Resources*, pages 7-32 to 7-36, includes policies of the Sacramento County 2030 General Plan that are relevant to biological resources, including aquatic biological resources discussed in this analysis.

IMPACTS AND ANALYSIS

SIGNIFICANCE CRITERIA

In accordance with Appendix G of the CEQA Guidelines, an impact is considered significant if the project or alternative would cause any of the following:

- A substantial adverse effect, either directly or through habitat modification, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS; or
- Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impacts related to the following significance thresholds are addressed in Draft EIR Chapter 7, *Biological Resources*.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by CDFW or USFWS;
- Have a substantial adverse effect on State and federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan.

METHODOLOGY AND ASSUMPTIONS

This section assesses the potential for development allowed under Alternative 5 to adversely change fisheries resources in or around the vicinity of the Riverside Pumping Plant. The impact analysis focuses on foreseeable changes to existing conditions and compares those changes to the significance criteria presented below. Potential impacts are analyzed using information presented above regarding habitats present in and

around the vicinity of the Riverside Pumping Plant, and potential occurrence of special-status and protected species. Specific to this impact analysis, three principal factors were considered: (1) the magnitude of the impact (i.e., substantial/not substantial); (2) the uniqueness of the affected resource (i.e., rarity of the resource); and (3) susceptibility of the affected resource to perturbation (i.e., sensitivity of the resource). The evaluation of potential significance considered the interrelationship of these three principal factors. For example, a relatively small magnitude impact to a State or federally listed species would be considered significant if the species is exceptionally rare or believed to be highly susceptible to disturbance.

Implementation of Alternative 5 would be regulated by the laws, regulations, plans, and policies summarized under, *Regulatory Setting*, above. Therefore, the impact analysis assumes that implementation of Alternative 5 would comply with existing applicable regulatory and permitting requirements.

To evaluate whether development allowed under Alternative 5 would result in aquatic biological resource impacts, the analysis considers how water supply operations could result in changes to existing conditions for special-status and native fishes. Construction and operation activities associated with the other project components do not have in-water components and therefore would not be expected to impact fish or their habitat. See Draft EIR Chapter 7, *Biological Resources*, for analysis of effects of construction and operations (non-water supply) to terrestrial biological resources.

Changes in operations of the Riverside Pumping Plant could result in both near-field and far-field effects. Near-field effects are those that have the potential to impact fish immediately surrounding the water intakes, such as through entrainment or impingement. Far-field effects are those that have the potential to impact fish upstream and/or further downstream of the water intakes, such as flow changes that result from increased diversions at the Riverside Pumping Plant. Numerical modeling (e.g. CalSim) to evaluate changes in river flows was not warranted because project-related changes in river flows (from changes in diversions) are a fraction of a percentage and within the sensitivity bounds (e.g., model noise or error) of the best available hydrologic and habitat suitability models.

IMPACT ALT 5 BIO-1: SPECIAL-STATUS FISH SPECIES

NEAR-FIELD IMPACTS

As introduced above, near-field effects are those effects that have the potential to impact fish immediately surrounding the Riverside Pumping Plant water intakes, such as through entrainment, impingement, or in-water maintenance activities.

ENTRAINMENT AND IMPINGEMENT

Operation of the Riverside Pumping Plant at levels or during seasons that it has not been used previously has the potential to entrain or impinge listed fish species in the Sacramento River such as out-migrating juvenile salmonids. During operations, water that is pulled into the intake could entrain fish swimming or feeding in adjacent water.

However, in conformance with State and federal fish screen requirements, the Riverside Pumping Plant added a new cylindrical fish screen in 2022 to prevent entrainment of special-status fish species (Jacobs 2022). The Riverside Pumping Plant is designed to meet standards in accordance with CDFW (2010) and NMFS (2023) fish screening criteria (Jacobs 2022). More specifically, the screen is designed to meet the following guidelines that provide protection for juvenile salmonids:

- Approach velocity (water velocity perpendicular to the screen) – less than or equal to 0.40 fps where exposure time is limited to less than 60 seconds, or 0.33 fps where exposure time is greater than 60 seconds;
- Minimum sweeping velocity (water velocity parallel to the screen) – two times the approach velocity; between 0.8 fps and 3 fps is optimal;
- Screen slot opening size – 1.75 millimeters (0.069 inch); and
- Screen porosity – 27% minimum open area.

A 1.75-millimeter screen opening size is understood to be effective at excluding juvenile salmonids of 22-millimeter standard length and greater (ICF International 2016), which is the equivalent of around 25-millimeter fork length. Therefore, this would be expected to exclude all juvenile salmonids occurring in the vicinity of the intake. And because this diversion is located approximately six river miles upstream of the Legal Delta boundary, Delta smelt and longfin smelt would not be expected to be present and vulnerable to entrainment.

MAINTENANCE IMPACTS

Maintenance activities associated with the cylindrical screen at the Riverside Pumping Plant involve sediment and debris removal that may accumulate near the pump station and fish screen (Jacobs 2022). The fish screen and pump station include a pumped water jet system that prevents sediment from accumulating. The jets spray water on the fish screens and pump bays to resuspend settled and accumulated sediment to be pumped back out into the main canal or river. Furthermore, the fish screens are self-cleaning but require routine maintenance and inspection in accordance with manufacturer's recommendations. Maintenance actions involve the periodic removal of excess accumulated sediment, vegetation, or other debris around the fish screens to ensure that the system operates at its design capacity and that fish passage hydraulic criteria are being achieved.

Maintenance activities can release sediments into the aquatic environment near the Riverside Pumping Plant. Suspended sediments in the water column have the potential to affect listed fish by disrupting normal feeding behavior, reducing growth rates, increasing stress levels, and reducing respiratory functions. Increased suspended solids can also affect aquatic organisms by reducing dissolved oxygen levels and light transmission, and when the sediment in the suspended solids resettles, it could potentially smother aquatic habitats and organisms. Research with salmonids has shown that high turbidity concentrations can reduce feeding efficiency; decrease food availability; reduce dissolved oxygen in the water column; result in reduced respiratory

functions and tolerance to diseases; and cause fish mortality (Berg and Northcote 1985; Gregory and Northcote 1993; Waters 1995).

However, these maintenance activities already occur infrequently (roughly once per year) and occur during low-flow period in the summer, when special-status fish species are least likely to occur, and the use of the Riverside Pumping Plant to serve the UWSP under Alternative 5 would not affect the scheduled maintenance. Furthermore, turbidity increases are brief and generally confined to within a few hundred feet of the activity. Turbidity levels would initially be higher than baseline levels, but the sediment is dispersed and redeposited, and background levels are expected to be restored within hours of the disturbance. Therefore, use of the Riverside Pumping Plant to serve the UWSP would not alter maintenance activities associated with the Riverside Pumping Plant in a way expected to impact special-status fish species or interfere with movement of native resident or migratory fish.

FAR-FIELD IMPACTS

As introduced above, far-field effects are those effects that have the potential to impact fish upstream and/or further downstream of the water intakes. Changes in operations of the Riverside Pumping Plant in order to serve the UWSP under Alternative 5 would increase diversions from the Sacramento River and change seasonality of diversions potentially resulting in changes in river flows and alteration of habitat for special-status fishes. Reduction in river flows during those new or changed periods of operation of the Riverside Pumping Plant could decrease available habitat for special-status species and potentially impede migration of juvenile and adult salmonids and sturgeons, as evaluated further below.

NCMWC has historically provided surface water to the UWSP area for agricultural purposes. Within the UWSP area, NCMWC reports historical agricultural diversions at the Riverside Pumping Plant ranging from 1,307 acre-feet per year (AFY) to 4,860 AFY with an average of 2,703 AFY for years 2013 through 2024 (see **Table ALT 5-3**). As shown below, water diversions for agricultural uses primarily occurred during April through September (see Table ALT 5-3) with no or very limited diversions during October through March each year.

Under Alternative 5, the UWSP would be anticipated to utilize 3,139 AFY of NCMWC surface water for domestic uses (see **Table ALT 5-4**). When comparing existing water diversions at the Riverside Pumping Plant to diversions under Alternative 5, the UWSP would utilize more surface water during the cooler months between September and March, and generally less water in the warmer months between April and August (see Table ALT 5-4). As a result, there would be increased diversions of the Sacramento River during the months of September through March in the range of approximately 122 AF to 270 AF (see Table ALT 5-4). Increased diversions during cooler months would coincide with greater presence of listed fish species in the Sacramento River adjacent to the UWSP, especially juvenile salmonids that primarily emigrate during winter and spring during higher flows. However, despite greater listed fish presence, the potential entrainment rate of juvenile salmonids would be lower under seasonally higher river flows due to a smaller proportion of the flows being diverted.

Table ALT 5-3: Historical Summary of Riverside Pumping Plant Diversions (acre-feet)

Year/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2024					216	542	599	584	58	364	1	0	2,365
2023				0	38	712	616	353	91	75	3	2	1,892
2022			307	389	133	165	335	220	59	7			1,307
2021			145	1,085	155	312	654	730	221	127			3,284
2020				63	325	341	204	229	160				1,321
2019						227	415	458	238	10			1,335
2018					247	739	944	699	367	6			3,002
2017					217	441	555	586	245				2,045
2016				90	539	935	951	758	430	80			3,782
2015				483	653	786	760	417	94	24			3,218
2014				147	843	1,104	969	733	162	28			4,014
2013				373	1,265	1,041	865	807	237	14			4,860
Average			**38**	**221**	**386**	**612**	**656**	**548**	**197**	**61**	**0**	**0**	**2,703**
Source: Wood Rogers October 15, 2025													

Table ALT 5-4: Proposed UWSP Anticipated Net New Water Demand by Month

Month	Proposed Surface Water Demand (acre-feet)	Average Existing Surface Water Usage (acre-feet)	Average Net Change in Water Usage (acre-feet)	Additional Monthly Water Use Beyond Existing	
				Acre Feet	Average cfs
Jan	140	0	+140	140	2.3
Feb	133	0	+133	133	2.2
Mar	122	0	+122	122	2
Apr	154	221	-67	0	0
May	245	386	-141	0	0
Jun	351	612	-261	0	0
Jul	401	656	-255	0	0
Aug	430	548	-138	0	0
Sep	406	197	+209	209	3.5
Oct	331	61	+270	270	4.5
Nov	258	0	+258	258	4.3
Dec	168	0	+168	168	2.8
Total	**3,139**	**2,681**	**+458**	**N/A**	**N/A**
Source: Wood Rogers October 15, 2025					

The Riverside Pumping Plant draws water at an instantaneous rate of 33 to 47 cubic feet per second(cfs) based on the existing pump and hydraulic head required to raise water over the levee (Jacobs 2022). The pump cycles on and off throughout the day as water is required to serve NCMWC water users, including the properties within the UWSP area. Therefore, averaged over a 24-hour period, the maximum rate of diversion to serve the UWSP equates to four to nine cfs. Converting the diversion amount (acre-feet per month) needed to serve the UWSP that is in addition to diversions occurring during existing conditions to an average daily discharge equates to an average additional water diversion of 2.2 to 4.5 cfs across the months of September through March (see Table ALT 5-4).

To evaluate the effect additional diversions at the Riverside Pumping Plant may have on fish habitat in the Sacramento River, the percentage of Sacramento River flow diverted was calculated. Sacramento River flow at Verona gauge (DWR 2025) was used as a measure of flow adjacent to the Riverside Pumping Plant. The percentage diverted was calculated monthly under minimum, mean, and maximum Sacramento River at Verona flows across the recent years of 2013-2024. These 12 years present a wide range of river conditions, including four critically dry years and three wet years. Under minimum monthly Sacramento River flow conditions (6,041 cfs to 10,238 cfs), the additional diversions in September through March equates to 0.02 to 0.07 percent of the flow present in the Sacramento River (see **Table ALT 5-5**).

Table ALT 5-5: Projected Rate of Sacramento River Flow Diverted by the Proposed UWSP Under the Range of Sacramento River Flow Conditions Observed from 2013-2024

Month	Additional Water Use Beyond Existing (cfs)	Sacramento River at Verona Years 2013-2024 (cfs)			Percentage Diverted (%)		
		Min	Mean	Max	Min Flows	Mean Flows	Max Flows
Jan	2.3	6,417	22,740	57,367	0.04	0.01	0.00
Feb	2.2	10,238	23,994	72,884	0.02	0.01	0.00
Mar	2	7,043	28,330	62,471	0.03	0.01	0.00
Apr	0	5,792	22,300	57,779	0.00	0.00	0.00
May	0	5,095	15,604	40,281	0.00	0.00	0.00
Jun	0	5,500	12,018	22,705	0.00	0.00	0.00
Jul	0	5,899	11,486	16,632	0.00	0.00	0.00
Aug	0	6,296	13,087	18,417	0.00	0.00	0.00
Sep	3.5	7,095	12,992	19,380	0.05	0.03	0.02
Oct	4.5	6,041	9,166	12,306	0.07	0.05	0.04
Nov	4.3	6,268	9,185	16,470	0.07	0.05	0.03
Dec	2.8	7,777	16,351	32,552	0.04	0.02	0.01
Source: California Department of Water Resources, 2025							

These very small diversion amounts (less than 0.1 percent) under Alternative 5 are not expected to have a meaningful impact on fish habitat or fish survival. An analysis completed by Perry and Pope (2018) investigated the effect of the proposed North Delta Diversion (NDD) (located downstream of the City of Sacramento on the Sacramento River) on survival of juvenile Chinook salmon. Their analyses used the results of a Bayesian survival model that allowed them to simulate travel time, migration routing, and survival of juvenile Chinook salmon migrating through the Delta in response to NDD operations (Perry and Pope 2018). Perry and Pope (2018) determined that the constant low-level pumping scenario, which simulated a diversion of 900 cfs, led to minimal decreases in survival of Chinook salmon of less than two percent across a wide range of river flows. Therefore, diversion flows from the UWSP of up to 4.5 cfs, 200 times smaller than the 900 cfs diversion modeled in Perry and Pope (2018), would be expected to result in no discernible changes to fish survival in the Sacramento River.

Near-Field and Far-Field Impacts Conclusion

The Riverside Pumping Plant is designed to meet fish screening criteria standards in accordance with CDFW (2010) and NMFS (2023), and therefore not expected to entrain or impinge juvenile salmonids that may be present in the Sacramento River at any time of the year. Furthermore, Delta smelt are not expected to be present and vulnerable to entrainment due to the Riverside Pumping Plant being located approximately six river miles upstream of the Delta boundary and upstream of Critical Habitat for Delta smelt.

Maintenance activities associated with the Riverside Pumping Plant take place under existing conditions. They are infrequent and occur during the low-flow period in the summer when special-status fish species are least likely to occur, and would not be altered as a result of the provision of raw water for domestic purposes in the UWSP area. Therefore, changes in maintenance activities are not expected to impact special-status fish species or interfere with movement of native resident or migratory fish.

Changes in diversion of Sacramento River flows associated with provision of raw water to the UWSP under Alternative 5 are estimated to be very small, less than 0.08 percent even under minimum Sacramento River flow conditions (see Table ALT 5-5). This low level of flow diversion (less than 0.1 percent) would be expected to be indiscernible relative to existing habitat conditions for special-status and native fish species. Therefore, additional Sacramento River diversions under Alternative 5 are not expected to impact special-status fish species or interfere with movement of native resident or migratory fish. Therefore, this impact would be **less than significant**.

Transportation

Introduction

The proposed UWSP includes expansion of and improvements to the circulation network within the UWSP area, including paving of Radio Road to open it to regular vehicular

traffic between San Juan Road and Garden Highway. As discussed above, in response to concerns about the levels of future traffic on Garden Highway, Alternative 5 would:

1. Remove the Radio Road vehicular connection between the plan area and Garden Highway (other than continued access for emergency response); and
2. Implement traffic calming on San Juan Road between Garden Highway and El Centro Road to discourage its use by through traffic.

The following analysis addresses the potential for these circulation changes in Alternative 5 to result in impacts that are different than those from the proposed UWSP as presented in the UWSP Draft EIR, Chapter 18, *Transportation*.

The analysis below is based on a technical memorandum prepared by Fehr & Peers in August 2025 (see Appendix ALT 5-1). In order to evaluate the changes in projected future conditions that would result from the elimination of regular vehicular traffic on Radio Road between the UWSP area and Garden Highway, and the implementation of traffic calming on San Juan Road between Garden Highway and El Centro Road, traffic forecasts were developed using the same version of the SACSIM travel demand model used in the *Final Local Transportation Analysis (LTA) for Upper Westside Specific Plan.* Roadway segments were analyzed to determine the segment daily level of service (LOS) using the same analysis methods as applied in the LTA. Peak hour intersection turning movement volumes were developed and reviewed to determine whether certain critical turning movements would experience notable increases in traffic (relative to the forecasts in the LTA), which could warrant supplemental traffic operations analysis.

The analysis of roadway safety was undertaken by developing traffic forecasts for average daily conditions for 23 different roadway segments and 14 different intersections under Cumulative Plus Revised Project conditions. This scenario was chosen because, compared to Existing Plus Project conditions, it addresses conditions with greater levels of background traffic on streets to be modified and/or effected.

Impact TR-1: Conflict with a Program, Plan, Ordinance or Policy Addressing the Circulation System

The proposed changes to the circulation system would not conflict with relevant General Plan policies addressing circulation as proposed roadways with the changes would continue to meet LOS operating standards with just a few exceptions where physical improvements to increase capacity have either been deemed infeasible or would be inconsistent with the UWSP's goal of creating an environment conducive to walking and bicycling. Furthermore, the UWSP would remain consistent with the Caltrans Four Pillars of Traffic Safety as the proposed traffic calming on San Juan Road between Garden Highway and El Centro Road would improve safety along this roadway. Finally, as the proposed changes would only affect vehicular circulation, the UWSP would continue to be consistent with policies addressing bicycle, pedestrian, and transit service as the proposed changes would not affect planned bicycle, pedestrian, and transit networks. Therefore, like with implementation of the proposed UWSP, Alternative 5 would not conflict with a program, plan, ordinance or policy addressing the circulation

system and the impact would be less than significant with implementation of Mitigation Measures TR-1a and TR-1b.

Impact TR-2: Vehicle Miles Traveled

The proposed changes to the UWSP circulation system would result in an overall net reduction of 800 average daily trips (ADT). As vehicle-miles traveled (VMT) is the product of daily trips and trip length, fewer daily trips would result in less VMT generated. In addition, the roadway network changes would remove travel routes that are likely more circuitous for project residents. In certain parts of the UWSP area, use of Garden Highway to access external destinations could be quicker than using El Centro Road or West El Camino Avenue but would result in longer travel lengths. Elimination of those connections effectively reduces average trip lengths, albeit very slightly. For these reasons, like with implementation of the proposed UWSP, VMT impacts under Alternative 5 would be less than significant.

Impact TR-3: Hazards Due to Design or Incompatible Uses

Elimination of the Radio Road connection to Garden Highway and the implementation of traffic calming along San Juan Road between Garden Highway and El Centro Road under Alternative 5 would result in Garden Highway north of Radio Road carrying considerably less traffic (a reduction of 2,900 daily trips) than the configuration of the proposed UWSP and Garden Highway south of San Juan Road carrying slightly less traffic (a reduction of 200 daily trips) than the configuration of the proposed UWSP. As such, with implementation of Alternative 5, potential hazards associated with traffic levels along and at intersections on Garden Highway would be less than with the proposed UWSP. Similarly, potential hazards associated with freeway off-ramp storage queues and on-ramp meter queues at the 1-80/West El Camino Avenue interchange and potential safety issues at I-80/West El Camino Avenue interchange associated with Sacramento 49er Travel Plaza truck stop would be less than with the proposed UWSP, as implementation of Alternative 5 would result in less traffic (a reduction of 400 daily trips) along West El Camino Avenue between I-80 and El Centro Road. Finally, as Alternative 5 would result in an overall net reduction in ADT, and thus fewer trips on area freeways, hazards associated with potential collisions on adjacent segments of I-80 and I-5 would be less than with the proposed UWSP.

With Alternative 5, there would be some roads that would experience minor increases in traffic flow, including El Centro Road and Radio Road east of Street 12 (East). El Centro Road north and south of Radio Road would experience increases of about 900 ADT southbound toward San Juan Road (which would remain LOS E) and 2,000 ADT northbound toward Arena Boulevard (which would increase to LOS F). El Centro Road is already at the maximum number of lanes allowed in both the City and County general plans (four lanes). The County Department of Transportation has indicated that an increase to six lanes would not be necessary, given that the main capacity constraint is the El Centro Road/Arena Blvd intersection, which is within the City of Sacramento's limits. The LTA prepared for the proposed UWSP identifies some operational improvements at that intersection (see Table 23 and Table 24 in the Final LTA), which

have been vetted by the City. These include a second westbound left turn lane, second southbound through lane, restriping the eastbound right turn lane to a shared eastbound through/right lane, lengthening the northbound right turn lane, and adding an overlap phase. These operational improvements would reduce the delay significantly from 131 to 109 seconds of delay, both of which still represent LOS F.

With Alternative 5, there would be a 4.3-6.5 percent increase in traffic at the El Centro/ Arena intersection, primarily in the westbound left, northbound through, northbound right, and southbound through movements. There are no additional feasible improvements to improve the westbound left and northbound through turning movements, beyond those already identified above. While a third northbound and southbound lane would improve operations, this would be inconsistent with the City of Sacramento General Plan. In addition, the City generally opposes further capacity expansion/roadway widening as a matter of policy. Thus, reclassification of El Centro Road to a six-lane roadway, whether for intersection or segment capacity, is not considered feasible or desirable.

For the segment of Radio Road between Street 12 (East) and El Centro Road, the analysis in the LTA for the proposed UWSP assumed a “low access control” roadway,[6] with a reduced capacity of 15,000 ADT (compared to 18,000 ADT capacity for a “moderate access control” roadway).[7] With development allowed under the proposed UWSP, the 17,100 ADT would exceed the 15,000 ADT threshold. The proposed operational improvement recommended in the LTA for the proposed UWSP is to design the segment of Radio Road between Street 12 (East) and El Centro Road to a moderate access control roadway standard (see LTA page 142), which would result in LOS E. With Alternative 5, which would increase traffic volumes on this segment from 17,100 to 17,700 ADT, the proposed operational improvement recommended in the LTA for the proposed UWSP would still mitigate the issue and result in LOS E.

Based on the above, the changes to roadway configurations under Alternative 5 would reduce traffic on Garden Highway north of Radio Road, as well as result in minor reductions in traffic flows at the I-80/West El Camino Avenue interchange, while resulting in some relatively minor increases in traffic flows on El Centro Road and Radio Road east of Street 12 (East). With these changes, like with implementation of the proposed UWSP, impacts to traffic hazards under Alternative 5 would remain less than significant with implementation of Mitigation Measures TR-3a through TR-3e.

Impact TR-4: Emergency Access

While Radio Road would be closed to regular vehicular use under Alternative 5, emergency vehicle access would still be provided along this roadway. As a result, impacts under Alternative 5 regarding emergency access would be less than significant, like those under the proposed UWSP.

[6] Road generally has frequent driveways and speeds of 25 to 35 miles per hour.

[7] Road generally has limited driveways and speeds 35 to 45 miles per hour.

Transportation Impacts Conclusion

As discussed above, the roadway network changes to the proposed UWSP circulation system under Alternative 5 would result in reduced projected future traffic levels on Garden Highway when compared to traffic levels under the proposed UWSP. With implementation of Alternative 5 all other transportation impact conclusions would be the same as with implementation of the proposed UWSP.

Utilities

Introduction

Under Alternative 5, NCMWC through an agreement with the Sacramento County Water Agency (SCWA), would serve as the raw water wholesaler, and the SCWA would serve as the water retailer, and would own, operate, the proposed WTP and maintain on-site storage, transmission, and distribution facilities. The analysis below includes an Environmental Setting describing existing conditions for water supply, demand, and infrastructure within the NCMWC's service area; a Regulatory Setting presenting relevant regulations, plans, and policies for water supply, conservation, and quality; and an Impact Discussion that states the thresholds of significance and addresses potential environmental effects related to the construction of water supply infrastructure (Impact UT-1) and the adequacy of water supply to meet project demands (Impact UT-2), as analyzed in Draft EIR Chapter 20, *Utilities*.

Environmental Setting

The NCMWC is a private, not-for-profit corporation representing the interests of its 280 member/shareholders. For more than 80 years, NCMWC has provided irrigation water, at cost, to its shareholders for agriculture use. NCMWC provides water services to 33,223 acres through pipelines, pumps and more than 50 miles of canals. NCMWC service area is adjacent to the Sacramento River, north to the Cross Canal, east to Natomas East Main Drainage Canal and south to the American River in Sacramento County.

Water Supply Entitlements, Water Rights And Contracts

Water Supply Sources

Background

In 1964, the NCMWC, along with hundreds of other Sacramento River water rights holders (diverters), signed a Sacramento River Settlement Contract with the USBR to purchase water from its Central Valley Project (CVP). In exchange for the right to purchase water, the diverters (contractors) agreed to limit their diversions from the Sacramento River to a monthly allocation which represented a good faith estimate of their historical use.

SACRAMENTO RIVER WATER SUPPLIES

NCMWC currently obtains surface water diversions from the Sacramento River to supply agricultural users in the Natomas Basin. As a Sacramento River contractor, it can divert up to 120,200 AFY. As discussed above, NCMWC along with several Sacramento River diverters is contracted with USBR pursuant to the Natomas Settlement Contract (14-06-200-885A-R-1). The Settlement Contract addresses portions of NCMWC's surface water rights and provides CVP water supplies for use within NCMWC's existing service area that includes the Natomas Vision Plan Area. The Settlement Contract can be amended to serve the UWSP area. Furthermore, NCMWC has sufficient capacity to serve the UWSP area as well as the broader Natomas Vision Plan Area.

As indicated in **Table ALT 5-6**, NCMWC's Sacramento River diversions have seasonal restrictions that only allow diversions and deliveries during specific months of the year. During late fall to early spring (October through March), Permit 19400 allows for direct diversion and delivery of another 10,000 AF. However, Permit 19400 is Term 91 limited (refer to detailed discussion of Critical Year Supplies, page 19) and is therefore not always available. To ensure year-round raw water deliveries, the delivery schedule of the USBR Contract entitlements would have to be modified for year-round diversions and deliveries. It should be noted that delivery of wholesale raw water from NCMWC to the UWSP area would also require a wholesale agreement between NCMWC and SCWA to allow service of M&I water to the proposed UWSP development.

SURFACE WATER DELIVERIES

In order to divert and deliver water from the Sacramento River to the urban developments within its service area, NCMWC would need to apply for or request modifications to its USBR Settlement Contract and water rights permits to change from strictly agricultural uses to also include M&I uses. Notably, NCMWC maintains specific M&I water rights for use at the Sacramento Airport and within the Metro Air Park development.

NORMAL YEAR SUPPLIES

As shown in **Table ALT 5-7**, under the USBR Settlement Agreement NCMWC can divert and deliver up to 120,200 AFY of Sacramento River water to agricultural users within its service area although delivery periods are limited to specific months pursuant to the Sacramento River Settlement Agreement and the conditions of the individual water rights permits. Separately, Water Permit 19400 (1978) allows for direct diversion and delivery of up to 10,000 AFY from October through March.

Table ALT 5-6: NCMWC Total Water Supplies

	USBR	California Water Rights Permits						
	Contract	**A000534**	**A001056**	**A001203**	**A001413**	**A015572**	**A022309**	**A025727 Permit: 19400**
Priority		3/1/1905	8/1/1918	3/1/1919	8/1/1919	10/1/1953	10/1/1965	5/1/1978
Source	CVP Settlement Contract	Sacramento River	Sacramento River	Sacramento River	Sacramento River	Sacramento River	Drain	Sacramento River and Drain (Winter)
Permit Total (AFY)	120,200	15,394.20	16,205.20	58,394.20	36,655.10	11,846.00	2,627.00	10,000.00
Delivery Period	April - October	April - October	April - October	May - October	May - October	April - June and October	March - June Sept and October	October - March
October	2,000							
November	0	0	0	0	0	0	0	
December	0	0	0	0	0	0	0	
January	0	0	0	0	0	0	0	
February	0	0	0	0	0	0	0	
March	0	0		0	0	0		
April	14,000			0	0			0
May	27,700							0
June	23,000							0
July	18,700					0	0	0
August	18,700					0	0	0
September	16,100					0		0
Totals (AFY)	**120,200**	**15,394**	**16,205**	**58,394**	**36,655**	**11,846**	**2,627**	**10,000**

Source: Natomas Central Mutual Water Company, August 13, 2025.

Note: Table adapted by ESA, October 2025.

Table ALT 5-7: USBR Contract Water Curtailments

USBR Contract Amount	25% Curtailment	Drought Protection Program 50% Curtailment
120,200 AFY	90,150 AFY	60,100 AFY
Source: Natomas Central Mutual Water Company, August 2025.		

CRITICAL YEAR SUPPLIES AND CVP DROUGHT PROTECTION PROGRAM

USBR SETTLEMENT CONTRACT CRITICAL YEAR REDUCTIONS

CVP water deliveries to Sacramento River Settlement Contractors are based on inflow quantities to Shasta Reservoir above Redding, California. Pursuant to the renewal of the USBR Settlement Agreement (May 2005), USBR may declare a Critical Year condition when the natural flows into Shasta Reservoir are equal to or less than 3.2 million acre-feet (MAF), or when total actual deficiencies below 4 MAF in the prior water year or series of successive prior water years experienced inflows of less than 4 MAF and current year forecasted inflow deficiencies exceed 800,000 acre-feet – in Critical Years, Sacramento River Settlement Contractors CVP water diversions are reduced by 25 percent.

Pursuant to the Agreement between USBR and Sacramento River Settlement Contractors for Establishment of a Drought Protection Program (January 2025), the signatories established a new program designed to improve water supply reliability and avoid severe storage deficiencies, such as the one that occurred in 2022. Under the Drought Protection Program when USBR declares a Critical Year and the Sacramento-San Joaquin Delta (Delta) is in a "Balanced Condition"[8] Sacramento River Settlement Contractors have agreed to further reduce diversions an additional 25 percent. As shown in Table ALT 5-7, NCMWC diversions of CVP water in Critical Years are reduced by 25 percent to a maximum of 90,150 AFY. Furthermore, in Critical Years an additional 25 percent reduction can be imposed under the new Drought Protection Program (January 2025). In such years, NCMWC diversions of CVP water can be reduced by up to a total of 50 percent to a maximum of 60,100 AFY.

WATER RIGHTS PERMIT CURTAILMENTS

As shown in Table ALT 5-6, Water Rights Permit 19400 was acquired after the 1963 USBR Settlement Agreement and can be used to divert and deliver water from October to March in any given year. On an annual basis, if the State Water Resources Control Board (SWRCB) determines that the Delta is in "Balanced Condition" and can declare a Term 91 condition when the natural flows in the Sacramento River are insufficient to meet the various water quality and water flow requirements in the Delta, and Supplemental Project

[8] Balanced Condition when Supplemental Project Water (SPW) releases are being made by the Central Valley Project or State Water Project (collectively Projects). The Delta is referred to be in "Balanced Condition" when the Projects are being operated to meet water quality and flow requirements in the Delta. SPW releases are releases of imported and previously stored Project water to meet in-basin entitlements, including maintenance of Delta water quality and flow requirements.

Water releases are being made by the CVP and SWP. It is likely that Term 91 will be declared more often in the future, reducing the diversions from the Sacramento River. Permit 19400 is subject to potential curtailment pursuant to Term 91. To address these potential curtailments under Term 91 during winter months, NCMWC has proposed seeking an amendment to its USBR Settlement Agreement that would allow for year-round diversions by reallocating some summer diversions to the winter period.

HISTORICAL AND EXISTING DELIVERIES – ALL WATER YEAR TYPES

As shown in **Tables ALT 5-8 and ALT-5-9**, NCMWC's historical diversions and deliveries range from as low as 29,012 AFY in 2022 to as high as 81,580 AFY in 2016. Over this 12-year time period NCMWC delivered an average of 68,099 AFY. In normal, wet or above normal water years, the average surface water delivery was 71,595 AFY. In dry and critical dry years (2014, 2015, 2021 and 2022), the surface water deliveries averaged 61,107 AFY. In 2022, NCMWC was only able to deliver to its agricultural users 29,012 AFY; in all other dry years, deliveries were above the Drought Protection Program 50 percent curtailment maximum of 60,100 AFY. Though the Drought Protection Program is designed to improve water supply reliability, decreased deliveries could potentially occur in the future, such as in 2022, when it is possible for water supplies reductions to be below the 50 percent curtailment level. Such conditions are addressed in a letter from NCMWC, included in Appendix F, which states that M&I water for the UWSP would be prioritized. Thus, under Alternative 5 the UWSP would be expected to have sufficient supplies even during these times when deliveries are below the Drought Protection Program limits.

Table ALT 5-8: Annual Surface Water Use

Year	Annual Surface Water (AFY) Deliveries
2024	60,799
2023	72,593
2022	29,012
2021	74,450
2020	75,053
2019	63,188
2018	74,879
2017	63,763
2016	81,580
2015	67,618
2014	73,348
2013	80,903

Note: Table adapted by ESA, October 2025.

Source: Natomas Central Mutual Water Company, August 13, 2025.

Table ALT 5-9: Average Surface Water Deliveries in All Year Type

Average Deliveries[1]	68,099
Average Deliveries[2]	71,595
Average Drought Year Deliveries[3]	61,107

Note: Table adapted by ESA, October 2025.

1. All water year types
2. Wet, above normal and normal years
3. 2014, 2015, 2021 and 2022

Source: Natomas Central Mutual Water Company, August 2025.

WATER DEMAND

EXISTING UWSP AREA AGRICULTURE WATER DEMAND

As shown in **Table ALT 5-10**, between 2013 and 2024 NCMWC delivered to agricultural users within the UWSP area between 1,307 and 4,860 AFY with an average of 2,703 AFY. In the drought years of 2014, 2015, 2021 and 2022, surface water deliveries for agricultural uses ranged from 1,307 AFY to 4,014 AFY with an average of 2,956 AFY. Because agricultural users demand more water for irrigation when there is less precipitation, the average water use was higher in the drought years compared to 2013-2014 average of 2,703 AFY.

Table ALT 5-10: Summary of Water Deliveries within UWSP Area (AFY)

Year/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2024					216	542	599	584	58	364	1	0	2,365
2023				0	38	712	616	353	91	75	3	2	1,892
2022			307	389	133	165	335	220	59	7			1,307
2021			145	1,085	155	312	654	730	221	127			3,284
2020				63	325	341	204	229	160				1,321
2019						227	415	458	238	10			1,353
2018					247	739	944	699	367	6			3,002
2017					217	441	555	586	245				2,045
2016				90	539	935	951	758	430	80			3,782
2015				483	653	786	760	417	94	24			3,218
2014				174	843	1,104	969	733	162	28			4,014
2013				373	1,265	1,041	865	807	237	14		256	4,860
Minimum					4	165	204	220	58				**1,307**
Average			38	221	386	612	656	548	197	61	0	22	**2,703**
Maximum			307	1,085	1,265	1,104	969	807	430	364	3	256	**4,860**

Source: Natomas Central Mutual Water Company, August 2025.

PROPOSED UWSP PROJECT WATER DEMAND – OPERATIONS

The estimated annual water demand for the UWSP would be 3,139 AFY and would be consistent with SCWA's 2020 Urban Water Management Plan. The proposed UWSP land uses and projected water demand for the UWSP area are presented in **Table 5-11**. It should be noted that the Agricultural Reserve, General Agriculture and Regional Commercial land uses are existing conditions and would not generate new water demands within the UWSP area[9]

Table ALT 5-11: UWSP Estimated Water Demand (AFY)

Land Uses	Corresponding Land Use Classification in WSMP(2)	Unit Water Demand (AFY/Acre)(1)(3)	Gross Acreage	Water Demand (AFY)(3)
RESIDENTIAL DESIGNATIONS				
Low Density Residential (RD-2)	Residential Low	1.47	164.5	242.3
Low Density Residential (RD-5)	Residential Low	2.29	429.2	982.8
Low Density Residential (RD-7)	Residential Low	2.29	133.0	304.5
Medium Density Residential (RD-10)	Residential Medium	3.58	62.5	102.0
High Density Residential (RD 25)	Residential Medium	3.58	36.4	130.2
High Density Residential (RD 40)	Residential Medium	3.58	22.6	164.0
NON-RESIDENTIAL				
Landscape Corridor	Park	3.01	38.2	115.1
Mixed Use	Mixed Use	5.75	82.0	471.5
Agricultural Reserve	-	n/a	410.2	n/a
General Agriculture	-	n/a	86.1	n/a
Agricultural Urban Reserve	Park	3.01	45.1	84.0
Commercial & Office (CC)	Commercial/Office	2.17	1.2	2.7
Commercial & Office (E/HC)	Commercial/Office	2.17	52.9	114.9
Roads	-	0.19	122.0	23.6
Public/Quasi-Public	Public	0.87	141.1	122.8
Public/Quasi-Public	-	0	15.0	0
Natural Reserve	-	0	141.9	0
Recreation	Park	3.01	82.3	153.0
Regional Commercial	Regional Commercial (RC)	n/a	n/a	n/a
TOTALS			**2,066**	**3,138.9**

[9] Upper Westside Water Master Plan, page 7

Notes:

1. Demand estimates per SCWA 2016 WSIP include 7.5 percent system losses
2. Proposed land use from UWS WSMP, October 2023.
3. Demands may vary slightly due to land use plan modifications.
Source: Sacramento County Water Agency, 2025.

ANTICIPATED UWSP NCMWC WATER DEMANDS

Under the UWSP, agricultural water demand would taper down as the proposed development would convert the existing agricultural land uses to developed land uses. Under existing conditions, from October through March NCMWC does not deliver raw water to meet agricultural uses in the UWSP area as existing agricultural uses do not irrigate crops during the winter months. Under Alternative 5 water use to meet M&I demand in the UWSP area between October and March would be required. As a result, NCMWC would increase monthly diversions from the Sacramento River during these months. Water supplies needed to serve the UWSP area during these months are expected to be as high as 331 acre-feet in October to as low as 122 acre-feet in March in any given year.[10]

Anticipated monthly deliveries to the UWSP area are shown in Table 8 and are consistent with the monthly water uses provided in the 2020 SCWA UWMP. In the October through March period, NCMWC would divert and deliver water to the UWSP area under its Water Right Permit 14900. As shown in **bold** in **Table ALT 5-12**, during the late fall (October) through early spring (March) NCMWC would divert 1,300 AFY more than under existing conditions to meet demand generated by the UWSP area.[11]

Table ALT 5-12: UWSP Water Demand by Month

Month	Proposed Surface Water Demand (acre-feet)
January	**140**
February	**133**
March	**122**
April	154
May	245
June	351
July	401
August	430
September[1]	**406**

[10] UWSP Alternative Water Source Memorandum, Wood-Rodgers, October 2025.

[11] UWSP Alternative Water Source Memorandum, Wood-Rodgers, October 2025.

Month	Proposed Surface Water Demand (acre-feet)
October[1]	**331**
November	**258**
December	**168**
Yearly Total	**3,139**

Notes:

1. Under existing conditions in September and October, NCMWC currently delivers 197 acre-feet and 61 acre-feet to agricultural users. Supplemental water supplies would be needed to meet the additional demand above average water use within the UWSP area.

Source: UWSP Alternative Water Source Memorandum, Wood-Rodgers, October 2025.

As shown in **Table ALT 5-13**, based on historical diversions and deliveries to existing agricultural users, the WSA estimated NCMWC's projected diversions and water supply deliveries over the next 20 years to meet agricultural and M&I within its service area including the UWSP area. Prior to serving the UWSP area with M&I water, NCMWC would be required tor modify its State water rights permits and amend its USBR Settlement Agreement.

Table ALT 5-13: Projected Water Deliveries

	2030	2035	2040	2045	2050
NCMWC – Service Area[1,2,3]	71,595	71,595	71,595	71,595	71,595
NCMWC – Service Area (Dry Years)[2,3]	61,107	61,107	61,107	61,107	61,107
UWSP – Average Annual	3,139	3,139	3,139	3,139	3,139
UWSP – Dry Years Annual	2,668	2,668	2,668	2,668	2,668

NOTES:

1 Based on average annual pumping at the Riverside Pumping Plan and annual deliveries to existing agricultural users, including the UWSP area and other proposed developments, i.e., GrandPark Southwest Specific Plan and Grandpark Trails Specific Plan.
2. Annual diversions and deliveries are expected to decrease over the next twenty years as agricultural uses within NCMWC service area are converted to urban uses. For conservative water supply planning purposes, diversions and deliveries are held constant through the 20-year planning horizon.
3. Average Annual deliveries include additional water supplies of 436 acre-feet needed to meet UWSP demands

SOURCE: Table derived by ESA from Natomas Central Mutual Water Company data and information based on demand management measures during dry years to achieve water conservation (Stage 2, up to 20%) pursuant to SCWA's Water Shortage Contingency Plan *(ver 4-19-21)*.

WATER INFRASTRUCTURE

NCMWC maintains four river pumping plants for extracting and delivery of Sacramento River water to its agricultural uses. The closest pump station to UWSP area is the Riverside Pumping Plant located west of the Garden Highway and Radio Road intersection. From there Sacramento River water is pumped into the NCMWC distribution system. While the NCMWC irrigation system is integrated throughout the Natomas Basin, there is a newly constructed raw water pipeline that conveys water south adjacent to the UWSP area.

The minimum and maximum preferred operating range for the Riverside Pumping Plant is approximately 33 and 47 cubic feet per second, respectively. This equates to a capacity of 14,800 to 21,100 gallons per minute. The pumping plant discharges into a concrete portion of the Riverside Canal.

Approximately 125 feet south of the Riverside Pumping Plant discharge point is the Riverside Canal/Pipeline Lift Station. This facility consists of valving, a 50-horsepower and 60-horesepower pump discharge into a new 48-inch HDPE pipeline. The 48-inch pipeline travels south transitioning to a 36-inch at existing Farm Road and then a 32-inch pipe at existing Parker Road. The pipeline ultimately discharges into an open canal that runs parallel to Interstate 80. The pipeline is currently utilized to serve agriculture water to existing NCMWC agricultural uses via periodic turnouts and discharges to open canals (Wood Rodgers 2025).

REGULATORY SETTING

FEDERAL

Draft EIR Chapter 20, *Utilities*, pages 20-15 to 20-16, includes federal regulations that address water quality, including the Federal Safe Drinking Water Act and the U.S. Environmental Protection Agency's role in implementing the act.

STATE

Draft EIR Chapter 20, *Utilities*, pages 20-16 to 7-20, includes State regulations that address water supply and quality, including the Urban Water Management Planning Act, California Public Resources Code requirements to prepare water supply assessments and written verification of water supply, and the State's role in implementing the Federal Safe Drinking Water Act.

LOCAL

Draft EIR Chapter 20, *Utilities*, pages 20-23 to 20-26, includes policies of the Sacramento County 2030 General Plan that are relevant to water conservation, quality and supply.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the CEQA Guidelines, an impact is considered significant if the project or alternative would cause any of the following:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects; or
- Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;

Impacts related to the following significance thresholds are addressed in Draft EIR Chapter 20, *Utilities*, and would remain unchanged under Alternative 5.As such, effects of Alternative 5 related to these significance criteria are not further addressed herein.

- Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; or
- Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

METHOD OF THE ANALYSIS

SCWA's 2020 UWMP provides a table of gross unit water use factors for various land uses. The water uses are divided into six main categories of water demand factors: single-family residential; multi-family residential, commercial, government and institutional, industrial and landscape irrigation. All water demand factors are based on acre-feet per year per acre (AFY/Acre). For the proposed UWSP, dwelling units are comprised of low, medium and high density residential while nonresidential areas are comprised of commercial and offices, landscape corridors, parks and other public area. A water supply assessment, or WSA, was prepared for Alternative 5 by the SCWA in December 2025 (see Appendix ALT 5-2). The WSA assessed available water supplies and described existing and projected water demand and then calculates and systematically compares water supply reliability for the UWSP under all water year types including normal, single dry, and multiple dry years over a 20-year planning horizon.

As shown in Table ALT 5-11, land uses allowed under the proposed UWSP would generate an estimated annual water demand of 3,139 AFY. Based on the WSA, water demand for the proposed UWSP was compared to water supplies available to the NCMWC, and a determination was made regarding the sufficiency of supply for the proposed UWSP.

Development allowed under the proposed UWSP would be required to comply with water conservation, reuse, and efficiency standards under CALGreen. To this end, development would use low-flow/high-efficiency plumbing fixtures, and landscaping in the UWSP area would be designed and maintained for low water use and appropriate site conditions and methods for reducing water demand. As a result, compliance with these measures may reduce the water demand of the proposed UWSP to less than 3,139 AFY.

IMPACT UT-1: CONSTRUCTION OF WATER SUPPLY INFRASTRUCTURE COULD RESULT IN ADVERSE PHYSICAL EFFECTS

Under Alternative 5, raw water would be diverted at the Riverside Pumping Plant and then treated at a proposed WTP on the north side of San Juan Road within the UWSP area. The anticipated capacity of the WTP would be approximately 7 million gallons per day and would be located on approximately 8-acres (subject to subsequent engineering and design). The WTP would also include a booster pump station and two 2.5-million-gallon storage tanks.

Raw surface water would be delivered to the UWSP area via an existing 48-inch distribution main that runs along the western border of the UWSP area. The proposed UWSP would connect to this main where it crosses San Juan Road, approximately 600 feet east of Garden Highway, via 30-inch main that would extend east along San Juan Road to the proposed WTP.

The transmission and distribution system for Alternative 5 would remain largely unchanged from those described for the proposed UWSP. However, there would be two additional 16-inch transmission mains conveying water from the WTP to the distribution system. The additional 16-inch transmission mains would convey potable water from the WTP to the transmission and distribution mains at the intersection of San Juan Road and Bryte Bend Road.

The connection to the existing 48-inch distribution main would occur within the right-of-way of San Juan Road while construction of the WTP and distribution system would occur within the footprint of the UWSP area that was evaluated in the Draft EIR. As a result, the potential impacts associated with the construction and installation of these improvements were considered throughout the technical chapters of the Draft EIR, including Chapter 6, *Air Quality*; Chapter 7, *Biological Resources*; Chapter 9, *Cultural Resources*; Chapter 11, *Geology, Soils, and Paleontology*; Chapter 15, *Noise and Vibration*; Chapter 18, *Transportation and Circulation*; and Chapter 19, *Tribal Cultural Resources*. Project-specific mitigation measures for construction identified for each topical issue would reduce potential significant impacts associated with construction and installation of the water treatment and distribution facilities associated with Alternative 5 to the maximum extent feasible. There are no environmental impacts that would occur specifically related to the construction and installation of these facilities. In addition, these facilities would be required to comply with the County's requirements for construction projects, including but not limited to, grading permits and encroachment permits.

During operations, odors, noise and lighting generated by the WTP are not expected to adversely affect future neighboring residential uses. Modern design of surface water treatment plants include provisions for limiting odor and noise impacts. For example, odors would be controlled and limited by covering basins/tanks, use of activated carbon filters or scrubbers, and chemical treatment and/or sludge management. Noise would be limited by providing sound walls, locating pumps away from property lines, and/or potentially housing pumps within buildings. Finally, lighting would be addressed via standard shielding based on lighting studies that would demonstrate compliance with

County standards. Specific details would be vetted and analyzed during the treatment plant design process and County review of improvement plans.

For these reasons, impacts from implementation of Alternative 5 would be less than significant, like from implementation of the proposed UWSP, with respect to water treatment and distribution facilities.

IMPACT UT-2: RESULT IN A PROJECT WATER DEMAND THAT CANNOT BE MET BY SUPPLY

As a result of implementation of the UWSP and conversion of land uses, (agricultural to urban) total water demand within NCMWC service area is expected to decrease over the 20-year planning horizon. A detailed discussion of water demand and supply under multiple types of water years is discussed further below.

NCMWC SERVICE AREAS – SUPPLY AND DEMAND

Table ALT 5-14 presents a water supply and demand comparison in all water year types, normal, dry and drought protection program years when supplies could be curtailed by 50 percent. Normal year supply quantities are assumed to be like historical average supplies presented in Table ALT 5-8, above. In normal water years, NCMWC has adequate water supply to meet existing and projected demand, including the proposed UWSP estimated water demand of 3,139 AFY. In normal years, NCMWC would have access to another 48,605 AFY after delivering water to UWSP and agricultural consumers.

In Critical Years (i.e., dry years) CVP supplies are assumed to be reduced by 25 percent to a maximum of 90,150 acre-feet (refer to Table ALT 5-14). In Critical Years, NCMWC has adequate water supplies to meet existing and projected demand including the UWSP area estimated 3,139 AFY of water demand. As shown in Table ALT 5-14, pursuant to the NCMWC and SCWA water service agreement discussed in Section 5, NCMWC would prioritize M&I deliveries to UWSP area to meet demand during Critical Years. As a result, in Critical Years when supplies are reduced by 25 percent, NCMWC would be able to meet existing and projected demand and NCMWC would have access to another 29,043 AFY after delivering water to UWSP and agricultural consumers. This assumes a projected 15 percent reduction in demand due to water conservation pursuant to SCWA's Water Shortage Contingency Plan (WSCP).[12]

[12] SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. SCWA Water Shortage Contingency Plan (ver 4-19-21)

Table ALT 5-14: NCMWC Supply and Demand in All Water Years

Year Type		2030	2035	2040	2045	2050
NORMAL YEAR						
Supply	USBR CVP Settlement Agreement	120,200	120,200	120,200	120,200	120,200
Demand	NCMWC – Service Area[1,2,3]	71,595	71,595	71,595	71,595	71,595
	Surplus/(Deficit)	48,605	48,605	48,605	48,605	48,605
CRITICAL YEAR AKA DRY YEAR						
Supply	USBR CVP (25% Curtailment)	90,150	90,150	90,150	90,150	90,150
Demand	NCMWC – Service Area (15% conservation or fallow lands and reduced planting)[1,2,3]	61,107	61,107	61,107	61,107	61,107
	Surplus/(Deficit)	29,043	29,043	29,043	29,043	29,043
DROUGHT PROTECTION PROGRAM CURTAILMENT						
Supply	USBR CVP (50% Curtailment)	60,100	60,100	60,100	60,100	60,100
Demand	NCMWC – Service Area (Dry Years 15% conservation or fallow lands and reduced planting)[1,2,3]	61,107	61,107	61,107	61,107	61,107
	Surplus/(Deficit)	(1,007)	(1,007)	(1,007)	(1,007)	(1,007)
Supply	USBR CVP (50% Curtailment)	60,100	60,100	60,100	60,100	60,100
Demand	NCMWC – Service Area (Dry Years 17% reduction or fallow lands and reduced planting)[1,2,3]	60,099	60,099	60,099	60,099	60,099
	Surplus/(Deficit)	1	1	1	1	1

NOTES:

1. Based on average annual pumping at the Riverside Pumping Plan and annual deliveries to existing agricultural users, including the UWSP area and other proposed developments, i.e., GrandPark Southwest and Grandpark Trails.
2. Annual diversions and deliveries are expected to decrease over the next twenty years as agricultural uses within NCMWC service area are converted to urban uses. For conservative water supply planning purposes, diversions and deliveries are held constant through the 20-year planning horizon.
3. Average Annual deliveries include additional water supplies of 436 acre-feet needed to meet UWSP demands.

Table derived by ESA from NCMWC data and information and based on demand management measures during dry years to achieve water conservation (Stage 2, up to 20%) pursuant to SCWA's Water Shortage Contingency Plan *(ver 4-19-21)*.

Source: UWSP Alternative Water Source Memo and NCMWC, October 2025

In years when the Drought Protection Program is in effect, CVP water is reduced by 50 percent or a maximum of 60,100 acre-feet for NCMWC (refer to Table ALT 5-14). Under the Drought Protection Program, NCMWC could experience a potential shortfall of 1,007 AFY as shown in Table ALT 5-14. In these Drought Protection Program years when supplies are reduced by 50 percent, pursuant to the NCMWC and SCWA water service agreement, NCMWC would prioritize M&I deliveries to UWSP area to meet demand. As a result, in Drought Protection Program Years when CVP supplies are reduced by 50 percent, NCMWC would be able to meet existing and projected demand. This assumes a projected 17 percent reduction in demand due to water conservation pursuant to SCWA's WSCP.[10]

UPPER WESTSIDE SPECIFIC PLAN SERVICE AREA - – SUPPLY AND DEMAND

Table ALT 5-15 presents a water supply and demand comparison in all water year types, including normal, Critical dry years when supplies could be curtailed by 25 percent, and Drought Protection Program years when supplies could be curtailed by 50 percent.

Table ALT 5-15: UWSP Area Supply and Demand in All Water Years

		2030	2035	2040	2045	2050
Supply	NCMWC - UWSP Deliveries	3,139	3,139	3,139	3,139	3,139
Demand	UWSP Service Area1	3,139	3,139	3,139	3,139	3,139
	Surplus/(Deficit)	0	0	0	0	0
Supply	USBR CVP (25% Curtailment)	3,139	3,139	3,139	3,139	3,139
Demand	UWSP Service Area1	3,139	3,139	3,139	3,139	3,139
	Surplus/(Deficit)	0	0	0	0	0
Supply	USBR CVP (50% Curtailment)	3,139	3,139	3,139	3,139	3,139
Demand	UWSP Service Area1	3,139	3,139	3,139	3,139	3,139
	Surplus/(Deficit)	0	0	0	0	0

NOTES:

1. For conservative water supply planning purposes, UWSP demand is held constant through the 20-year planning horizon. Under SCWA's Water Shortage Contingency Plan (ver. 4-19-21) demand would be reduced in response to applicable water conservation measures.

Table derived by ESA from NCMWC data and information and based on demand management measures during dry years to achieve water conservation (Stage 2, up to 20%) pursuant to SCWA's Water Shortage Contingency Plan *(ver 4-19-21)*.

Source: Alternative Water Source Memo and NCMWC, October 2025

Normal year supply quantities are assumed to be similar to historical average supplies presented in ALT Table 5-15. In normal water years, NCMWC has adequate water supply to meet existing and projected demand, including the UWSP estimated 3,139

AFY of water demand. In normal years, NCMWC has sufficient supplies to meet demand generated by the UWSP area.

In dry Critical Years, when CVP water supplies are reduced by 25 percent as presented in Table ALT 5-7, NCMWC would be able to meet existing and projected demand including demand generated by the UWSP area and would have access to another 29,043 AFY after delivering water to UWSP and agricultural consumers. This assumes a projected 15 percent reduction in demand due to water conservation pursuant to SCWA's WSCP[13]. As shown in ALT Table 5-16, pursuant to a NCMWC and SCWA water service agreement, NCMWC would prioritize M&I deliveries to UWSP area to meet demand during Critical Years. As a result, in Critical Years when CVP supplies are reduced by 25 percent, NCMWC would be able to meet existing and projected demand including demand generated by the UWSP area.

In years when the Drought Protection Program is in effect, CVP water is reduced by 50 percent or a maximum of 60,100 acre-feet (refer to Table ALT 5-7). In these years NCMWC could experience a supply shortfall. In these Drought Protection Program years, pursuant to a NCMWC and SCWA water service agreement, NCMWC would prioritize M&I deliveries to UWSP area to meet demand. This assumes a projected 17 percent reduction in demand due to water conservation pursuant to SCWA's WSCP.[14] As a result, in Drought Protection Program years when CVP supplies are reduced by 50 percent, NCMWC would be able to meet existing and projected demand including demand generated by the UWSP area.

For the reasons described above, impacts to water supply with implementation of Alternative 5, like with implementation of the proposed UWSP, would be less than significant.

UTILITIES IMPACTS CONCLUSION

As discussed above, impacts related to the provision of potable water supply from the NCMWC and the construction of necessary treatment and distribution infrastructure with implementation of Alternative 5 would be less than significant, the same impact conclusion as with the proposed UWSP.

[13] SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. SCWA Water Shortage Contingency Plan (ver 4-19-21)

[14] SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. SCWA Water Shortage Contingency Plan (ver 4-19-21)

COMPARATIVE ANALYSIS OF ENVIRONMENTAL EFFECTS

The Draft EIR included an analysis of the following CEQA topics: aesthetics, agricultural resources, air quality, biological resources, climate change, cultural resources, energy, geology, soils, and paleontology, hazards, and hazardous materials, hydrology and water quality, land use, mineral resources, noise, population and housing, public services and recreation, transportation, tribal cultural resources, utilities, and wildfire. The comparative impacts of Alternative 5 on each of these topics is addressed below.

AESTHETICS

Impacts related to aesthetics under Alternative 5 would be like those described for the proposed UWSP, as the same amount of land would be converted from farmland and rural use to urban use under this alternative. As a result, impacts related to scenic views, visual character, and new sources of light would remain significant and unavoidable under Alternative 5 like the proposed UWSP.

AGRICULTURAL RESOURCES

Impacts related to agricultural resources under Alternative 5 would be like those described for the proposed UWSP, as the same amount of farmland within the UWSP area would be converted to urban uses. Therefore, with respect to the conversion of farmland to non-agricultural uses, the proposed plan's significant and unavoidable impact with mitigation would remain the same under Alternative 5. Furthermore, impacts related to conflicts with existing agricultural use and zoning under this alternative would also remain less than significant.

AIR QUALITY

Impacts related to air quality would be the same under Alternative 5 when compared to the proposed UWSP, as the location and amount of residential and non-residential development under this alternative would be the same as under the proposed UWSP. As a result, the proposed UWSP's significant and unavoidable impacts (with mitigation) would remain be same with respect to conflicts with an applicable air quality plan long-term, operational emissions of criteria air pollutants and precursors, and toxic air contaminants.

BIOLOGICAL RESOURCES

Residential and non-residential development under Alternative 5 would occur over the same development footprint as the proposed UWSP, and therefore the effects of this alternative on biological resources, except for fish species, would not differ from the UWSP as proposed. Therefore, with respect to sensitive species, riparian habitats, wetlands, wildlife movement, wildlife nursery sites, tree preservation, and conflicts with a habitat conservation plan, the proposed plan's less-than-significant impacts with mitigation would be generally the same under this alternative.

Under Alternative 5 the source of UWSP domestic water supply would come from the Sacramento River and NCMWC's Riverside Pumping Plant and therefore could lead to

direct and indirect effects to special-status fish species. Annually a total of 3,139 AFY, a net increase of 458 acre feet per year in water that has previously been delivered from the Riverside Pumping Plant to the UWSP area for agricultural purposes, would be available for development allowed under the proposed UWSP. This change in the use of diverted water at the Riverside Pumping Plant would lead to an increase in annual diversions and a change in seasonality of diversions compared to existing conditions. Importantly, a total of 1,300 AFY of water would be diverted during the September through March period when sensitive fish species are present in the Sacramento River.

As described in greater detail above, changes in diversion of Sacramento River flows associated with provision of raw water to the proposed UWSP under Alternative 5 are estimated to be very small, less than 0.08 percent of flow even under minimum Sacramento River flow conditions. This low level of flow diversion (less than 0.1 percent of river flows) would be expected to be indiscernible relative to existing habitat conditions for special-status and native fish species. Therefore, additional Sacramento River diversions from the Riverside Pumping Plant under the Alternative 5 are not expected to impact special-status fish species or interfere with movement of native resident or migratory fish. Therefore, this impact would be less than significant.

Climate Change

Impacts related to GHG emissions and climate change would be the same under Alternative 5 as under the proposed UWSP, as the amount of residential and nonresidential development under Alternative 5 would be the same as under the proposed UWSP. As a result, the proposed UWSP's less-than-significant impact (with mitigation) related to construction GHG emissions would be the same. Similarly, less-than-significant (with mitigation) impacts related to operational GHG emissions and conflicts with an applicable plan, policy, or regulation related to GHG emissions would also be the same.

Cultural Resources

Impacts related to cultural resources under Alternative 5 would also be like those described for the proposed UWSP as the project footprint would remain the same, and thus the amount of ground disturbance would remain the same under this alternative. Therefore, with respect to historical resources, archaeological resources and/or human remains, the proposed UWSP's significant and unavoidable impacts with mitigation would remain the same under Alternative 5.

Energy

Impacts related to energy consumption would be the same under Alternative 5 when compared to the proposed UWSP, as residential and non-residential development under this alternative would be the same as under the proposed UWSP. As a result, the proposed UWSP's less-than-significant impacts related to energy use would be the same.

Geology, Soils, and Paleontology

Impacts related to geology and soils under Alternative 5 would be the same as the proposed UWSP as the same number of residents, employees, and potentially structures would be exposed to the same seismic risks, geologic hazards, and soil conditions found in the UWSP area. Therefore, the same mitigation as identified for the proposed UWSP would also be required under this alternative to reduce the impact to a less-than-significant level.

Concerning paleontological resources, the impact related to these resources would also continue to be potentially significant under Alternative 5, as the potential for the discovery of unknown paleontological resources would remain the same. As a result, the same mitigation as identified for the proposed UWSP would also be required under this alternative to reduce the impact to a less-than-significant level.

Hazards and Hazardous Materials

The location and amount of the residential and non-residential development under Alternative 5 would be the same as under the proposed UWSP. As a result, impacts with respect routine transport, use, or disposal of hazardous materials, accidental release of hazardous materials, hazardous emissions or use of hazardous materials near schools, and physically interfering with an adopted emergency response plan or emergency evacuation plan under this alternative would remain less than significant. Furthermore, with respect to potential onsite contamination, the same mitigation as identified for the proposed UWSP would also be required under this alternative to reduce the impact to a less-than-significant level.

Hydrology and Water Quality

Impacts related to hydrology and water quality under Alternative 5 would be like those described for the proposed UWSP, as the same amount of land would be developed under this alternative as the proposed plan. Therefore, impacts with respect to groundwater supplies or management; flood risk; alteration of drainage patterns; addition of impervious surfaces resulting in erosion, siltation, increased runoff, impedance, or redirection of flood flows; and conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan would remain less than significant. Furthermore, with respect to violation of water quality standards or waste discharge requirements, or degradation of surface or groundwater quality, the same mitigation as identified for the proposed UWSP would also be required under this alternative to reduce the impact to a less-than-significant level.

Land Use

Alternative 5 includes the same development area footprint and residential and commercial densities as the proposed UWSP. As a result, impacts with respect to consistency with applicable land use plans, policies, and regulations, including the Sacramento County 2030 General Plan and the County Zoning Code, the physical division of an established community or conflict with any land use plan, policy, or

regulation adopted for the purpose of avoiding or mitigating an environmental effect would remain less than significant.

Noise

The location and amount of the residential and non-residential development under Alternative 5 would be the same as under the proposed UWSP. Therefore, impacts related to construction noise, construction vibration, traffic noise, and stationary noise would remain potentially significant but could be reduced to less-than-significant levels with the same mitigation measures proposed for UWSP. However, stationary noise impacts on offsite receptors from facilities like the high school sports stadium and parks would remain significant and unavoidable, even with mitigation. Additionally, aircraft noise exposure for future residents would be addressed similarly to UWSP through insulation and disclosure requirements.

Population and Housing

Impacts related to population and housing under Alternative 5 would be the same as those described for the proposed UWSP, as the amount of residential use under this alternative would be the same. Therefore, impacts related to the inducement of substantial unplanned population growth in the area, either directly or indirectly, would remain significant and unavoidable. Furthermore, impacts related to displacement of housing would also remain less than significant.

Public Services and Recreation

Impacts related to public services and recreation under Alternative 5 would be the same as those described for the proposed UWSP, as the amount of residential and commercial use under this alternative would be the same. As a result, impacts related to the demand for police protection service, fire protection service, public schools, parks and recreation, and libraries would remain less than significant under Alternative 5.

Transportation

As discussed above, the proposed roadway network changes to the proposed UWSP circulation system would reduce projected future traffic levels on Garden Highway and slightly increase traffic on El Centro Road and Radio Road but would not otherwise change the impact conclusions reached in the Draft EIR. Therefore, significant and unavoidable impacts (with mitigation) related to the consistency with plans, ordinances, or policies addressing the circulation system and design-related hazards such as ramp queueing and safety issues near the Sacramento 49er truck stop would remain the same. Furthermore, impacts with respect to VMT and emergency access impacts would also continue to be less than significant for the same reason.

Tribal Cultural Resources

Impacts related to tribal cultural resources under Alternative 5 would be like those described for the proposed UWSP, as the project footprint, and thus the amount of ground disturbance, would remain the same under this alternative. As a result, the

proposed UWSP's significant and unavoidable impacts would remain under this alternative even with the same mitigation required.

Utilities and Service Systems

Infrastructure

The amount and location of required wastewater, stormwater/drainage, electrical, natural gas, and telecommunication infrastructure would remain the same as those described for the proposed UWSP as the amount of the residential and non-residential development under Alternative 5 would be the same as under the proposed plan. As discussed above, the proposed water treatment and distribution infrastructure to serve Alternative 5 would either occur within an existing right-of-way or within the footprint of the USWP area that was evaluated in the Draft EIR. Therefore, the impact related to the construction of required infrastructure to serve development allowed under the proposed UWSP would remain less than significant.

Water Supply

As discussed above, the NCMWC would have adequate planned water supply to serve development allowed under the proposed UWSP during normal, single dry, and multiple dry years as confirmed by the WSA prepared by SCWA for the proposed UWSP. As a result, the impact related water supply would remain less than significant.

Sewer

The amount of the residential and non-residential development under Alternative 5 would be the same as under the proposed UWSP. Therefore, impacts related to demand for wastewater disposal would remain less than significant.

Solid Waste

The amount of the residential and non-residential development under Alternative 5 would be the same as under the proposed UWSP. Therefore, impacts related to demand for solid waste disposal would remain less than significant.

Relationship to Project Objectives

All of the objectives for the proposed UWSP would be achieved under Alternative 5.

Environmentally Superior Alternative

Because the significant impacts of Alternative 5 are essentially the same as those of the proposed UWSP, there are no changes in the conclusions of the Draft EIR regarding the Environmentally Superior Alternative. As previously presented in Chapter 3 of the Draft EIR, *Alternatives*, Alternative 4: Reduced Footprint would be the environmentally superior alternative. While none of the significant impacts of the proposed UWSP or Alternative 5 would be avoided under Alternative 4, due to its substantially reduced development footprint, this alternative would provide the greatest reduction in the magnitude of significant impacts while still meeting or partially meeting several of the proposed UWSP objectives.

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APPENDIX ALT 5-1

REVISED PROJECT ROADWAY NETWORK ANALYSIS

Fehr & Peers

Technical Memorandum

Date: August 18, 2025

To: Cameron Shew and Gary Gasperi – Sacramento County Department of Transportation

From: John Gard – Fehr & Peers

Subject: Upper Westside Specific Plan Revised Project Roadway Network Analysis

SA25-0316

Purpose

Fehr & Peers was requested to perform a focused impact analysis to the roadway network resulting from the following potential change to the Upper Westside Specific Plan (UWSP) circulation system:

- Remove Radio Road vehicular connection between Plan Area and Garden Highway.
- Implement traffic calming on San Juan Road between Garden Highway and El Centro Road to discourage its use by through traffic.

The removed street would become an emergency vehicle access (EVA). To model the effects of traffic calming, the free-flow speed on the above segment of San Juan Road was reduced from its present speed limit by 20 miles per hour (mph). The Bryte Bend Road vehicular connection between Plan Area and Garden Highway would remain.

The "Revised Project" terminology used in this memo represents the above roadway modifications[1]. No changes in project land uses were made.

Traffic forecasts were developed for average daily conditions for 23 different roadway segments and 14 different intersections under Cumulative Plus Revised Project conditions. This scenario was chosen (instead of Existing Plus Project) because it is comprised of greater levels of background traffic on streets to be modified and/or effected.

Analysis Methodologies

Traffic forecasts were developed using the same version of the Sacsim travel demand model used in the *Final Local Transportation Analysis (LTA) for Upper Westside Specific Plan* (Fehr & Peers, 2025).

Roadway segments were analyzed to determine the segment daily level of service (LOS) using the same analysis methods as applied in the LTA. Peak hour intersection turning movement volumes were developed and reviewed to determine whether certain critical turning movements would experience notable increases in traffic (relative to the forecasts in the LTA), which could warrant supplemental traffic operations analysis.

[1] The UWSP LTA had assumed a Street 9 connection to Garden Highway. As part of the Final EIR for the Upper Westside Specific Plan, additional analysis was performed that led to the conclusion that the removal of this connection (estimated to carry 900 vehicles per day at project buildout) would not adversely affect roadway network operations. The analysis of the "Revised Project" presented here includes the effects of that street removal along with others listed above.

Cumulative Plus Revised Project Conditions

Figure 1 shows the ADT for the Cumulative Plus Revised Project scenario for a subset of the roadway segments that were studied in the UWSP DEIR. These include facilities in Sacramento County, City of Sacramento, and within Caltrans's right-of-way (ROW) including several streets that would be constructed by the project.

Table 1 shows the ADT on the five gateway streets. Key findings from this table are:

1. The eliminated project street connections to Garden Highway would cause Garden Highway north of Radio Road to carry considerably less traffic than the DEIR proposed project.
2. The traffic diverted away from Garden Highway would primarily shift to El Centro Road between Radio Road and Arena Boulevard (2,000 ADT increase).
3. The revised project would reduce the amount of traffic (relative to the DEIR proposed project) by 400 ADT on West El Camino Avenue between I-80 and El Centro Road.
4. When considering all five gateway routes, there is a net decrease of 800 trips per day. This could be associated with less cut-through traffic within the UWSP area and also changes in UWSP area trip-making due to the change in street connections.

Table 1: Change in ADT at Project Gateway Streets – Cumulative Plus Revised Project Conditions

Segment	General Direction Relative to UWSP Area	Average Daily Traffic (ADT) [1]		
		Cumulative Plus Project (UWSP DEIR) [2]	Cumulative Plus Revised Project [3]	Change
Garden Highway: Powerline Road to Radio Road	North	8,500	5,600	-2,900
El Centro Road: Arena Boulevard to Radio Road	North	35,900	37,900	2,000
San Juan Road: El Centro Road to Orchard Lane	East	15,500	15,600	100
West El Camino Avenue: El Centro Road to I-80 WB Ramps	Southeast	88,700	88,300	-400
Garden Highway: East of I-80 Overcrossing	South	5,000	5,400	400
Total		153,600	152,800	-800

Notes:
[1] Values rounded to nearest 100 vehicles.
[2] Source is Figures 18a and b of UWSP LTA.
[3] Derived by using the same version of SACSIM model used in DEIR to analyze changes in travel demand associated with street modifications described above.
Source: Fehr & Peers, 2025.

Table 2 shows the change in ADT along Garden Highway and the UWSP project accesses connecting to it with the Revised Project. As shown, the project would cause notable decreases in ADT along various segments of Garden Highway along the project frontage and to its north. There would be a slight increase in ADT (400) on Garden Highway east of the I-80 overcrossing.

Table 2: Change in ADT along Garden Highway and its Project Accesses – Cumulative Plus Revised Project Conditions

Segment	Average Daily Traffic (ADT) [1]				
	Existing	Cumulative No Project	Cumulative Plus Project (UWSP DEIR) [2]	Cumulative Plus Revised Project [3]	Change Between UWSP DEIR and Revised Project
Garden Highway: Powerline Road to Radio Road	2,300	3.500	8,500	5,600	-2,900
Garden Highway: south of San Juan Road	1,800	1,100	2,400	2,200	-200
Garden Highway: East of I-80 Overcrossing	1,900	1,700	5,000	5,400	400
Radio Road: East of Garden Highway	-	-	1,400	0	-1,400
San Juan Road: East of Garden Highway	2,300	3,200	6,200	4,500	-1,700
Street 9: East of Garden Highway	-	-	1,000	0	-1,000
Bryte Bend Road: North of Garden Highway	-	-	2,900	3,100	200

Notes:
[1] Values rounded to nearest 100 vehicles.
[2] Source is Figures 18a and b of UWSP LTA.
[3] Derived by using the same version of SACSIM model used in DEIR to analyze changes in travel demand associated with street modifications described above.
Source: Fehr & Peers, 2025.

Roadway Segment LOS Results

Table 3 shows the Cumulative Plus Revised Project LOS on 18 roadway segments in Sacramento County that were also studied in the UWSP LTA. Key findings from this table are:

- El Centro Road between Arena Boulevard and Radio Road would degrade from LOS E (acceptable) to LOS F (unacceptable) due to the 2,.00 ADT increase caused by the Revised Project.
- Garden Highway (from Powerline Road to San Juan Road) and Powerline Road north of Garden Highway would improve from LOS E (unacceptable) to LOS D (acceptable) with the Revised Project.
- The Revised Project would further degrade cumulatively LOS F operations (under the DIER proposed project) on Radio Road between Street 12 and El Centro Road. It would have this segment's volume-to-capacity ratio to increase from 1.14 to 1.187 due to a 600 ADT increase.

In summary, eliminating street connections to Garden Highway would result in less travel on it (and improved operations) with corresponding increases in traffic on El Centro Road south of Arena Boulevard and Radio Road west of El Centro Road.

Fehr & Peers

Table 3: Sacramento County Roadway Segment Operations – Cumulative Plus Revised Project Conditions

Segment	LOS Standard	Cumulative Plus Project (UWSP DEIR LTA) Conditions				Cumulative Plus Revised Project Conditions		
		Classification	ADT	V/C [1]	LOS	ADT	V/C [1]	LOS
West El Camino Avenue west of El Centro Road	E	Arterial, low access control (4 lanes)	18,800	0.63	B	18,700	0.62	B
West El Camino Avenue: El Centro Road to I-80 WB Ramps	E	Arterial, moderate access control (6 lanes)	**88,700**	**1.48**	**F**	**88,300**	**1.47**	**F**
El Centro Road: Street 4 to West El Camino Avenue	E	Arterial, moderate access control (6 lanes)	20,900	0.39	A	21,200	0.39	A
El Centro Road: West El Camino Avenue to Street 5	E	Arterial, moderate access control (6 lanes)	**62,100**	**1.15**	**F**	**61,800**	**1.14**	**F**
El Centro Road: Farm Road to Street 7	E	Arterial, moderate access control (4 lanes)	**45,600**	**1.27**	**F**	**45,600**	**1.27**	**F**
El Centro Road: San Juan Road to Radio Road	E	Arterial, moderate access control (4 lanes)	33,000	0.92	E	33,900	0.94	E
El Centro Road: Radio Road to Arena Boulevard	E	Arterial, moderate access control (4 lanes)	35,900	1.00	E	**37,900**	**1.05**	**F**
Radio Road: Street 12 (E) to El Centro Road	E	Arterial, low access control (2 lanes)	**17,100**	**1.14**	**F**	**17,700**	**1.18**	**F**
San Juan Road: Bryte Bend Road to Street I	E	Arterial, low access control (2 lanes)	9,600	0.64	B	8,500	0.57	A
San Juan Road: El Centro Road to Orchard Lane	E	Arterial, low access control (2 lanes)	**15,600**	**1.04**	**F**	**15,600**	**1.04**	**F**
Bryte Bend Road: Radio Road to San Juan Road	E	Arterial, low access control (2 lanes)	5,100	0.34	A	5,600	0.37	A
Bryte Bend Road: San Juan Road to Street 7	E	Arterial, low access control (2 lanes)	7,300	0.49	A	7,100	0.47	A
Bryte Bend Road: El Camino Avenue to Street 8	E	Arterial, low access control (2 lanes)	3,200	0.21	A	3,200	0.21	A
Bryte Bend Road: north of Garden Highway	E	Arterial, low access control (2 lanes)	2,900	0.19	A	3,100	0.21	A
Powerline Road: Del Paso Road to Garden Highway	D	Rural, 2 lane road, <24' of pavement, <6' shoulders	**8,000**	**0.63**	**E**	5,100	0.40	D
Garden Highway: Powerline Road to Radio Road	D	Rural, 2 lane road, <24' of pavement, <6' shoulders	**8,500**	**0.66**	**E**	5,600	0.44	D
Garden Highway: Radio Road to San Juan Road	D	Rural, 2 lane road, <24' of pavement, <6' shoulders	**7,000**	**0.55**	**E**	5,400	0.42	D
Garden Highway: San Juan Road to Street 9	D	Rural, 2 lane road, <24' of pavement, <6' shoulders	2,400	0.19	C	2,200	0.17	C

Notes:
[1] v/c = Volume to capacity ratio.
Bolded cells represent unacceptable operations.
Source: Fehr & Peers, 2025.

Table 4 shows the change in daily traffic on study roadways in the City of Sacramento and under Caltrans control.[2] Changes to these roadway segments are modest.

Table 4: Change in ADT on Study Roadway Segments Under Jurisdiction of City of Sacramento and Caltrans

Segment	Average Daily Traffic (ADT) [1]			
	Cumulative No Project	Cumulative Plus Project (UWSP DEIR LTA)	Cumulative Plus Revised Project [2]	Difference (Revised Project – DEIR LTA)
West El Camino Avenue over I-80	26,700	67,100	66,900	-200
West El Camino Avenue east of I-80	24,200	45,400	45,800	400
Arena Boulevard west of I-5	35,700	41,700	41,600	-100
San Juan Road east of Orchard Lane	7,700	15,500	15,600	100
Garden Highway east of I-80 Overcrossing	1,700	5,000	5,400	400
Garden Highway west of I-5	17,400	21,700	21,800	100

Notes:
[1] Values rounded to nearest 100 vehicles.
[2] Derived by using the same version of SACSIM model used in DEIR to analyze changes in travel demand associated with street modifications described above.
Source: Fehr & Peers, 2025.

Intersection Peak Hour Turning Movement Volumes

Figure 2 shows the AM and PM peak hour turning movement volumes at 15 critical intersections in the UWSP study area under Cumulative Plus Revised Project conditions. These locations are those most likely to have meaningful changes in traffic as a result of the project circulation network changes.

Table 5 compares the total cumulative AM and PM peak hour intersection traffic volumes and the specific turning movement volumes at four especially critical intersections from the DEIR Proposed Project and Revised Project scenarios. The following conclusions are derived from this table:

1. **AM and PM peak hour traffic volumes at the El Centro Road/West El Camino Avenue intersection and at the two I-80/West El Camino Avenue interchange ramp terminal intersections would decrease as a result of the Revised Project**. The range of decrease is 0.4% to 2.8%.
   Conclusion: The recommended geometric improvements would continue to operate in the same or slightly improved manner relative to the cumulative plus project results shown in the *Final Local Transportation Analysis (LTA) for Upper Westside Specific Plan* (Fehr & Peers, 2025).

[2] LOS analysis is not shown here because the City does not analyze roadway segment operations for daily conditions as part of project-level analyses (though such analyses may be performed for General Plan updates).

Table 5: Comparison of Peak Hour Volumes at Critical Intersections

Intersection	Movement	AM (PM) Peak Hour Volume	
		Cumulative Plus Project (UWSP DEIR LTA)	Cumulative Plus Revised Project
West El Camino/El Centro Road	Eastbound Through	637 (872)	457 (683)
	Westbound Left	440 (707)	419 (720)
	Westbound Through	750 (759)	769 (763)
	Westbound Right	1,877 (2,241)	1,834 (2,266)
	Southbound Left	2,002 (2,090)	2,183 (2,205)
	Northbound Right	619 (419)	626 (473)
	Total & Percent Change	**7,003 (7,760)**	**6,912 (7,693) -1.3% (-0.9%)**
West El Camino/I-80 WB Ramps	Eastbound Through	1,836 (1,933)	1,854 (1,829)
	Eastbound Right	1,422 (1,520)	1,412 (1,546)
	Westbound Through	2,211 (2,683)	2,157 (2,685)
	Southbound Left (Off-ramp)	697 (313)	706 (307)
	Southbound Right (Off-ramp)	856 (1,038)	865 (1,064)
	Total & Percent Change	**7,209 (7,993)**	**7,183 (7,874) -0.4% (-1.5%)**
West El Camino/I-80 EB Ramps	Eastbound Through	1,829 (1,394)	1,832 (1,373)
	Eastbound Right	704 (852)	728 (763)
	Westbound Through	1,160 (1,655)	1,142 (1,593)
	Northbound Left (Off-ramp)	1,238 (1,534)	1,204 (1,535)
	Northbound Right (Off-ramp)	177 (339)	210 (338)
	Total & Percent Change	**5,724 (6,213)**	**5,650 (6,037) -1.3% (-2.8%)**
Arena Boulevard/El Centro Road	Westbound Left	411 (608)	406 (577)
	Northbound Through	886 (903)	990 (960)
	Northbound Right	485 (561)	475 (552)
	Southbound Through	994 (843)	1,035 (899)
	Total & Percent Change	**3,987 (3,988)**	**4,247 (4,161) +6.5% (+4.3%)**

Notes:
[3] Derived by using the same version of SACSIM model used in DEIR (and same forecasting techniques) to analyze changes in travel demand associated with street modifications described above.
Source: Fehr & Peers, 2025.

2. **The Revised Project would result in approximately 20 more vehicles during the AM and PM peak hours using the I-80 WB off-ramp at West El Camino Avenue, and no change in AM and PM peak hour traffic at the I-80 EB off-ramp at West El Camino Avenue**. This represents a 1.5% increase during each peak hour.
   Conclusion: The Revised Project would not cause traffic to spillback onto the I-80 mainline under cumulative plus project conditions assuming the improvements identified in the UWSP LTA are implemented.[3]

3. **Although the total traffic volume would increase at the El Centro Road/West El Camino Avenue intersection with the revised project, the critical westbound left and northbound right movements would not experience any increases**.
   Conclusion: The revised project would not be expected to require any modifications to off-site improvements at this intersection.

Effects on Vehicle Miles Traveled (VMT)

The UWSP DEIR included an analysis of the DEIR proposed project's effect on VMT, reaching a conclusion that the impact would be less than significant. This finding would not change under the Revised Project for the following reasons:

1. Table 1 shows a net reduction of 800 ADT entering/exiting the project gateways. As VMT is the product of daily trips and trip length, fewer daily trips means less VMT generated.
2. The Revised Project removes travel routes that are likely more circuitous for project residents. In certain parts of the Plan Area, use of Garden Highway to access external destinations could be quicker than using El Centro Road or West El Camino Avenue but would result in longer travel lengths. Elimination of those connections effectively reduces average trip lengths, albeit very slightly.

[3] Table 16 of the UWSP LTA shows the maximum queue at the westbound off-ramp to be 1,025 feet (under cumulative plus project conditions with recommended improvements). Adding one additional vehicle every three minutes (20 vph) would not cause that queue to grow 50% such that it exceeds the 1,500 feet of available storage.

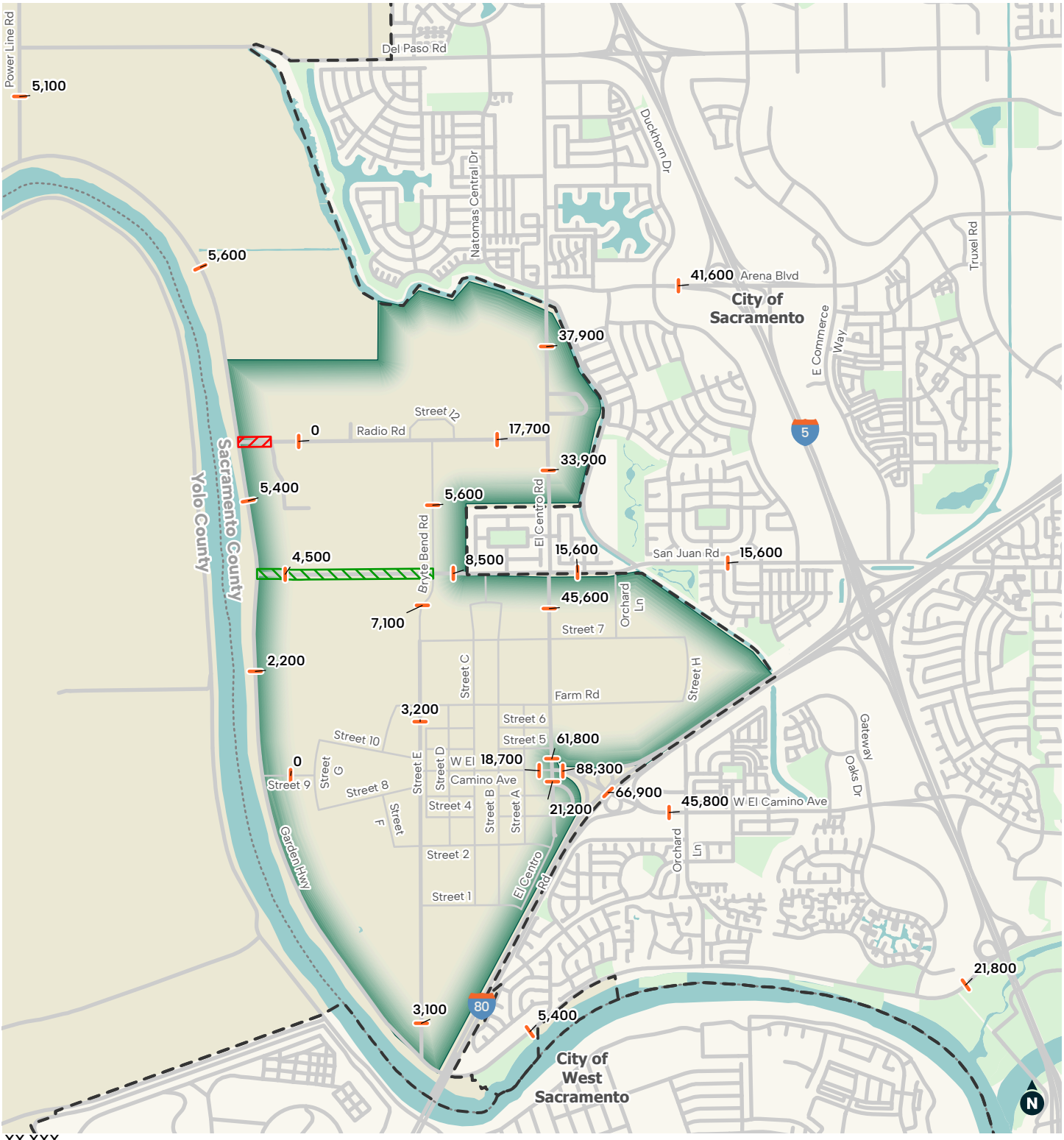
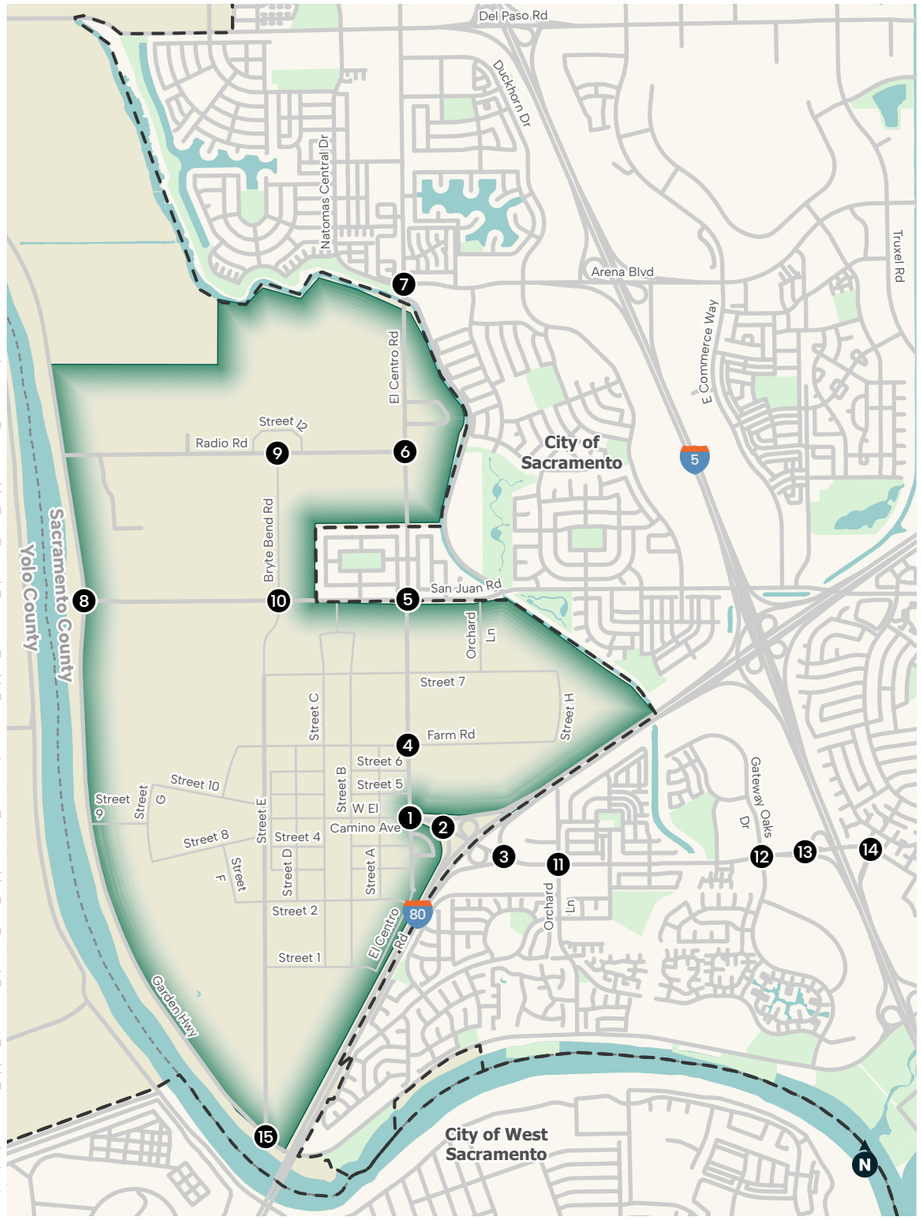
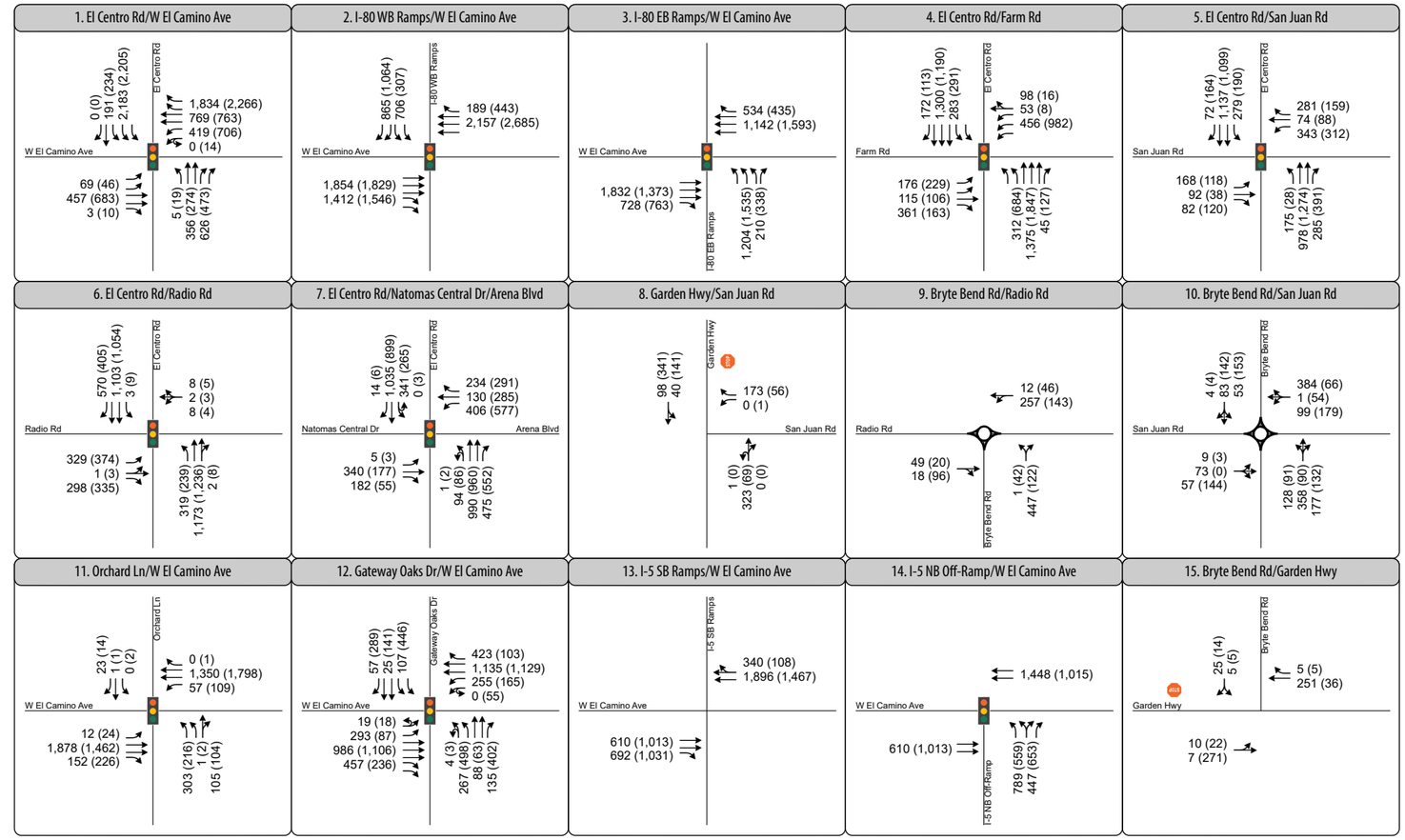


FIGURE 1

Average Daily Traffic – Cumulative Plus Revised Project Conditions

Fehr & Peers





- Study Intersection
- Upper Westside Specific Plan Boundary
- Waterway/Waterbody
- Park
- City Limits
- County Boundary
- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign
- Roundabout

FIGURE 2

Peak Hour Traffic Volumes and Lane Configurations – Cumulative Plus Project Conditions

Fehr & Peers

APPENDIX ALT 5-2

WATER SUPPLY ASSESSMENT

Sacramento County Water Agency

Water Supply Assessment for Upper Westside Specific Plan

Prepared by Sacramento County Water Agency
September 2022
(Revised December 2023)
(Revised February 2023)
(Revised August 2025)
(Revised October 2025)
(Revised November 2025)
(Revised December 2025)

(Administrative Draft Pending Board Approval)

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Appendix F - NCMWC Letter of Interest to provide wholesale water to SCWA for UWSP Area
Appendix G - Upper West Side Specific Plan Water Supply Master Plan

1. INTRODUCTION

BACKGROUND

In 2001, California adopted Senate Bill (SB) 610 and SB 221, thereby amending the California Water Code (Water Code). Under these laws, certain types of development projects are required to provide detailed water supply assessments to planning agencies. The requirements for a water supply assessment (WSA) are set forth in the California Water Code (Water Code) Sections 10910 et seq. A WSA connects water supply and land use planning with the environmental review process. The law also reflects the growing awareness of the need to incorporate water supply and demand analysis at the earliest possible stage in the land use planning process. Any proposed project that is subject to the California Environmental Quality Act (CEQA) and would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project, is subject to SB 610 and is required to prepare a WSA. This WSA has been prepared with the expectation that Sacramento County Water Agency (SCWA) will be the potable water retailer for the proposed Project and will purchase raw water from Natomas Central Mutual Water Company (NCMWC).

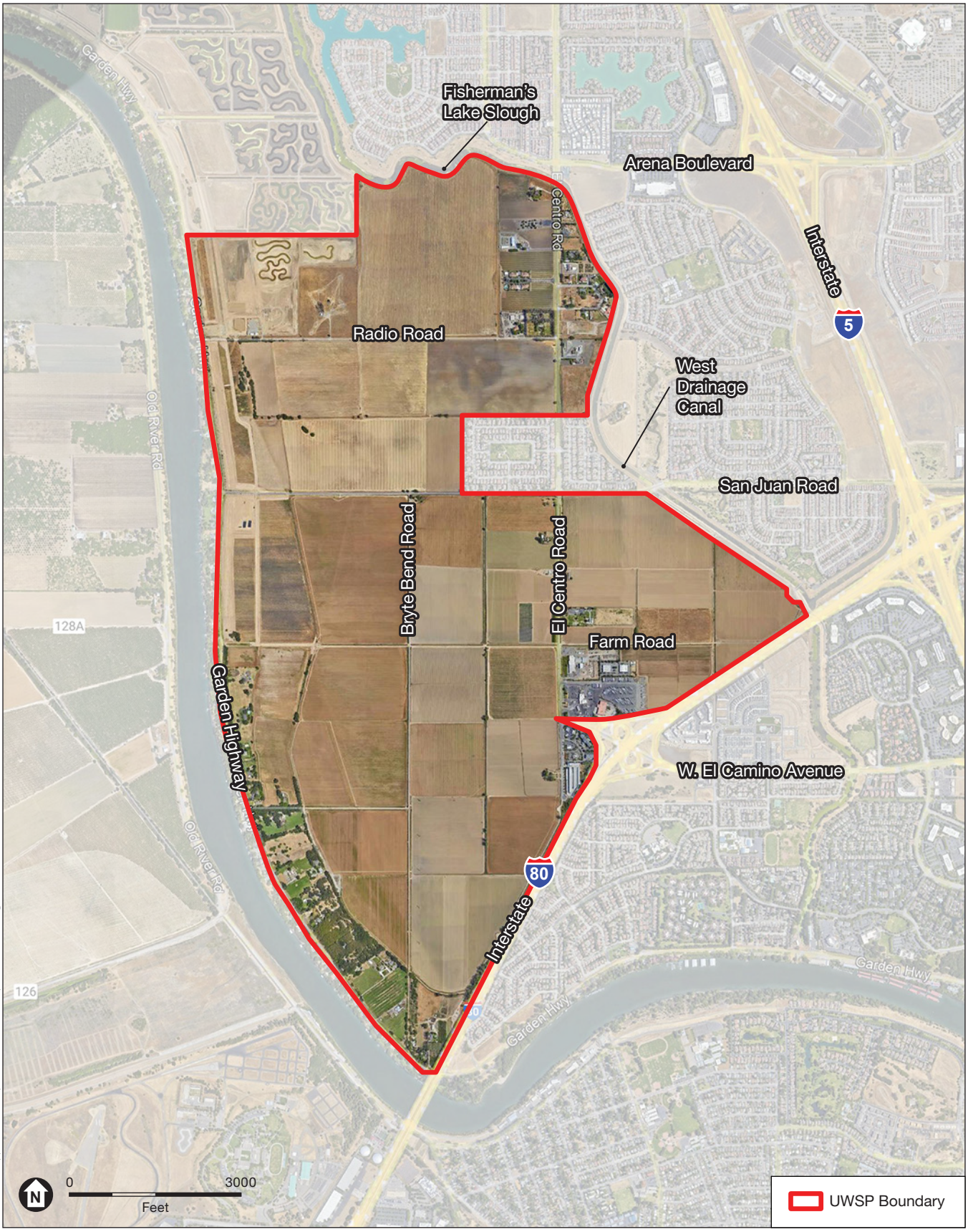
THE PROPOSED DEVELOPMENT PROJECT

The UWSP is in unincorporated Sacramento County adjacent to the existing City of Sacramento communities of North and South Natomas. The UWSP area is bounded by Fisherman's Lake Slough to the north, the West Drainage Canal (Witter Canal) to the east, I-80 to the south, and Garden Highway to the west as shown in **Figure 1**. The UWSP encompasses 2,066 acres of proposed residential, commercial, greenspace and agricultural uses.

The proposed Project is subject to CEQA and would allow for residential and mixed-use developments that may include more than 500 residential units. The UWSP would provide a mix of residential and non-residential land uses to accommodate 9,356 housing units with a mixture of densities that support all population segments, and over 3 million square feet of commercial, retail, and office uses that serve the community's needs. Key features of the UWSP would include a mixed-use Town Center, 10 active parks, and an extensive system of greenbelts and multi-use trails with linkages to downtown Sacramento. Development would be limited to a 1,532-acre Development Area while the remaining 534 acres would serve as an agricultural buffer (Ag Buffer) along the western edge of the UWSP area.

WATER SUPPLY ASSESSMENT OBJECTIVE

The primary purpose of a WSA is to determine whether the identified water supply or water supplier will be able to meet projected demands for the Project, in addition to their existing and planned future uses, over a 20-year planning period in normal, single-dry, and multiple-dry water years. Secondarily, a WSA provides decision-makers a regional framework on which to base a decision about the sufficiency of water supplies for the proposed Project.



SOURCE: Google Earth Pro, basemap, 2021; ESA, 2022

Upper Westside Specific Plan WSA

Figure 1
UWSP Area

This WSA assesses the availability of identified water supplies under normal-, single-dry-, and multiple-dry-year conditions, accounting for the projected water demand of the proposed Project in addition to other existing and planned future uses of the identified water supply.

This WSA examines the service areas of NCMWC and SCWA, (Section 4), wholesale water supplies and the reliability of these supplies (Section 5), the projected water demand of existing and future demand including the proposed Project (Section 6), and a comparison of supply and demand as required in a WSA (Section 7), estimated costs, time frames, and permits for obtaining new surface water supplies (Section 8) and Conclusion (Section 9).

DOCUMENT STRUCTURE

This WSA is organized following a basic hierarchy to describe each issue: regional context NCMWC service area; local context SCWA service area, Project-level analysis for the proposed Project; the assessment as a comparison of water supply and demand for the Project; and existing and future demand in all water year types. The report is as follows:

1. Introduction; project overview, location, and description; and document structure
2. Proposed land use planning and designations
3. General information on water supply planning under SB 610
4. Service area summaries
5. Water supply setting including local climate, water supplies, capacities, and reliability
6. Regional and proposed Project water demands, including historical, projected, and projected dry-year demand
7. Supply-demand comparisons
8. Anticipated Timing, Estimated Costs, and Permits for new surface water supplies
9. Conclusion

2. PROPOSED LAND USE PLAN AND LAND USE DESIGNATIONS

The portion of the UWSP area set aside for development would include a mix of residential, commercial mixed-use, and commercial land uses. Other land uses include schools, parks, urban farm/greenbelt, canals, open space, landscaped corridors, and major roadways. The portion of the plan area set aside for the Ag Buffer includes agricultural residential and cropland.

A summary of proposed land uses within the UWSP area is included in **Table 1**. As shown, the portion of the plan area set aside for development would total 1,532 acres, or approximately 75 percent of the UWSP area, while the portion of the UWSP area set aside for the Ag Buffer would total 534 acres, or about 25 percent of the area. Overall, the UWSP would include 9,356 dwelling units with an estimated population of 25,460 residents and approximately 3.1 million square feet of non-residential space as shown in **Figure 2**. Furthermore, to facilitate the construction of a diverse array of housing types throughout the UWSP area, the UWSP includes

a "Missing Middle Housing Incentive" program, which is intended to encourage the construction of attached, "missing middle" housing units (e.g., duplex, triplex, fourplex) within conventional single-family detached neighborhoods (i.e., LDR, LMDR, MDR). As shown in Table 1, a residential allocation of 300 Missing Middle reserve units have been set aside, which have not been allocated to any parcel. This unit reserve can be used to increase the unit allocation of any LDR, LMDR, and MDR parcel outside the Town Center up to the maximum allowed for a parcel's land use density range, provided that the additional units awarded are used for the construction of attached, missing middle housing units.

Table 1. UWSP Proposed Land Uses

Land Use Map Symbol	Land Use Designation (Density Range)	Net Acres[1]	Anticipated Density/FAR[2]	Dwelling Units[3]/ Square Feet	Population Estimate[4]	Percent Area	Percent Units
Residential Uses							
VLDR	Very Low Density Residential (1.0-4.0 du/ac)	166.7 ac	1.0 du/ac	168 du	504	8.1%	1.8%
LDR	Low Density Residential (4.0-7.0 du/ac)[5]	390.8 ac	5.5 du/ac	2,149 du	6,447	18.9%	23.0%
LMDR	Low Medium Density Residential (6.0-10.0 du/ac)[5]	134.9 ac	8.0 du/ac	1,079 du	3,237	6.5%	11.5%
MDR	Medium Density Residential (8.0-20.0 du/ac)	61.9 ac	12.0 du/ac	743 du	2,229	3.0%	7.9%
HDR	High Density Residential (20.0-40.0 du/ac)	36.4 ac	25.0 du/ac	910 du	2,275	1.8%	9.7%
VHDR	Very High Density Residential (20.0-40.0 du/ac)	22.6 ac	35.0 du/ac	791 du	1,978	1.1%	8.5%
Missing Middle Reserve Units		0.0 ac		300 du	750	0.0%	3.2%
Subtotal		813.3 ac		6,140 du	17,420	39.4%	65.6%
Commercial Uses							
CMU	Commercial Mixed Use[6] (0.02-2.00+ FAR & 30.0-100.0+ du/ac)	83.6 ac	0.60 FAR 39.2 du/ac	3,216 du 2,184,970 SF	8,040	4.0%	34.4%
E/HC	Employment/Highway Commercial[7]	52.9 ac		921,730 SF	--	2.6%	--
Subtotal		*136.5 ac*		3,216 du 3,106,700 SF	*8,040*	*6.6%*	*34.4%*
Public, Park & Open Space Uses							
S	Schools – K-8, HS, CC	124.2 ac				6.0%	
P	Parks	79.1 ac				3.8%	
G/UF	Greenbelt/Urban Farm	44.1 ac				2.1%	
OS-C	Open Space – Canal	15.0 ac				0.7%	
OS	Open Space – Lake Basins & Others	167.9 ac				8.1%	
Subtotal		*430.3 ac*				*20.8%*	
Right-of-way							
	Major Roads A	115.9 ac				5.6%	
	Landscape Corridors	27.8 ac				1.3%	
Subtotal		*143.7 ac*				*7.0%*	
Subtotal Development Area		**1523.8 ac**				**73.7%**	

Land Use Map Symbol	Land Use Designation (Density Range)	Net Acres[1]	Anticipated Density/FAR[2]	Dwelling Units[3]/ Square Feet	Population Estimate[4]	Percent Area	Percent Units
Ag Buffer							
AR	Agricultural Residential[8]	86.1 ac		--		4.2%	
AG	Agricultural Cropland[8]	414.3ac		--		20.1%	
OS	Open Space – Ag Buffer	36.6 ac				1.8%	
	Major Road B – Ag Buffer	5.4 ac				0.3%	
Subtotal		*542.4 ac*				*26.3%*	
	Total	**2,066.2 ac**		**9,356 du 3,106,700 SF**	**25,460**	**100%**	**100%**

NOTES: ac = acres; CC = Community College land use designation; du/ac = dwelling units per acre; FAR = floor area ratio; HS = High School land use designation; K-8 = Kindergarten through 8th Grade School land use designation

1 Net acreage based on Land Use Plan generated in GIS/AutoCAD by Wood Rodgers, February 2025. Arterial and collector roads, some primary residential streets, and adjacent landscape corridors as shown on map, have been netted out.

2 Anticipated density/FAR is an estimate to establish a development allocation for each land use designation in the plan area.

3 Buildout estimates are derived as a cumulative total for each land use designation, which are based on anticipated density/FAR. Each specific plan parcel is permitted to develop within its specified land use density/FAR range, which may be greater or less than the anticipated density/FAR.

4 Estimate assumes 3.0 persons per household for single-family and 2.5 persons per household for multi-family residential uses. Overall average is 2.73 persons per household.

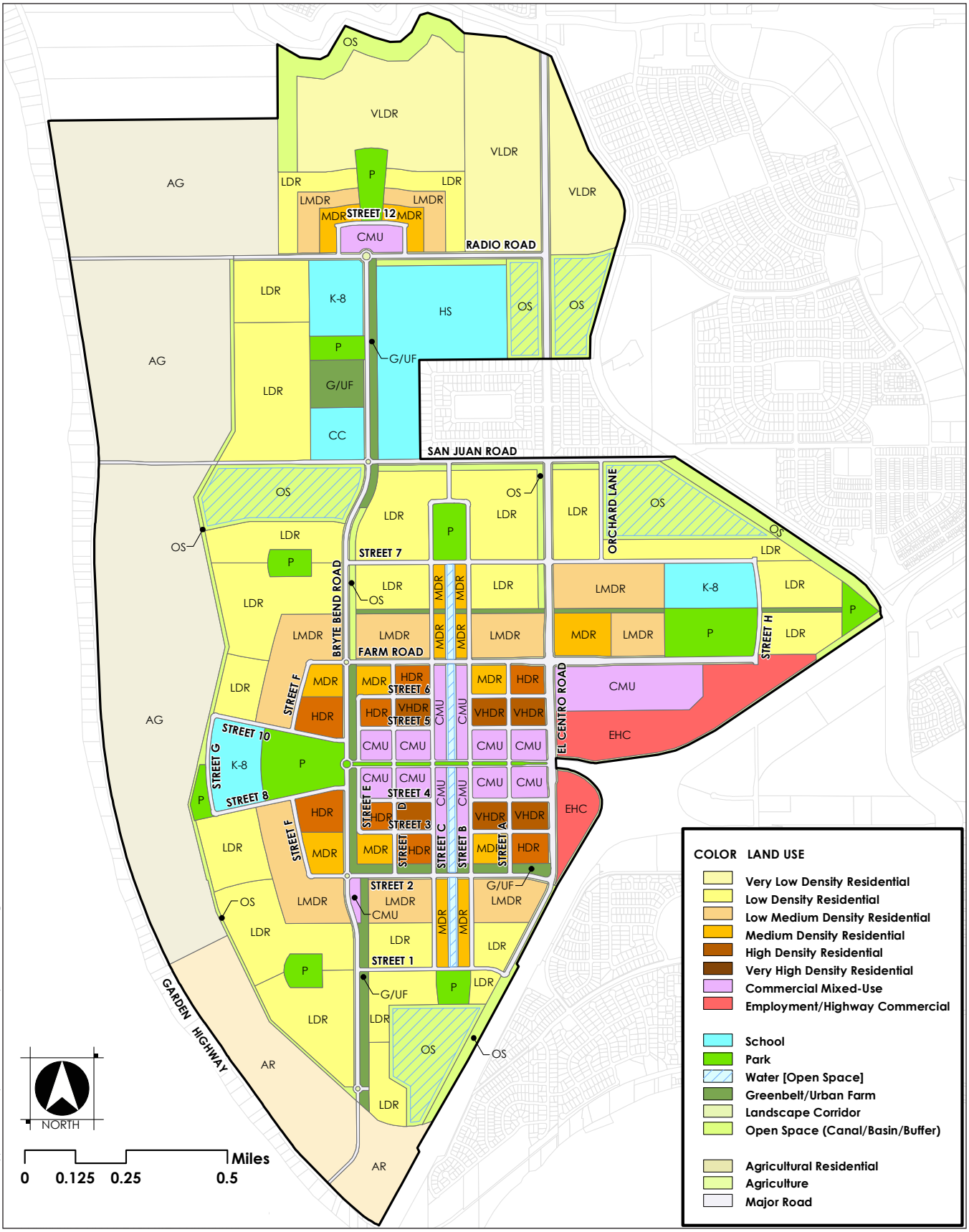
5 Residential density calculations exclude approximately 5.5 acres of Development Area designated for planned public facilities including water storage tank, sewer pump station, and electric substations.

6 No residential units are allocated to the 1.2-acre Commercial Mixed Use (CMU) parcel at the southeast corner of Bryte Bend Road and Street 2 to accommodate a planned fire station.

7 Non-residential square footage allocations are additive to existing commercial uses that were constructed prior to Specific Plan approval.

8 Ag-Buffer uses (AR and AG) have no unit allocation and are not included in the 1,532-acre Development Area or Urban Policy Area/Urban Services Boundary expansion area.

SOURCE: Wood Rodgers 2025



D150587.01 - Upper Westside Specific Plan EIR\05 Graphics-GIS-Modeling-USE AZURE\Illustrator

SOURCE: Upper Westside Specific Plan Admin Draft #4, 2025

Upper Westside Specific Plan WSA

Figure 2
UWSP Land Use Plan

3. WATER SUPPLY PLANNING

California has many different processes through which the development and/or maintenance of water supplies are planned on a local and regional level. Urban Water Management Plans (UWMPs), Groundwater Management Plans (GMPs), Integrated Regional Water Management Plans (IRWMPs), Municipal Service Reviews (MSRs) and water resources components of General Plans all integrate a degree of regional planning of water supply and demand.

To complement these large-scale planning processes, California enacted Senate Bill (SB) 610 and 221 in 2002, both of which emphasize the interrelationships between land use and water supply planning and require the incorporation of water supply and demand analysis at the earliest possible stage in the planning process for sizeable land use projects. These statutes primarily apply to the planning of water supplies and identification of sources for defined "projects" (Water Code, Section 10912) in the case of SB 610 and for individual residential subdivision projects of more than 500 units in the case of SB 221. SB 610 amended portions of the Water Code, including Section 10631, which contains the Urban Water Management Planning Act, and added Sections 10910, 10911, 10912, 10913, and 10915, which describe the required elements of a WSA to be prepared and relied upon during the CEQA process. WSAs are prepared in connection with the environmental review process for defined "projects" (generally very similar to "projects of statewide, regional, or area wide significance," as defined in "CEQA Guidelines" Section 15206), and provide information (along with EIR analysis) to be considered by agency decision-makers at the time of project approval. Nothing in SB 610 prevents a city or county from approving a proposed project even in the face of information concluding that there is not sufficient water supply for build-out of the project.

Under both laws, agencies are required to consider water demands over a 20-year planning horizon, considering normal, single dry, and multiple dry year scenarios in light of the water provider's existing and planned future uses, including agricultural and manufacturing uses.

WATER SUPPLY PLANNING UNDER SB 610 AND SB 221

As the "public water system" that will supply water to the UWSP area, SCWA is required to prepare a WSA and water supply verifications (WSVs), under the requirements of Senate Bills 610 and 221, and the Government Code (Sections 65867.5, 66455.3 and 66473.7). There are three primary areas to be addressed in a WSA:

(1) A description of all relevant water supply entitlements, water rights, and/or water contracts;

(2) A description of the available water supplies and the infrastructure, either existing or proposed, to deliver the water; and

(3) An analysis of the demand placed on those supplies, by the project, and relevant existing and planned future uses in the area.

Where the description of existing water supply entitlements, water rights, and/or water contracts shows insufficient water supplies to serve the proposed project as well as existing and planned uses over the 20-year planning horizon, additional information is required to describe how and where sufficient supplies may be obtained. Such information must include the estimated costs, financing methods, and regulatory approvals needed to obtain new supplies, as well as a projected time frame for obtaining them. This is included in Section 8 of this WSA. WSVs must also contain information regarding existing supplies, as well as more detailed confirmation that the appropriate infrastructure planning and funding is in place to fully commit water supplies to a project. Senate Bill 610, which is applicable to certain large projects subject to CEQA or considered a "project" under Water Code Section 10912(a) or (b), builds on the information that is typically contained in an UWMP. The amendments to Water Code Section 10631 were designed to make WSAs and UWMPs consistent. A key difference between the WSAs and UWMPs is that pursuant to Water Code Section 10621, UWMPs are required to be updated every five years on or before July 1, in years ending in one and six, while WSAs are required as part of the environmental review process for each individually qualifying project. As a result, the 20-year planning horizons for each type of document may cover slightly different planning periods. Additionally, not all water providers who must prepare a WSA under SB 610 are required to prepare an UWMP because these water systems do not meet the requirements in Water Code section 10631. As stated above, only public water systems providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) annually must prepare UWMPs.

SB 610 WATER SUPPLY ASSESSMENT

The SB 610 water supply assessment process involves answering the following questions:

- Is the project subject to CEQA?
- Is it a project under SB 610?
- Is there a public water system?
- Is there a current UWMP that accounts for the project demand?
- Is groundwater a component of the supplies for the project?
- Are there sufficient supplies available to serve the project over the next 20 years?

"Is the Project Subject to CEQA?"

The first step in the SB 610 process is determining whether the project is subject to CEQA. SB 610 amended Public Resources Code Section 21151.9 to read: "Whenever a City or county determines that a project, as defined in Section 10912 of the Water Code, is subject to this division [i.e., CEQA], it shall comply with part 2.10 (commencing with Section 10910) of Division 6 of the Water Code." The County of Sacramento (County) is the CEQA lead agency, as required, the County is conducting an environmental review under the requirements of CEQA. As the CEQA lead agency, the County determined that the proposed Project is a project subject

to CEQA. The information contained in this assessment will be used to inform and support the Recirculated DEIR and will be appended thereto.

"Is It a Project Under SB 610?"

The second step in the SB 610 process is to determine if a project meets the definition of a "Project" under Water Code Section 10912(a). Under this section, a "Project" is defined as meeting any of the following criteria:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet (ft2) of floor space;
- A commercial building employing more than 1,000 persons or having more than 250,000 ft2 of floor space;
- A hotel or motel with more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park, planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 ft2 of floor area;
- A mixed-use project that includes one or more of these elements; or
- A project creating the equivalent demand of 500 residential units.

Alternately, if a public water system has less than 5,000 service connections, the definition of a "Project" also includes any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of service connections for the public water system.

As previously stated, the proposed Project would allow for residential and mixed-use developments that may include more than 500 units. In fact, the proposed Project would allow up to 9,356 new dwelling units, and for that reason, it meets the requirements as a "Project" under the Water Code. As a result, a WSA pursuant to Water Code Section 10912 (a) will need to be prepared prior to completion of the Recirculated DEIR. Therefore, the County has determined that a WSA is required as part of the CEQA analysis of the Recirculated DEIR.

"Is There a Public Water System?"

The third step in the SB 610 process is determining if there is a "public water system" to serve the project. Section 10912(c) of the California Water Code states: "[A] public water system means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections."

As the wholesaler, NCMWC will divert and deliver raw water to SCWA. SCWA will be the public water purveyor for the proposed Project that will own and operate the new public water system to treat, store and distribute potable water within the UWSP area.

"Is There a Current Urban Water Management Plan That Accounts for the Project Demand?"

Step four in the SB 610 process involves determining if there is a current UWMP that considers the projected water demand for the project area. The Water Code requires that all public water systems providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 AF annually must prepare an UWMP. Pursuant to Water Code Section 10621, UWMPs are required to be updated every five years on or before July 1, in years ending in one and six.

NCMWC diverts and delivers raw water to agricultural users within its service area and is not required to prepare UWMPs per the Water Code. In 2020, SCWA prepared an UWMP (**Appendix A**), which was adopted in June 2021. At the time of adoption, the UWSP was not within SCWA service area. The SCWA 2020 UWMP shows that current SCWA supplies are fully allocated to existing service areas, taking into account projected growth. The UWS lies outside of all SCWA benefit zones and outside of the POU of SCWA's existing water rights and contracts. SCWA does not currently have any water supplies to serve this area but has the capacity to treat and deliver water supplies obtained through a wholesale contract to serve UWS through the appropriate processes. As discussed below, in the event that SCWA becomes the water purveyor for the UWSP area, a new Benefit Zone with a rate structure to finance the zone would be created and included in subsequent UWMP documents.

Water Code Section 10910(c)(2) states: "If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g) [i.e., the WSA]." If projected water demand associated with the proposed project was not accounted for in the most recently adopted urban management plan, Water Code Section 10910(c)(3) states: "the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

"Is Groundwater a Component of the Supplies for the Project?"

According to the requirements of SB 610, if groundwater is identified as a possible source, Section 10910(f) of the Water Code also applies and a description of the groundwater basin or basins from which the proposed project will be supplied must be included in the WSA. Per the Alternative Water Source Memo by Wood Rodgers (Appendix B), groundwater is not a proposed water source for the UWSP area and is not evaluated further in this WSA.

"Are There Sufficient Supplies to Serve the Project over the Next 20 Years?"

The final step in the SB 610 process is to illustrate the available water supplies, including the availability of these supplies in all water-year conditions (normal year, single dry year, and multiple dry years) over a 20-year planning horizon, and an assessment of how these supplies relate to project-specific and cumulative demands over 20- and 25-year planning periods as compared to the SCWA 2020 UWMP. The water supply and demand comparisons are presented and discussed in Section 7. Section 9 of this WSA provides a conclusion.

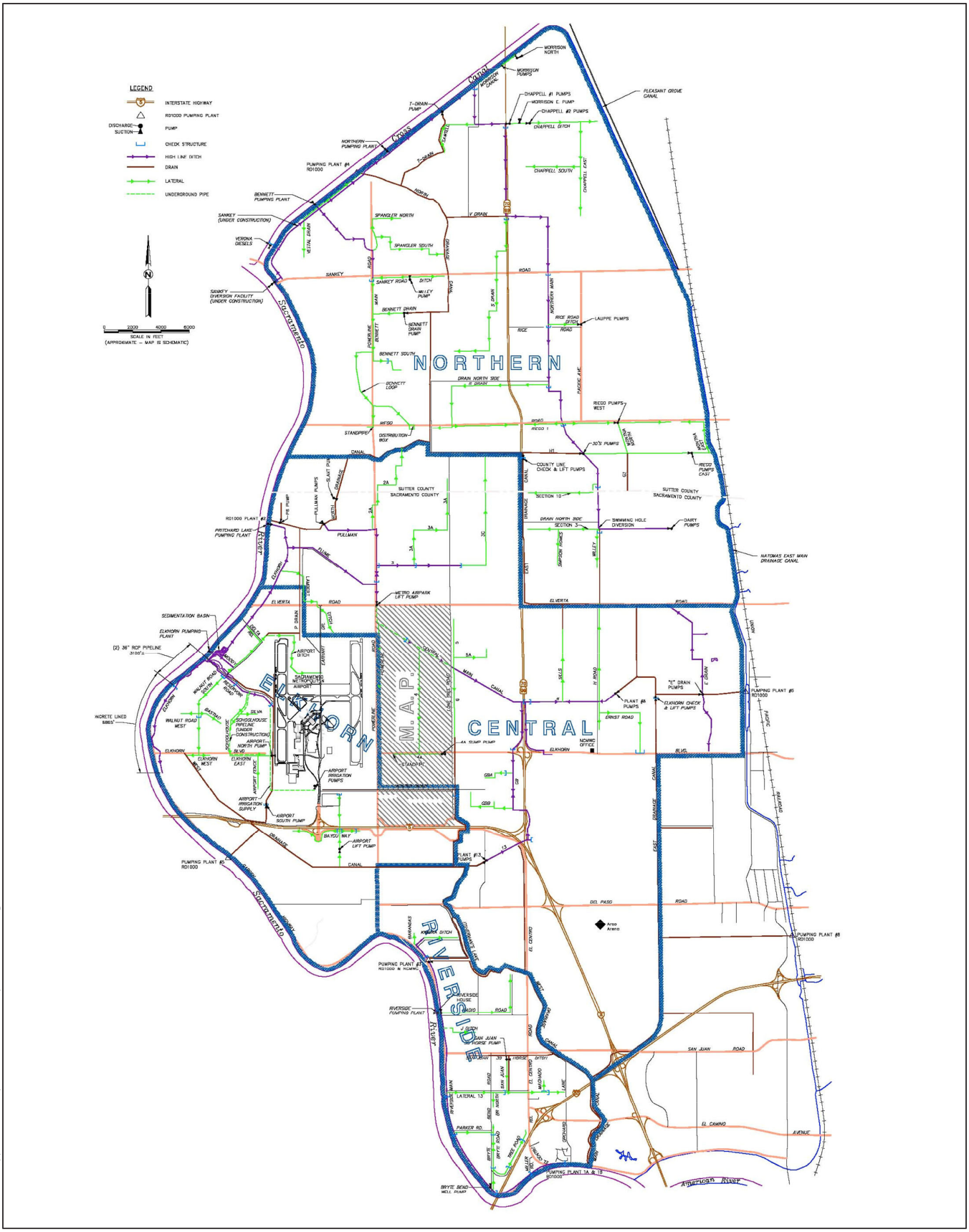
WSA Conclusion: Under normal and dry years, NCMWC would have sufficient CVP water supplies available to serve development implemented under the UWSP plus existing demand and planned future uses between 2025 and 2045. In critical dry years when the Drought Protection Program's measures are in effect, CVP supplies could be reduced by 50 percent, in these cases, NCMWC would not be able to meet projected demand, including demand generated by the UWSP. However, with implementation of a prioritization agreement per the letter from NCMWC (Appendix F) and an amendment to the USBR settlement agreement (Appendix D) to allow for some of those water supplies to be diverted during winter months, water supplies delivered through the NCMWC system for treatment and distribution by SCWA in the UWSP area would meet demand during Drought Protection Program curtailments.

4. SERVICE AREA SUMMARIES

NATOMAS CENTRAL MUTUAL WATER COMPANY

The Natomas Central Mutual Water Company (NCMWC) is a private, not-for-profit corporation representing the interests of its 280 member/shareholders. For more than 80 years, NCMWC has provided irrigation water, at cost, to its shareholders for agriculture use. NCMWC does not provide potable water to any shareholders, nor does it have the capability to treat raw water. NCMWC provides water services to 33,223 acres through pipelines, pumps and more than 50 miles of canals. NCMWC service area is adjacent to the Sacramento River, north to the Cross Canal, east to Natomas East Main Drainage Canal and south to the American River in Sacramento County. Refer to **Figure 3**.

In March 2004, NCMWC authorized its staff and consultants to finalize an operating agreement with another long-time Sacramento water provider, American States Utility Services, Inc. (ASUS), to provide water and wastewater services to municipal and industrial users in the Natomas Basin. The partnership allows NCMWC to serve all development within its service area, while preserving habitat, encouraging conservation and maximizing the value of our shareholders' historic water rights. The partnership with ASUS makes certain that the water NCMWC draws from the Sacramento River, American River and from groundwater wells stays in northern California.



SOURCE: Mead & Hunt

Upper Westside Specific Plan WSA

Figure 3
NCMWC Service Area Facility Map

D1505587.01 - Upper Westside Specific Plan EIR\05 Graphics-GIS-Modeling-USE AZURE\Illustrator

SACRAMENTO COUNTY WATER AGENCY

SCWA has created several assessment zones to enable potable water related projects. SCWA currently provides water service to seven different hydraulic areas as well as wholesale water to the Elk Grove Water District. These service areas include: Metro Air Park, Northgate 880, Arden Park Vista, Southwest Tract, Zone 40, Hood Water Maintenance District (Hood), and East Walnut Grove (Walnut Grove). SCWA's Zone 40 service area represents the largest group of customers and linked hydraulic service areas. Through its water service area, SCWA is currently providing water service to approximately 70,000 residential, commercial, irrigation, industrial and institutional/governmental service connections throughout all the water service areas. Much of the development is low-density, single-family housing and retail related commercial use, except for the Northgate and Metro Air Park service areas which are predominantly warehouse and light industrial customers. Refer to **Figure 4**.

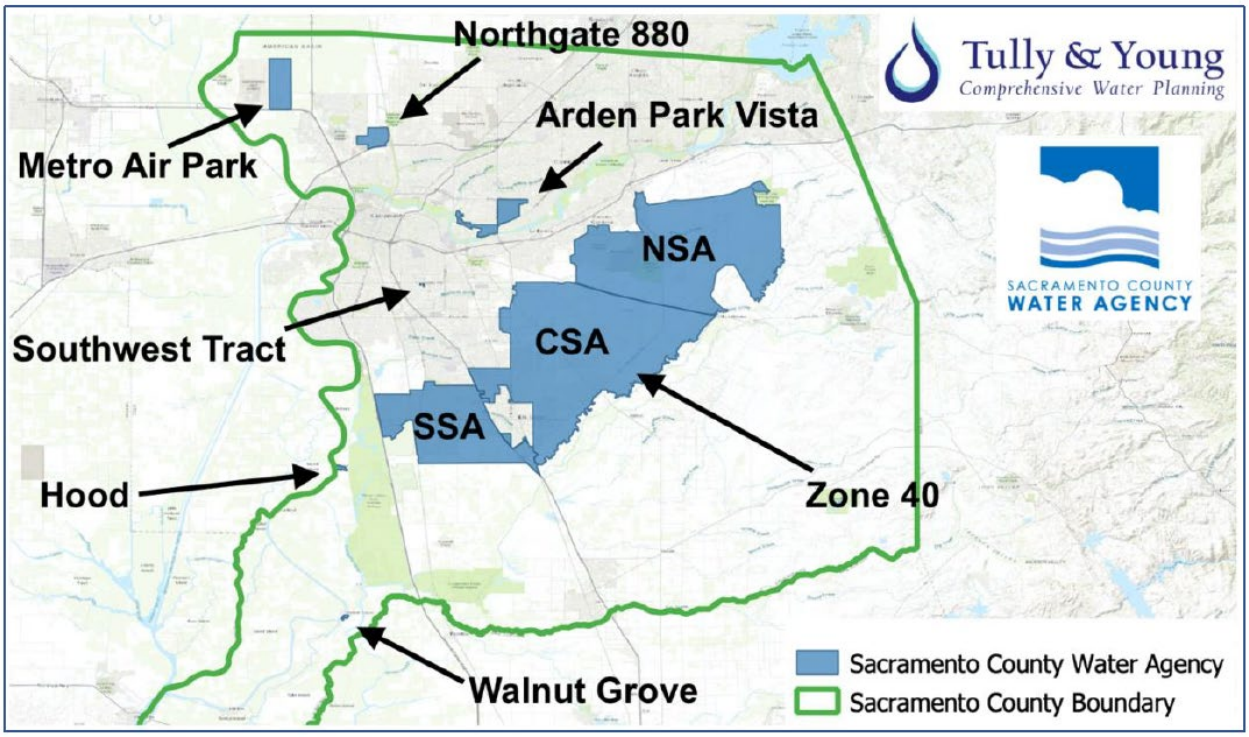


Figure 4. SCWA Service Area

The proposed UWSP area is currently within the NCMWC agricultural service area to receive surface water for agricultural uses, consistent with Sacramento County's approval of the UWSP project, therefore, to receive for municipal and industrial (M&I) water services the UWSP area would need to be designated as a new benefit zone within SCWA's service area. NCWMC would be the water supply wholesale agency and would divert raw water at its Riverside Pumping Plant and deliver raw water to a new water treatment plant within the UWSP area. The new UWSP

water treatment plant, appurtenances and related facilities would be owned and operated by Sacramento County Water Agency.

5. WATER SUPPLY SETTING

This section presents local climate conditions and reviews water supply sources, entitlements, water rights and contracts.

CLIMATE

Typical of the California Central Valley, Sacramento County has a Mediterranean climate with hot, dry summers and cool, wet winters. Historical averages show January as the coolest and wettest month, and July as the hottest and driest. The wet season is from October to April with a 30-year annual average rainfall of 19.94 inches. The annual mean temperature is 61.5 degrees, but the summer months can regularly see average highs in the mid-high 90s, and average winter lows hover down in the 30s and 40s. Other climate characteristics include frequent tule fog coinciding with the rainy season which brings dense fog caused by high relative humidity (after rain) and rapid cooling during the night. The fog can get trapped, due to temperature inversions common in the Sacramento valley, for days or even weeks. Snow is rare but cold fronts can bring freezing temperatures with trace amounts of snow and ice. Autumn starts warm and dry and becomes cooler, wetter, and foggier later into the season. The last rains in spring are generally in late April or early May.

Figure 5 shows the average monthly temperature, rainfall, and evapotranspiration (ETo) for the service area.

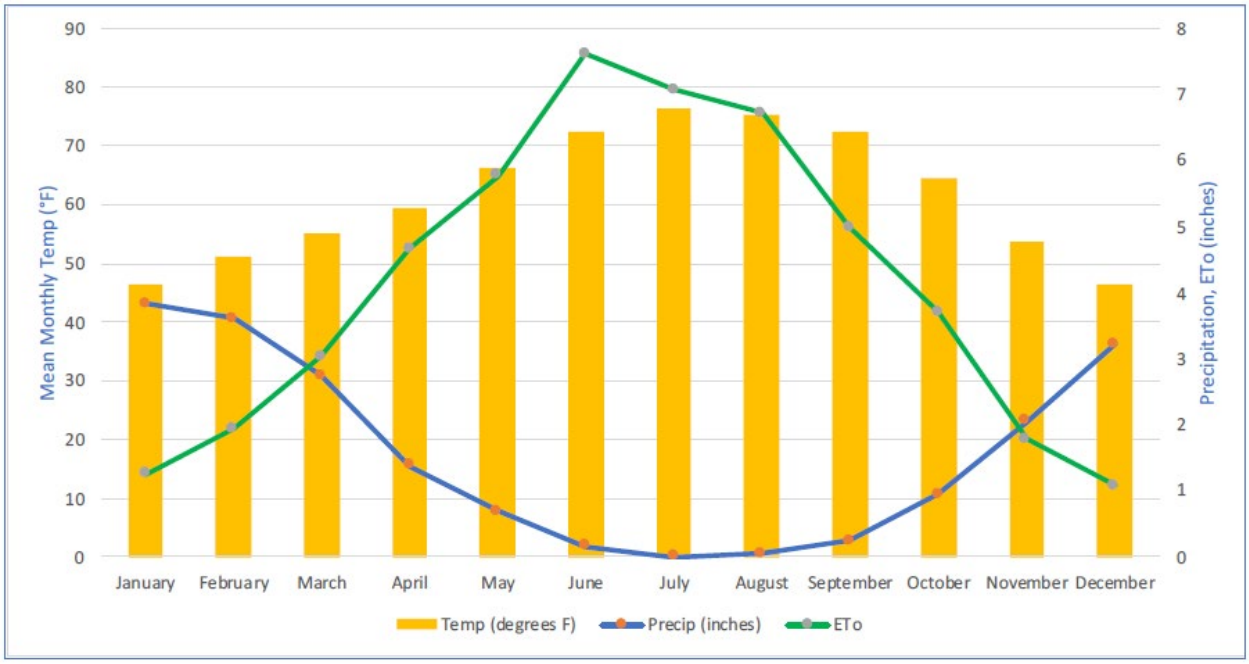


Figure 5. Sacramento County Average Climate Conditions

As noted in the 2020 SCWA UWMP, actual annual rainfall totals deviate quite significantly from the 30-year average. In most years, precipitation totals fall below the mean.

WATER SUPPLY ENTITLEMENTS, WATER RIGHTS AND CONTRACTS

Water Code Section 10910(d)(1) states: "The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the City or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights or water service contracts."

Water Supply Sources

Background

The NCMWC is the combination of the four original mutual water companies that were established to divert and deliver Sacramento River water to the reclaimed areas in the American Basin. At the time each water company constructed their distinct diversion facility and obtained individual water permits from the State of California. However, operating independent and distinct water companies was expensive and the Boards of Directors and management, in an effort to benefit from "economies of scale," decided to combine all of the water rights and facilities through a series of mergers. The final merger in 1963 set the stage for the American Basin to be represented by one governing body during very important negotiations with the United States Bureau of Reclamation (USBR) concerning its Central Valley Project (CVP).

In 1964, the re-formed NCMWC, along with hundreds of other Sacramento River water rights holders (diverters), signed a Sacramento River Settlement Contract with USBR to purchase water from the CVP. In exchange for the right to purchase water, the diverters (contractors) agreed to limit their diversions from the Sacramento River to a monthly allocation which represented a good faith estimate of their historical use.

The CVP has long-term agreements to supply water to more than 250 contractors in 29 of California's 58 counties. Deliveries by the CVP include providing an annual average of 5 million acre-feet of water for farms; 600,000 acre-feet of water for municipal and industrial uses; and water for wildlife refuges and maintaining water quality in the Sacramento-San Joaquin Delta.

Prior to delivering surface water to the UWSP area, NCMWC would need to amend its contract with USBR to supply surface water for municipal and industrial uses and modify its delivery schedule from seasonal deliveries for agricultural uses to year-round deliveries to the UWSP area. Moreover, to receive surface water for use within the UWSP area, NCMWC and SCWA would need to execute a water service agreement that describes annual delivery schedules and quantities in all water year types. This agreement would include a commitment to prioritize surface water deliveries for M&I use during drought and critical drought years at current market

prices[1], a defining feature of the California water market which encourages water rights holders, including agricultural users, to buy, sell or lease water to others who need it, helping allocate water more efficiently during droughts or shortages.

Sacramento River Water Supplies

Currently NCMWC water supplies are surface water diversions from the Sacramento River necessary to serve the agricultural users in the Natomas Basin. As a Sacramento River contractor, it can divert up to 120,200 AFY. As previously mentioned, NCMWC along with several Sacramento River diverters is contracted with USBR pursuant to the Natomas Settlement Contract (14-06-200-885A-R-1). The USBR Settlement Agreement addresses portions of NCMWC's surface water rights and provides CVP supplies for use in the Natomas Vision Plan Area. The USBR Settlement Contract can be amended to serve the UWSP area. Furthermore, NCMWC has sufficient capacity to serve the UWSP area as well as the broader Natomas Vision Plan Area. However, as illustrated in **Table 2**, NCMWC Sacramento River diversions have seasonal restrictions that only allow diversions and deliveries during specific months of the year. During late fall to early spring (October through March), permit 19400 allows for direct diversion and delivery of another 10,000 AF. However, Permit 19400 is Term 91 limited (refer to detailed discussion of Critical Year Supplies, page 19) and is therefore not always available. To ensure year-round raw water deliveries, the delivery schedule of the USBR Contract entitlements would have to be modified for year-round diversions and deliveries. It should be noted that delivery of wholesale raw water from NCMWC to the UWSP area will also require a wholesale agreement with SCWA to serve M&I water to the proposed development.

Table 2. NCMWC Total Water Supplies

	USBR	California Water Rights Permits						
	Contract	A000534	A001056	A001203	A001413	A015572	A022309	A025727 Permit:19400
Priority		3/1/1905	8/1/1918	3/1/1919	8/1/1919	10/1/1953	10/1/1965	5/1/1978
Source	CVP Settlement Contract	Sacramento River	Sacramento River	Sacramento River	Sacramento River	Sacramento River	Drain	Sacramento River and Drain (Winter)
Permit Total (AFY)	120,200	15,394.20	16,205.20	58,394.20	36,655.10	11,846.00	2,627.00	10,000.00
Delivery Period	April - October	April - October	April - October	May - October	May - October	April - June and October	March - June Sept and October	October - March
October	2,000							
November	0	0	0	0	0	0	0	
December	0	0	0	0	0	0	0	
January	0	0	0	0	0	0	0	
February	0	0	0	0	0	0	0	
March	0	0		0	0	0		
April	14,000			0	0			0
May	27,700							0

[1] NCMWC Letter of Interest to provide wholesale water to SCWA for UWSP Area

	USBR	California Water Rights Permits						
June	23,000							0
July	18,700					0	0	0
August	18,700					0	0	0
September	16,100					0		0
Totals (AFY)	**120,200**	**15,394**	**16,205**	**58,394**	**36,655**	**11,846**	**2,627**	**10,000**

Note: Table adapted by ESA, October 2025.
Source: Natomas Central Mutual Water Company, August 13, 2025.

Surface Water Deliveries

In order to divert and deliver Sacramento River water to the urban developments within its service area, NCMWC will need to apply for or request modifications to its USBR Settlement Contract and water rights permits from strictly agricultural uses to M&I uses. Notably, NCMWC maintains specific M&I water rights for use at the Sacramento Airport and Metro Airpark areas.

Normal Year Supplies

As shown in Table 3, under the USBR Settlement Agreement, NCMWC can divert and deliver up to 120,200 AFY of CVP Sacramento River water to agricultural users within its service area although delivery periods are limited to specific months pursuant to the Sacramento River Settlement Agreement and the conditions of individual water rights permits. Water Permit 19400 (1978) allows for direct diversion and delivery of up to 10,000 AFY from October through March.

CRITICAL YEAR SUPPLIES AND CVP DROUGHT PROTECTION PROGRAM

USBR Settlement Contract Critical Year Reductions

CVP water deliveries to Sacramento River Settlement Contractors are based on inflow quantities to Shasta Reservoir above Redding, California. Pursuant to the renewal of the USBR Settlement Agreement (May 2005), USBR may declare a Critical Year condition when the natural flows into Shasta Reservoir are equal to or less than 3.2 million acre-feet (MAF), or when total actual deficiencies below 4 MAF in the prior water year or series of successive prior water years experienced inflows of less than 4 MAF and current year forecasted inflow deficiencies exceed 800,000 acre-feet – in Critical Years, Sacramento River Settlement Contractors CVP water diversions are reduced by 25 percent.

Pursuant to the Agreement between USBR and Sacramento River Settlement Contractors for Establishment of a Drought Protection Program (January 2025) the signatories established a new program designed to improve water supply reliability and avoid severe storage deficiencies, such as the one that occurred in 2022. Under the Drought Protection Program when USBR declares a Critical Year and the Sacramento-San Joaquin Delta (Delta) is in a "balanced condition"[2]

[2] Balanced Condition when Supplemental Project Water (SPW) releases are being made by the Central Valley Project or State Water Project (collectively Projects). The Delta is referred to be in "Balanced Condition" when the Projects are being operated to meet water quality and flow requirements in the Delta. SPW releases are releases of

Sacramento River Settlement Contractors have agreed to further reduce diversions an additional 25 percent. As shown in **Table 3**, NCMWC diversions of CVP water in Critical Years are reduced by 25 percent, or 90,150 AFY. Furthermore, in Critical Years, an additional 25 percent reduction can be imposed under the new Drought Protection Program (January 2025), in these years, NCMWC diversions of CVP water can be reduced by up to a total of 50 percent or 60,100 AFY.

Table 3. NCMWC Water Supplies and USBR CVP Water Reductions

USBR Contract Amount	Critical Year 25% Curtailment	Drought Protection Program 50% Curtailment
120,200 AFY	90,150 AFY	60,100 AFY
Source: Natomas Central Mutual Water Company, August 2025.		

Water Rights Permit Curtailments

As shown in Table 2, water rights permit 19400, was acquired after the 1963 USBR Settlement Agreement and can be used to divert and deliver water from October to March in any given year. On an annual basis, if the State Water Resources Control Board (SWRCB) determines that the Delta is in "Balanced Condition" and can declare a Term 91 condition when the natural flows in the Sacramento River are insufficient to meet the various water quality and water flow requirements in the Delta, and Supplemental Project Water releases are being made by the CVP and SWP. It is likely that Term 91 will be declared more often in the future, reducing the diversions from the Sacramento River. Permit 19400 is subject to potential curtailment pursuant to Term 91. To address these potential curtailments under Term 91 during winter months, NCMWC has proposed seeking an amendment to its USBR Settlement Agreement that would allow for year-round diversions by reallocating some summer diversions to the winter period.

Historical and Existing Deliveries – All Water Year Types

As shown in **Tables 4 and 5**, NCMWC's historical diversions and deliveries range from as low as 29,012 AFY in 2022 to as high as 81,580 AFY in 2016; over this 12-year time period NCMWC delivered an average of 68,099 AFY. In normal, wet or above normal water years, the average surface water delivery was 71,595 AFY. In dry and critical dry years (2014, 2015, 2021 and 2022), the surface water deliveries averaged 61,107 AFY. However, in 2022, NCMWC was only able to deliver 29,012 AFY to its agricultural users, in all other dry years, deliveries were above the Drought Protection Program, 50 percent curtailment of 60,100 AFY. Though the Drought Protection Program is designed, in part, to improve water supply reliability, decreased deliveries could potentially occur in the future, such as in 2022 when it is possible for curtailments to reduce water supplies below the 50percent value in Drought Protection Program years. The letter from NCMWC included in Appendix F, however, states that M&I water for the

imported and previously stored Project water to meet in-basin entitlements, including maintenance of Delta water quality and flow requirements.

UWSP will be critical and prioritized. Thus, the project is expected to have sufficient supplies during these times to serve prioritized water to UWS.

Table 4. Annual Surface Water Use

Year	Annual Surface Water (AFY) Deliveries
2024	60,799
2023	72,593
2022	29,012
2021	74,450
2020	75,053
2019	63,188
2018	74,879
2017	63,763
2016	81,580
2015	67,618
2014	73,348
2013	80,903
Note: Table adapted by ESA, October 2025. Source: Natomas Central Mutual Water Company, August 13, 2025.	

Table 5. Average Surface Water Deliveries in all Water Year Types

Average Deliveries[1]	68,099
Average Deliveries[2]	71,595
Average Drought Year Deliveries[3]	61,107
1. All water year types 2. Wet, above normal and normal years 3. 2014, 2015, 2021 and 2022 Note: Table adapted by ESA, October 2025. Source: Natomas Central Mutual Water Company, August 2025.	

6. WATER DEMAND ANALYSIS

This section shows the calculated water demand for the proposed project as well as projected demand for NCMWC and SWCA systems.

EXISTING UWSP AREA AGRICULTURE WATER DEMAND

As shown in **Table 6**, between 2013 and 2024 NCMWC delivered surface water to its agricultural users within the UWSP area, deliveries ranged from 1,307 AFY to 4,860 AFY with an average of 2,703 AFY. It is important to note that in the drought years of 2014, 2015, 2021 and 2022, surface water deliveries for agricultural uses ranged from 1,307 AFY to 4,014 AFY with an average of 2,956 AFY. As a result of low precipitation, the average water use was higher in the drought years compared to 2013-2024 average of 2,703 AFY.

Table 6. Summary of Water Deliveries within UWSP Area (AFY)

Year/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2024					216	542	599	584	58	364	1	0	2,365
2023				0	38	712	616	353	91	75	3	2	1,892
2022			307	389	133	165	335	220	59	7			1,307
2021			145	1,085	155	312	654	730	221	127			3,284
2020				63	325	341	204	229	160				1,321
2019						227	415	458	238	10			1,353
2018					247	739	944	699	367	6			3,002
2017					217	441	555	586	245				2,045
2016				90	539	935	951	758	430	80			3,782
2015				483	653	786	760	417	94	24			3,218
2014				174	843	1,104	969	733	162	28			4,014
2013				373	1,265	1,041	865	807	237	14		256	4,860
Minimum					4	165	204	220	58				**1,307**
Average			38	221	386	612	656	548	197	61	0	22	**2,703**
Maximum			307	1,085	1,265	1,104	969	807	430	364	3	256	**4,860**

Source: Natomas Central Mutual Water Company, August 2025.

PROPOSED UWSP PROJECT WATER DEMAND - OPERATIONS

The UWSP area is estimated to be 2,066 acres as shown in Figure 2. The estimated annual water demand for the UWSP is 3,139 AFY and is consistent with SCWA's 2020 Urban Water Management Plan. The proposed land uses and projected water demand for the UWSP area are presented in **Table 7**. It should be noted that the Agricultural Reserve, General Agriculture and Regional Commercial land uses are considered existing conditions and would not generate new water demands within the UWSP area[3].

Table 7. UWSP Estimated Water Demand (AFY)

Land Uses	Corresponding Land Use Classification in WSMP[(2)]	Unit Water Demand (AFY/Acre) [(1)(3)]	Gross Acreage	Water Demand (AFY)[(3)]
Residential Designations				
Low Density Residential (RD-2)	Residential Low	1.47	164.5	242.3
Low Density Residential (RD-5)	Residential Low	2.29	429.2	982.8
Low Density Residential (RD-7)	Residential Low	2.29	133.0	304.5
Medium Density Residential (RD-10)	Residential Medium	3.58	62.5	102.0
High Density Residential (RD 25)	Residential Medium	3.58	36.4	130.2
High Density Residential (RD 40)	Residential Medium	3.58	22.6	164.0

[3] Upper Westside Water Master Plan, page 7

Land Uses	Corresponding Land Use Classification in WSMP[2]	Unit Water Demand (AFY/Acre) [1][3]	Gross Acreage	Water Demand (AFY)[3]
Non-Residential				
Landscape Corridor	Park	3.01	38.2	115.1
Mixed Use	Mixed Use	5.75	82.0	471.5
Agricultural Reserve	-	n/a	410.2	n/a
General Agriculture	-	n/a	86.1	n/a
Agricultural Urban Reserve	Park	3.01	45.1	84.0
Commercial & Office (CC)	Commercial/Office	2.17	1.2	2.7
Commercial & Office (E/HC)	Commercial/Office	2.17	52.9	114.9
Roads	-	0.19	122.0	23.6
Public/Quasi-Public	Public	0.87	141.1	122.8
Public/Quasi-Public	-	0	15.0	0
Natural Reserve	-	0	141.9	0
Recreation	Park	3.01	82.3	153.0
Regional Commercial	Regional Commercial (RC)	n/a	n/a	n/a
TOTALS			**2,066**	**3,138.9**

Notes:
1. Demand estimates per SCWA 2016 WSIP include 7.5 percent system losses
2. Proposed land use from UWS WSMP, October 2023.
3. Demands may vary slightly due to land use plan modifications.

ANTICIPATED UWS NCMWC WATER DEMANDS

The proposed UWSP area is anticipated to generate a water demand of 3,139 AFY (refer to Table 7) to meet M&I uses. Anticipated monthly deliveries to the UWSP area are shown in Table 8 and are consistent with the monthly water uses provided in the 2020 SCWA UWMP. In October through March, NCMWC would divert and deliver water to the UWSP area under its water right permit 14900. As shown in **bold** in **Table 8**, NCMWC would divert an additional 1,300 AFY during the late fall (October) through early spring (March) to meet demand generated by the UWSP area.[4]

Under the UWSP, agricultural uses would taper out as the proposed development would convert the existing agricultural lands to developed land uses. From October through March, NCMWC does not deliver raw water to meet agricultural uses in the UWSP area as existing agricultural uses that do not irrigate crops during the winter months. However, water use to meet M&I demand in the UWSP area between October and March will be required, as a result, NCMWC will increase monthly diversions from the Sacramento River. Water supplies needed to serve the UWSP area during these months are expected to be as high as 331 acre-feet in October to as low as 122 acre-feet in March in any given year.[5]

[4] UWSP Alternative Water Source Memorandum, Wood-Rodgers, October 2025.
[5] UWSP Alternative Water Source Memorandum, Wood-Rodgers, October 2025.

Table 8 UWSP Water Demand by Month

Month	Proposed Surface Water Demand (acre-feet)
January	**140**
February	**133**
March	**122**
April	154
May	245
June	351
July	401
August	430
September[1]	**406**
October[1]	**331**
November	**258**
December	**168**
Yearly Total	**3,139**

Notes:
1. Under existing conditions in September and October, NCMWC currently delivers 197 acre-feet and 61 acre-feet to agricultural users. Supplemental water supplies would be needed to meet the additional demand above average water use within the UWSP area.
Source: UWSP Alternative Water Source Memorandum, Wood-Rodgers, October 2025.

As shown in **Table 9**, based on historical diversions and deliveries to existing agricultural users, the WSA estimated NCMWC's projected diversions and water supply deliveries over the next 20 years to meet agricultural and M&I within its service area including the UWSP area. It should be noted that prior to serving the UWSP area with M&I water, NCMWC will need to apply for modifications to its State water rights permits and amend its USBR Settlement Agreement. This modification of rights is expected to have a cost of approximately $3 million and take multiple years to complete.

Table 9. Projected Water Deliveries

	2030	2035	2040	2045	2050
NCMWC – Service Area[1,2,3]	71,595	71,595	71,595	71,595	71,595
NCMWC – Service Area (Dry Years)[2,3]	61,107	61,107	61,107	61,107	61,107
UWSP – Average Annual	3,139	3,139	3,139	3,139	3,139
UWSP – Dry Years Annual	2,668	2,668	2,668	2,668	2,668

NOTES:
1 Based on average annual pumping at the Riverside Pumping Plan and annual deliveries to existing agricultural users, including the UWSP area and other proposed developments, i.e., GrandPark Southwest Specific Plan and Grandpark Trails Specific Plan.
2. Annual diversions and deliveries are expected to decrease over the next twenty years as agricultural uses within NCMWC service area are converted to urban uses. For conservative water supply planning purposes, diversions and deliveries are held constant through the 20-year planning horizon.
3. Average Annual deliveries include additional water supplies of 436 acre-feet needed to meet UWSP demands
SOURCE: Table derived by ESA from Natomas Central Mutual Water Company data and information based on demand management measures during dry years to achieve water conservation (Stage 2, up to 20%) pursuant to SCWA's Water Shortage Contingency Plan *(ver 4-19-21)*.

7. COMPARISON OF AVAILABLE WATER SUPPLIES VERSUS DEMAND

Section 10910(c)(3) of the Water Code states, "the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available for normal, dry and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

WATER SUPPLY RELIABILITY – IN ALL WATER YEAR TYPES

NCMWC Service Areas – Supply and Demand

Table 10 presents a water supply and demand comparison in all water year types, normal, dry and Drought Protection Program years when supplies could be curtailed by 50 percent. Normal year supply quantities are assumed to be similar to historical average supplies presented in Table 2. In normal water years, NCMWC has adequate water supply to meet existing and projected demand, including the UWSP estimated 3,139 AFY of water demand. In normal years, NCMWC would have access to another 48,605 AFY after delivering water to UWSP and agricultural consumers.

Table 10. NCMWC Supply and Demand in All Water Years

		2030	2035	2040	2045	2050
Normal Year						
Supply	USBR CVP Settlement Agreement	120,200	120,200	120,200	120,200	120,200
Demand	NCMWC – Service Area[1,2,3]	71,595	71,595	71,595	71,595	71,595
	Surplus/(Deficit)	48,605	48,605	48,605	48,605	48,605
Critical Year aka Dry Year						
Supply	USBR CVP (25% Curtailment)	90,150	90,150	90,150	90,150	90,150
Demand	NCMWC – Service Area (15% conservation or fallow lands and reduced planting)[1,2,3]	61,107	61,107	61,107	61,107	61,107
	Surplus/(Deficit)	29,043	29,043	29,043	29,043	29,043
Drought Protection Program Curtailment						
Supply	USBR CVP (50% Curtailment)	60,100	60,100	60,100	60,100	60,100
Demand	NCMWC – Service Area (Dry Years 15% conservation or fallow lands and reduced planting)[1,2,3]	61,107	61,107	61,107	61,107	61,107
	Surplus/(Deficit)	(1,007)	(1,007)	(1,007)	(1,007)	(1,007)
Supply	USBR CVP (50% Curtailment)	60,100	60,100	60,100	60,100	60,100
Demand	NCMWC – Service Area (Dry Years 17% reduction or fallow lands and reduced planting)[1,2,3]	60,099	60,099	60,099	60,099	60,099
	Surplus/(Deficit)	1	1	1	1	1

NOTES:

1. Based on average annual pumping at the Riverside Pumping Plan and annual deliveries to existing agricultural users, including the UWSP area and other proposed developments, i.e., GrandPark Southwest and Grandpark Trails.

2. Annual diversions and deliveries are expected to decrease over the next twenty years as agricultural uses within NCMWC service area are converted to urban uses. For conservative water supply planning purposes, diversions and deliveries are held constant through the 20-year planning horizon.

3. Average Annual deliveries include additional water supplies of 436 acre-feet needed to meet UWSP demands

Table derived by ESA from NCMWC data and information and based on demand management measures during dry years to achieve water conservation (Stage 2, up to 20%) pursuant to SCWA's Water Shortage Contingency Plan *(ver 4-19-21)*.
Source: UWSP Alternative Water Source Memo and NCMWC, October 2025

In Critical Years (aka, dry years) CVP supplies are assumed to be reduced by 25 percent to 90,150 acre-feet (refer to Table 3). In Critical Years, NCMWC has adequate water supplies to meet existing and projected demand including the UWSP area estimated 3,139 AFY of water demand. As shown in Table 10, pursuant to the NCMWC and SCWA water service agreement discussed in Section 5, NCMWC will prioritize M&I deliveries to UWSP area to meet demand during Critical Years. As a result, in Critical Years when supplies are reduced by 25 percent, NCMWC can meet existing and projected demand and NCMWC would have access to another 29,043 AFY after delivering water to UWSP and agricultural consumers. This assumes a projected 15 percent reduction in demand due to water conservation pursuant to SCWA's Water Shortage Contingency Plan (WSCP)[6].

In years when the Drought Protection Program is in effect, CVP water is reduced by 50 percent or 60,100 acre-feet (refer to Table 3). Under the Drought Protection Program, NCMWC could experience a potential shortfall of 1,007 AFY as shown in Table 10. In these Drought Protection Program years when supplies are reduced by 50 percent, pursuant to the NCMWC and SCWA water service agreement discussed in Section 5, NCMWC will prioritize M&I deliveries to UWSP area to meet demand during Critical Years. As a result, in Critical Years when CVP supplies are reduced by 50 percent, NCMWC can meet existing and projected demand. This assumes a projected 17 percent reduction in demand due to water conservation pursuant to SCWA's WSCP[6].

Upper Westside Specific Plan Service Area - – Supply and Demand

Table 11 presents a water supply and demand comparison in all water year types, in these cases, normal, dry and Drought Protection Program years when supplies could be curtailed by 50 percent. Normal year supply quantities are assumed to be similar to historical average supplies presented in Table 2. In normal water years, NCMWC has adequate water supply to meet existing and projected demand, including the UWSP estimated 3,139 AFY of water demand. In normal years, NCMWC has sufficient supplies to meet demand generated by the UWSP area.

In Critical Years, when CVP water supplies are reduced by 25 percent as presented in Table 3. NCMWC can meet existing and projected demand including demand generated by the UWSP area and would have access to another 29,043 AFY after delivering water to UWSP and agricultural consumers. This assumes a projected 15 percent reduction in demand due to water

[6] SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. SCWA Water Shortage Contingency Plan (ver 4-19-21)

conservation pursuant to SCWA's WSCP[7]. As shown in Table 11, pursuant to the NCMWC and SCWA water service agreement discussed in Section 5, NCMWC will prioritize M&I deliveries to UWSP area to meet demand during Critical Years. As a result, in Critical Year when CVP supplies are reduced by 50 percent, NCMWC can meet existing and projected demand including demand generated by the UWSP area.

Table 11. UWSP Area Supply and Demand in All Water Years

		2030	2035	2040	2045	2050
Supply	NCMWC - UWSP Deliveries	3,139	3,139	3,139	3,139	3,139
Demand	UWSP Service Area[1]	3,139	3,139	3,139	3,139	3,139
	Surplus/(Deficit)	0	0	0	0	0
Supply	USBR CVP (25% Curtailment)	3,139	3,139	3,139	3,139	3,139
Demand	UWSP Service Area[1]	3,139	3,139	3,139	3,139	3,139
	Surplus/(Deficit)	0	0	0	0	0
Supply	USBR CVP (50% Curtailment)	3,139	3,139	3,139	3,139	3,139
Demand	UWSP Service Area[1]	3,139	3,139	3,139	3,139	3,139
	Surplus/(Deficit)	0	0	0	0	0

NOTES:

1. For conservative water supply planning purposes, UWSP demand is held constant through the 20-year planning horizon. Under SCWA's Water Shortage Contingency Plan (ver. 4-19-21) demand would be reduced in response to applicable water conservation measures.

Table derived by ESA from NCMWC data and information and based on demand management measures during dry years to achieve water conservation (Stage 2, up to 20%) pursuant to SCWA's Water Shortage Contingency Plan *(ver 4-19-21)*.

Source: Alternative Water Source Memo and NCMWC, October 2025

In years when the Drought Protection Program is in effect, CVP water is reduced by 50 percent or 60,100 acre-feet (refer to Table 3). Under the Drought Protection Program when CVP supplies are curtailed by 50 percent, NCMWC could experience a supply shortfall. In these Drought Protection Program years, pursuant to the NCMWC and SCWA water service agreement discussed in Section 5, NCMWC will prioritize M&I deliveries to UWSP area to meet demand during Critical Years. This assumes a projected 17 percent reduction in demand due to water conservation pursuant to SCWA's WSCP.[8] As a result, in Critical Year when CVP supplies are reduced by 50 percent, NCMWC can meet existing and projected demand including demand generated by the UWSP area.

[7] SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. SCWA Water Shortage Contingency Plan (ver 4-19-21)

[8] SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. SCWA Water Shortage Contingency Plan (ver 4-19-21)

Drought Risk Assessment

As part of the 2020 UWMP, the California Water Code, as amended added Section 10635(b) requiring urban water suppliers to develop a drought risk assessment (DRA) as part of their UWMPs. The DRA is a planning exercise that considers the effects on available water supply sources should a five-year drought occur immediately following the preparation of the DRA, in this case, 2021 through 2025. The DRA evaluates the effects of an immediate five-year drought. A discussion of SCWA's DRA is presented in Section 5.1 of its 2020 UWMP and analyzes five years of supply and demand scenarios under a long-term drought scenario. The DRA also considers the implementation of SCWA's 2020 Water Shortage Contingency Plan (WSCP) and its effect on available supply and total demand, however the WSCP was not created with UWSP being a new benefit zone.

WATER SHORTAGE CONTINGENCY PLAN

Pursuant to the Urban Water Management Planning Act (Water Code Section 10632), water suppliers with a Water Shortage Contingency Plan (WSCP) can implement subsequent stages of demand reduction measures listed in its UWMP as a strategy to balance supply and demand.

A WSCP allows SCWA to reduce water deliveries to customers and implement demand reductions during periods of water shortage. Therefore, to overcome the potential supply deficits the SCWA will follow its adopted WSCP to implement drought-planning sequences and associated operating procedures that subsequently initiate different levels of demand management relative to surface water supply rationing imposed by NCWMC. The WSCP can be found in SCWA's 2020 UWMP Attachment 2.

The Water Code Section 10632 requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage) as compared to the normal reliability condition. The following six stages list the shortage response actions:

- **Stage 1 (Up to 10% shortage)** – Stage 1 is a "Water Alert" where voluntary conservation is encouraged.
- **Stage 2 (Up to 20% shortage)** – Stage 2 is a "Moderate Shortage" and will be implemented if the Stage 1 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages.
- **Stage 3 (Up to 30% shortage)** – Stage 3 is a "Severe Shortage" that requires water allocations and mandatory conservation.
- **Stage 4 (Up to 40% shortage)** – Stage 4 is a "Critical Shortage" that includes all steps taken in prior stages regarding allocations and mandatory conservation.
- **Stage 5 (Up to 50% shortage)** – Stage 5 is a "Shortage Crisis" that includes all steps taken in prior stages regarding allotments and mandatory conservation. This stage will be

implemented in the event that the source of supply is severely curtailed to the level that requires each customer to restrict their water use for only human health and safety purposes.

- **Stage 6 (Greater than 50% shortage)** – Stage 6 is an "Emergency Shortage" condition that includes all steps taken in prior stages regarding allotments and mandatory conservation.

8. ANTICIPATED TIMING, ESTIMATED COSTS, AND PERMITS

NCMWC wholesale deliveries of raw water would be conveyed via new raw water transmission lines and treated by SCWA at a new on-site 7 million gallons per day surface water treatment plant to meet potable water standards. In addition, two 2.5-million-gallon storage tanks would be required to meet peak day demand, fire flows and provide redundancy. Engineering, design and construction of the new water treatment facility and tanks would be required. Conceptual designs for these new facilities are attachments to Appendix B. **Table 12** contains the estimated cost for this option, which would be the responsibility of the project applicant, and the estimated timing is discussed below.

Table 12. Estimated Costs of Water Supply Option to Be Borne By Project Applicant

Cost Item	Estimated Cost
Wholesale agreement with NCMWC	$0.3M
Capital buy-in into existing system	N/A
New infrastructure (transmission and distribution systems)[1,2]	$31.5M
New water treatment plant and storage tanks[1,2]	$25.3M
Local permits and approvals	$2M
Conversion of Agricultural Rights to M&I Rights	$3M
SGMA compliance – NASb GSP Revisions	N/A
New groundwater wells and equipment	N/A
Environmental Compliance	$2M
System Design	$5M
Total Estimated Cost	**$69.1M**

Notes:
1. Contingency is 30% of treatment plant and tank estimated construction costs and 20% of other construction costs.
2. Costs for design, engineering, local permitting and environmental clearance
Source: Sacramento County Water Agency, Wood Rodgers.

SCWA expects that negotiating wholesale water agreements with NCMWC would take approximately two years for negotiations and governing body approvals. The timeline for a CVP contract amendment process varies significantly, often taking several months to multiple years, depending on the complexity of the proposed changes and associated environmental compliance requirements. There is no single, fixed timeframe as each amendment is evaluated on a case-by-case basis. As such, for consistency with the projected timeframe for construction of the proposed surface water facilities, this WSA also assumes up to 4 years for approval of modifications to NCMWC's Natomas Settlement Agreement.

Construction of the surface water facilities (including treatment, storage, transmission, etc.) would require an estimated 4 years.

Use of NCMWC supplies would require a wholesale agreement with NCMWC in which raw water for UWSP would be first priority water. Existing NCMWC surface water supplies are for agricultural use and would need to be modified to allow M&I water use and as discussed in Section 5 would need to be modified for year-round deliveries. There could be additional modifications needed depending upon the legal process to update and amend the Natomas Settlement Agreement. NCMWC's Riverside Pumping plant and intakes have adequate fish screens to prevent entrainment of special-status salmonids.

The new surface water facilities will require various permits, new contracts, and contract modifications. SCWA currently holds a public water system permit issued by the California Department of Public Health (CDPH). The engineering and design of any new production, water treatment, transmission and storage would require review and approval by CDPH.

9. CONCLUSION

According to the requirements of Water Code Section 10910(c)(3) "the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

As discussed in Section 4, implementation of the UWSP would result in changes to NCMWC purpose of use (from agricultural deliveries to M&I uses) and add the UWSP area as a new benefit zone in SCWA's service area. As a result of implementation of the UWSP and conversion of land uses, (agricultural to urban) total water demand within NCMWC service area is expected to decrease over the 20-year planning horizon.

As discussed in Section 7, under normal, Critical Dry conditions, NCMWC would have sufficient CVP water supplies available to serve development implemented under the UWSP plus existing demand and planned future uses between 2030 and 2050. However, under the Drought Protection Program reductions when CVP diversions are reduced by 50 percent, as shown in Tables 10 and 11, projected demand could exceed available supplies, including demand generated by the UWSP area. As discussed in Section 7 and shown in Tables 10 and 11, pursuant to the NCMWC and SCWA water service agreement discussed in Section 5, NCMWC will prioritize M&I deliveries to UWSP area to meet demand during Critical Years. As a result, in Critical Year when CVP supplies are reduced by 50 percent, NCMWC can meet existing and projected demand including demand generated by the UWSP area. Therefore, in all water years including Critical Years and under the Drought Protection Program years water supplies delivered through NCMWC's water service systems for treatment and distribution by SCWA in

the UWSP area would be able to meet existing and projected demand including demand generated by the UWSP area.

WATER SUPPLY ASSESSMENT APPROVAL PROCESS

Pursuant to California Water Code 1910 et seq. and CEQA Guidelines 15155 on **DATE**, the Sacramento County Board of Supervisors, by resolution adopted this WSA as it pertains proposed development contemplated in the UWSP, as a new benefit zone within SCWA's service area.

10. REFERENCES

Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001, California Department of Water Resources

2020 Urban Water Management Plan, Sacramento County Water Agency

Alternative Water Source Memorandum, Wood Rodgers

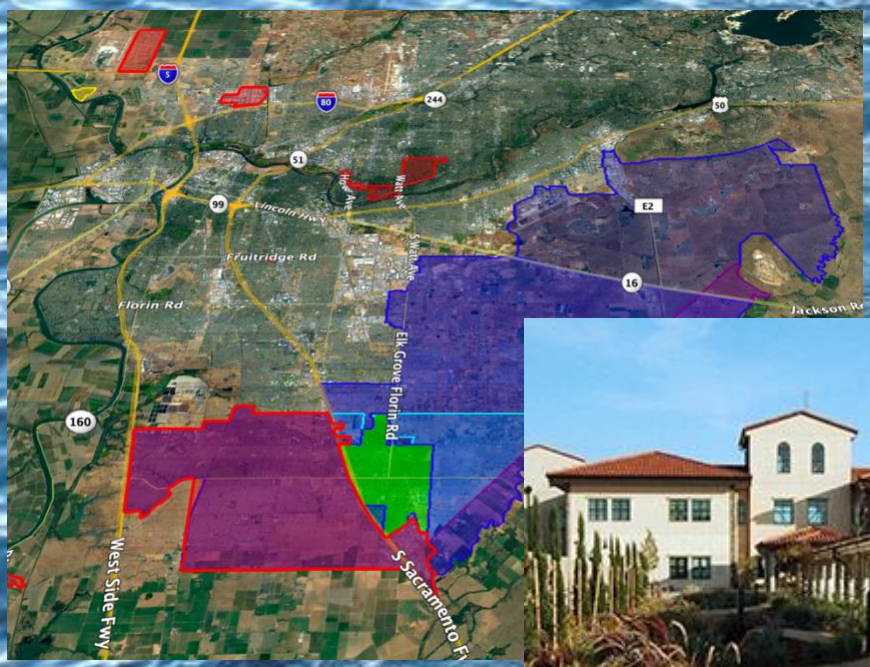
USBR Settlement Agreement with Natomas Central Mutual Water Company

USBR Settlement Agreement with Sacramento River Settlement Contractors to establish a Drought Protection Program

2020 Water Shortage Contingency Plan, Sacramento County Water Agency

NCMWC Letter of Interest to provide wholesale water to SCWA for UWSP Area

Appendix A - 2020 Urban Water Management Plan, Sacramento County Water Agency





2020 Urban Water Management Plan

DEPARTMENT OF WATER RESOURCES
SACRAMENTO COUNTY
WATER AGENCY

Prepared by

Tully & Young
Comprehensive Water Planning

Final: Adopted June 15, 2021

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Appendix A Water Shortage Contingency Plan A-1

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This 2020 Urban Water Management Plan was prepared under the direction of a California licensed civil engineer.



Executive Summary
Layperson's Description

After the devastating drought in the late 1970s, the California Legislature declared California's water supplies a limited resource, subject to ever-increasing demands and that the long-term, reliable supply of water is essential to protect California's businesses, communities, agricultural production, and environmental interests. The Legislature also recognized a need to strengthen local and regional drought planning and increase statewide resilience to drought and climate change. Thus, in 1983, the California Legislature created the Urban Water Management Planning Act (UWMPA).[1] The UWMPA requires urban water suppliers serving over 3,000 customers or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan every five years,[2] and demonstrate water supply reliability in a normal year, single dry year, and droughts lasting at least five years over a twenty-year planning horizon.[3] The UWMPA also requires each urban water supplier to prepare a drought risk assessment and water shortage contingency plan.[4] And last, beginning in July 2022, each urban water supplier must prepare an annual water supply and demand assessment.[5] The California Legislature asserts that aggregating all of these legal requirements at the urban water supplier level will improve local, regional, and statewide water planning and water resilience.

At a practical level, the Urban Water Management Plan (UWMP) is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP will provide the supplier's elected officials, management, staff, and customers with an understanding of past, current, and future water conditions and management. The UWMP integrates local and regional land use planning, regional water supply, infrastructure, and demand management projects as well as providing for statewide challenges that may manifest through climate change and evolving regulations. Thoughtful urban water management planning provides an opportunity for the supplier to integrate supplies and demands in a balanced and methodical planning platform that addresses short-term and long-term planning conditions. In brief, the UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility.

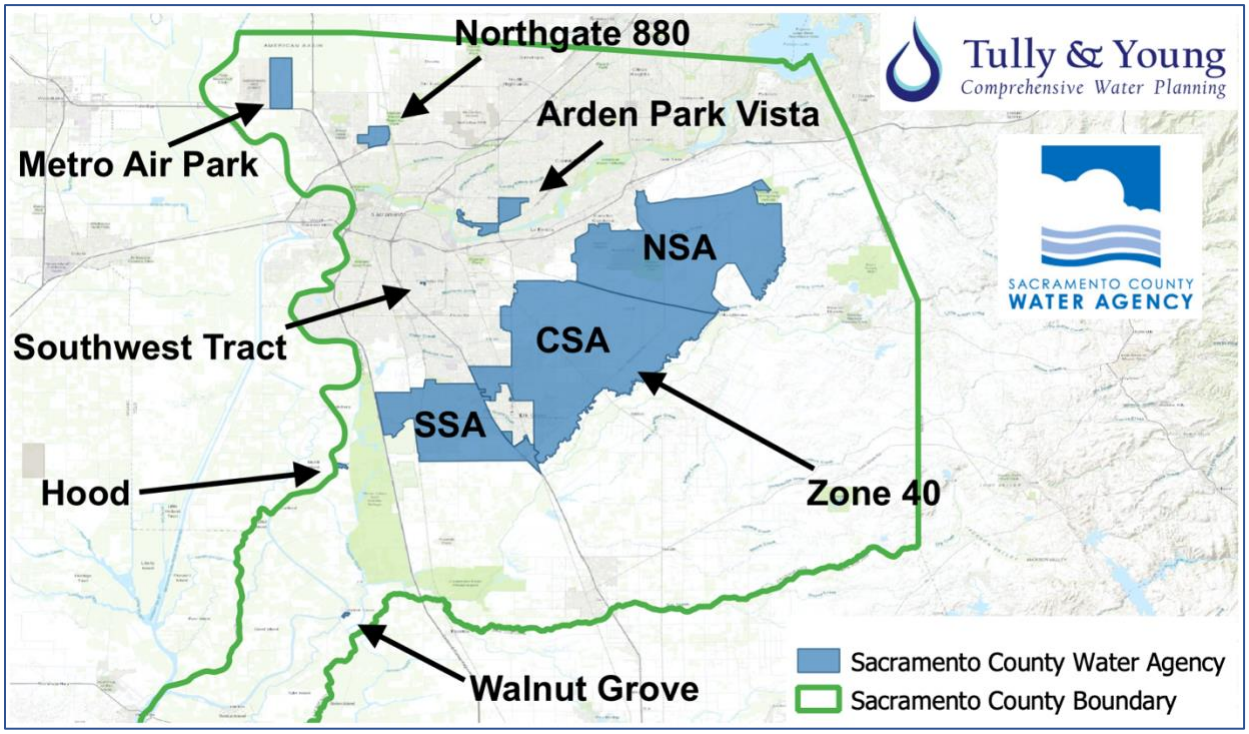
[1] California Water Code Section 10610 *et seq*. (Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1) and its subsequent amendments
[2] California Water Code Section 10610 *et seq*.
[3] California Water Code Sections 10631-10635
[4] California Water Code Sections 10632
[5] California Water Code Sections 10632.1

ES-1 Sacramento County Water Agency

The Sacramento County Water Agency (SCWA) was formed in 1952 as a special act district codified in Chapter 66 of the California Water Code Appendix.[6] The SCWA Act states that SCWA was created, in part, "for purposes of controlling and conserving storm, flood and other surface water for any beneficial purpose… and obtaining of ground or other water or a water supply and the production, storage, transmission, distribution, sale, or other disposition of such water…."[7] The SCWA Act further establishes that SCWA's service area boundaries include "all of the territory within the County of Sacramento."[8] As such, SCWA's fundamental purpose is to provide safe and reliable drinking water to its wholesale and retail customers throughout Sacramento County.

SCWA encompasses seven water service areas and provides retail water service to approximately 59,000 residential and commercial customers in Sacramento County.[9] SCWA also wholesales water to Elk Grove Water District and works with neighboring water suppliers and land use agencies to ensure long-term water system reliability. Figure ES-1 below shows SCWA's service area boundary as well as the seven service areas: Metro Air Park, Northgate 880, Arden Park Vista, Southwest Tract, Zone 40, Hood Water Maintenance District (Hood), and East Walnut Grove (Walnut Grove). Within Zone 40 there are further subdivisions into the North Service Area (NSA), Central Service Area (CSA), and South Service Area (SSA).

Figure ES-1: SCWA Water Service Area



[6] California Water Code Appendix, Sacramento County Water Agency Act, Section 66-1 *et seq*., 1952. (SCWA Act)
[7] California Water Code Appendix, Sacramento County Water Agency Act, Chapter 66, 1952.
[8] SCWA Act Section 66-1.
[9] SCWA has eight public water systems but those are contained wholly within the seven service areas.

ES-2 SCWA Water Service Reliability

Each of SCWA's seven service areas are served with a unique set of water supplies. Each of the seven service areas have long-term water reliability in normal, single dry years, and five consecutive dry years through 2045. The details related to these conclusions are contained in the main chapters of SCWA's 2020 UWMP. The information below generally describes the water system reliability for each service area.

- **Metro Air Park**: Water supply delivered from the City of Sacramento to meet current demands of approximately 125 acre-feet and 2045 demands of approximately 5,715 acre-feet.
- **Northgate 880**: Water supply is derived from SCWA's groundwater supplies to meet current demands of approximately 1,345 acre-feet and 2045 demands of approximately 1,365 acre-feet
- **Arden Park Vista**: Water supply is derived from SCWA's groundwater supplies to meet current demands of approximately 3,560 acre-feet and 2045 demands of 3,217 acre-feet.
- **Southwest Tract**: Water supply is derived from a water supply contract with California American Water Company to meet current demands of approximately 30 acre-feet and 2045 demands of approximately 24 acre-feet.
- **Zone 40**: Zone 40 has a number of potable surface water supplies, a non-potable surface water supplies, and groundwater available to meet its customers' demands.
  - Zone 40 potable water supplies consist of three water rights from the Sacramento River, two Central Valley Project contracts for water, a contract for water with Aerojet, a contract supply from North Delta Water Agency, and groundwater supplies to meet current demands of approximately 37,620 acre-feet and 2045 demands of 74,388 acre-feet.
  - Zone 40 non-potable supplies consist of a contract for recycled water supplies from Sacramento Regional County Sanitation District to meet current non-potable demands of approximately 962 acre-feet and 2045 demands of approximately 3,300 acre-feet.
- **Hood Water Maintenance District**: The Hood Water Maintenance District service area water supply is entirely derived from SCWA's groundwater supplies to meet current demands of approximately 30 acre-feet and 2045 demands projected to be 31 acre-feet
- **East Walnut Grove**: The East Walnut Grove service area water supply is entirely derived from SCWA's groundwater supplies to meet current demands of approximately 60 acre-feet and projected 2045 demands of 56 acre-feet.

In summary, SCWA's diverse potable and non-potable surface water supply portfolio, combined with its conjunctive management of groundwater resources, provide stable and reliable water supplies to meet SCWA's current and 2045 future water demands in all seven service areas as well as its wholesale delivery obligations. This supply reliability encompasses normal, single dry, and five consecutive dry year scenarios.

Chapter 1
Introduction

Formed in 1952, the Sacramento County Water Agency (SCWA) provides safe and reliable drinking water to approximately 59,000 residential and commercial customers in Sacramento County. SCWA is an independent Agency but operates as a department within the Sacramento County government structure. SCWA's service area boundaries coincide with Sacramento County boundaries. However, its retail water service encompasses seven specific geographic areas within the county boundary, each of them created within SCWA's enabling legislation as a separate "benefit zone".[10] SCWA also provides wholesale water to the City of Elk Grove.

Ensuring an adequate supply of water is available to serve the existing and future needs for SCWA's residential and Commercial, Institutional and Industrial (CII) customers is a critical component of successful operations. This Urban Water Management Plan (UWMP) draws on local, regional, and statewide inputs to synthesize information from numerous sources into a reliable water management action plan designed to be referred by SCWA's Board, Management, and Staff.

1.1 Background and Purpose

SCWA has prepared this 2020 UWMP to comply with the Urban Water Management Planning Act (UWMPA) requirements for urban water suppliers.[11] This 2020 UWMP addresses SCWA's water management planning efforts to assure adequate water supplies to meet forecast demands over the next 25 years. As required by the UWMPA, SCWA's 2020 UWMP specifically assesses the availability of its supplies to meet forecast water uses during average, single-dry and five consecutive drought years through 2045. Verification that future demands will not exceed supplies and assuring the availability of supplies in dry-year conditions are critical outcomes of this 2020 UWMP.

The 2020 UWMP is an update to SCWA's 2015 UWMP and presents new data and analysis as required by the California Department of Water Resources (DWR) and the California Water Code (CWC) since 2015. The 2020 UWMP is also a comprehensive water planning document that describes existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use.

The UWMP is designed to be a valuable water management and planning tool to guide and inform the SCWA Board of Directors, managers, customers, and the State of California about its water management

[10] Although there are seven service areas, SCWA has eight public water systems contained in those service areas.
[11] California Water Code sections 10610 through 10657.

practices. The 2020 UWMP reflects SCWA's planning assumptions and goals and should be used in combination with other planning resources and documents over the UWMP planning horizon.

The State of California's drought vulnerability and the additional pressures of climate change and population growth have emphasized the importance of planning ahead to meet water demands with potentially at-risk water supplies. This forward planning is an important outcome of the 2020 UWMP.

1.2 Basis for Plan Preparation

SCWA operates Public Water Systems as described in California Health and Safety Code 116275. SCWA qualifies as both a Wholesale Water Supplier and Retail Urban Water Supplier as described in Water Code Section 10617, providing water for municipal purposes to more than 3,000 customers or 3,000 acre/feet of water per year. SCWA wholesales water to Elk Grove Water District. These characteristics require SCWA to prepare an Urban Water Management plan every five years. SCWA owns and operates smaller water systems which fall below the service threshold for UWMP reporting; however, these systems are included in this plan. SCWA's Public Water System details are listed in Table 1-1.

Table 1-1: Public Water System Information

Public Water System Number	Public Water System Name
CA3400101	Hood Water Maintenance District
CA3400106	East Walnut Grove
CA3400156	Southwest Tract Water Maintenance District
CA3400173	Northgate 880
CA3410002	Arden Park Vista
CA3410029	Laguna Vineyard
CA3410704	Mather-Sunrise
CA3400473	Metro Air Park[12]
Total Connections approximately 59,000[13]	

The State Legislature passed numerous new requirements since the 2015 UMWP which are detailed throughout this 2020 UWMP.[14] Major updates to the requirements are listed below along with a reference to the corresponding section in which they are addressed in this document.

- **Five Consecutive Dry-Year Water Reliability Assessment:** The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation. This statutory change requires a Supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period. This new

[12] SCWA designated Zone 50: Metro Air Park Special Planning Area

[13] Total connections are described in more detail in Chapter 2.

[14] California Water Code Section 10608 to 10608.44; Section 10609 to 10609.38; Section 10610 to 10657

requirement is addressed in Chapter 3—Water Supply Characterization, Chapter 4–Water Use, and Chapter 5— Water Service Reliability Assessment.

- **Drought Risk Assessment (DRA):** Due to the severity of recent California droughts and the variability associated with climate change predictions, the California Legislature created a DRA requirement for UWMPs. The DRA requires assessment over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability for five consecutive dry years. The DRA is informed by Chapter 3 – Supply Characterization and formally addressed in Chapter 5— Water Service Reliability Assessment and Chapter 6—Water Shortage Contingency Plans.
- **Seismic Risk:** Evaluating seismic risk to water system infrastructure and facilities and having a mitigation plan is now required by the Water Code. Incorporating the water system into regional or county hazard mitigation planning is an important aspect of this new statue. Seismic risk is addressed in Chapter 6.
- **Water Shortage Contingency Plan:** In 2018, the Legislature modified the UWMPA to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides a Supplier with an action plan for a drought or catastrophic water supply shortage. The WSCP is described in Chapter 6 of this UWMP.
- **Groundwater Supplies Coordination:** 2020 UWMPs are required to be consistent with Groundwater Sustainability Plans following the 2014 Legislature enactment of the 2014 Sustainable Groundwater Management Act (SGMA). SCWA's Groundwater Supplies are described in Chapter 3—Water Supply Characterization.
- **Lay Description:** A synopsis of the fundamental determinations of the UWMP is a new statutory requirement in 2020. This section of the is intended for new staff, new governing members, customers, and the media, and it can ensure a consistent representation of the Supplier's detailed analysis.

1.3 Coordination and Outreach

As required by the UWMPA, Sacramento County Water Agency has coordinated with nearby agencies while developing this UWMP to ensure consistency with other related planning efforts such as city and county General Plans, Water Master Plans (WMP) and Groundwater Sustainability Plans (GSP). This requirement includes coordination with (a) water suppliers that share a common water source, (b) relevant water management agencies that affect SCWA's water assets, and relevant public agencies that may have land use or other regulatory relationships with the SCWA. SCWA has prepared this 2020 UWMP in coordination with regional water purveyors and has appropriately notified and coordinated with other appropriate local government agencies as listed in Table 1-2.

SCWA is also a member of the Regional Water Authority (RWA), a joint powers authority, created by water purveyors in the Sacramento region to have a unified approach to regional water issues. The RWA provides members and associates significant regional coordination to enhance water management practices. Moreover, SCWA encourages active involvement by diverse populations in preparing its UWMP and gathers input through public communications and public meetings.

Further, as stipulated in Water Code Section 10621(b), every urban water supplier shall seek active involvement from diverse elements of the community. SCWA sought public participation with a hearing and notices to members of the community. These coordination efforts and Statutory Requirements for Notice are also included in Table 1-2.

Table 1-2: Public and Agency Coordination

Coordinating Agencies	Coordinate Regarding Demands	Sent Copy of Draft UWMP	Sent 60-Day Notice	Notice of Public Hearing
Cities, Counties, Customers, and Interested Parties				
Sacramento Groundwater Authority			X	
City of Elk Grove	X		X	
City of Sacramento	X		X	
Regional Water Authority			X	
Sacramento County Department of Water Resources	X		X	
Golden State Water Company			X	
U.S. Bureau of Reclamation			X	
Sacramento Central Groundwater Authority			X	
Cal American Water Company			X	
City of Rancho Cordova			X	
General Public				

1.3.1 Water Supplier Information Exchange

Water Code Section 10631 requires wholesale and retail water agencies to provide each other with information regarding water supply and demand. Since SCWA receives water from other entities and provides water as a wholesaler to its retail customers, it has coordinated on both sides with supply and demand information. SCWA has water supplies derived from appropriative water rights issued by the State Water Resources Control Board, regional agency contract rights with various entities – including the City of Sacramento, Sacramento Regional County Sanitation District, and Aerojet-Rocketdyne, and contract rights with the United States Bureau of Reclamation. SCWA's wholesale customer is Elk Grove Water District. SCWA exchanged wholesale water supplier information with the City of Sacramento and the United States Bureau of Reclamation in accordance with the UWMP Act. SCWA exchanged retail water supplier information with Elk Grove Water District in accordance with the UWMP Act.

1.3.2 Statutory Requirements for Notice

In accordance with the UWMPA, notification of the UWMP update was provided to cities and counties within the service area at least 60 days prior to the public hearing of the plan as required by Section 10621(b) of the Water Code. Since SCWA is a part of the County of Sacramento it did not need to notify the County. Electronic copies of the final UWMP will be provided to the County no later than 30 days after its submission to DWR.

1.4 UWMP Adoption

SCWA held a public hearing regarding its 2020 UWMP on June 15, 2021. Before the hearing, a draft was made available for public inspection at the SCWA administration building and on the SCWA's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the Sacramento Bee in accordance with Government Code 6066 and posting of the hearing at the SCWA administration building.

SCWA's elected body adopted this 2020 UWMP on June 15, 2021. A copy of the adopted 2020 UWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto SCWA website.

SCWA plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption. These include the following required DWR Excel workbooks:

- "FINAL Submittal 2020 UWMP Tables 04.02.2021.xls"
- "FINAL SBX7-7 Verification Form 04.02.2021.xls"
- "FINAL Energy Use Tables 04.01.21.xls"

The contents of this UWMP are meant to provide flexible management options for the recommended actions. The reliability assessments, for example, follow predicted land use planning and suggested water supply management actions that should be implemented or adjusted in the five year period between this UWMP and the 2025 UWMP update. Thus, implementation of this plan is intended to be flexible to meet changing conditions over the 2020 UWMP's five year planning horizon.

1.5 Document Organization

This UWMP is organized as follows:

- Chapter 2 provides a description of the SCWA service area, demographic characteristics and climate, and describes the future population the Agency anticipates needing to serve.
- Chapter 3 describes SCWA's current and future water supplies and the availability of the supplies through 2045.
- Chapter 4 details the customer uses, including the past and future estimated uses, and describes the SCWA's past and on-going demand management measures.
- Chapter 5 presents the SCWA's water system service reliability into the future, including an assessment of reliability if a drought occurred over the next five consecutive years.
- Chapter 6 is SCWA's stand-alone water shortage contingency plan, incorporated as a chapter in this UWMP, but also available to be shared and utilized separate from the UWMP.

NOTE TO DWR:

Sacramento County Water Agency has written this Urban Water Management Plan (UWMP) primarily as a water resources planning tool to effectively manage water supply, reliability and demand. This UWMP also satisfies all the requirements of the Urban Water Management Planning Act (UWMPA).

The body of the document provides narratives, analysis and data that DWR requests in its 2020 UWMP Guidebook, including changes to the California Water Code since 2015. Efforts have also been made to include enhancements to this document wherever possible as recommended in the 2020 UWMP Guidebook.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into required DWR submittal tables consistent with the organization of the tables in Appendix E of the 2020 UWMP Guidebook. These tables are separately uploaded to DWR's web portal. This UWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F in the 2020 UWMP Guidebook.

Chapter 2
Water Service and System Description

Sacramento County is located in the northern part of California's Central Valley, east of the San Francisco Bay Area along the confluence of the Sacramento and American Rivers. The County stretches from the Sacramento River on the West to the base of the Sierra Foothills on the east and covers about 994 square miles. The northern portion of the county is dominated by the City of Sacramento and its metro area whereas the southern portion is dominated by crop lands and the delta.

Sacramento County Water Agency (SCWA) was formed by a special legislative act in 1952 giving the County the Authority to create assessment zones to fund and manage water projects. SCWA is one of 27 water purveyors within Sacramento County and primarily provides for southern and southeastern Sacramento County as well as some industrial areas, suburban communities, small county enclaves, and future development areas which lie outside of other purveyor service areas.

2.1 SCWA Water Service Areas

Operated as the County Water Resources Department, SCWA has created several assessment zones to enable potable water related projects. SCWA currently provides water service to seven different hydraulic areas as well as wholesale water to the Elk Grove Water District. These service areas include: Metro Air Park, Northgate 880, Arden Park Vista, Southwest Tract, Zone 40, Hood Water Maintenance District (Hood), and East Walnut Grove (Walnut Grove). SCWA's Zone 40 service area represents the largest group of customers and linked hydraulic service areas (see Figure 2-1). Each service area is further described below.

2.1.1 Zone 40 Service Area

The Zone 40 service area is the largest area served by SCWA and includes interconnected infrastructure facilities that facilitate the use of a diversity of water supplies. The Zone 40 has three service areas as follows:

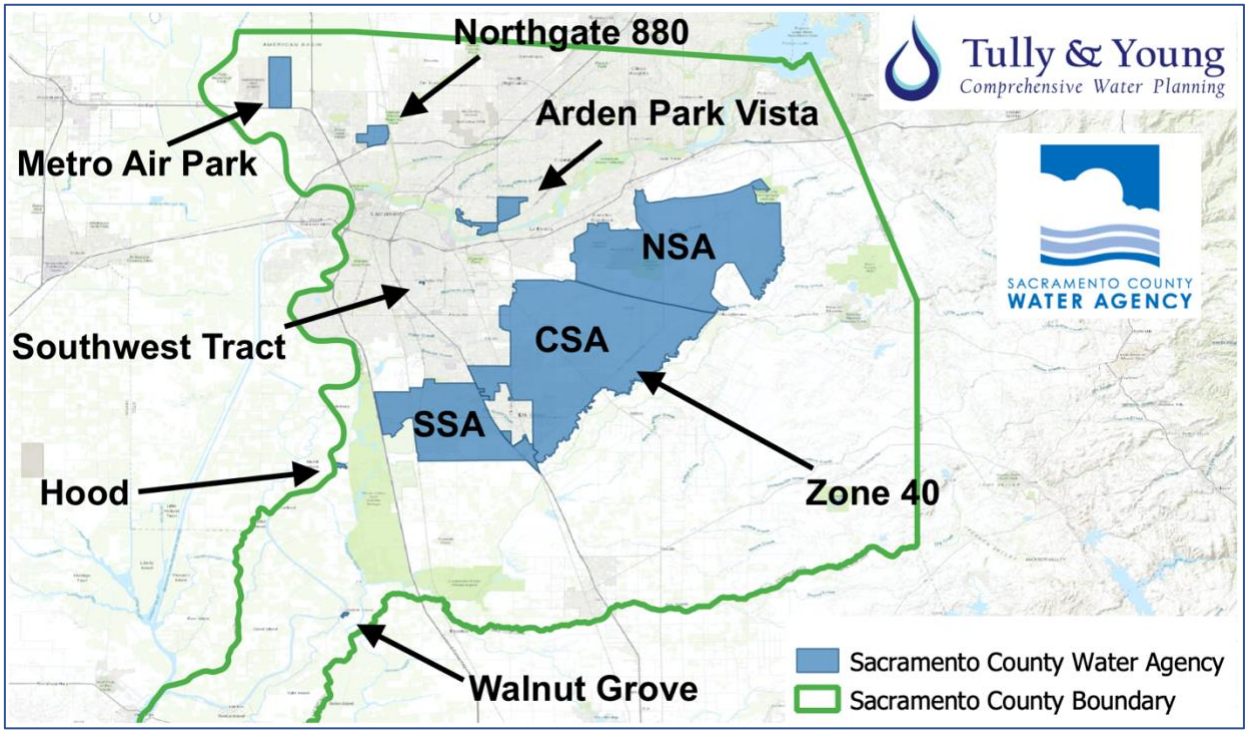
- North Service Area (NSA)
- Central Service Area (CSA)
- South Service Area (SSA)

North Service Area

The NSA is located south of the American River and includes part of the City of Rancho Cordova. Historically, the NSA was supplied exclusively by groundwater. In recent years, SCWA has supplied

surface water supply to the NSA from the Vineyard Water Treatment Plant (WTP), as part of the agency's conjunctive use program. The NSA is the least developed of the three service areas, with currently less than 10 percent of the projected build out population. This service area includes the old Mather and Sunrise Corridor systems. SCWA assumed ownership of the Mather System shortly after the County of Sacramento took over Mather Air Force Base after it was decommissioned by the United States Air Force in the mid-1990s. In the case of the Sunrise Corridor System, SCWA was asked to take ownership and provide water service after the system was constructed through an assessment district in the late 1980's. Most of the land within the NSA boundary is rural and undeveloped but significant growth is anticipated over the next 30 years.[15]

Figure 2-1: Water Service Area



Central Service Area

The CSA is located to the south of the NSA and is supplied by surface water from the Vineyard WTP and groundwater. The CSA is partially developed with approximately 38% of the projected build out population.[16] SCWA provides wholesale water to Elk Grove Water District within the CSA. This service area includes the old Grantline-99 system, as well as the newer Vineyard, Vineyard Springs, and North Vineyard Station areas. The CSA is predominately residential with a small number of commercial and institutional customers and a large rural component to the east.

[15] According to current customer account information, NSA has nearly 6,800 connections of the 28,800 anticipated at build-out.

[16] According to current customer account information, CSA has nearly 14,400 connections of the 38,300 anticipated at build-out.

South Service Area

The SSA is located south of the CSA and to the west of Highway 99. The SSA is the most developed of the three service areas, with currently nearly 90% of the projected build out population.[17] The SSA is supplied by a mix of surface water, groundwater, and recycled water. The surface water comes from the Vineyard SWTP and is conveyed through the CSA. The Franklin Intertie can also supply treated surface water from the City of Sacramento. This service area currently supplies the Laguna, East Franklin, and Laguna Ridge areas. The SSA is predominantly residential with some commercial and institutional customers.

2.1.2 Arden Park Vista

The Arden Park Vista service area is located north of the American River and east of the City of Sacramento. The system began with the development of the Sierra Oaks and Arden Park areas approximately 80 years ago. The service area predominantly consists of single-family residential customers. The Arden Park Vista service area water system is supplied by groundwater wells with the ability to purchase water from adjacent agencies, if necessary, and consists of one pressure zone. The system remains a groundwater-based system dependent on system pressure to cycle well pumps on and off, along with supplemental water supplied from interconnections with the City of Sacramento and Sacramento Suburban Water District (SSWD). As this area was constructed long before water meters were standard practice, it is the only remaining area with a significant number of unmetered customers. SCWA anticipates completing conversion of all customers to meters by 2025.

2.1.3 Metro Air Park

Metro Air Park is a newer retail service area located north of Highway 5 next to the Sacramento International Airport. This area is planned as an industrial hub with two shipping facilities and warehouses currently operating and more in development. Wholesale water service for this area is a contract supply from the City of Sacramento. As this area has no residential or institutional uses, demand patterns will be different than typical service areas.

2.1.4 Northgate 880

The Northgate 880 service area is located east of Highway 5 and north of Highway 80. This area is isolated from other SCWA service area and is fed only by local groundwater supplies. The area is nearly built out with the majority of uses being commercial and industrial. Development of the area is primarily industrial and heavy commercial use.

2.1.5 Hood Water Maintenance District (Hood)

The Hood Water Maintenance District (Hood) service area is located in the southern part of Sacramento County along the east side of the Sacramento River. The approximately 75 residential and six

[17] According to current customer account information, SSA has nearly 33,000 connections of the 38,100 anticipated at build-out.

commercial customers are supplied by groundwater wells using a single pressure zone system. SCWA took over operation and maintenance of this water system in the 1970s.

2.1.6 East Walnut Grove (Walnut Grove)

The East Walnut Grove service area is located in the southern part of Sacramento County along the east side of the Sacramento River within the town of Walnut Grove. Water is supplied from groundwater wells using a single pressure zone. Service is provided to just over 100 residential and 30 commercial customers, with additional services for a few institutional users and park landscaping. SCWA took over operation and maintenance of this water system in 2002.

2.1.7 Southwest Tract Water Maintenance District

The Southwest Tract Water Maintenance District (Southwest Tract) service area is located in central Sacramento County, south of the American River, near Fruitridge Road and Stockton Boulevard. Southwest Tract is a small service area with approximately 18 single-family accounts, 12 multi-family connections and one institutional service. The Southwest Tract is served by groundwater supply derived from the SCWA's formation of the Southwest Water Maintenance District in 1958 and a water service agreement with Fruitridge Vista Water Company (Fruitridge) executed in 1970. This agreement was subsequently assumed by another water agency that is serving the Southwest Tract area.

2.1.8 Service Area Summary

Altogether SCWA provides water service to approximately 59,000 residential, commercial, irrigation, industrial and institutional/governmental service connections throughout all the water service areas. Much of the development is low-density, single-family housing and retail related commercial use, with the exception of the Northgate and Metro Air Park service areas which are predominantly warehouse and light industrial customers. Table 2-1(a) through Table 2-1(g) provide the historical and current number of service connections by customer class.

Table 2-1(a): Zone 40 Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	46,909	47,962	48,827	49,457	50,708	51,657
Multi-Family Residential	238	276	279	306	313	317
Commercial/Institutional	1075	1089	1,103	1,093	1,122	1,108
Industrial	117	118	117	117	119	118
Landscape Irrigation	866	891	906	912	937	948
Other	45	43	43	43	42	41
Total	49,250	50,379	51,275	51,928	53,241	54,189

Table 2-1(b): Arden Park Vista Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	2,777	2,789	2,831	2,834	2,830	2,692
Multi-Family Residential	1,305	1,305	1,425	1,425	1,283	1,283
Commercial/Institutional	195	198	201	198	201	202
Landscape Irrigation	17	16	16	17	19	19
Other	6	6	7	5	7	2
Total	4,300	4,314	4,480	4,479	4,340	4,198

Table 2-1(c): Northgate 880 Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Commercial/Institutional	153	164	186	197	213	213
Industrial	89	79	58	23	30	30
Landscape Irrigation	20	20	26	29	29	29
Other	14	14	14	14	14	14
Total	276	277	284	263	286	286

Table 2-1(d): Metro Air Park Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Commercial/Institutional	0	0	1	2	2	4
Landscape Irrigation	0	0	2	2	2	6
Total	0	0	3	4	4	10

Table 2-1(e): Hood Water Maintenance District Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	76	76	75	75	75	76
Commercial/Institutional	6	6	6	6	6	6
Total	82	82	81	81	81	82

Table 2-1(f): East Walnut Grove Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	110	110	112	112	116	116
Multi-Family Residential	5	5	5	5	5	5
Commercial/Institutional	38	38	39	39	41	41
Landscape Irrigation	4	4	4	4	4	4
Total	157	157	160	160	166	166

Table 2-1(g): Southwest Tract Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	17	17	17	17	18	18
Multi-Family Residential	12	12	12	12	12	12
Commercial/Institutional	1	1	1	1	1	1
Total	30	30	30	30	31	31

2.2 Service Area Climate

Typical of the California Central Valley, Sacramento County has a Mediterranean climate with hot, dry summers and cool, wet winters. Historical averages show January as the coolest and wettest month, and July as the hottest and driest. The wet season is from October to April with a 30-year annual average rainfall of 19.94 inches. The annual mean temperature is 61.5 degrees, but the summer months can regularly see average highs in the mid-high 90s, and average winter lows hover down in the 30s and 40s. Other climate characteristics include frequent tule fog coinciding with the rainy season which brings dense fog caused by high relative humidity (after rain) and rapid cooling during the night. The fog can get trapped, due to temperature inversions common in the Sacramento valley, for days or even weeks. Snow is rare but cold fronts can bring freezing temperatures with trace amounts of snow and ice. Autumn starts warm and dry and becomes cooler, wetter, and foggier later into the season. The last rains in spring are generally in late April or early May.

Figure 2-2 shows the average monthly temperature, rainfall, and evapotranspiration (ETo) for the service area. Actual annual rainfall totals deviate quite significantly from the 30-year average as illustrated in Figure 2-3. In most years, precipitation totals fall below the mean.

2.2.1 Climate Change

While the California Water Code does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply—both in a historical and projected context.

Sacramento County's climate is highly variable with respect to precipitation and temperature. The dry summer months make the state extremely susceptible to drought when a deficiency in precipitation materializes, especially in mountain snowpack. Much of the water supply comes from the mountains falling as winter rain or snow and is then stored as snowpack and subsequently captured in reservoirs and appropriated throughout the year.

Figure 2-2: Average Climate Conditions[18]

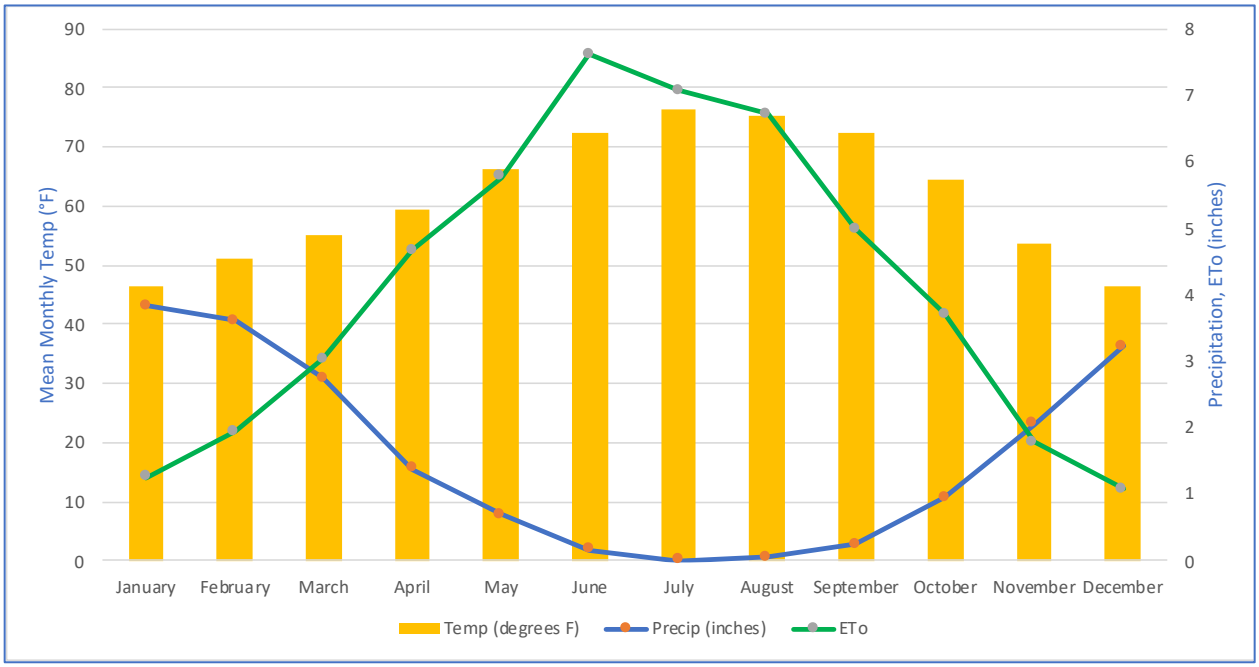
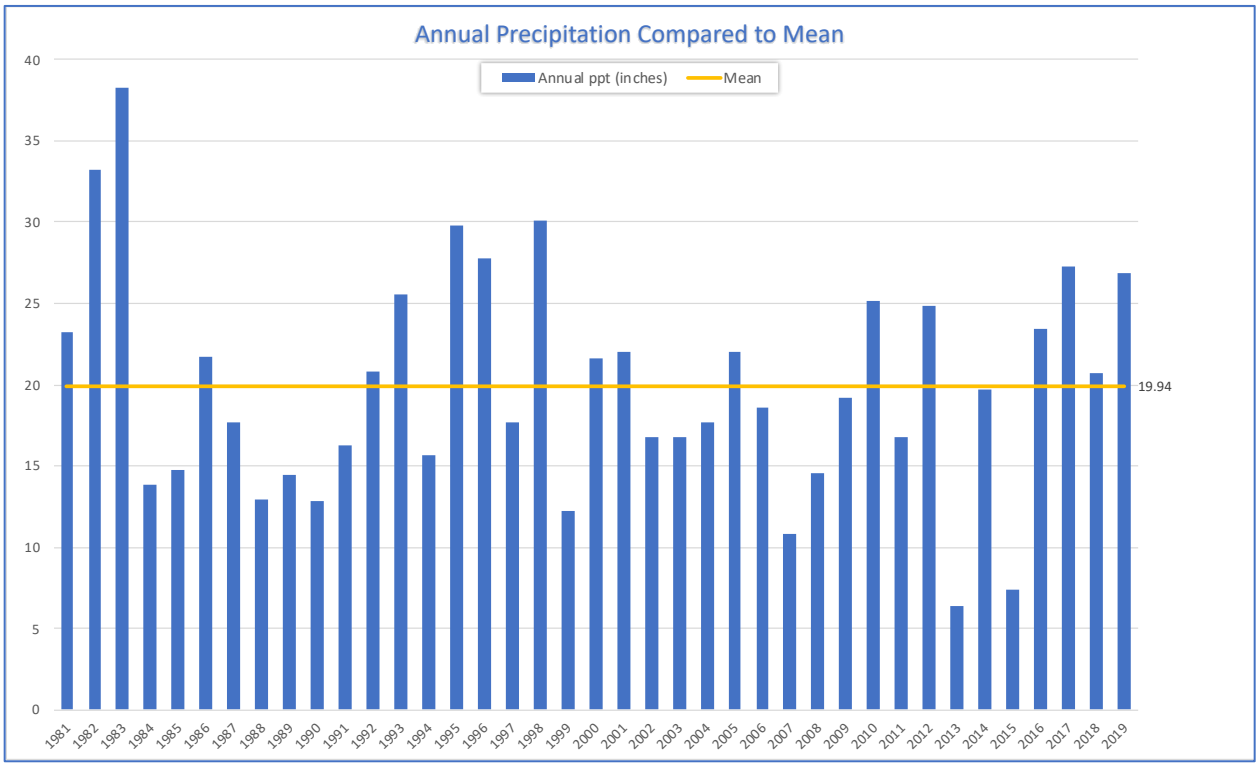


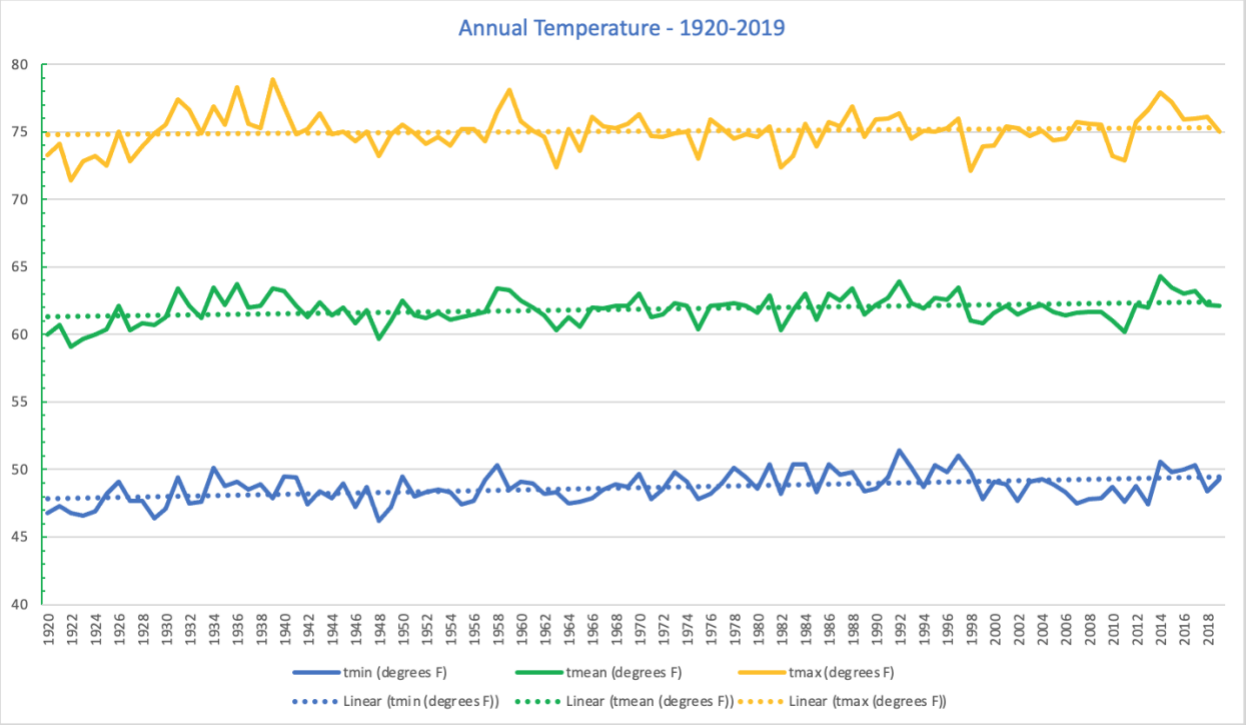
Figure 2-3: Annual Precipitation Variability (1981-2019)



[18] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.4474 Lon: -121.4110 Elev: 26ft; ETo data is from CIMIS Verona - Sacramento Valley - Station 235 from May 2012 – Oct 2020.

The Regional Water Authority (RWA), of which SCWA is a member, partnered with other local water purveyors and the U.S. Department of the Interior, Bureau of Reclamation on a climate change study called the American River Basin Study (ARBS) with the purpose of developing climate change adaptation strategies specific to the Basin[19]. Much of Sacramento County is located in the western portion of the basin and study area. Sacramento County has experienced a general warming trend over the last 100 years, as shown by the trendlines in Figure 2-4.

Figure 2-4: Historical Annual Temperature (1920-2019)[20]



Surface air temperatures are projected to increase steadily, with average summer temperatures increasing by approximately 7.2 degrees Fahrenheit (°F) by the end of the 21st century (Figure 2), and winter temperatures increasing by 4.9°F. Projections of daily maximum and minimum temperatures suggest similar warming trends during all seasons, with maximum temperatures projected to increase as much as 7.3°F during the summer months.

Climate change is generally forecast to bring higher temperatures, more variability in precipitation and more frequent and prolonged droughts. Although there is a lack of a clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation.

[19] Full findings and approved ARBS study can be found at www.pcwa.net/planning/arbs

[20] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.4474 Lon: -121.4110 Elev: 26ft

Water supplies in the SCWA region are inextricably tied to the Sierra snowpack runoff, and the ARBS indicates that the Snow Water Equivalent (SWE) is projected to decrease significantly due to higher average surface temperatures and precipitation variability. Historical average SWE for the American River basin is 3.1 inches. It is forecasted to decrease to 2.0 inches across all climate scenarios and future time periods. Areas that accumulate snow are projected to have up to a 12-inch decrease in average annual SWE, resulting in a loss of snow by 50-75% through the end of the century[21]. This will place strain on summer and fall water supply in Sacramento County and throughout the state due to earlier runoff. Peak runoff is expected to shift by more than a month earlier by mid to late century. Increased evapotranspiration would also accompany the intensification of hotter extreme temperatures.

Currently available documents from SCWA assume that current supply availability remains flat but recent documents qualify this with the uncertainties related to climate change impacts on supply availability, habitat and species considerations, and changing flow requirements.

This 2020 UWMP Update includes additional Climate Change discussion in Chapters 3 and 4.

2.3 Current and Projected Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the SCWA's economic, social, and demographic trends give valuable insight to water management and planning. This section of the UWMP addresses these factors to provide a supportable basis for forecasting future water use.

2.3.1 Current Population and Historic Trends

Since being the largest major settlement adjacent to the first major gold find during the California Gold Rush, Sacramento grew at a rapid rate. With the City of Sacramento tripling in size between 1850 and 1860, there was a rapid development of lands around the City of Sacramento to provide food and resources to the growing City. As such, growth in the County started in the northwestern portion adjacent to the City of Sacramento and has grown in all directions. Currently, the population is primarily growing in the remaining areas to the east and southeast of the City – areas predominantly served by the SCWA in the Zone 40 service area (see Figure 2-1).

Table 2-2 presents the recent and estimated current population for the various SCWA service areas. Because the various service areas do not easily correlate to existing boundaries represented by the California Department of Finance in their historic and recent population analyses, the estimates in the table are derived using a variety of methods as represented in the footnotes. There is no estimated

[21] American River Basin Study

population present in the Northgate 880 or Metro Air Park areas because those areas have no residential developments.

Table 2-2: Estimated Population – Historical and Current

Service Area	2010	2015	2020
Zone 40[22]		~146,000	~169,000
Arden Park Vista[23]		~11,500	~11,500
Southwest Tract	~150	~150	~150
Hood[24]	~200	~300	~300
East Walnut Grove	~450	~450	~450
Elk Grove WD Wholesale Area		~10,500	~12,000
Total		~168,900	~193,400

2.3.2 Current and Projected Land Use

While the SCWA has several water service areas, Zone 40 is the predominant area that has experienced growth and is expected to continue to grow significantly. As described previously, Zone 40 is comprised of three subareas: the North Service Area (NSA), the Central Service Area (CSA) and the South Service Area (SSA). Growth in these three service areas was evaluated and documented in the SCWA's Zone 40 Water System Infrastructure Plan Update (WSIP), completed in September 2016.[25]

In addition to growth in Zone 40, the SCWA's Zone 50 (Metro Air Park) also anticipates significant growth. However, this service area only includes commercial and industrial customers and is served by a contract with the City of Sacramento. As such, the Metro Air Park area has a reliable water supply system for its future growth potential.

All other SCWA water service areas are either fully built out or nearing buildout and therefore are not described here.

Zone 40 Land Use and Growth Projections

The WSIP included a projection of total connections over time for each of the three subareas (see Figure 2-5). As indicated in the WSIP table, projections were made beginning in 2010 and reflected anticipated

[22] Estimated based upon residential connection data from SCWA for 2015 and 2020 multiplied by Department of Finance occupancy data for Sacramento County.

[23] 2020 APV population based on residential connection count and Sacramento County occupancy rate of 2.80 people per house according to the Department of Finance data at: https://www.dof.ca.gov/Forecasting/Demographics/Estimates/

[24] https://datacommons.org/tools/timeline#&place=geoId/0634484&statsVar=Count_Person

[25] In January 2021, the SCWA prepared a draft Zone 40 Water Supply Master Plan Amendment that repeated much of the analysis and growth projections in the WSIP. This recent draft amendment was prepared to address the proposed Elk Grove Sports Complex, located in the SSA, which would be served by the SCWA.

developments until a build-out condition was reached. For SSA, build-out was expected by 2035, while the NSA and CSA areas were expected to build-out shortly after 2050.

Figure 2-5: Projected Connections for Zone 40[26]

Table 3-9. Projected Connections in 5-Year Increments

Service area	2010	2015	2020	2025	2030	2035	2040	2045	2050	Buildout (2052)
NSA	4,600	5,600	7,500	10,000	12,500	16,100	19,800	23,600	27,300	28,800
CSA	15,600	16,600	18,400	20,900	23,400	27,000	30,800	34,500	38,300	38,300
SSA	28,900	30,300	32,800	35,300	37,800	38,100	38,100	38,100	38,100	38,100
Total Zone 40	49,100	52,600	58,800	66,300	73,800	81,300	88,800	96,300	103,800	105,200

Using actual customer connection information from the SCWA for 2015 and 2020, a comparison can be made to the expected connections in 2020, and adjustments, if necessary, can be presumed for on-going growth rates for purposes of this 2020 UWMP.

Table 2-3: Comparison of Projected Connections to Actual Connections

		2015	2020
SSA	Actual Count	28,393	32,929
	WSIP Projection	30,300	32,800
	Diff.	94%	100%
CSA	Actual Count	13,165	14,434
	WSIP Projection	16,600	18,400
	Diff.	79%	78%
NSA	Actual Count	5,344	6,803
	WSIP Projection	5,600	7,500
	Diff.	95%	91%

Note: The "Diff." value is the actual count divided by the WSIP projected number of connections.

As shown in Table 2-5, the SSA and the NSA actual connection count match or are reasonably consistent with the WSIP projection for 2015 and 2020 as shown in Figure 2-5. Growth in the CSA, however, has lagged from the WSIP projections. However, the SCWA anticipates the long-term growth in total CSA connections shown in Figure 2-5 to still occur such that they will match by 2045.

For purposes of the 2020 UWMP, connection forecasts for each five-year increment are evenly distributed between 2025 and 2045 for the NSA and CSA subareas, with 2045 connection estimates

[26] SCWA's 2016 WSIP, Table 3-9. The figures depicted in this Table are updated per the additional tables in this section and Chapter 4.

matching the WSIP's 2045 forecast. For SSA, which is expected to reach build-out by 2035, the remaining growth was equally spread between 2025 and 2035. Table 2-6 presents the incremental accumulated connections that are used to forecast water use for this 2020 UWMP (further described in Chapter 4) and compares them to the WSIP projections through 2045 for each subarea.

Table 2-4: Zone 40 Forecast Connections for UWMP and Comparison to WSIP

		2020	2025	2030	2035	2040	2045
SSA	New Connections (cumulative)		1,724	3,447	5,171	5,171	5,171
	UWMP Forecast	32,929	34,653	36,376	38,100	38,100	38,100
	WSIP Projected	32,800	35,300	37,800	38,100	38,100	38,100
CSA	New Connections (cumulative)		4,013	8,026	12,040	16,053	20,066
	UWMP Forecast	14,434	18,447	22,460	26,474	30,487	34,500
	WSIP Projected	18,400	20,900	23,400	27,000	30,800	34,500
NSA	New Connections (cumulative)		3,359	6,719	10,078	13,438	16,797
	UWMP Forecast	6,803	10,162	13,522	16,881	20,241	23,600
	WSIP Projected	7,500	10,000	12,500	16,100	19,800	23,600

A number of development areas were identified as part of the WSIP when projecting the future total growth in the connections. Figure 2-6 shows the projected development locations within Zone 40. Because the timing and configuration of various previously approved and proposed development is dynamic and reacts to market conditions and other growth factors, the forecast connections are not assigned to any particular named development shown in Figure 2-6.

2.3.3 Economic Trends & Other Social and Demographic Factors

Sacramento County has a large, diverse economy, which includes being home to the State Capitol of California, the eighth-largest economy in the world. Its economic history has been tied to California's globally significant agricultural production centered in the Sacramento Valley. Agriculture is still an important part of the economy in the county, but key industries such as transportation, agribusiness, manufacturing, clean energy, technology, health care, and a robust housing market fuel its growth.

The SCWA service area is one of the more undeveloped parts of the county, with much of the land use being dedicated to residential, commercial, retail, light industrial, and agriculture. Elk Grove is the largest city in the area and hosts a significant tech sector, including an Apple, Inc. campus which employs approximately 5,000 people. Other large employment sectors include healthcare, education, and retail. The residential population of the SCWA also has a significant number of commuters that travel outside of the area to the greater metropolitan region for work. The SCWA Zone 40 service area is continuing to grow and therefore could see significant residential and commercial growth during the UWMP planning horizon through 2045.

The coronavirus pandemic crippled the national and global economy in 2020 and Sacramento County was no exception. The County's unemployment rate spiked to almost 14% in May 2020. Since then, the County has regained some of the jobs and the reported unemployment rate has declined sharply but there remains a level of uncertainty with the pace of economic recovery due to the pandemic.

Figure 2-6: Zone 40 Existing or New Development Project Locations [source: WSMP Amendment[27]]

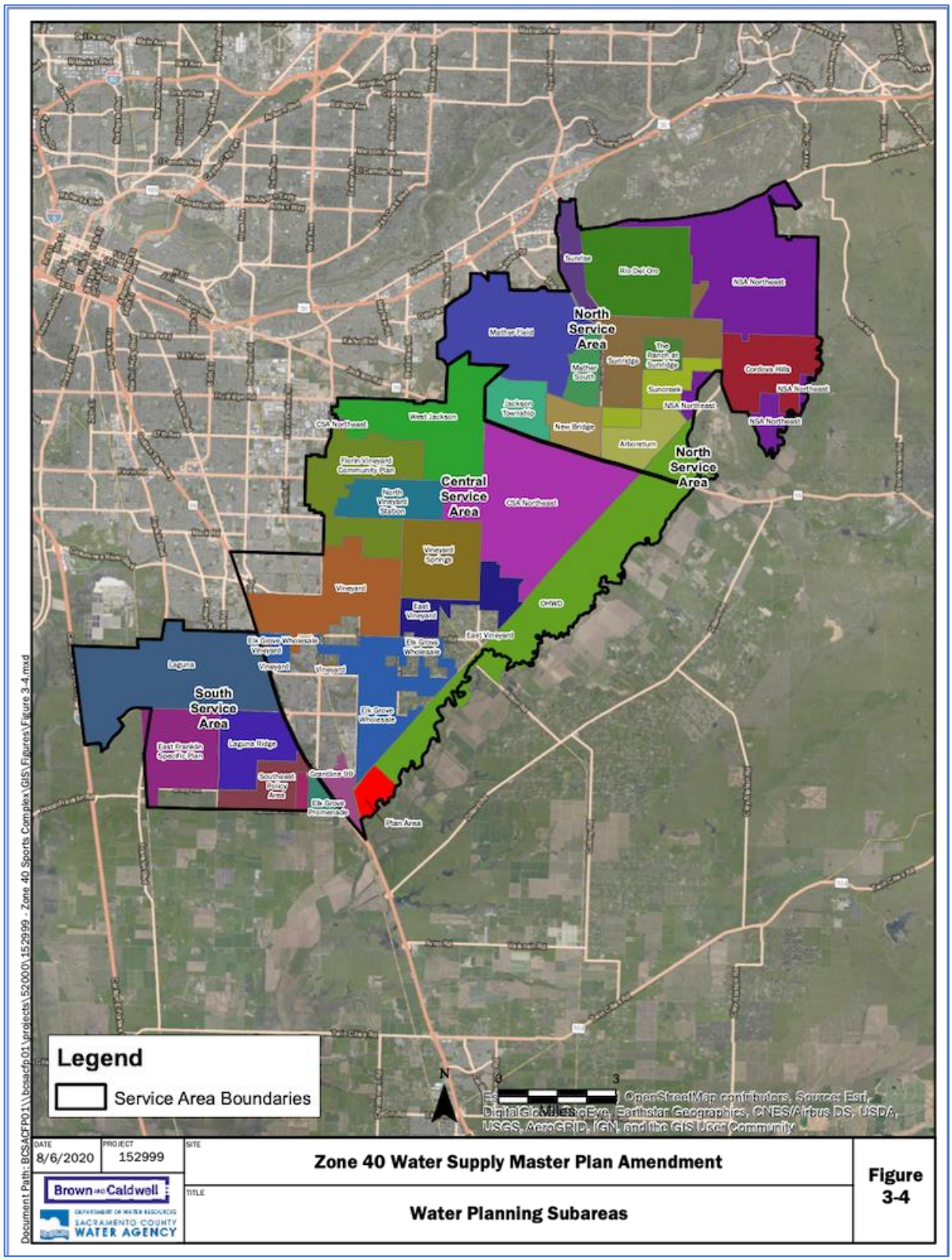
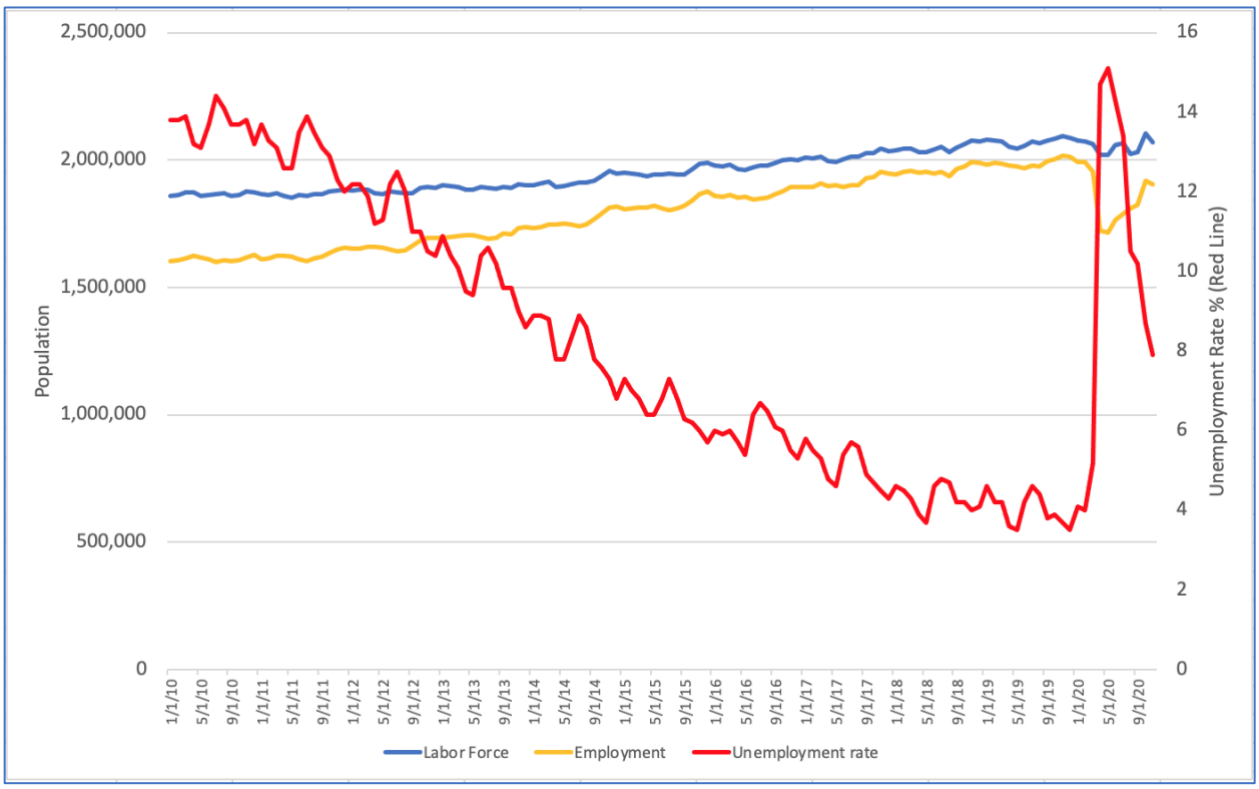


Figure 2-7: Sacramento County Employment Data



According to the 2010 US Census, the ethnic makeup of the census designated places within the SCWA service area is 55% White, 19% Hispanic/Latino, 15% Asian, 11% African American, and 8% other races or mixed race. The median income for Sacramento County is $77,262. Within the census designated places, the SCWA service area median income is $74,715.[28]

Using the connections methodology shown in Table 2-7, there are an estimated 56,000 households in the SCWA service area. Although Sacramento County has an average of 2.71 persons per household, the SCWA service areas have higher occupancy rates estimated to be equivalent to that listed by the Department of Finance for Elk Grove.[29]

Expected Population Based Upon Land-Use Planning

To forecast projected service area population as accurately as possible requires consideration of the past growth rate, local economic predictions, and current and projected land uses. Importantly, one of the recent statutory updates to the UWMP Act states urban water suppliers "shall coordinate with local or regional land use authorities"[30] regarding land uses that may affect water management planning.

[27] Figure is from the SCWA's January 2021 draft Zone 40 Water Supply Master Plan Amendment, Figure 3-4.
[28] American Community Survey - Income, Poverty, Employment 2019
[29] California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties
[30] CA Water Code Section 10631(a).

Since boundaries used for various population projections made by the Department of Finance do not correlate to SCWA's service areas, the projected population for this UWMP is estimated using the projections of total new connections shown in Table 2-6. Population projections are only provided for Zone 40 as the other SCWA water service areas with residential customers – Arden Park Vista, Hood, Southwest Tract and East Walnut Grove – are not expected to grow as they are already at build-out conditions.[31]

The Zone 40 projected future population is based upon estimating the mix of the total connections shown in Table 2-6 among residential and non-residential customers. While the actual mix will depend on the proposed projects within each Zone 40 subarea, using the existing mix of residential to non-residential connections can be a proxy for estimating the future mix for the incremental new connections. With an estimate of new residential connections, California Department of Finance (DoF) occupancy rates for Sacramento County can be applied to estimate future populations for each subarea. Table 2-7 provides the estimated number of new residential connections, the assumed occupancy rate, and a projected population for each subarea, as well as a total population projection for Zone 40.

Table 2-5: Zone 40 Population Forecast tied to UWMP Connection Projections

SSA	Residential Unit Ratio			2020 = 97%		Forecast =	96%
	Occupancy Rate [using DoF estimate for Elk Grove]			3.27	people per unit		
	Cumulative New Residential Units		2025	2030	2035	2040	2045
			1,655	3,309	4,964	4,964	4,964
	Population Forecast	2020	2025	2030	2035	2040	2045
		102,966	108,377	113,788	119,199	119,199	119,199
CSA	Residential Unit Ratio			2020 = 95%		Forecast =	97%
	Occupancy Rate [using DoF estimate for Sacramento Co.]			3.27	people per unit		
	Cumulative New Residential Units		2025	2030	2035	2040	2045
			3,893	7,786	11,678	15,571	19,464
	Population Forecast	2020	2025	2030	2035	2040	2045
		45,819	58,549	71,278	84,008	96,737	109,467
NSA	Residential Unit Ratio			2020 = 91%		Forecast =	90%
	Occupancy Rate [using DoF estimate for Rancho Cordova]			3.27	people per unit		
	Cumulative New Residential Units		2025	2030	2035	2040	2045
			3,023	6,047	9,070	12,094	15,117
	Population Forecast	2020	2025	2030	2035	2040	2045
		20,215	30,102	39,989	49,875	59,762	69,649
Zone 40 Total Population		169,000	197,027	225,054	253,081	275,698	298,314

[31] Minor population increases may occur in these areas if occupancy rates increase. But for purposes of this 2020 UWMP, occupancy rates and total residential customer connections are expected to stay consistent over the UWMP planning horizon.

2.4 Delivery System Details

SCWA serves customers in all its service areas through several small- and large-scale potable infrastructure systems, as well as a recycled water system that serves the SSA.

Further discussion of these systems and the water supply used within each is included in Chapter 3, with current and future customer water use described in detail in Chapter 4.

2.4.1 Potable System

SCWA's primary function is delivering potable water to its customers in the previously described service areas. While a small percentage of total delivery is recycled water is delivered in the SSA, SCWA efficiently delivers more than 40,000 acre-feet of potable water annually. The following provides a brief overview of SCWA's potable water systems.

Zone 40 Delivery System

Zone 40, SCWA's largest customer service area, also has the most complex infrastructure. SCWA supplies a combination of groundwater and surface water into an interconnected system with multiple pressure zones. As shown in Figure 2-8, SCWA's Zone 40 distribution system is served by two primary surface water inputs and multiple groundwater inputs.[32]

SCWA surface water supplies for Zone 40 are diverted from the Sacramento River at Freeport and through the City of Sacramento's (City) Sacramento River WTP and Fairbairn WTP. Surface water diverted from the Sacramento River at the Freeport diversion structure is conveyed through the Freeport Regional Water Authority (FRWA) pipeline, treated at the Vineyard WTP (currently permitted at 60 MGD), and then delivered to customers in the CSA, SSA, and NSA.

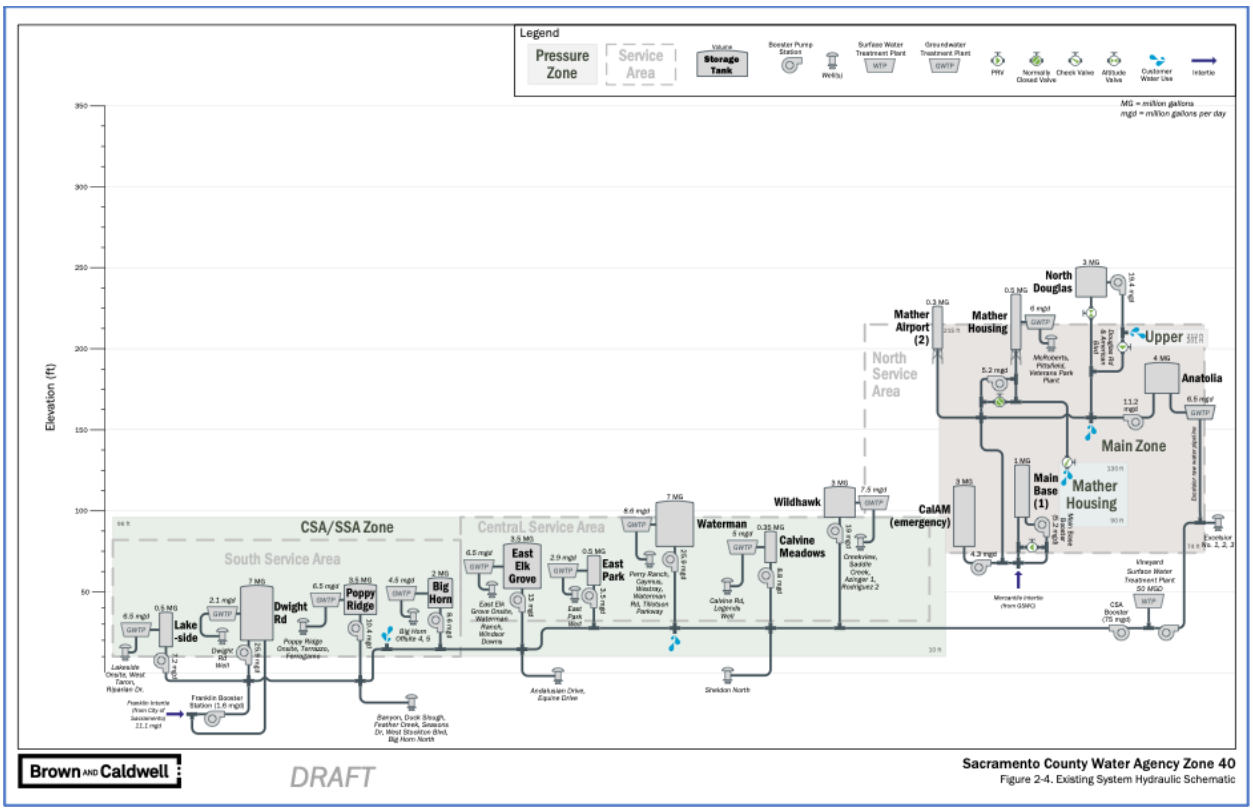
Surface water can also be provided to the SSA through the Franklin Intertie between the City's and SCWA's distribution systems. The City could divert and treat a portion of SCWA's surface water, and then wheel that water through their distribution system to the Franklin Intertie to Zone 40.

Groundwater is supplied to Zone 40 from wells that that are connected to groundwater treatment plants (GWTPs) and from wells that pump directly into the distribution system (direct feed). Most GWTP facilities consist of wells that supply raw water into a treatment plant, a ground level storage tank, and a pump station. Most GWTPs are supplied by more than one well. The direct feed wells pump directly into the distribution system and do not require treatment. Direct feed wells are located in some areas of the CSA and SSA.

In addition to the source and primary conveyance of the supplies, SCWA maintains an array of booster pumps, storage tanks, and distribution pipelines to assure continued and reliable pressurized potable water service.

[32] More detailed information regarding the Zone 40 infrastructure is available in the SCWA's January 2021 draft Zone 40 Water Supply Master Plan Amendment.

Figure 2-8: Zone 40 Potable Water System Schematic[33]



Non-Zone 40 Delivery Systems

All of the other water delivery systems, with the exception of Metro Air Park, are supplied by groundwater systems that extract, and in some cases treat, then pump water into single pressure zone distribution systems. Metro Air Park is served with a combination of surface and groundwater resources (surface or groundwater is provided at the discretion of the City of Sacramento) treated and provided to the SCWA at the Metro Air Park location for SCWA management and delivery to customers in that specific service area.

2.4.2 Non-potable System

As described in further detail in Chapter 3, SCWA operates a recycled water system to serve non-potable needs within the SSA. In May 2003 the recycled water system officially went online and is currently delivering recycled water to the communities of Laguna West, Lakeside, and Stonelake in the Elk Grove and Laguna areas in the SSA to irrigate street medians, commercial landscaping, parks, and school sites.

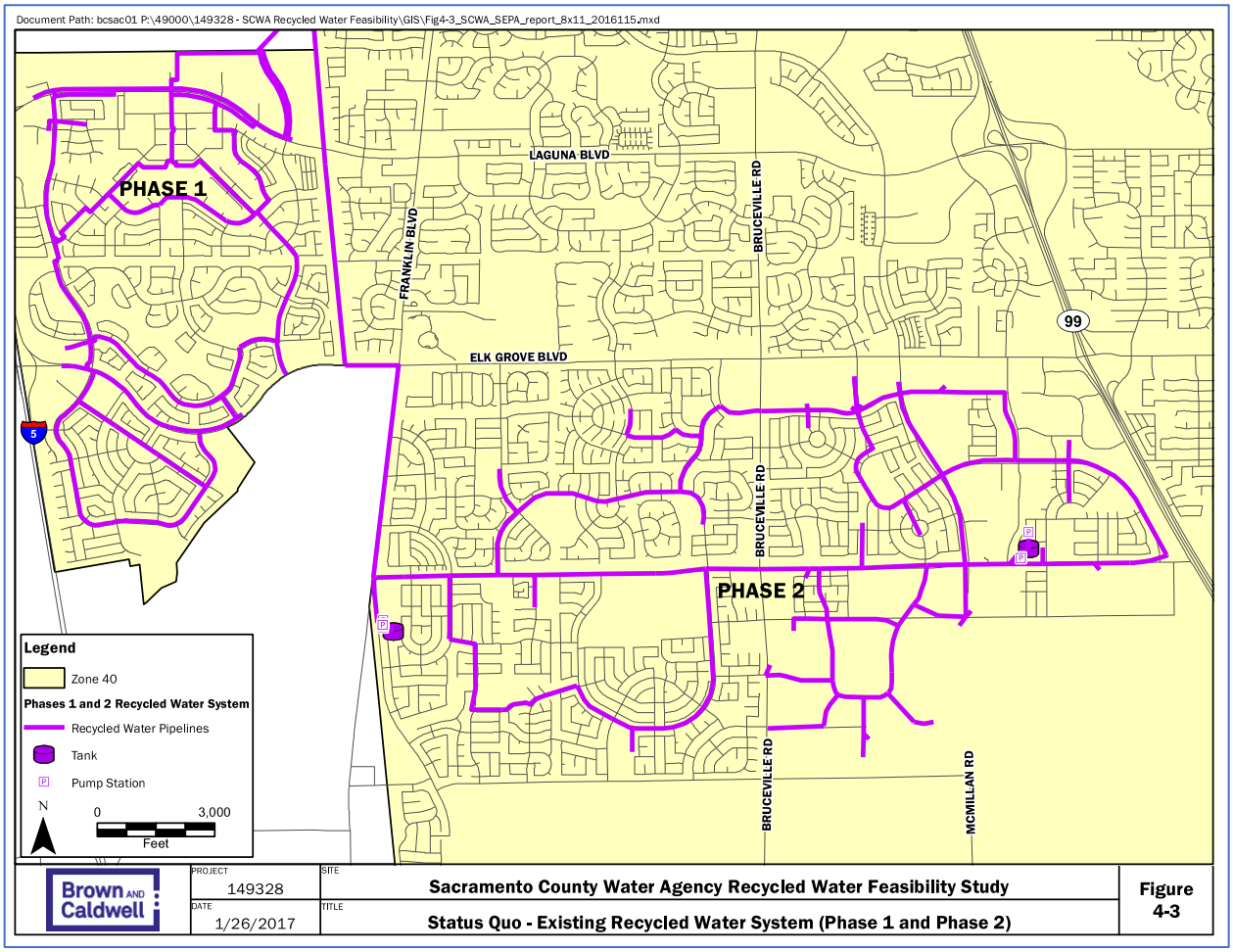
Tertiary treated wastewater is produced for SCWA at Sacramento Regional County Sanitation District's (SRCSD) 5-MGD Water Reclamation Facility (WRF) located at the Sacramento Regional Wastewater

[33] Figure is from the SCWA's January 2021 draft Zone 40 Water Supply Master Plan Amendment, Figure 2-4, modified to also show the NSA Phase A Pipeline.

Treatment Plant site. Recycled water is conveyed from the WRF via a single 24-inch transmission main that then drops to a 20-inch pipeline to SCWA's branched distribution system shown in Figure 2-9.

SCWA owns and maintains this recycled water distribution system. The Phase 1 portion of the program has 54 user sites which include parks, schoolyards, commercial landscaping, and roadway medians. All operations are conducted in accordance with the Regional Water Quality Control Board (RWQCB) and State Water Resources Control Board recycled water standards and SRCSD's Master Reclamation Permit Waste Discharge Requirement (WDR) #97-146). SCWA's Phase 2 system is currently in progress and expected to begin treated recycled water deliveries upon completion of the Harvest Water pipeline.

Figure 2-9: SSA Non-Potable Water System Schematic [source: Recycled Water Feasibility Study[34]]



[34] Figure is from the SCWA's July 2017 Recycled Water Feasibility Study, Figure 4-3.

2.5 Energy Intensity

Among the statutory changes enacted with new requirements for 2020 UMWPs, an urban supplier shall include any of the following information it can readily obtain in the 2020 UWMP:[35]

- An estimate of the amount of energy used to extract or divert water supplies.
- An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
- An estimate of the amount of energy used to treat water supplies.
- An estimate of the amount of energy used to distribute water supplies through its distribution systems.
- An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
- An estimate of the amount of energy used to place water into or withdraw from storage.
- Any other energy-related information the urban water supplier deems appropriate.

Referred to as "Energy Intensity Reporting" for urban water suppliers, energy Intensity is defined as: total amount of energy expended in kilowatt-hours (kWh) by the urban water supplier on a per acre-foot basis to take water from the location where the urban water supplier acquires the water to its point of delivery.

Due to the way that water is supplied in the various SCWA service areas, it is not currently possible to separate out extraction, treatment, storage, and distribution energy uses. This is due to the number of well head treatment facilities on a single power meter as well as wells located at tank sites with only a single power meter. Given this, SCWA uses the Total Utility Approach. This method sums the annual energy consumed for all water management processes, divided by total volume of water in acre feet. These processes include extraction, diversion, conveyance, placement into storage, treatment, and distribution. The total energy intensity is reported in Table 2-8.

Table 2-6: Energy Intensity – Total Utility Approach

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	52,465
Energy Consumed (kWh)	25,829,586
Energy Intensity (kWh/acre-foot)	492

[35] California Water Code Section 10631.2(a).

Chapter 3
Water Supply

Sacramento County Water Agency (SCWA) has numerous water assets that are available to serve the separate service areas throughout its broad boundary. The water assets consist of surface water rights, groundwater rights, and surface water and groundwater supply contracts. The purpose of this section is to describe each of these water assets in detail as they relate to the various water service areas within SCWA and provide a detailed summary for SCWA water supply portfolio under normal, single dry, and five-consecutive dry year conditions through 2045.

3.1 Description of SCWA's Surface Water Rights and Contracts

SCWA has twelve surface water rights and water supply contracts – all with varying terms and conditions and all with varying degrees of water supply reliability. The rights and contracts are as follows:

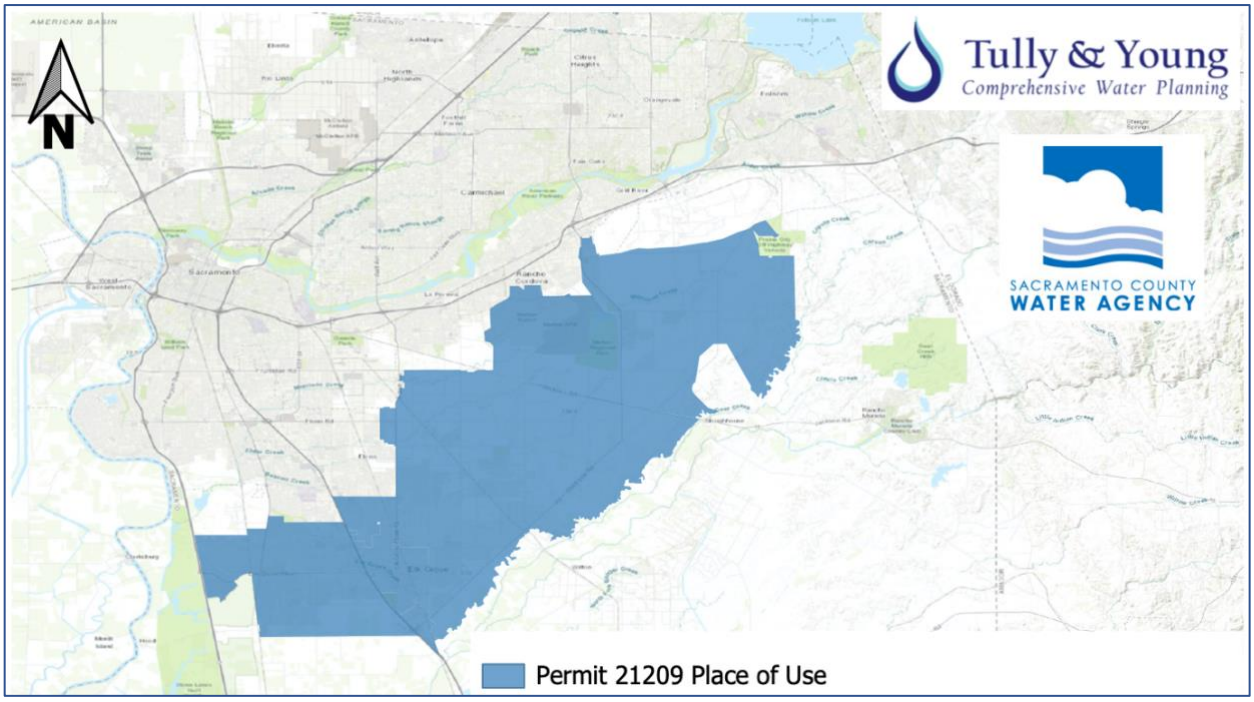
1. SWRCB Appropriative Water Right Permit 21209
2. SCWA CVP Contract 14-06-200-5198B-IR1-P (Feb 2020) ("SMUD Contract")
3. SCWA CVP Contract 6-07-20-W1372-P (Feb 2020) ("Fazio Contract")
4. Agreement Between Sacramento County, SCWA and Aerojet with respect to Transfer of GET Water
5. SWRCB Appropriative Water Right License 1062
6. SWRCB Appropriative Water Right License 4060
7. Contract Between State of California Department of Water Resources and North Delta Water Agency
8. 2002 Wholesale Agreement Between SRCSD and SCWA
9. 2004 Agreement with the City of Sacramento for Wholesaling and/or Wheeling Water Service for Sacramento International Airport and Metro Air Park
10. 2000 Agreement Between City of Sacramento and the Sacramento County Water Agency to Treat and Deliver (Wheel) Surface Water
11. 2000 Memorandum of Understanding Regarding the Operation of A Water System Interconnection at 2750 Mercantile Drive
12. Fruitridge Vista Water Company Contract now held by Cal American Water Company

Each of these water supply sources is described separately in this section with an analysis of the historic uses and future supply opportunities. Importantly, the water management actions described in this chapter as well as chapters 4 and 5, demonstrate SCWA's use of local water supplies reducing its need to import water from other regions in California.

3.1.1 SWRCB Appropriative Water Right Permit 21209

In 1995, SCWA filed Application 30454 and obtained Water Right Permit 21209 (Permit 21209). Permit 21209 allows SCWA to divert up to 132 cubic feet per second in all months of the year from the Sacramento River. Permit 21209 may be used anywhere in SCWA's Zone 40 for municipal uses. Figure 3-1 shows Permit 21209's place of use. The total supply potentially available under Permit 21209 is 71,000 acre-feet per year.

Figure 3-1: Permit 21209 Place of Use



SCWA's diversion under this water right is subject to "Term 91." The State Water Resources Control Board (SWRCB) may declare a Term 91 condition when the natural flows in the Sacramento River are insufficient to meet the various water quality and water flow requirements in the Delta. When SWRCB declares Term 91, SCWA must cease diversions under Permit 21209. In normal water years, Term 91 is usually declared on June 1 and then released on October 1. Occasionally, the normal year Term 91 declaration varies where runoff patterns and amounts deviate from anticipated conditions. For example, in 2018 (a normal water year), Term 91 was released on October 1 then reinstated on October 15. It was then re-released on November 1. It is likely that Term 91 will be declared more often in the future, reducing the diversion periods available for SCWA's Permit 21209.[36] It is important to note that the diversion limitation of 132 cfs in Permit 21209 limits the monthly availability of the water in a normal year (that includes Term 91) to 7,855 acre-feet per month.

[36] A short review of SCWA's Permit Progress Reports shows that the diversion and use reporting may deviate from the legal requirements under the water right and under-reports the conserved water, reclaimed/recycled water, and conjunctive groundwater uses in SCWA's service area.

Term 91 has significant implications for diversions in dry years and dry conditions. In 2014, one of the driest years on record, Term 91 was declared on April 1 and lasted through December. In the Fall and Winter of 2020-2021, Term 91 was in effect from October 15 through January 4. Accordingly, Term 91 will likely impact SCWA's ability to directly divert and deliver Sacramento River water supplies in the future under Permit 21209. Table 3-1 shows the last 10 years of Permit 21209's monthly supply deliveries.

Table 3-1: Last 10 Years of SCWA Permit 21209 Monthly Water Deliveries (acre-feet per year)[37]

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	101	584	360	1,061	1,362	1,458	1,113	732	598
2012	515	479	505	565	845	1,120	1,391	1,413	1,306	1,089	65	0
2013	374	648	775	810	1,521	1,436	1,533	1,459	1,345	1,389	1,267	437
2014	9	0	485	695	1,124	0	0	0	0	0	0	0
2015	0	0	555	825	0	0	0	0	0	0	0	0
2016	0	0	0	872	223	17	0	0	0	0	0	0
2017	0	0	0	0	767	638	640	459	861	967	658	436
2018	0	238	949	1,217	1,732	0	0	0	0	0	0	0
2019	667	728	917	371	460	594	570	761	702	947	993	690
2020	57	387	1,658	1,746	2,043	303	0	0	0	688	0	0

Last Permit 21209 is just that – a Permit Supply. Under California water rights law, SCWA must demonstrate full beneficial use of the water supply by December 31, 2030. In the event SCWA does not put all the water under Permit 21209 to beneficial use by that date, the SWRCB may either grant a permit extension or allow the permit to expire, which may reduce the amount of water SCWA could use. Nevertheless, for purposes of this UWMP we assume that SCWA has the capability to use the permitted water supplies for beneficial uses in its service area through 2045.

Table 3-2 shows the projected annual water supplies under Permit 21209 for normal, single dry, and five consecutive dry years through 2025. It is important to note the limitation on this supply on a monthly timestep as shown in the master supply table at the end of this chapter.

[37] Table 3-1 indicates that diversions under Permit 21209 may have occurred, or been misreported, when Term 91 was in effect.

Table 3-2: Permit 21209 Normal Year, Single Dry Year, and Five Consecutive Year Availability

Year	Acre-feet per Year
Normal	62,840
Single Dry	31,420
Dry Year 1	47,130
Dry Year 2	39,275
Dry Year 3	31,420
Dry Year 4	39,275
Dry Year 5	47,130

Table 3-3 shows the anticipated annual water supply deliveries for normal, single dry, and five consecutive dry years for Permit 21209 through 2045.

Table 3-3: Permit 21209 Annual Deliveries in Varying Year Types Through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		62,840	62,840	62,840	62,840	62,840
Single Dry Year		31,420	31,420	31,420	31,420	31,420
Multi-Year Drought	Year 1	47,130	47,130	47,130	47,130	47,130
	Year 2	39,275	39,275	39,275	39,275	39,275
	Year 3	31,420	31,420	31,420	31,420	31,420
	Year 4	39,275	39,275	39,275	39,275	39,275
	Year 5	47,130	47,130	47,130	47,130	47,130

A normal year for this water right relates to the probability of Term 91 implementation. Normally, Term 91 is implemented on June 1 and lifted on October 1. Thus, we have used the historical highest supply deliveries during these time periods to show the supply availability in 2025 and then gradually increased the amount through 2045 by approximately 2,000 acre-feet per year based upon reasonable demand growth projections. The supply figures in Table 3-3 represent supplies that would likely be delivered and used through 2045. Table 3-2 shows actual supply availability.

A single dry year under this water right is defined by an extended implementation of Term 91. In this instance, 2014 and 2015 represent the most drastic water years where Term 91 was in place all or part of nine months of the year. As such, we will use three months of availability to reflect the single dry year scenario and base the condition on 2015 – the most conservative dry year representation. We increase the demand by 300 acre-feet per year into the future to represent a reasonable demand increase in each month (100 acre-feet per month) when the water supply is available.

Multiple dry years under this water right permit represent conditions where Term 91 is in effect over varying periods for the water right. In this future scenario, we anticipate conditions where Term 91 is in effect in Year 1 and Year 2 from May through October – representing an extension of two months beyond the normal Term 91 implementation. Thus, this water supply is available for six of twelve months out of the year. We increase the potential supply availability by 100 acre-feet per month of

availability into the future (still well within the total available water supply under the water right). Years 3 and 4 represent nine months of Term 91 implementation in accordance with 2014 and 2015, yet replace monthly usages with the highest usage during those periods on record. Again, we increase the supply available under these years as increasing by 100 acre-feet per month into the future. Last, Year 5 represents a reduced Term 91 extension in May and October like Years 1 and 2 and has a 100 acre-feet per month of availability increase into the future. All of these figures represent the highest historical water uses in the identified water months with reasonable water supply augmentation.

3.1.2 SCWA CVP Contract 14-06-200-5198B-IR1-P (Feb 2020) (SMUD Contract)

In 1970, the Sacramento Municipal Utility District (SMUD) entered a Central Valley Project (CVP) water service contract with the United States Bureau of Reclamation (Reclamation). SMUD was unable to utilize all of the water supplies under that contract and assigned a portion of its CVP contract to SCWA in 2006. SCWA received the contract and in February of 2020 converted the contract to a lasting supply under the Water Infrastructure Improvements for the Nation (WIIN) Act. These activities created the final SCWA CVP Contract 14-06-5198B-IR1-P (hereafter, "SMUD Contract") that has no expiration or renewal date. SMUD Contract has a total supply volume of 30,000 acre-feet of CVP Project Supply water. CVP Project Supply water is derived from Reclamation's SWRCB issued appropriative water rights on the American River watershed system that allow Reclamation to divert water to storage in Folsom Reservoir for delivery throughout the calendar year. SCWA's water supply under this contract may be used for Municipal and Industrial purposes and may be diverted during any month of the year. Moreover, Article 3(g) allows SCWA to "carryover" or "pre-use" water supplies made available under the contract. Table 3-4 shows the last 5 years of use for SCWA SMUD Contract.

Table 3-4: Last Five Years of SMUD Contract Deliveries (acre-feet per year)

Year	Percent Allocation	CVP Supplies
2015	25%	0
2016	100%	0
2017	100%	0
2018	75%	9,329
2019	100%	10,671
2020	75%	4,758

The water supplies available under SMUD Contract are subject to Reclamation's Municipal and Industrial Shortage Policy (M&I Shortage Policy).[38] The M&I Shortage Policy allocates water supplies under constrained conditions based upon Reclamation's water year percentage allocation number applied against the last three years of CVP Project Supply use in unconstrained conditions. Adjustments to the historical use numbers can be made based on alternative water supplies used in lieu of CVP Project Supply, population growth, extraordinary conservation measures, and other unique or unusual

[38] https://cawaterlibrary.net/wp-content/uploads/2017/10/miwsp-guidelines.pdf

circumstances. The primary component for obtaining larger dry year supplies, however, is that SCWA should use CVP Project Supply in unconstrained water years to access more CVP Project Supply in constrained water years.

SMUD Contract water may be used anywhere in SCWA's Zone 40 as depicted in Exhibit A to the contract. The place of use includes all of Elk Grove including service areas served by Elk Grove Water District. Figure 3-2 shows the SMUD Contract place of use. In addition, Article 9 allows transfers and exchanges of water supplied under the contract described later in this section.

Table 3-5 shows the anticipated annual water supply deliveries for normal, single dry, and five consecutive dry years for SCWA SMUD Contract through 2045.

Table 3-5: SMUD Contract Annual Deliveries in Varying Year Types (acre-feet per year)

Year		Last 3 Years of 100% Allocation*	Percent Allocation	Allocation Amount
Normal		8,253	100%	30,000
Single Dry		8,253	25%	2,063
Multi-Year Drought	2021 (1st year)	8,253	75%	6,190
	2022 (2nd year)	8,253	50%	4,126
	2023 (3rd year)	8,253	25%	2,063
	2024 (4th year)	8,253	25%	2,063
	2025 (5th year)	8,253	50%	4,126

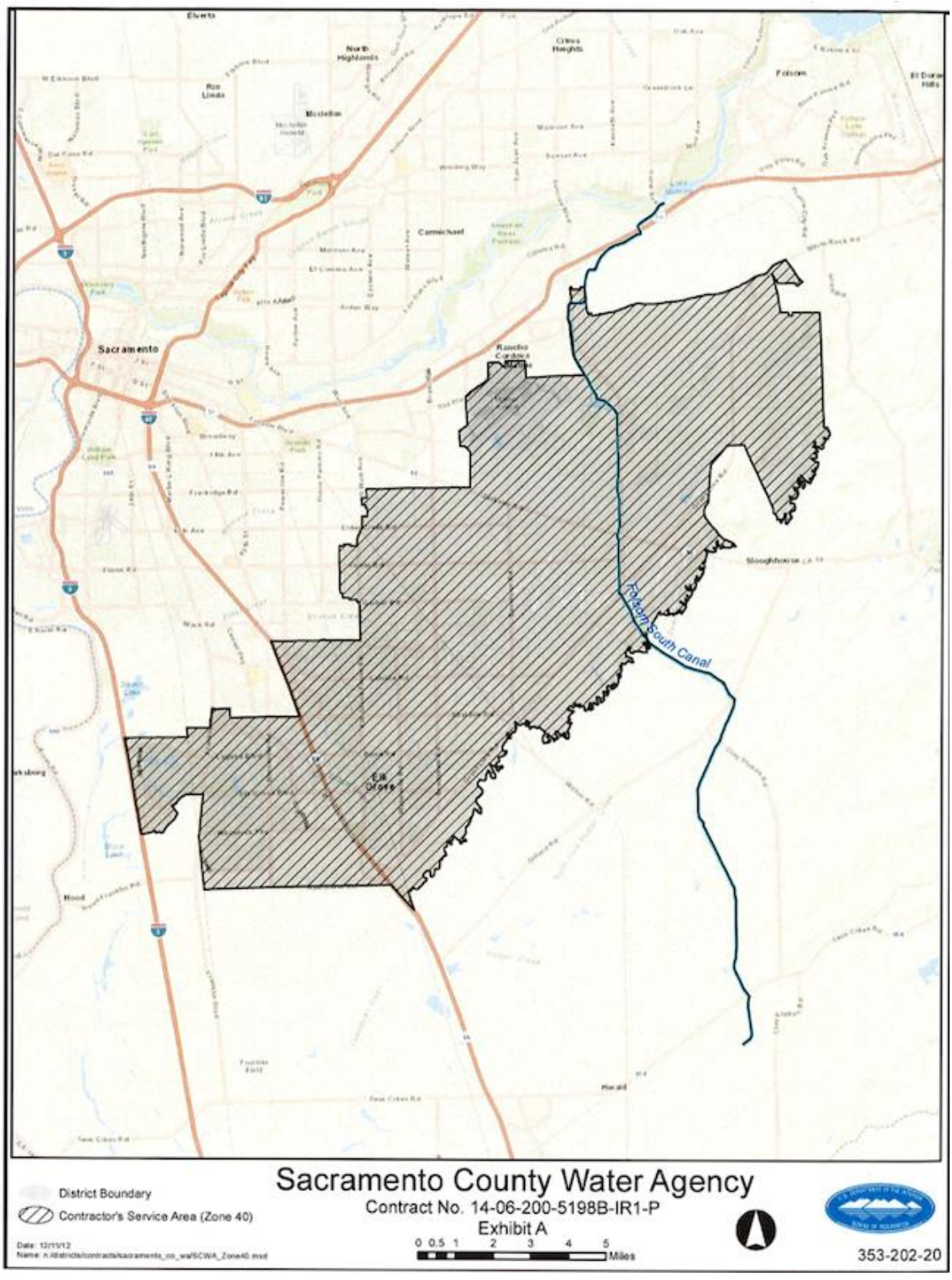
*The allocation number is based upon the M&I Shortage Policy available use adjustments

Projected water supply availability under this water supply is shown in Table 3-6.

Table 3-6: SMUD Contract Future Projected Supply Availability Through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		30,000	30,000	30,000	30,000	30,000
Single Dry Year		2,023	2,500	3,750	5,000	7,500
Multi-Year Drought	Year 1	6,068	7,500	11,250	15,000	22,500
	Year 2	4,045	5,000	7,500	10,000	15,000
	Year 3	2,023	2,500	3,750	5,000	7,500
	Year 4	2,023	2,500	3,750	5,000	7,500
	Year 5	4,045	5,000	7,500	10,000	15,000

Figure 3-2: Place of Use under SCWA SMUD Contract



3.1.3 SCWA CVP Contract 6-07-20-W1372-P (Fazio Contract)

In 1999, the SCWA entered a Central Valley Project (CVP) water service contract with Reclamation for 22,000 acre-feet of CVP Project Supply. In 2016, SCWA assigned 7,000 acre-feet of the CVP Project Supply to the City of Folsom, leaving 15,000 acre-feet of CVP Project Supply remaining on the contract. SCWA converted the contract to a lasting supply under the Water Infrastructure Improvements for the Nation (WIIN) Act in February 2020. All of these activities created the final SCWA CVP Contract 6-07-20-W1372-P (hereafter, "Fazio Contract") that has no expiration or renewal date. Fazio Contract has a total supply volume of 15,000 acre-feet of CVP Project Supply water. CVP Project Supply water is derived from Reclamation's SWRCB issued appropriative water rights on the American River watershed system that allow Reclamation to divert water to storage in Folsom Reservoir for delivery throughout the calendar year. SCWA's water supply under this contract may be used for Municipal and Industrial purposes and may be diverted during any month of the year. Moreover, Article 3(g) allows SCWA to "reschedule" water supplies made available under the contract for use in a subsequent year. Table 3-7 shows the use for Fazio Contract since 2015.

Table 3-7: Fazio Contract Deliveries 2015-2020 (acre-feet per year)

Year	Percent Allocation	CVP Supplies
2015	25%	125
2016	100%	8,381
2017	100%	9,396
2018	75%	104
2019	100%	0
2020	75%	2,375

The water supplies available under Fazio Contract are subject to Reclamation's Municipal and Industrial Shortage Policy (M&I Shortage Policy).[39] The M&I Shortage Policy allocates water supplies under constrained conditions based upon Reclamation's water year percentage allocation number applied against the last three years of CVP Project Supply use in unconstrained conditions. Adjustments to the historical use numbers can be made based on alternative water supplies used in lieu of CVP Project Supply, population growth, extraordinary conservation measures, and other unique or unusual circumstances. The primary component to obtain significant supplies requires SCWA to use CVP Project Supply in unconstrained water years in order to have access to CVP Project Supply in constrained water years.

Fazio Contract water may be used anywhere in SCWA's Zone 40 as depicted in Exhibit A to the contract. The place of use includes all the City of Elk Grove including service areas served by Elk Grove Water District. Figure 3-3 shows the Fazio Contract place of use. Unlike the SMUD Contract, Article 9 restricts the transfer or exchange of this water supply to within Sacramento County.

[39] https://cawaterlibrary.net/wp-content/uploads/2017/10/miwsp-guidelines.pdf

Table 3-8 shows the anticipated annual water supply deliveries for normal, single dry, and five consecutive dry years for Fazio Contract through 2025.

Figure 3-3: Place of Use under Fazio Contract

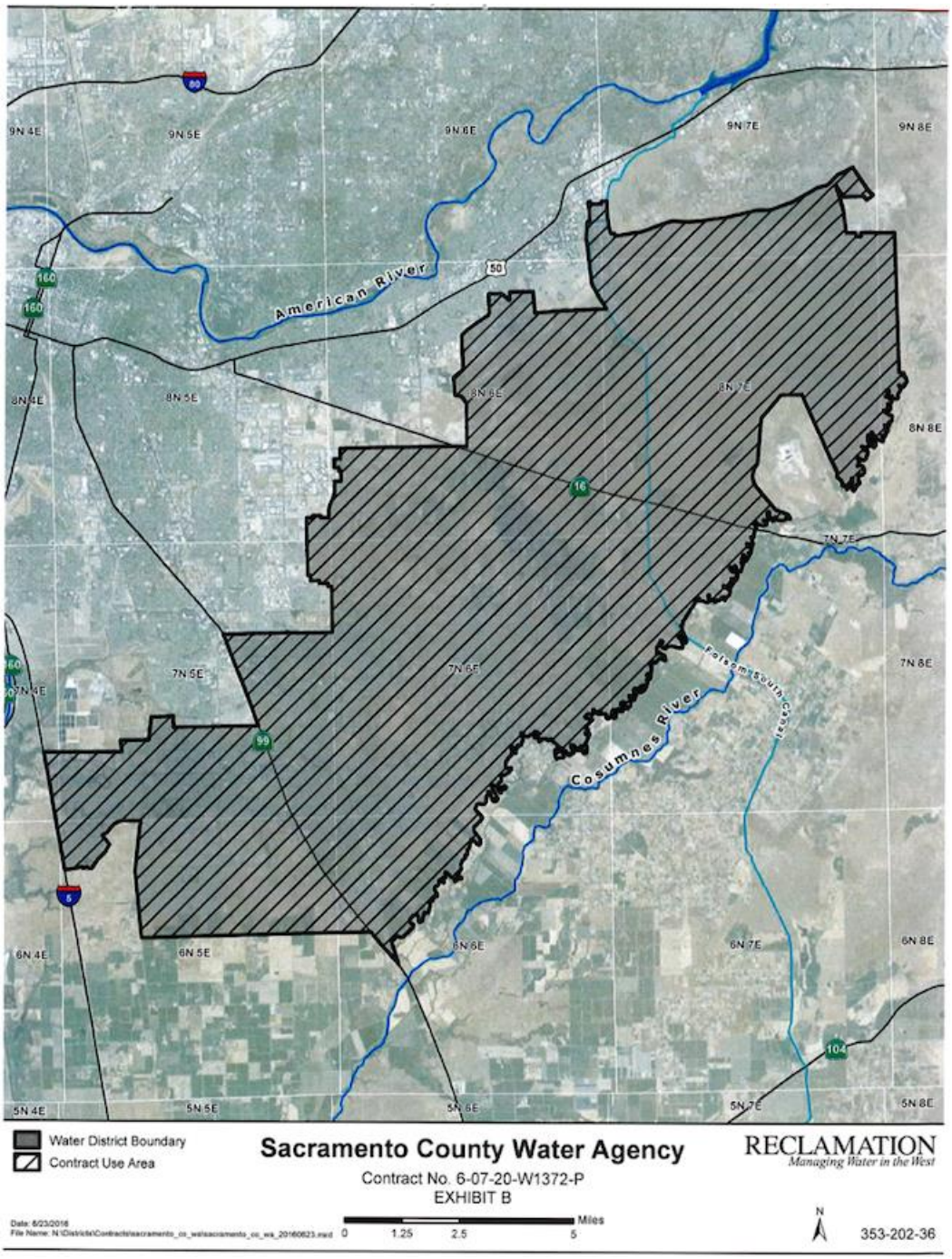


Table 3-8: Fazio Contract Annual Deliveries in Varying Year Types (acre-feet per year)

Year		Last 3 years of 100% allocation	Percent Allocation	Allocation Amount
Normal		5,926	100%	15,000
Single Dry		5,926	25%	1,481
Multi-Year Drought	2021 (1st year)	5,926	75%	4,444
	2022 (2nd year)	5,926	50%	2,963
	2023 (3rd year)	5,926	25%	1,481
	2024 (4th year)	5,926	25%	1,481
	2025 (5th year)	5,926	50%	2,963

The total projected water supply available under the Fazio Contract through 2045 is shown in Table 3-9.

Table 3-9: Future Projected Supply Availability Through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		15,000	15,000	15,000	15,000	15,000
Single Dry Year		2,500	2,500	2,500	2,500	2,500
Multi-Year Drought	Year 1	7,500	7,500	7,500	7,500	7,500
	Year 2	5,000	5,000	5,000	5,000	5,000
	Year 3	2,500	2,500	2,500	2,500	2,500
	Year 4	2,500	2,500	2,500	2,500	2,500
	Year 5	5,000	5,000	5,000	5,000	5,000

3.1.4 SCWA Aerojet GET Water

In 2010, Aerojet General Corporation (Aerojet) and Sacramento County Water Agency entered a formal settlement agreement related to groundwater contamination issues caused by Aerojet in the SCWA service area. As part of this agreement, Aerojet agreed to deliver and SCWA agreed to receive up to 8,900 acre-feet of Aerojet Groundwater Extraction and Treatment (GET) water. Aerojet extracts and treats contaminated groundwater at its GET facilities from the American River watershed region and discharges the treated water to the American River. SCWA diverts this water at the Freeport Regional Water Project facility for use throughout its service area. Article 2.3 of the settlement agreement states that SCWA "assumes all risks concerning Aerojet's right, title, and interest in GET Transferred Water." Nevertheless, the supply availability has not diminished and SCWA uses the water in its service area. The delivery pattern available for the water may allow SCWA to take larger portions of the supply, if not all the supply, as needed and made available by Aerojet. The water supply is 100% reliable in all year types because the groundwater extraction and treatment are part of a federally mandated remediation program. Aerojet's remediation program will continue beyond the planning horizon of this SCWA's UWMP. Table 3-10 shows the total Aerojet GET water used over the last 5 years in SCWA's service area.

Table 3-10: Last Five Years of SCWA Aerojet GET Water Deliveries (acre-feet per year)

Year	Total
2015	4,529
2016	423
2017	0
2018	3,224
2019	0
2020	3,587

Table 3-11 shows the total Aerojet GET water available in normal, single dry, and five consecutive dry years through 2025.

Table 3-11: Aerojet GET Water Supply Availability Through 2025 (acre-feet per year)

Year		GET Contract Amount
Normal		8,900
Single Dry		8,900
Multi-Year Drought	2021 (1st year)	8,900
	2022 (2nd year)	8,900
	2023 (3rd year)	8,900
	2024 (4th year)	8,900
	2025 (5th year)	8,900

Table 3-12 shows the supply availability of the Aerojet GET water through 2045.

Table 3-12: Aerojet GET Water Supply Availability 2025-2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		8,900	8,900	8,900	8,900	8,900
Single Dry Year		8,900	8,900	8,900	8,900	8,900
Multi-Year Drought	Year 1	8,900	8,900	8,900	8,900	8,900
	Year 2	8,900	8,900	8,900	8,900	8,900
	Year 3	8,900	8,900	8,900	8,900	8,900
	Year 4	8,900	8,900	8,900	8,900	8,900
	Year 5	8,900	8,900	8,900	8,900	8,900

3.1.5 SWRCB Appropriative Water Right License 1062

SCWA holds Water Right License 1062 to divert 4.09 cubic feet per second from the Sacramento River from April 1 to October 1 each year for a maximum annual total diversion of 805 acre-feet.[40] The water right has a priority date of August 28, 1918 and is not subject to Term 91. Assuming the recent SWRCB Order is finalized, the water supply may be used for municipal uses in Zone 40 in the future. Figure 3-4

[40] Draft SWRCB Order dated January 22, 2021 for license 1062 and 4060

shows the place of use of License 4060. Table 3-13 shows the total License 1062 water available in all year types.

Table 3-13: License 1062 Water Supply Availability (acre-feet per year)

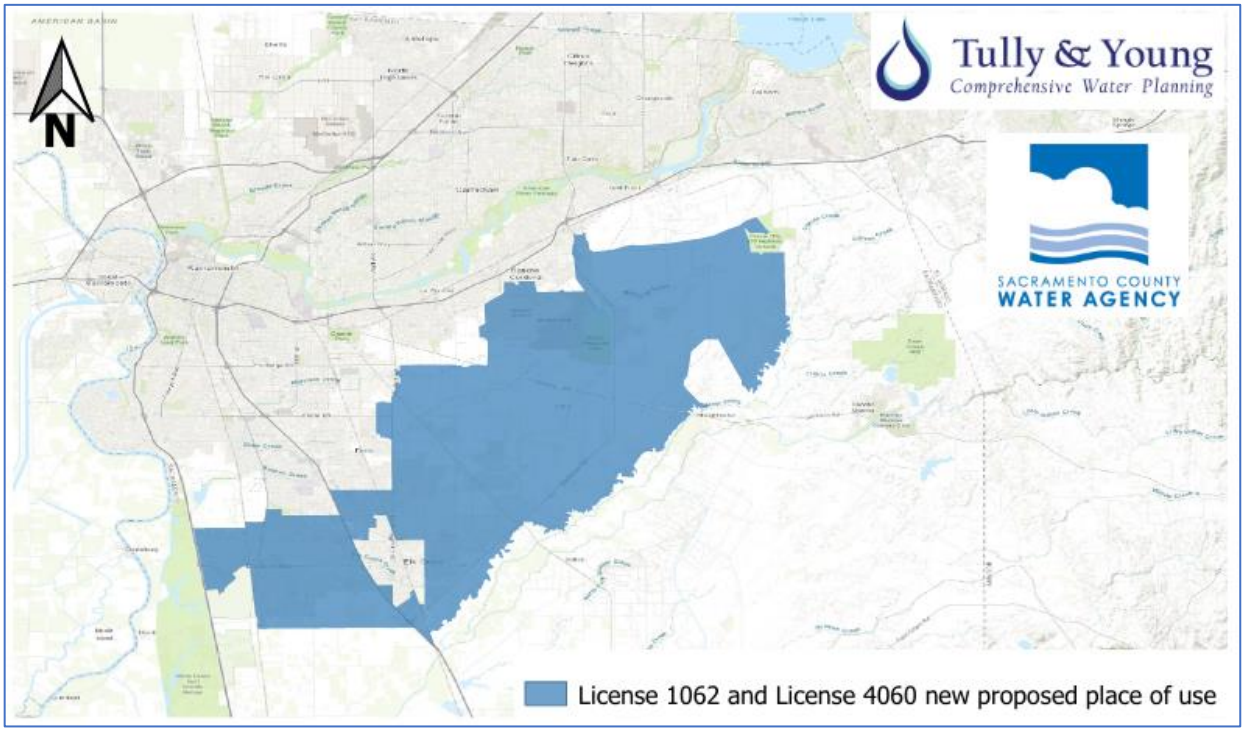
Total Supply		2025	2030	2035	2040	2045
Normal		805	805	805	805	805
Single Dry Year		805	805	805	805	805
Multi-Year Drought	Year 1	805	805	805	805	805
	Year 2	805	805	805	805	805
	Year 3	805	805	805	805	805
	Year 4	805	805	805	805	805
	Year 5	805	805	805	805	805

3.1.6 SWRCB Appropriative Water Right License 4060

SCWA holds Water Right License 4060 to divert 1.48 cubic feet per second from the Sacramento River from May 1 to October 1 each year for a maximum annual total diversion of 101 acre-feet.[41] The water right has a priority date of September 20, 1951. The water supply may be used for irrigation in an area in northern Sacramento County. Figure 3-4 shows the place of use of License 4060.

Table 3-14 shows the total License 4060 water available in all year types.

Figure 3-4: Place of Use of License 1062 and License 4060



[41] Draft SWRCB Order dated January 22, 2021 for license 1062 and 4060

Table 3-14: License 4060 Water Supply Availability (values in acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		101	101	101	101	101
Single Dry Year		101	101	101	101	101
Multi-Year Drought	Year 1	101	101	101	101	101
	Year 2	101	101	101	101	101
	Year 3	101	101	101	101	101
	Year 4	101	101	101	101	101
	Year 5	101	101	101	101	101

3.1.7 Contract Between State of California DWR and North Delta Water Agency

The North Delta Water Agency was formed in 1974 to protect the water resources in specific portions of Yolo, Solano, Sacramento, and San Joaquin counties. In 1981, the NDWA executed the "*Contract Between the California Department of Water Resources for the Assurance of a Dependable Water Supply of Suitable Quality*" (NDWA Contract) as a settlement of claims related to the then-proposed "Peripheral Canal." The NDWA Contract assures that the State, through both the State Water Project (SWP) and the California Department of Water Resources' (DWR) water right permits, will maintain a dependable water supply of adequate quantity and quality for municipal, industrial, and agricultural purposes within the NDWA service area. Specifically, Article 8(a) states in relevant part "…the State shall furnish such water as may be required within the Agency to the extent not otherwise available under the water rights of water users." SCWA analyzed its service area boundary in October of 2020 and determined that a portion of its service area lies within the NDWA service area and that property owners within the NDWA boundary are paying property tax assessments to secure NDWA water supplies. Figure 3-5 shows the overlap between SCWA service area and the NDWA service area.

SCWA has never delivered the NDWA water supplies for uses within its service area boundary. NDWA water supplies are 100% reliable in all year types. SCWA plans to deliver these supplies in future years to meet a portion of its service area demands – including all current and projected future demands in the NDWA service area.

Table 3-15 shows the projected NDWA water supply availability for normal, single dry, and five consecutive dry years through 2025.

Table 3-16 shows the projected monthly future NDWA water deliveries into SCWA's service area through 2045.

Figure 3-5: SCWA Service Area and NDWA Service Area

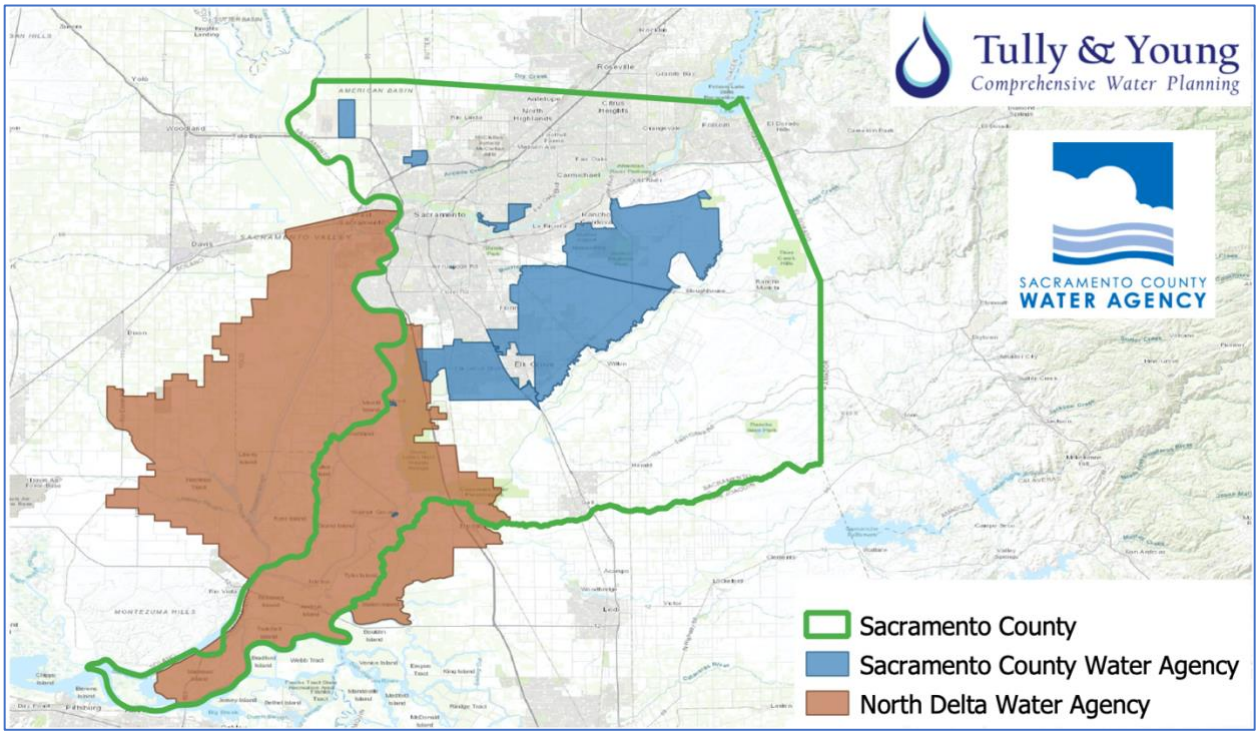


Table 3-15: NDWA Water Supply for SCWA through 2025 (values in acre-feet per year)

Year		North Delta Water Agency
Normal		450
Single Dry		450
Multi-Year Drought	2021 (1st year)	450
	2022 (2nd year)	450
	2023 (3rd year)	450
	2024 (4th year)	450
	2025 (5th year)	450

Table 3-16: NDWA Water Supply for SCWA (values in acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		450	450	450	450	450
Single Dry Year		450	450	450	450	450
Multi-Year Drought	Year 1	450	450	450	450	450
	Year 2	450	450	450	450	450
	Year 3	450	450	450	450	450
	Year 4	450	450	450	450	450
	Year 5	450	450	450	450	450

3.1.8 2002 Wholesale Agreement Between SRCSD and SCWA

In 2002, Sacramento Regional County Sanitation District (SRCSD) agreed to deliver up to 3.5 million gallons a day of recycled water to SCWA. Section V of the agreement allows SCWA to only take the amount of recycled water "needed to meet the recycled water demands of [its] customers." SRCSD will sell the water to SCWA at a discounted cost of 60% of SCWA's current water rate. Moreover, Section XIII requires SRCSD to provide a backup well at approximately 1500 GPM in the event that the recycled water supply does not meet the standards of Order No. 97-146 (Master Water Reclamation Permit). The agreement has no expiration date. Although no formal amendments to the agreement have occurred, SCWA recognized its maximum use was 1.98 mgd of recycled water and allowed SRCSD to deliver the remaining water to the S.P.A. Cogeneration Facility located near the Campbell Soup Plant site. To date, recycled water has only been delivered to the Phase 1 area. Nevertheless, SCWA continues to receive recycled water supplies under this agreement for use in the Elk Grove area. Figure 3-6 shows the area receiving recycled water from SRCSD.

Figure 3-6: Place of Use of SCWA Recycled Water

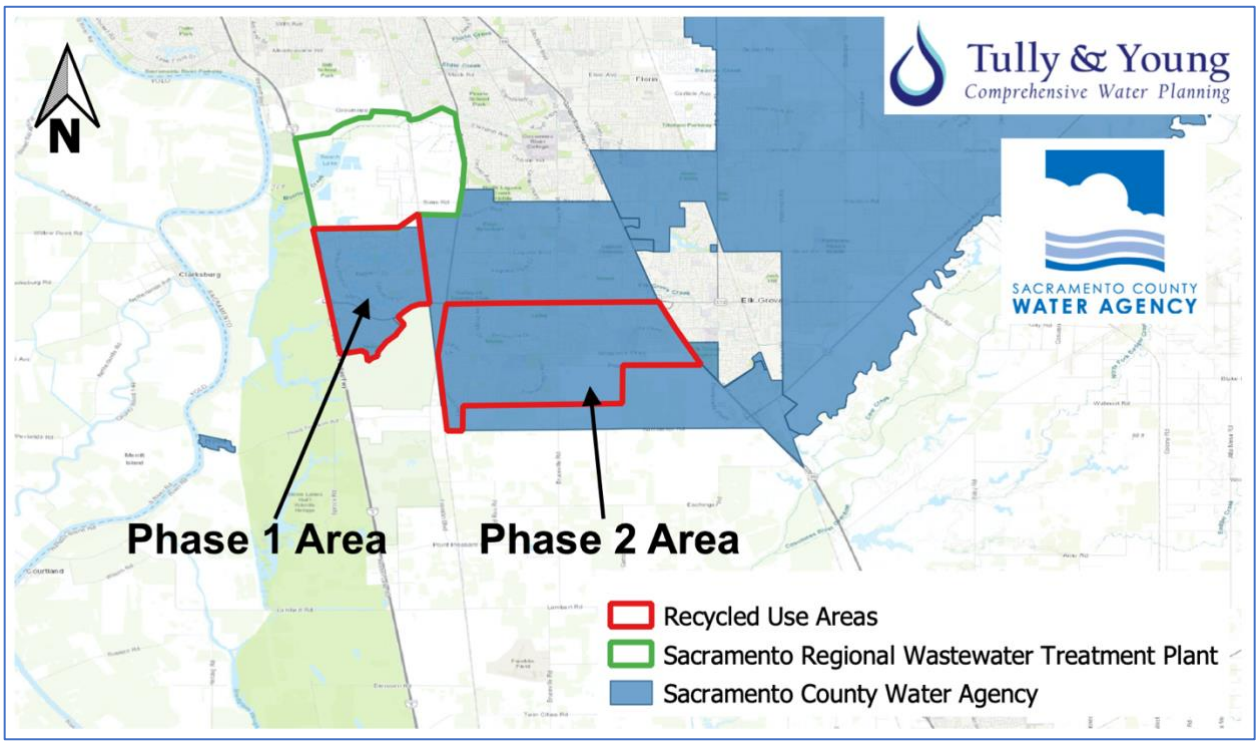


Table 3-17 shows the last five years of recycled water deliveries into SCWA's service area.

Table 3-17: Last Five Years of SCWA Recycled Water Deliveries (values in acre-feet per year)

Year	Total
2015	745
2016	720
2017	845
2018	861
2019	901
2020	962

The recycled water supply is derived from consumed indoor water supplies in the SRCSD service region. As such, this supply of water is 100% reliable in all year types barring some unforeseen issue impacted by the Master Water Reclamation Permit. Table 3-18 shows the projected recycled water supplies for normal, single dry, and five consecutive dry years through 2025 and Table 3-19 shows the reliability through 2045.

Table 3-18: SCWA Recycled Water Supply (values in acre-feet per year)

Year		Recycled Production
Normal		3,921
Single Dry		3,921
Multi-Year Drought	2021 (1st year)	3,921
	2022 (2nd year)	3,921
	2023 (3rd year)	3,921
	2024 (4th year)	3,921
	2025 (5th year)	3,921

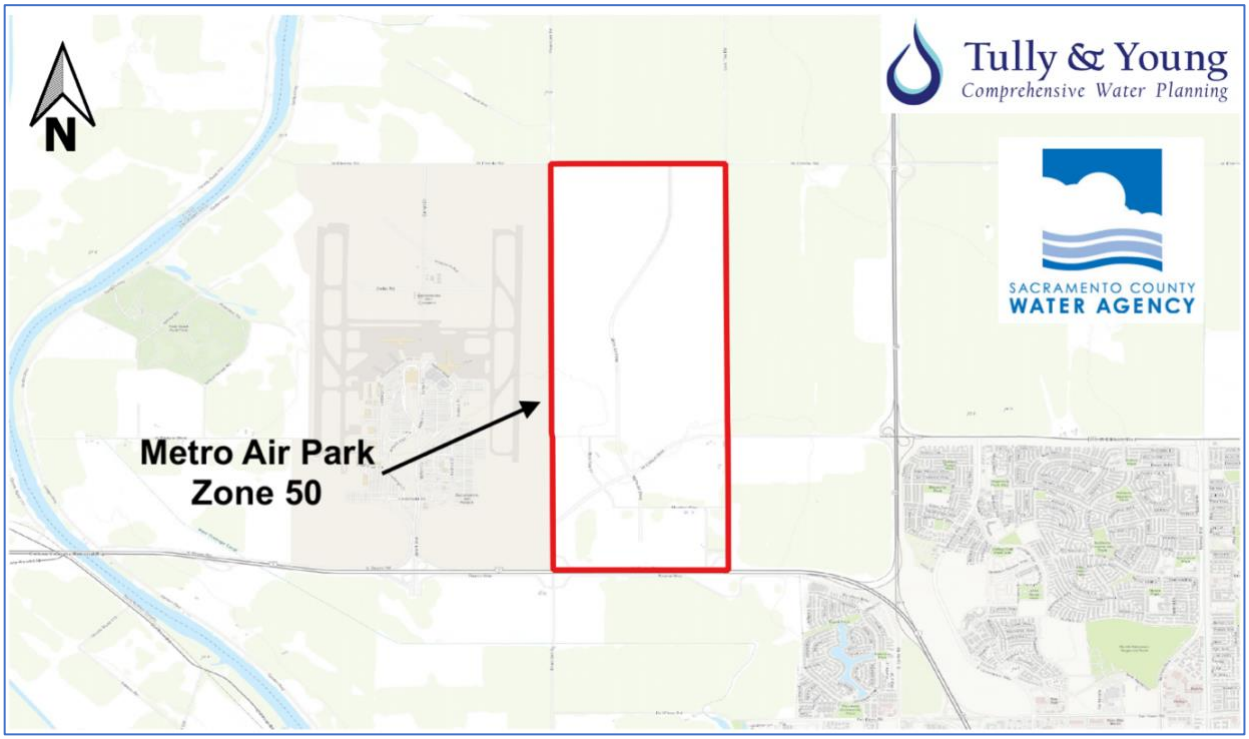
Table 3-19: Future Projected Supply Availability Through 2045 (values in acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		3,921	3,921	3,921	3,921	3,921
Single Dry Year		3,921	3,921	3,921	3,921	3,921
Multi-Year Drought	Year 1	3,921	3,921	3,921	3,921	3,921
	Year 2	3,921	3,921	3,921	3,921	3,921
	Year 3	3,921	3,921	3,921	3,921	3,921
	Year 4	3,921	3,921	3,921	3,921	3,921
	Year 5	3,921	3,921	3,921	3,921	3,921

3.1.9 2004 Agreement with the City of Sacramento for Wholesaling And/Or Wheeling Water Service for Sacramento International Airport and Metro Air Park

The City of Sacramento (City) and SCWA entered an agreement in October of 2004 to enable the City to provide wholesale water or wheel SCWA water to Sacramento International Airport and to SCWA Zone 50 for use at the proposed Metro Air Park (2004 Agreement). Although there have been attempts to subsume this agreement into subsequent agreements, the 2004 Agreement remains valid and enforceable. The City has delivered City water to the SCWA service areas described in the 2004 Agreement but, to date, SCWA has not wheeled any of its water supplies as allowed by the agreement. The context for this assessment is to describe the supply-side of the 2004 Agreement where the City provides a water supply to meet Airport and Metro Air Park water demands. Figure 3-7 shows the Metro Air Park service areas where City of Sacramento water could be directly delivered.

Figure 3-7: SCWA Metro Air Park (Zone 50) Service Area



The total water supply that the City delivers to the Airport and Metro Air Park will not exceed 11.7 million gallons per day (mgd) assuming that SCWA provides notice to the City in accordance with Article 5a that it needs more than 5 mgd. To date, SCWA has not reached the 5 mgd threshold. Moreover, the reductions in wholesale supply availability will be consistent with City reductions to its own customers and be curtailed upon "the occurrence of an emergency conditions." Thus, the future supply availability for these service areas may be adjusted on a monthly basis but may not exceed 5 mgd in the near term and 11.7 mgd in the long term. Table 3-20 shows the projected water supplies under the 2004 Agreement for normal, single dry, and five consecutive dry years through 2025. Table 3-21 shows the projected future annual deliveries under the 2004 Agreement for a normal, single dry, and five consecutive dry years through 2045.

Table 3-20: 2004 Agreement Annual Deliveries in Varying Year Types (acre-feet per year)

Year		Air Park Production
Normal		500
Single Dry		500
Multi-Year Drought	2021 (1st year)	500
	2022 (2nd year)	500
	2023 (3rd year)	500
	2024 (4th year)	500
	2025 (5th year)	500

Table 3-21: Future Projected Supply Availability Through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		1,058	2,088	3,112	4,142	5,195
Single Dry Year		1,058	2,088	3,112	4,142	5,195
Multi-Year Drought	Year 1	1,058	2,088	3,112	4,142	5,195
	Year 2	1,058	2,088	3,112	4,142	5,195
	Year 3	1,058	2,088	3,112	4,142	5,195
	Year 4	1,058	2,088	3,112	4,142	5,195
	Year 5	1,058	2,088	3,112	4,142	5,195

3.1.10 2000 Agreement Between City of Sacramento and the Sacramento County Water Agency to Treat and Deliver (Wheel) Surface Water

In 2000, the City and SCWA entered an agreement where the City would treat, wheel, and deliver SCWA water supplies to the lawful places of use of SCWA's water assets (2000 Agreement). The 2000 Agreement does not include additional water supply sources beyond those already possessed by SCWA but is an important component in potentially meeting water supply obligations in areas that are better connected to the City's water system. The 2020 UWMP does not incorporate the 2000 Agreement as a basis for any additional water supply reliability. SCWA does, however, have access to 11 MGD of firm capacity in the City's System.[42]

3.1.11 2000 Memorandum of Understanding Regarding the Operation of A Water System Interconnection at 2750 Mercantile Drive

In 2000, SCWA entered a water supply MOU with Southern California Water Company (Company) for potential water service through an interconnection at Mercantile Drive. Company could provide SCWA with 1,000 gallons per minute, or 1,613 acre-feet per year, on a maximum sustained flow rate through the eight inch system interconnection. SCWA may take the water and will be billed in accordance with Company Schedule No. AC-1, Arden-Cordova District. The dry-year reliability of this water source is less

[42] 2000 Agreement at 4.

certain as it relates directly to the reliability of the Company's overall supply system. Specifically, Article E states in relevant part that the Company "may limit supply to the County if operations of the Interconnection would adversely affect water service to Company's customers." Table 3-22 shows the last five years of Company water deliveries into SCWA's service area.

The Company water supply is derived from groundwater systems in Company's service area. As such, this supply of water is very reliable in all year types barring some unforeseen issue impacted by a significant outage or curtailment of Company's pre-1914 appropriative water right. As such, Table 3-23 shows the future planned use for Company's water in SCWA's service area.

Table 3-22: Last Five Years of Company Water Deliveries to SCWA (acre-feet per year)

Retail Area	GSWC Wholesale
2016	0.31
2017	0.49
2018	0.25
2019	0.72
2020	2.25

Table 3-23: Company Water Supply in SCWA Through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		1,613	1,613	1,613	1,613	1,613
Single Dry Year		1,613	1,613	1,613	1,613	1,613
Multi-Year Drought	Year 1	1,613	1,613	1,613	1,613	1,613
	Year 2	1,613	1,613	1,613	1,613	1,613
	Year 3	1,613	1,613	1,613	1,613	1,613
	Year 4	1,613	1,613	1,613	1,613	1,613
	Year 5	1,613	1,613	1,613	1,613	1,613

3.1.12 Fruitridge Vista Water Company Contract

The Southwest Tract is served by a water supply derived from the County's formation of the Southwest Water Maintenance District in 1958 and a water service agreement with Fruitridge Vista Water Company (Fruitridge) executed in 1970. Under the 1970 Agreement, Fruitridge would deliver a portion of its groundwater supplies to the Southwest Tract customers. The 1970 Agreement has no expiration. The current water supply entity assigned the obligations under the contract resides with Cal American Water Company. Nevertheless, the Southwest Tract customers still receive water supplies under the terms of the 1970 Agreement. Figure 3-8 shows the geographical location of the Southwest Tract. Table 3-24 shows the last five years of water deliveries to the Southwest Tract. Table 3-25 shows the projected water supplies for the Southwest Tract for normal, single dry, and five consecutive dry years through 2025. Table 3-26 shows the normal year, dry year, and five consecutive dry year water supply availability through 2045.

Figure 3-8: Southwest Track Location

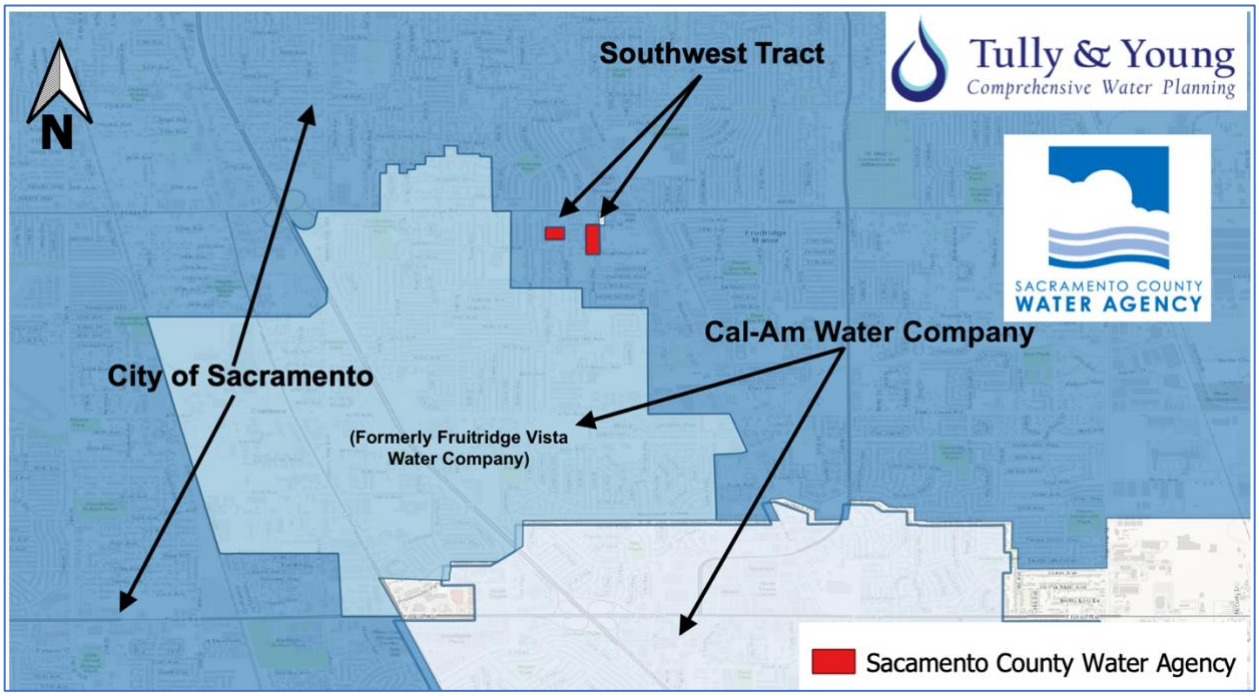


Table 3-24: Last Five Years Southwest Tract Deliveries (acre-feet per year)

Year	Southwest Tract
2016	26
2017	22
2018	21
2019	21
2020	23

Table 3-25: Southwest Tract Water Supply for SCWA through 2025 (acre-feet per year)

Year		Southwest Tract
Normal		30
Single Dry		30
Multi-Year Drought	2021 (1st year)	30
	2022 (2nd year)	30
	2023 (3rd year)	30
	2024 (4th year)	30
	2025 (5th year)	30

Table 3-26: Future Projected Supply Availability Through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		30	30	30	30	30
Single Dry Year		30	30	30	30	30
Multi-Year Drought	Year 1	30	30	30	30	30
	Year 2	30	30	30	30	30
	Year 3	30	30	30	30	30
	Year 4	30	30	30	30	30
	Year 5	30	30	30	30	30

3.2 Groundwater

Groundwater supplies constitute a major component of SCWA's water supply portfolio. In some service areas, groundwater is the sole source of supply while in other service areas groundwater is managed conjunctively with surface water supplies. This section separates the various service areas' groundwater supplies to address long-term groundwater supply management issues within those areas.

3.2.1 Groundwater Basin Descriptions

This section provides a description of SCWA's groundwater supplies including descriptions of the applicable groundwater basins, the status of groundwater management, overdraft conditions, historical groundwater pumping, and the remediated groundwater supply.

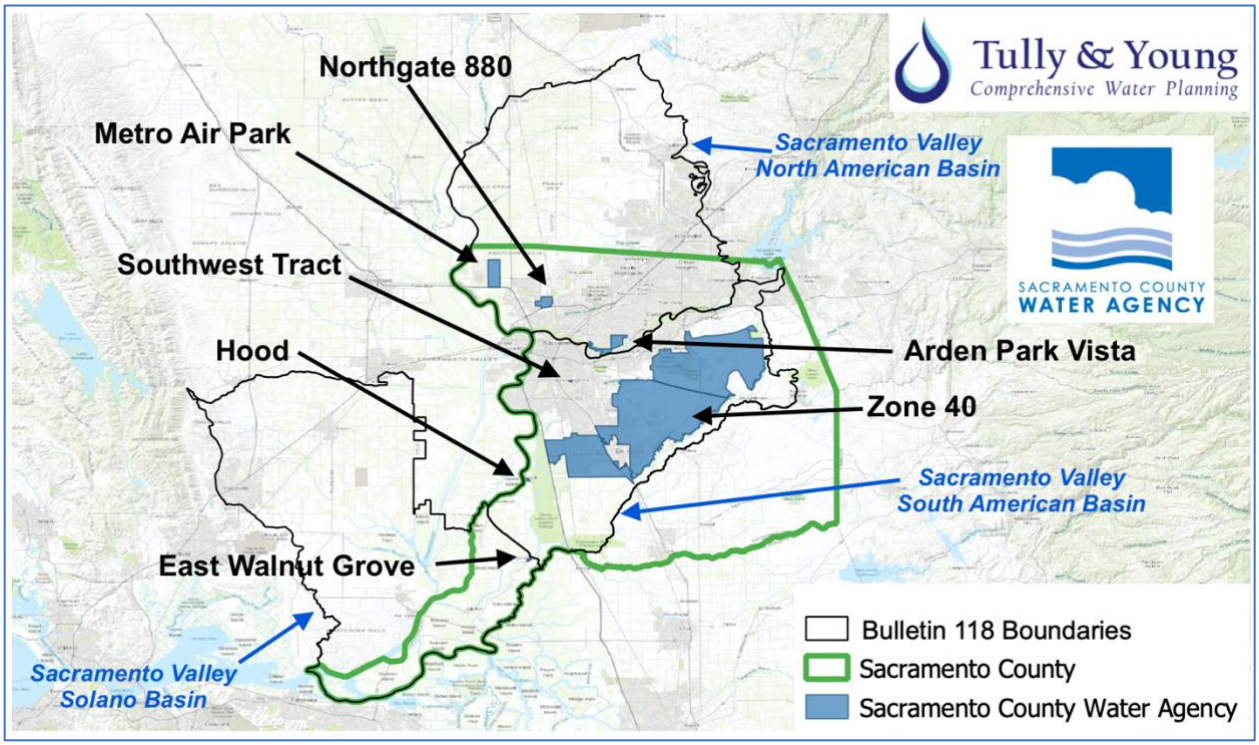
There are two primary groundwater subbasins described in the California Department of Water Resources' (DWR) Bulletin 118 that affect SCWA's groundwater extraction and use: The Sacramento Valley Basin – North American Subbasin (5-21.64) and the Sacramento Valley Basin – South American Subbasin (5-21.65). The total extent of these two groundwater subbasins are shown in Figure 3-9 below. SCWA also extracts groundwater from the Solano Subbasin in its East Walnut Grove service area. The relevant Solano Subbasin characteristics are described later in this document in the context of East Walnut Grove groundwater.

Sacramento Valley Basin– North American Subbasin

The North American Subbasin covers an area of approximately 548 square miles and is located under lands contained in Placer, Sutter, and Sacramento counties. The North American Subbasin is bound on the south by the American River, on the north and west by the Sacramento, Feather, and Bear Rivers, and on the east by the bedrock of the Sierra Nevada foothills. The North American Subbasin is categorized as a "high priority basin" because there is a large population overlying the basin that relies upon its supplies to meet its potable and raw water needs and other factors as determined by DWR.[43] The North American Subbasin is not in an overdraft condition and has no adjudicated areas.

[43] May 2020, Sustainable Groundwater Management Act 2019 Basin Prioritization – Process and Results Document

Figure 3-9: North American and South American Groundwater Subbasins



The North American Subbasin is stratified into different hydrogeological layers with regional differences in groundwater quality and transmissivity. The stratigraphic succession of geologic formations in the subbasin include, from oldest to youngest: crystalline basement rock, Miocene/Pliocene Volcanics, Older Alluvium of Pliocene and Pleistocene, and Younger Alluvium. Those formations which consist of the main freshwater-bearing aquifer system underlying the SCWA service areas include (from oldest to youngest):

- Miocene/Pliocene Volcanics (Mehrten Formation)
- Older Alluvium of Pliocene and Pleistocene (Laguna Formation)
- Younger Alluvium

The deepest deposits consist of Miocene and Pliocene Volcanic of the Mehrten Formation. It is composed of black sands, gravels, silts, and clays interbedded with tiff breccia. The thickness ranges from between 200 and 1,200 feet thick. The sand and gravel intervals are found to be highly permeable.

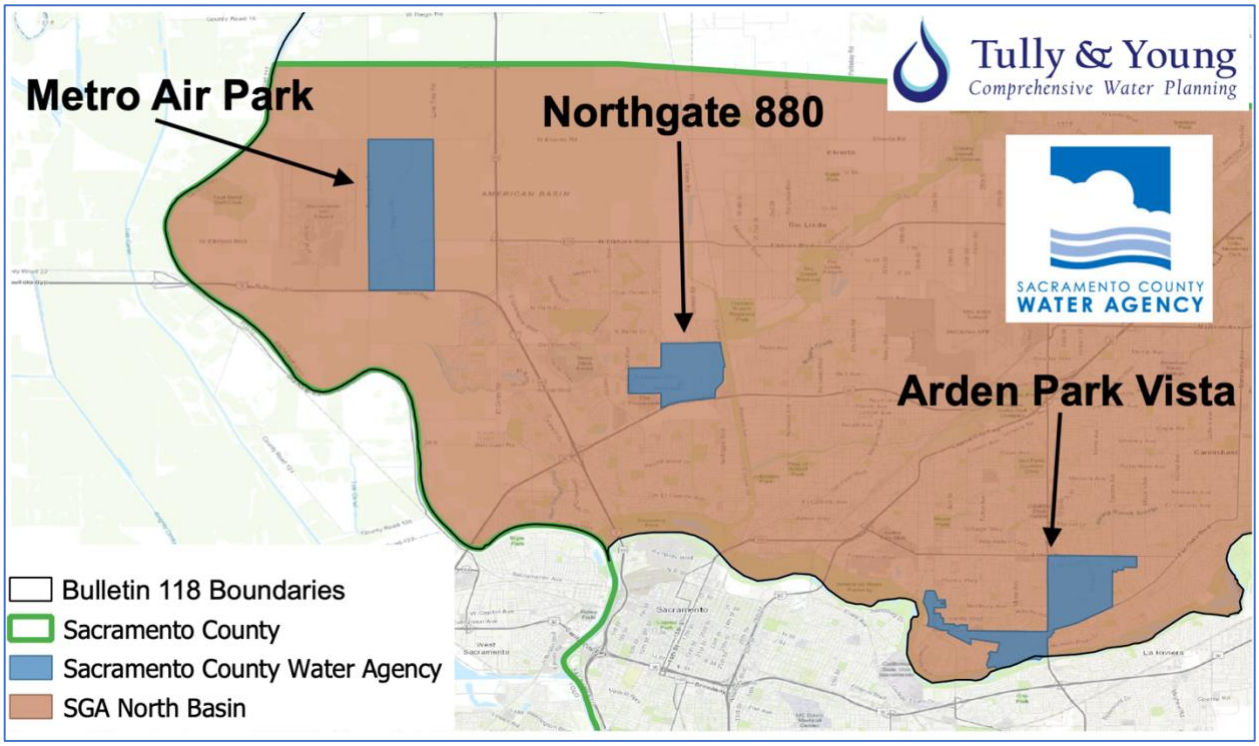
The older alluvium of Pliocene and Pleistocene age is the primary freshwater bearing formation within the North American Subbasin. The older alluvium consists of loosely compacted sands, silts, and gravels. This alluvial unit is exposed between the Sierra Nevada Foothills and the younger alluvium. Thicknesses range from 100 to 650 feet thick and is moderately permeable.

The younger alluvium is a formation of silts and clays that overlies the older alluvium. This alluvium consists of flood basin deposits and stream channel deposits from the nearby Sacramento River. The estimated thickness ranges from zero to 100 feet and may be locally interbedded with stream channel

deposits of the Sacramento River. Due to the small grain sizes of the clays and silts, this layer generally has lower permeability and low well yield. However, sand and gravel zones interbedded in the younger alluvium are highly permeable and commonly have high well yields.

The 2000 Water Forum Agreement help characterize a smaller sub-component of the North American Subbasin as the "North Basin." The North Basin is shown in Figure 3-10 below. The North Basin contains all the SCWA service areas discussed in this section. SCWA has three primary service areas that overlie the North Basin – the Airport and Metro Air Park, Northgate 880, and Arden Park Vista. Figure 3-10 shows the location of these service areas in Sacramento County.

Figure 3-10: Location of SCWA Service Areas in North American Subbasin



All of these service areas have extracted and delivered groundwater over the course of the last ten years. Table 3-27 shows SCWA's historic annual groundwater extractions in the North American Subbasin in each service area.

Table 3-27: 2015-2020 Annual North American Subbasin Groundwater Use (acre-feet per year)[44]

North Basin Use	Arden Park Vista	Northgate 880	Metro Air Park
2015	2,803	1,074	
2016	3,096	968	47
2017	3,474	1,281	150
2018	3,430	1,387	277
2019	3,382	1,200	441
2020	3,726	1,365	460

Sacramento Valley – South American Subbasin

The South American Subbasin (5-21.65) is defined as the area bounded on the west by the Sacramento River, on the north by the American River, on the south by the Cosumnes and Mokelumne rivers, and on the east by the Sierra Nevada Range covering 388 square miles. The eastern basin boundary is defined by the Sierra Nevada foothills and follows a north-south line extending from Folsom Reservoir to Rancho Murieta. Along this line, little groundwater flows into or out of the groundwater basin. The rivers that surround the South American Subbasin generally create a groundwater divide in the shallow subsurface although there is interaction between groundwater subbasins at greater depths. The western portion of the subbasin consists of nearly flat floodplain deposits from the surrounding rivers and tributaries.

Bulletin 118-3 identifies and describes various geologic formations that constitute the water-bearing deposits underlying Sacramento County. These formations include an upper, unconfined aquifer system consisting of the Victor, Fair Oaks, and Laguna Formations (now known as the Modesto Formation), and a lower, semiconfined aquifer system consisting primarily of the Mehrten Formation. These formations are typically composed of lenses of interbedded sand, silt, and clay, interlaced with coarse-grained stream channel deposits. The Mehrten formation outcrops near the Sierra Foothills along the eastern Central Basin boundary and is typically characterized as a black sandy lens.

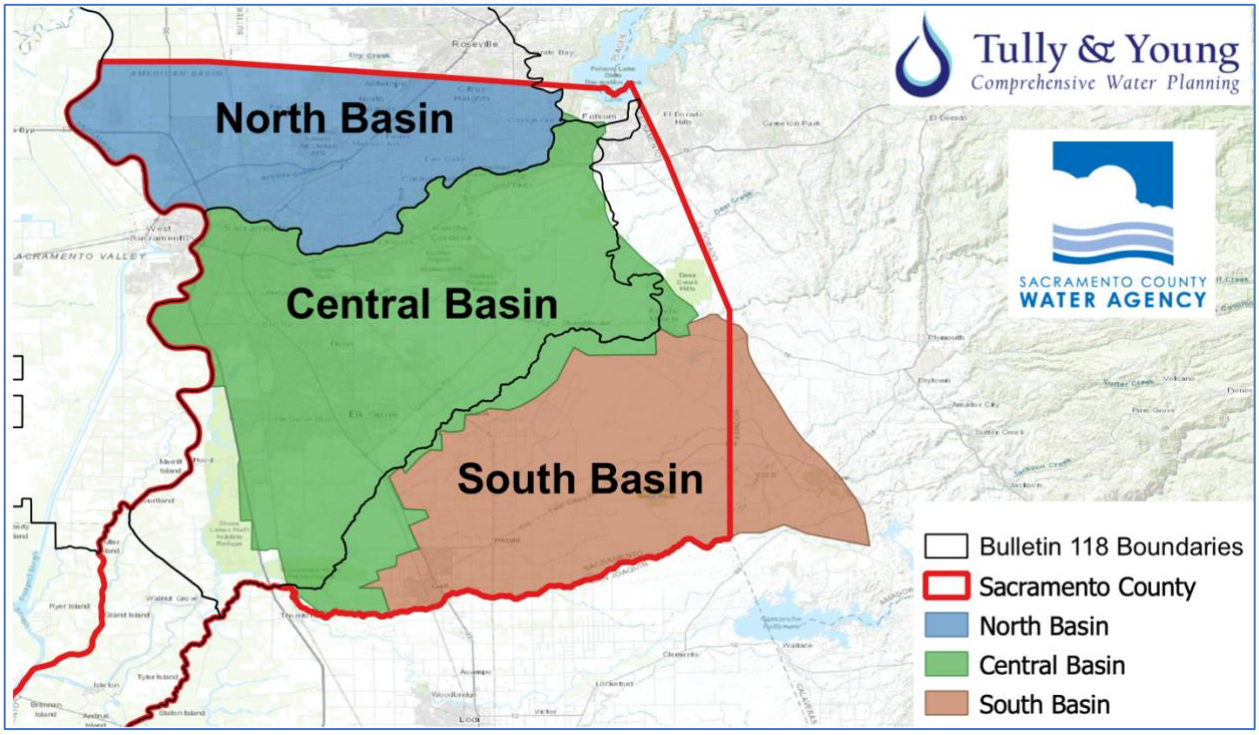
Groundwater in the South American Subbasin generally occurs in a shallow aquifer zone (Laguna or Modesto Formation) or in an underlying deeper aquifer zone (Mehrten Formation). Within the subbasin, the shallow aquifer extends approximately 200 to 300 feet below the ground surface and, in general, water quality in this zone is considered good with the exception of arsenic detections in a few locations. The shallow aquifer is typically used for private domestic wells requiring no treatment unless high arsenic values are encountered, causing owners to possibly target other water-bearing strata.

The deep aquifer is separated from the shallow aquifer by a discontinuous clay layer that serves as a semi-confining layer for the deep aquifer. The base of the potable water portion of the deep aquifer averages approximately 1,400 feet below ground surface (bgs). Water in the deep aquifer typically has higher concentrations of total dissolved solids (TDS), iron, and manganese. Groundwater used in the South American Subbasin is supplied from both the shallow and deeper aquifer systems.

[44] Metro Air Park groundwater supplies are derived from the 2004 SCWA and City of Sacramento Contract.

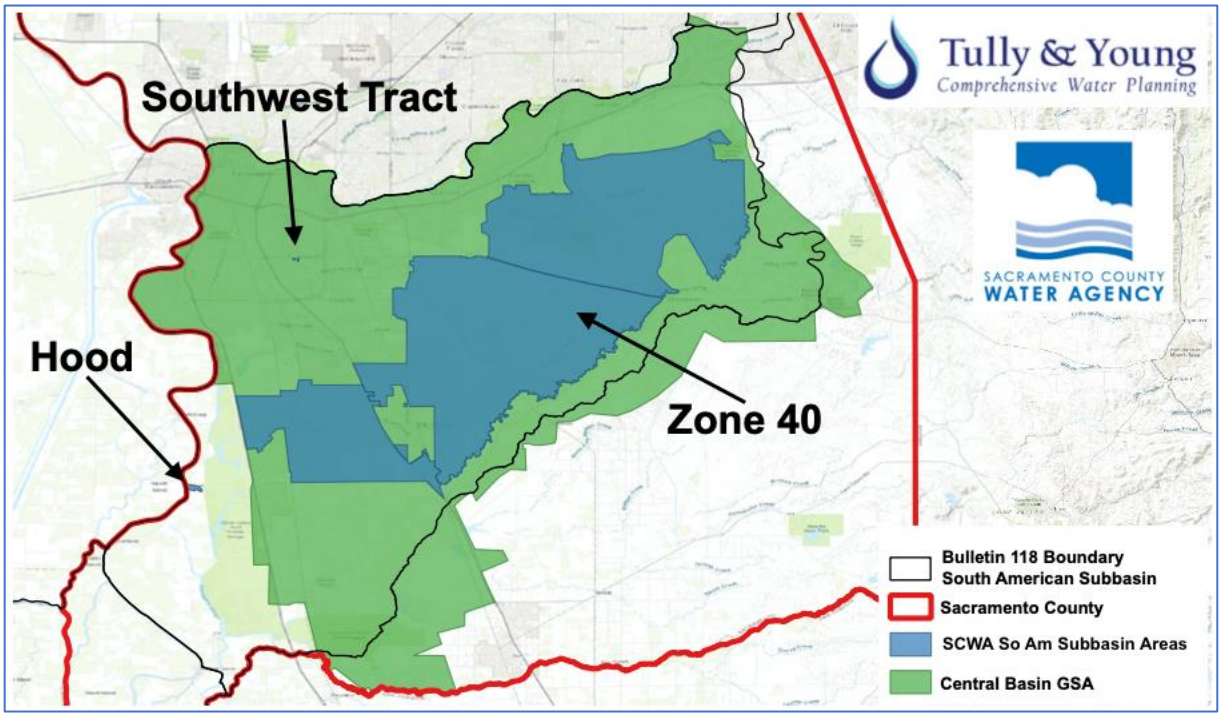
The South American Subbasin was locally referred to under the 2000 Water Forum Agreement as the "Central Basin" and its total area is a close approximation of the area comprising the South American Subbasin. Figure 3-11 below shows the North Basin, Central Basin, and South Basin as characterized in local basin management as defined by the 2000 Water Forum Agreement and will most likely be updated to the current subbasin name(s) in any future updates to the Water Forum Agreement.

Figure 3-11: Groundwater Basin Descriptions in Sacramento County



SCWA has two service areas that overlie the Central Basin – the Southwest Water Maintenance District and Zone 40. Figure 3-12 shows the location of these service areas in Sacramento County.

Figure 3-12: Location of SCWA Service Areas in South American Subbasin



All of these service areas have extracted and delivered groundwater over the course of the last 10 years. Table 3-28 shows SCWA's annual groundwater extractions in the Central Basin in each service area.

Table 3-28: 2015-2020 Annual South American Subbasin Groundwater Use (acre-feet per year)

Retail Area	Zone 40 NSA	Zone 40 CSA/SSA	Hood
2016	3,946	14,909	35
2017	1,991	15,165	44
2018	1,988	14,760	86
2019	1,553	13,101	76
2020	2,095	20,281	99

3.2.2 Groundwater Management in North American and South American Subbasins

The increased use of water in the North Basin and the Central Basin led to the development of governance structures and management plans aimed at stabilizing groundwater extractions and planning for future uses. These governance structures and management plans are further developing under the 2014 Sustainable Groundwater Management Act. This section will describe the groundwater management in both basins.

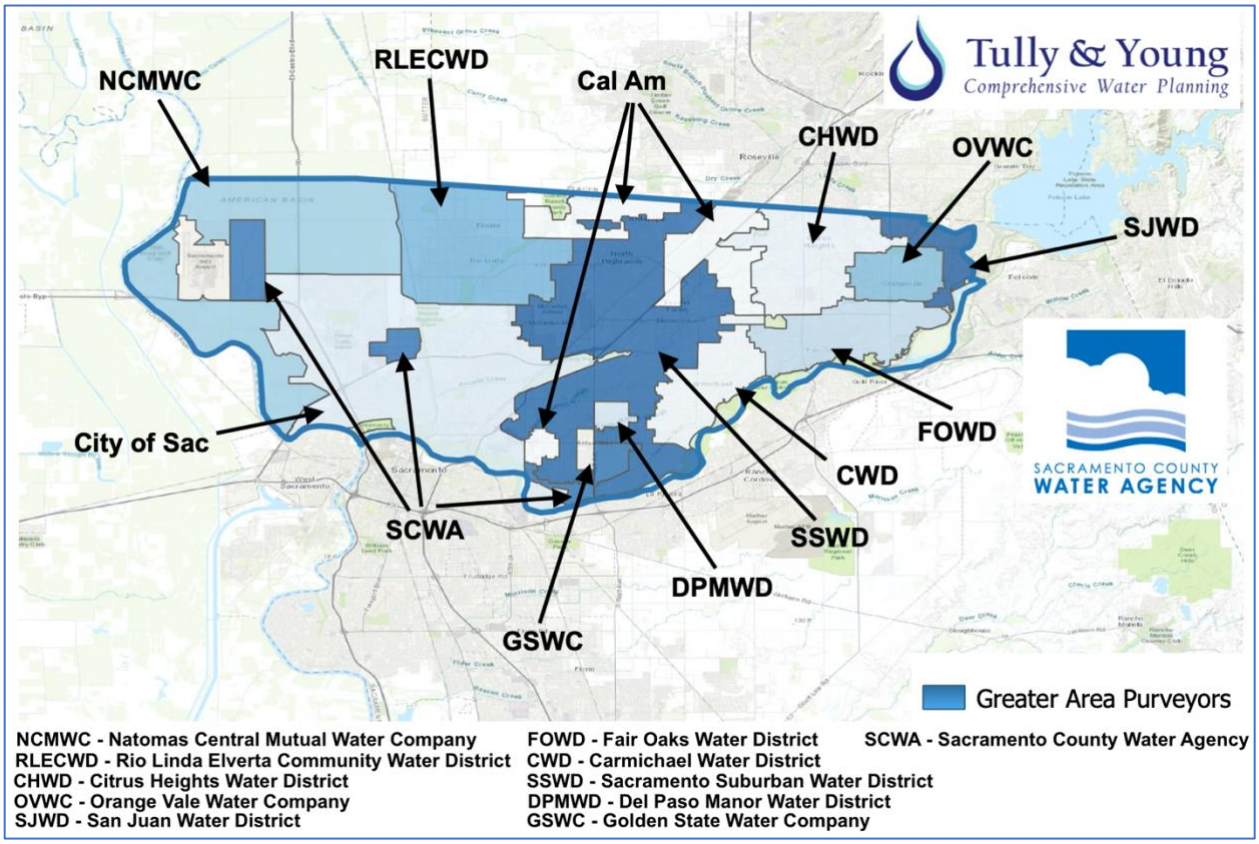
North American Subbasin Groundwater Management

The Sacramento Groundwater Authority (SGA) was formed as a Joint Powers Authority in 1998 to manage groundwater in the Sacramento County portion of the North American Subbasin. SGA incorporates the service areas of multiple water purveyors, including SCWA. Figure 3-13 shows the SGA agencies.

In 2014, SGA developed a Groundwater Management Plan (GMP) under Assembly Bill 3030 (called an AB 3030 GMP). The 2014 GMP established parameters to maintain the long-term sustainable yield target of 131,000 acre-feet, detailed activities SGA will take to sustainably manage the North American Subbasin, and evaluated groundwater management activities and their effectiveness.

The Sustainable Groundwater Management Act (SGMA) was signed into law in September 2014. SGMA requires the formation of Groundwater Sustainability Agencies (GSA) and Groundwater Sustainability Plans (GSP) to achieve sustainability in the state's groundwater basins. In 2016, SGA became the exclusive GSA for the Sacramento County portion of the American Subbasin and by 2017 the entire Sacramento Valley – North American Subbasin had additional GSAs formed covering the entire North American Subbasin area. By January 2022, SGA and the other GSAs must prepare a comprehensive plan to sustainably manage the North American Subbasin. The primary planning document guiding sustainability in the North Basin subcomponent of the North American Subbasin is SGA's 2014 GMP. As such, the guiding principles in that document govern SCWA's groundwater planning in the Sacramento County portion of the North American Subbasin.

Figure 3-13: SGA Agencies



South American Subbasin Groundwater Management (Formerly Central Basin)

The Sacramento Central Groundwater Authority (SCGA) was formed as a Joint Powers Authority in 2006 to manage groundwater in the majority of the South American Subbasin. . SCGA incorporates a number of water service providers, including SCWA. Figure 3-14 shows the SCGA participating agencies.

In 2006, SCGA developed a Groundwater Management Plan (GMP) under Assembly Bill 3030 (called an AB 3030 GMP). The 2006 GMP established parameters to maintain the long-term sustainable yield target of 273,000 acre-feet, detailed activities SCGA will take to sustainably manage the Central Basin, and evaluated groundwater management activities and their effectiveness.

The Sustainable Groundwater Management Act (SGMA) was signed into law in September 2014. The Sacramento Valley – South American Subbasin has six Groundwater Sustainability Agencies created to cover the entire subbasin area. Figure 3-15 shows the GSA's jurisdictional areas. By January 2022, the GSAs must prepare a comprehensive Groundwater Sustainability Plan to sustainably manage the South American Subbasin. The primary planning document guiding sustainability in the South American Subbasin is SCGA's 2006 GMP until the South American Subbasin GSP is submitted in January 2022. As such, the guiding in the 2006 GMP governs SCWA's groundwater planning in the South American Subbasin until the GSP is approved by DWR before January 2024.

Figure 3-14: SCGA Participating Agencies

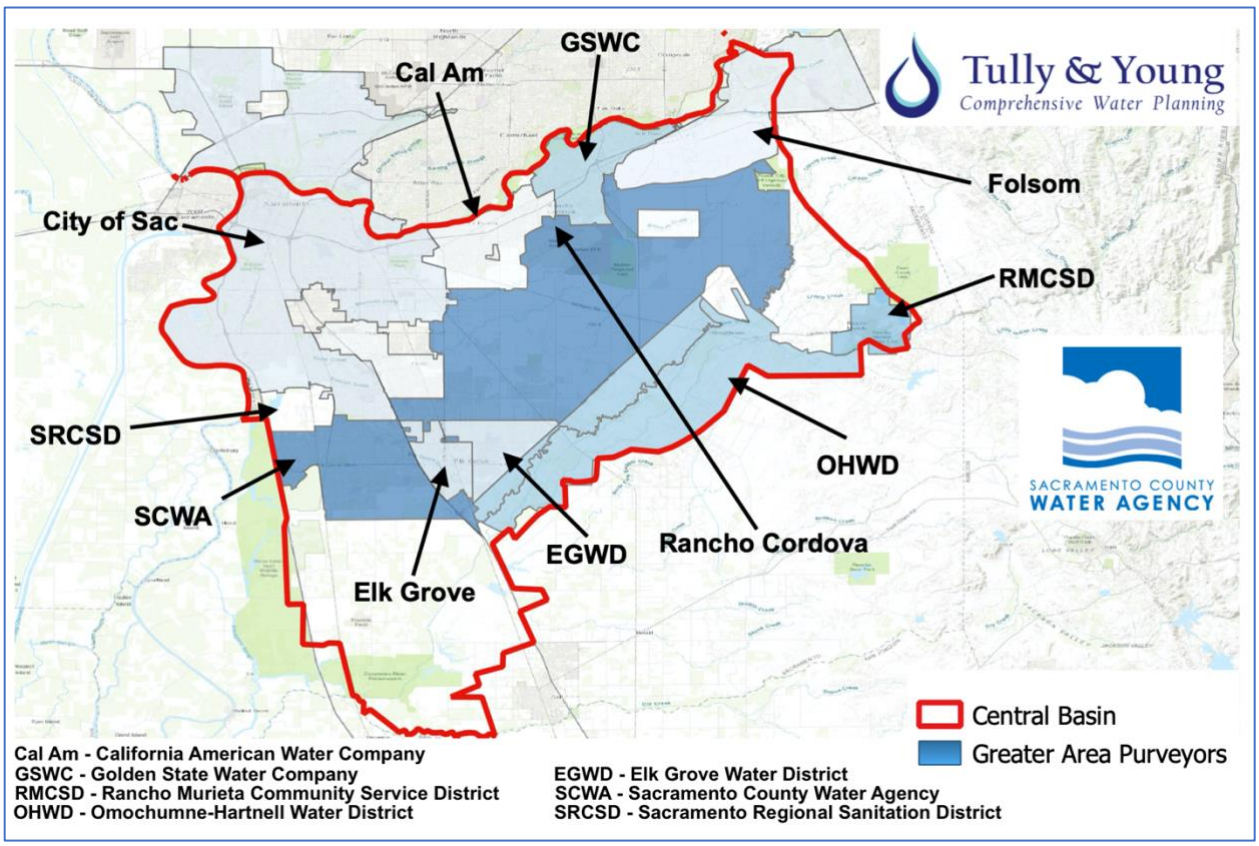
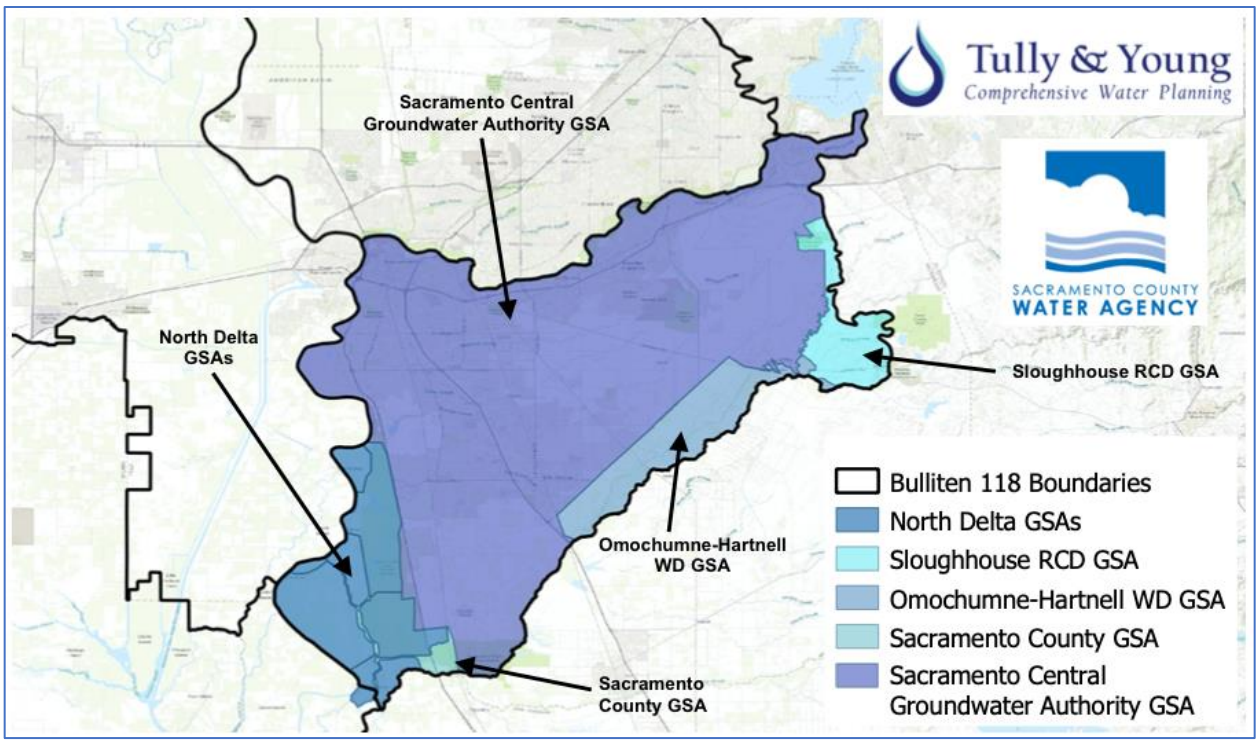


Figure 3-15: South American Subbasin Groundwater Sustainability Agencies



3.2.2 Zone 40 Groundwater

Zone 40 groundwater supplies consist of a total existing capacity of 68.17 million gallons per day (MGD) with an anticipated expansion of 63.83 MGD. Zone 40 has a total of 41 wells. Zone 40 groundwater is characterized in three sections, North Service Area (NSA), Central Service Area (CSA), and South Service Area (SSA). The Mather-Sunrise portion of the system constitutes the NSA while the CSA and SSA constitute the Laguna-Vineyard water system. The NSA system is largely independent from the intersection of the CSA and SSA systems. As such, this UWMP characterizes groundwater development and use in the Zone 40 area in two areas – the Mather-Sunrise Area (NSA) and the Laguna-Vineyard Area (CSA and SSA).

There are 41 wells in the Zone 40 system with a reasonable design capacity of 62.6 MGD. SCWA anticipates an average use of approximately 41,000 acre-feet per year with a maximum use approaching 69,900 acre-feet per year from this subbasin.[45] Table 3-28 depicts the last 10 years of water deliveries from the Mather-Sunrise groundwater system.

Table 3-29: Zone 40 Historical Groundwater Production (acre-feet per year)

Year	Zone 40 Production
2016	18,856
2017	17,157
2018	16,748
2019	14,654
2020	22,475

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Zone 40 anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-30 and through 2045 as shown in Table 3-31.

Table 3-30: Zone 40 Groundwater Supply for SCWA through 2025 (acre-feet per year)

Year		Zone 40 Groundwater
Normal		41,000
Single Dry		41,000
Multi-Year Drought	2021 (1st year)	41,000
	2022 (2nd year)	41,000
	2023 (3rd year)	41,000
	2024 (4th year)	41,000
	2025 (5th year)	41,000

[45] WSIP at Table 5-1.

Table 3-31: Zone 40 Projected Groundwater Production through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		41,000	46,000	56,000	56,000	56,000
Single Dry Year		41,000	46,000	56,000	56,000	56,000
Multi-Year Drought	Year 1	41,000	46,000	56,000	56,000	56,000
	Year 2	41,000	46,000	56,000	56,000	56,000
	Year 3	41,000	46,000	56,000	56,000	56,000
	Year 4	41,000	46,000	56,000	56,000	56,000
	Year 5	41,000	46,000	56,000	56,000	56,000

3.2.3 Arden Park Vista Groundwater

Arden Park Vista is an independent system that is currently served wholly through groundwater deliveries. There are 10 wells in the Arden Park Vista system with a reasonable design capacity of 11.34 MGD. Table 3-32 depicts the last 5 years of water deliveries from the Arden Park Vista groundwater system.

Table 3-32: Arden Park Vista Historical Groundwater Production (acre-feet per year)

Year	Arden Park Vista
2015	2,803
2016	3,096
2017	3,474
2018	3,430
2019	3,382
2020	3,726

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Arden Park Vista anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-33 and through 2045 as shown in Table 3-34.

Table 3-33: Arden Park Vista Groundwater Supply for SCWA through 2025 (acre-feet per year)

Year		Arden Park Vista
Normal		3,500
Single Dry		3,500
Multi-Year Drought	2021 (1st year)	3,500
	2022 (2nd year)	3,500
	2023 (3rd year)	3,500
	2024 (4th year)	3,500
	2025 (5th year)	3,500

Table 3-34: Arden Park Vista Projected Groundwater Production through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		3,500	3,500	3,500	3,500	3,500
Single Dry Year		3,500	3,500	3,500	3,500	3,500
Multi-Year Drought	Year 1	3,500	3,500	3,500	3,500	3,500
	Year 2	3,500	3,500	3,500	3,500	3,500
	Year 3	3,500	3,500	3,500	3,500	3,500
	Year 4	3,500	3,500	3,500	3,500	3,500
	Year 5	3,500	3,500	3,500	3,500	3,500

3.2.4 Northgate 880 Groundwater

Northgate 880 is an independent system that is currently served wholly through groundwater deliveries. There are 6 wells in the Northgate 880 system with a reasonable design capacity of 7.82 MGD. Table 3-35 depicts the last 5 years of water deliveries from the Northgate 880 groundwater system.

Table 3-35: Northgate 880 Historical Groundwater Production (acre-feet per year)

Year	Northgate 880
2016	968
2017	1,281
2018	1,387
2019	1,200
2020	1,365

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Northgate 880 anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-36 and production through 2045 as shown in Table 3-37.

Table 3-36: Northgate 880 Groundwater Supply for SCWA through 2025 (acre-feet per year)

Year		Northgate 880
Normal		1,400
Single Dry		1,400
Multi-Year Drought	2021 (1st year)	1,400
	2022 (2nd year)	1,400
	2023 (3rd year)	1,400
	2024 (4th year)	1,400
	2025 (5th year)	1,400

Table 3-37: Northgate 880 Projected Groundwater Production through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		1,400	1,400	1,400	1,400	1,400
Single Dry Year		1,400	1,400	1,400	1,400	1,400
Multi-Year Drought	Year 1	1,400	1,400	1,400	1,400	1,400
	Year 2	1,400	1,400	1,400	1,400	1,400
	Year 3	1,400	1,400	1,400	1,400	1,400
	Year 4	1,400	1,400	1,400	1,400	1,400
	Year 5	1,400	1,400	1,400	1,400	1,400

3.2.5 Hood Water Maintenance District (Hood) Groundwater

Hood is an independent system that is currently served wholly through groundwater deliveries. There are 2 wells in the Hood system with a reasonable design capacity of 0.84 MGD. Table 3-38 depicts the last 5 years of water deliveries from the Hood groundwater system.

Table 3-38: Hood Historical Groundwater Production (acre-feet per year)

Year	Hood
2016	35
2017	44
2018	86
2019	76
2020	99

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Hood anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-39 and production through 2045 as shown in Table 3-40.

Table 3-39: Hood Groundwater Supply for SCWA through 2025 (acre-feet per year)

Year		Hood
Normal		90
Single Dry		90
Multi-Year Drought	2021 (1st year)	90
	2022 (2nd year)	90
	2023 (3rd year)	90
	2024 (4th year)	90
	2025 (5th year)	90

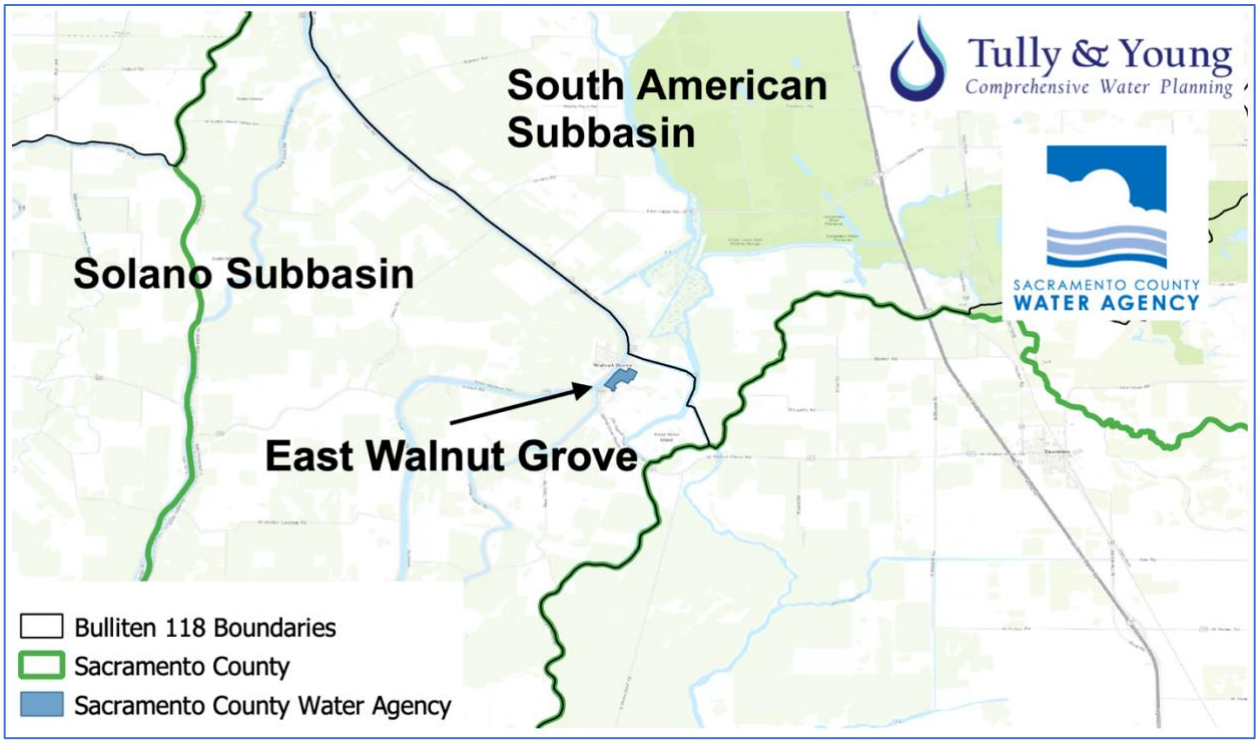
Table 3-40: Hood Projected Groundwater Production through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		90	90	90	90	90
Single Dry Year		90	90	90	90	90
Multi-Year Drought	Year 1	90	90	90	90	90
	Year 2	90	90	90	90	90
	Year 3	90	90	90	90	90
	Year 4	90	90	90	90	90
	Year 5	90	90	90	90	90

3.2.6 East Walnut Grove Groundwater

East Walnut Grove is an independent system that is currently served wholly through groundwater deliveries. There is 1 well in the Walnut Grove system with a reasonable design capacity of 0.43 MGD. East Walnut Grove is located in the Solano Subbasin (DWR Bulletin 118 Basin 5-021.66). Figure 3-16 shows the relevant portion of the Walnut Grove service area in the Solano Subbasin.

Figure 3-16: East Walnut Grove Geographic Location in Solano Subbasin



The Solano Subbasin is subject to the Solano Subbasin GSA Collaborative that is composed of five Groundwater Sustainability Agencies (GSA): City of Vacaville GSA, Northern Delta GSA, Sacramento County GSA, Solano GSA, and Solano Irrigation District GSA. All of these entities are collectively developing the Solano Groundwater Sustainability Plan (GSP). The Solano GSP is set for release in 2022. Nothing in the proposed Solano GSP will limit the water supplies available to SCWA's East Walnut Grove Service Area.

Table 3-41 depicts the last 5 years of water deliveries from the East Walnut Grove service area.

Table 3-41: East Walnut Grove Historical Groundwater Production (acre-feet per year)

Year	Walnut Grove
2016	68
2017	74
2018	64
2019	59
2020	56

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, East Walnut Grove anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-42 and production through 2045 as shown in Table 3-43.

Table 3-42: Walnut Grove Groundwater Supply for SCWA through 2025 (acre-feet per year)

Year		Walnut Grove
Normal		80
Single Dry		80
Multi-Year Drought	2021 (1st year)	80
	2022 (2nd year)	80
	2023 (3rd year)	80
	2024 (4th year)	80
	2025 (5th year)	80

Table 3-43: Walnut Grove Projected Groundwater Production through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal		80	80	80	80	80
Single Dry Year		80	80	80	80	80
Multi-Year Drought	Year 1	80	80	80	80	80
	Year 2	80	80	80	80	80
	Year 3	80	80	80	80	80
	Year 4	80	80	80	80	80
	Year 5	80	80	80	80	80

3.3 Water Quality

SCWA carefully tracks all water quality standards associated with its water assets. These water quality standards are best addressed at the individual service area levels where water extraction, treatment, and delivery are consistent with the parameters in those locations. In general, SCWA's water quality as delivered to its end users meets and exceeds federal and state standards for drinking water. As shown in the tables below, SCWA has extensive water quality testing protocols and annually provides detailed water quality statements for public review and consideration. The SCWA consumer confidence reports website is as follows: https://waterresources.saccounty.net/ccr/Pages/default.aspx. The information incorporated into the 2020 UWMP is derived from the 2019 reports since the 2020 data has not been assembled into the final reporting format.

3.3.1 Zone 40 – Laguna-Vineyard (Central and South Areas)

Zone 40 water quality monitoring is disaggregated into two discrete areas – the "Central and South Areas" and the "North Area." This section addresses water quality issues in the Central and South Areas. Table 3-44 shows the Zone 40 CSA and SSA water quality report for 2019.

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

Table 3-44: CSA and SSA Water Quality

Water Quality Standards	Goal Level	Max Level	Surface Water Measured	Groundwater Measured
Primary Standards				
Arsenic	0.004	10	ND	ND
Barium	2	1	ND	ND
Chromium (Total Cr)	100	50	ND	ND
Hexavalent Chromium	0.02	n/a	ND	2.3
Fluoride (natural)	1	2	ND	ND
Nitrate (as N)	10	10	ND	0.72
TTHMs (disinfection)	n/a	80	ND	ND
Control of DBP Precursors	n/a	TT	1.16	NA
Gross Alpha Activity	0	15	ND	ND
Uranium	0.43	20	ND	ND
Chlorine Residuals	4	4	ND-2.24	1.28
TTHMs (distribution system)	n/a	80	7-60	41.3
HAA5	n/a	60	4.4-39	24.8
Fluoride (distribution system)	1	2	0.55-0.78	0.66
Total Coliform Bacteria	0	1 NTU	.099 NTU	
Turbidity	n/a	95%<=0.3 NTU	100%	
Secondary Standards				
Color	n/a	15	ND	1.9
Iron	n/a	300	ND	ND
Manganese	n/a	50	ND	ND
Odor	n/a	3	1.9	1.2
Turbidity	n/a	5	ND	0.15
TDS	n/a	1000	81.5	214
E.C.	n/a	1600	125	295.6
Chloride	n/a	500	4.7	13.8
Sulfate	n/a	500	3.3	2.9
pH	n/a	MO	7.9	8
Total Hardness (as CaCO3)	n/a	MO	48	94
Total Alkalinity (as CaCO3)	n/a	MO	60	130
Bicarbonate (as HCO3)	n/a	MO	73	159
Sodium	n/a	MO	6.9	27
Calcium	n/a	MO	11	19
Magnesium	n/a	MO	5	12
Lead & Copper				
Lead	0.2	15	ND	
Copper	0.3	1.3	0.07	
Federal Unregulated Contaminates				
Manganese	n/a	0.4	ND	6.25
Germanium	n/a	0.3	ND	0.84
Bromide	n/a	n/a	5	NA
TOC	n/a	n/a	1.96	NA
HAA5	n/a	n/a	11.6	
HAA6Br	n/a	n/a	2.73	
HAA9	n/a	n/a	14.06	

3.3.2 Zone 40 – Mather-Sunrise (North Area)

This section addresses water quality issues in the North Area of Zone 40. Table 3-45 shows the Zone 40 NSA water quality report for 2019.

Table 3-45: NSA Water Quality

Water Quality Standards	Goal Level	Max Level	Surface Water Measured	Groundwater Measured
Primary Standards				
Hexavalent Chromium	0.02	n/a	ND	ND
Nitrate (as N)	10	10	ND	ND
Control of DBP Precursors	n/a	TT	1.16	NA
Chlorine Residuals	4	4	.15-2.3	1.36
Total Trihalomethanes	n/a	80	73	68.8
Haloacetic Acids	n/a	60	67	47.8
Fluoride (distribution system)	1	2	0.77	0.65
Total Coliform Bacteria	0	1 NTU	.099 NTU	
Turbidity	n/a	95%<=0.3 NTU	100%	
Secondary Standards				
Color	n/a	15	ND	0.83
Iron	n/a	300	ND	ND
Odor	n/a	3	1.9	1.8
Turbidity	n/a	5	ND	0.4
TDS	n/a	1000	81.5	127
E.C.	n/a	1600	125	164
Chloride	n/a	500	4.7	5.3
Sulfate	n/a	500	3.3	0.5
pH	n/a	MO	7.9	8
Total Hardness (as CaCO3)	n/a	MO	48	52.3
Total Alkalinity (as CaCO3)	n/a	MO	60	66.8
Bicarbonate (as HCO3)	n/a	MO	73	82
Sodium	n/a	MO	6.9	14
Calcium	n/a	MO	11	11
Magnesium	n/a	MO	5	5.8
Lead & Copper				
Lead	0.2	15	ND	
Copper	0.3	1.3	0.11	
Federal Unregulated Contaminates				
Manganese	n/a	0.4	ND	6.25
TOC	n/a	n/a	1.96	NA
HAA5	n/a	n/a	11.6	
HAA6Br	n/a	n/a	2.73	
HAA9	n/a	n/a	14.06	

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

3.3.3 Arden Park Vista, Northgate 880, and Southwest Tract

This section addresses water quality issues in the Arden Park Vista, Northgate, and Southwest Tract areas. Table 3-46 shows the water quality report for these areas.

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

Table 3-46: Arden Park, Northgate 880, and Southwest Tract Water Quality

Water Quality Standards	Goal Level	Max Level	Arden Park	Northgate	SW Tract
Primary Standards					
Arsenic	0.004	10	ND	4.1	3.6
Barium	2	1	ND	0.14	0.1
Chromium (Total Cr)	100	50	ND	ND	ND
Fluoride (natural)	1	2	ND	0.13	ND
Nitrate (as N)	10	10	1.8	1	5.6
Tetrachloroethylene (PCE)	0.06	5	ND	ND	ND
Trichloroethylene (TCE)	1.7	5	ND	ND	NA
Gross Alpha Activity	0	15	ND	ND	3.4
Uranium	0.43	20	ND	ND	4.2
Chlorine Residuals	4	4	0.91	1.17	0.77
TTHMs (distribution system)	n/a	80	0.2	0.5	0.5
HAA5	n/a	60	ND	ND	ND
Fluoride (distribution system)	1	2	0.71	NA	NA
Total Coliform Bacteria	0	1 NTU	0	0	0
Secondary Standards					
Iron	n/a	300	ND	ND	ND
Manganese	n/a	50	ND	ND	ND
Turbidity	n/a	5	ND	0.19	0.1
TDS	n/a	1000	226	297	321
E.C.	n/a	1600	292	516	533
Chloride	n/a	500	12.6	28	32
Sulfate	n/a	500	13.1	16.3	23
pH	n/a	MO	7.8	8	7.8
Total Hardness (as CaCO3)	n/a	MO	138.8	156	226
Total Alkalinity (as CaCO3)	n/a	MO	129.6	146	NR
Bicarbonate (as HCO3)	n/a	MO	156.3	175	230
Sodium	n/a	MO	11.7	28	19
Calcium	n/a	MO	29	31	51
Magnesium	n/a	MO	16.3	18.8	24
Lead & Copper					
Lead	0.2	15	ND	ND	ND
Copper	0.3	1.3	0.19	0.3	0.081
Federal Unregulated Contaminates					
Vanadium	n/a	50	NR	NR	15
Molybdenum	n/a	n/a	NR	NR	0.2
Strontium	n/a	n/a	NR	NR	493
Chromium (Total Cr)	n/a	50	ND	ND	ND
Hexavalent Cr	n/a	n/a	2.1	8.8	ND
Chlorate	n/a	800	NR	NR	236
Chloroform	n/a	n/a	ND	ND	ND
Dichlorodifluoromethane	n/a	1	NR	NR	ND
Per & Polyfluoralkyl Substances					
Perfluorooctanoic Acid	5.1	10	ND	NR	NA
Perfluorooctanesulfonic Acid	6.5	40	ND	NR	NA
Perfluorohexane sulfonic acid	n/a	n/a	ND	NR	NA

3.3.4 Hood Water Maintenance District and East Walnut Grove

This section addresses water quality issues in the Hood Water Maintenance District (Hood) and East Walnut Grove areas. Table 3-47 shows the water quality report for Hood and East Walnut Grove service areas.

Table 3-47: Hood and East Walnut Grove Water Quality

Water Quality Standards	Goal Level	Max Level	Hood	East Walnut Grove
Primary Standards				
Arsenic	0.004	10	ND	6.2
Fluoride (natural)	1	2	ND	0.14
Chlorine Residuals	4	4	1.17	0.94
TTHMs (distribution system)	n/a	80	72.5	35.5
HAA5	n/a	60	13.3	9.1
Fluoride (distribution system)	1	2	0.86	0.74
Total Coliform Bacteria	0	1 NTU	0	0
Secondary Standards				
Color	n/a	15	3	3
Manganese	n/a	50	218	39
Odor	n/a	3	2.25	1.8
Turbidity	n/a	5	0.11	ND
Zinc	n/a	5	ND	ND
TDS	n/a	1000	605	440
E.C.	n/a	1600	1050	755
Chloride	n/a	500	215	125
Sulfate	n/a	500	8.05	8.4
pH	n/a	MO	265	47
Total Hardness (as CaCO3)	n/a	MO	205	200
Total Alkalinity (as CaCO3)	n/a	MO	245	240
Bicarbonate (as HCO3)	n/a	MO	ND	3.8
Sodium	n/a	MO	105	150
Calcium	n/a	MO	73	11
Magnesium	n/a	MO	21	4.7
Lead & Copper				
Lead	0.2	15	ND	8.7
Copper	0.3	1.3	0.093	0.73

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

3.4 Climate Change

While the California Water Code does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply – both in an historical and future-projection context. SCWA's 2020 UWMP has incorporated climate change considerations into its water supply analysis, water demand analysis, water supply reliability assessment and water shortage contingency plan. The characterizations are imbedded into the characterizations of supply availability in normal, single dry, and five-consecutive dry year periods as well as the changes in demands that may result from climatological changes in those same periods. Moreover, the climate change characterizations are incorporated into future projected conditions through the 2045 planning horizon.

The Regional Water Authority (RWA) partnered with other local water purveyors and the U.S. Department of the Interior, Bureau of Reclamation on a climate change study called the American River Basin Study (ARBS) with the purpose of developing climate change adaptation strategies specific to the Basin.[46] Climate change is generally forecast to bring higher temperatures, more variability in precipitation and more frequent and prolonged droughts. Although there is a lack of a clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation. These climate change considerations have been incorporated into the water supply forecasts for SCWA contained in this Chapter.

3.5 Water Transfers and Exchanges

SCWA is an active participant in regional water transfers and exchanges. SCWA has been active in developing its water supply portfolio through strategic acquisitions – like its CVP Contracts – as well as converting agricultural water rights for municipal and industrial uses – like Licenses 1060 and 4060. SCWA has also engaged in extensive water conservation actions and protected its water assets under Water Code section 1011. Moreover, SCWA has a sophisticated conjunctive use program to optimize surface and groundwater assets in order to protect those assets for the future under Water Code section 1011.5. In these ways, SCWA has anticipated future water transfers and exchanges with its available water assets.

In 2020, SCWA participated in its first groundwater substitution transfer as part of the American River Watershed Region's water transfer program. This transfer program engaged the City of Sacramento, SCWA, Sacramento Suburban Water District, Carmichael Water District, Fair Oaks Water District, and Golden State Water Company to pool water assets for a through-Delta transfer to water-short entities in central and southern California. SCWA participated by helping the region deliver surface water by providing 1,500 acre-feet of groundwater supplies to the City of Sacramento. Importantly, the region spent significant time and resources to ensure that the groundwater substitution transfer would not cause injury to any other groundwater purveyor in the region. The Regional Water Authority (RWA), the

[46] Full findings and approved ARBS study can be found at www.pcwa.net/planning/arbs

Sacramento Groundwater Authority (SGA), and the Sacramento Central Groundwater Authority (SCGA) were all notified of the transfer. The regional agencies engaged in extensive well-monitoring efforts, discounted transferable supplies to ensure groundwater recovery, and are conducting a follow-up assessment of basin recovery. In short, the regional groundwater substitution transfer was predicated on comprehensive safeguards for the region's groundwater supplies and protecting surface water assets for current and future beneficial uses.

SCWA anticipates participating in other water transfers and exchanges in the future – both to diversify the utility of the regional water asset portfolio as well as generate revenue to support its long-term water management objectives. These coordinated water transfer and exchange activities may involve delivering portions of SCWA surface supplies to other areas within the SCWA service areas, exchanging water assets with other retail providers, and developing more robust conjunctive use actions to support groundwater substitution transfers. These future water transfers will conform with all guidelines recommended in the relevant Groundwater Sustainability Plans. Moreover, SCWA will continue to fund and work with RWA in developing transfers and exchanges in the context of the proposed regional groundwater bank. Nevertheless, in each proposed water transfer and exchange, SCWA will take necessary steps to protect regional water assets and the environment.

3.6 Planned Water Supply Projects

At this time, SCWA is not planning to develop any additional water supply sources in its service area. SCWA's planned potable projects include improvements to its treatment and delivery systems in order to create system redundancy and protect the supply reliability for its customers. Specifically, the Vineyard Water Treatment Plant Phase 2 will provide an additional 50 MGD of capacity to the SCWA system to deliver water throughout the Zone 40 area. Phase 2 was anticipated at the time the project was conceived and is pending development based upon SCWA water demand and regional need. In addition, SCWA has a planned groundwater well program that will augment its groundwater supplies in accordance with its reasonable growth projections.

Desalinated Water

Desalination involves removing salts and impurities from seawater or non-potable surface water or groundwater using treatment technologies such as reverse osmosis membranes or distillation methods. Desalination facilities are costly to construct and operate relative to SCWA's current supply sources. There are also significant environmental and permitting issues associated with the water intake and with disposal of brine from the treatment process. As such, SCWA does not have any plans for developing desalinated water supplies.

3.7 Master Supply Spreadsheets

The purpose of this section is to combine all the water supplies available to SCWA's Zone 40 into one location and show the water supplies availability in the future. Table 3-48 shows the combined monthly availability of all sources of SCWA's Zone 40 supplies in a normal, single dry, and five consecutive dry

years through 2025. The sources of supplies for the other SCWA service areas are shown elsewhere in this chapter.

Table 3-48: Monthly Availability of Water Supply Sources in Zone 40 through 2025 (acre-feet per year)

Total Supply		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Normal Year		14,169	14,181	14,577	14,673	15,674	8,748	9,422	9,659	9,495	16,489	15,946	14,706	157,740
Single Dry Year		9,678	9,689	10,086	3,934	4,934	5,863	6,537	6,775	6,610	5,749	5,206	10,214	85,274
Multi-Year Drought	2021	9,678	9,689	10,086	10,182	6,562	7,491	8,166	8,403	8,239	7,377	11,455	10,214	107,542
	2022	9,678	9,689	10,086	10,182	5,664	6,593	7,267	7,505	7,340	6,479	5,936	10,214	96,633
	2023	9,678	9,689	10,086	3,934	4,934	5,863	6,537	6,775	6,610	5,749	5,206	10,214	85,274
	2024	9,678	9,689	10,086	10,182	5,163	6,092	6,767	7,004	6,840	5,979	5,436	10,214	93,129
	2025	9,678	9,689	10,086	10,182	6,053	6,982	7,657	7,894	7,730	6,868	11,455	10,214	104,488

Table 3-49(a) through (f) shows the individual monthly volume of each source of SCWA Zone 40 supplies that are available through 2025.

Table 3-49(a): Monthly Availability of Permit 21209 in Zone 40 through 2025 (acre-feet per year)

Total Supply		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Normal Year		7,855	7,855	7,855	7,855	7,855					7,855	7,855	7,855	62,840
Single Dry Year		7,855	7,855	7,855									7,855	31,420
Multi-Year Drought	2021	7,855	7,855	7,855	7,855							7,855	7,855	47,130
	2022	7,855	7,855	7,855	7,855								7,855	39,275
	2023	7,855	7,855	7,855									7,855	31,420
	2024	7,855	7,855	7,855	7,855								7,855	39,275
	2025	7,855	7,855	7,855	7,855							7,855	7,855	47,130

Table 3-49(b): Monthly Availability of SMUD CVP Contract in Zone 40 through 2025 (acre-feet per year)

Total Supply		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Normal Year		2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	30,000
Single Dry Year					253	253	253	253	253	253	253	253		2,023
Multi-Year Drought	2021					1,011	1,011	1,011	1,011	1,011	1,011			6,068
	2022					578	578	578	578	578	578	578		4,045
	2023				253	253	253	253	253	253	253	253		2,023
	2024					289	289	289	289	289	289	289		2,023
	2025					674	674	674	674	674	674			4,045

Table 3-49(c): Monthly Availability of Fazio CVP Contract in Zone 40 through 2025 (acre-feet per year)

Total Supply		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Normal Year		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	15,000
Single Dry Year					185	185	185	185	185	185	185	185		1,481
Multi-Year Drought	2021					741	741	741	741	741	741			4,444
	2022					423	423	423	423	423	423	423		2,963
	2023				185	185	185	185	185	185	185	185		1,481
	2024					212	212	212	212	212	212	212		1,481
	2025					494	494	494	494	494	494			2,963

Table 3-49(d): Monthly Availability of Aerojet GET Supply in Zone 40 through 2025 (acre-feet per year)

Total Supply		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Normal Year		742	742	742	742	742	742	742	742	742	742	742	742	8,900
Single Dry Year					1,113	1,113	1,113	1,113	1,113	1,113	1,113	1,113		8,900
Multi-Year Drought	2021					1,483	1,483	1,483	1,483	1,483	1,483			8,900
	2022					1,271	1,271	1,271	1,271	1,271	1,271	1,271		8,900
	2023				1,113	1,113	1,113	1,113	1,113	1,113	1,113	1,113		8,900
	2024					1,271	1,271	1,271	1,271	1,271	1,271	1,271		8,900
	2025					1,483	1,483	1,483	1,483	1,483	1,483			8,900

Table 3-49(e): Monthly Availability of NDWA Supply in Zone 40 through 2025 (acre-feet per year)

Total Supply		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Normal Year														0
Single Dry Year					56	56	56	56	56	56	56	56		450
Multi-Year Drought	2021													0
	2022					64	64	64	64	64	64	64		450
	2023				56	56	56	56	56	56	56	56		450
	2024					64	64	64	64	64	64	64		450
	2025					75	75	75	75	75	75			450

Table 3-49(f): Monthly Availability of Groundwater in Zone 40 through 2025 (acre-feet per year)

Total Supply		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Normal Year		1,823	1,834	2,231	2,327	3,327	4,256	4,931	5,168	5,003	4,142	3,600	2,359	41,000
Single Dry Year		1,823	1,834	2,231	2,327	3,327	4,256	4,931	5,168	5,003	4,142	3,600	2,359	41,000
Multi-Year Drought	2021	1,823	1,834	2,231	2,327	3,327	4,256	4,931	5,168	5,003	4,142	3,600	2,359	41,000
	2022	1,823	1,834	2,231	2,327	3,327	4,256	4,931	5,168	5,003	4,142	3,600	2,359	41,000
	2023	1,823	1,834	2,231	2,327	3,327	4,256	4,931	5,168	5,003	4,142	3,600	2,359	41,000
	2024	1,823	1,834	2,231	2,327	3,327	4,256	4,931	5,168	5,003	4,142	3,600	2,359	41,000
	2025	1,823	1,834	2,231	2,327	3,327	4,256	4,931	5,168	5,003	4,142	3,600	2,359	41,000

Table 3-50 shows the existing and planned water supplies in Zone 40 through 2045.

Table 3-50: Zone 40 Supply Availability through 2045 (acre-feet per year)

Total Supply		2025	2030	2035	2040	2045
Normal Year		159,096	164,096	174,096	174,096	174,096
Single Dry Year		87,199	92,676	103,926	105,176	107,676
Multi-Year Drought	Year 1	111,954	118,386	132,136	135,886	143,386
	Year 2	99,576	105,531	118,031	120,531	125,531
	Year 3	87,199	92,676	103,926	105,176	107,676
	Year 4	95,054	100,531	111,781	113,031	115,531
	Year 5	107,431	113,386	125,886	128,386	133,386

Chapter 4
Water Use

Understanding water use characteristics is essential to enable SCWA to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This section characterizes SCWA's retail and wholesale customer demands – current and forecast over the next few decades. Characteristics such as how demands vary among different land use classifications, throughout the year, and under differing hydrologic conditions, all help with that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon SCWA's past and current water use, in addition to considerations of anticipated growth, new regulations, changing climate conditions and trends in customer water use behaviors. A thorough analysis examines each water use sector for a variety of factors, then aggregates the information into a comprehensive projection of customer water use that becomes the foundation for integration with SCWA's water supplies (see Chapter 3) to assess long-term water system reliability (see Chapter 5).

Several legislative changes were enacted since SCWA completed its 2015 UWMP. The new requirements must be addressed in the 2020 UWMP in addition to completing requirements from the prior statutory language. While there have been many changes, the critically important items that must be addressed are highlighted below:

- Provide quantified distribution system losses for each of the 5 preceding years and whether the State standard was met. [CWC 10631(d)(3)(A) and (C)]
- Include a drought risk assessment (DRA) for a drought period that lasts five consecutive water years, starting from the year following the assessment, which would be 2021 for this round of UWMPs. The DRA requires a comparison of water supplies with total projected water use. Therefore, the SCWA must produce a projected water use for the years 2021 through 2025 as part of the water use projections up to 2045. [CWC 10635(b)]
- Conduct an annual water supply and demand assessment on or before July 1 of each year (following adoption of its 2020 UWMP) where the annual assessment includes current year unconstrained demand. The SCWA will consider "unconstrained demand" as the expected water use in the upcoming year, based on recent water use, before any projected response actions it may trigger under its Water Shortage Contingency Plan (see Chapter 6). [CWC 10632.1]

This section is organized as follows:

- Current Customer Water Use – This subsection presents data reflecting the SCWA's residential and non-residential customers for 2016 through 2019 as well as the actual 2020 water use and presents the SCWA's distribution system losses for this same period.
- Compliance with 2020 Urban Water Use Target – This subsection documents the derivation of the 2020 GPCD value and comparison to the 2020 GPCD target.
- Demand Management Measures – This subsection provides a narrative description of each water demand management measure implemented by the SCWA over the past five years and describes the planned measures for the foreseeable future.
- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable water within the SCWA's service area, including land-use classifications, unit demand factors, and estimation of distribution system losses. This subsection also estimates the variations in customer water use the SCWA should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the 5-year Drought Risk Assessment (DRA) and defining the "unconstrained demand" for purposes of the annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to California Water Code 10631.1.

4.1 Current Customer Water Use

As described in Chapter 2, SCWA has been serving potable water to over 59,000 customer connections for the past several years as well as wholesaling water to Elk Grove Water District (EGWD). Under normal operations, water supplied by SCWA to its customers is drawn from several sources, depending on the service area, and either directly delivered (when groundwater) or treated at the Vineyard water treatment plant (when surface water). The current customers, their recent and expected water use trends, and SCWA's on-going demand management efforts targeting these customers provide a foundational basis for this UWMP's water use forecast to 2045.

Furthermore, the actual water use in 2020 is the basis for determining SCWA's compliance with its 2020 gallons per capita per day (GPCD) target established in its 2015 UWMP. This subsection presents this relevant information.

4.1.1 Retail Customer Water Use: 2016 to 2019

Recent retail customer water use can help SCWA understand water use trends, effects of temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. Water Code Section 10631(d)(1) also requires SCWA to quantify past customer water use.[47]

[47] California Water Code Section 10631(d)(1)

As described in Chapter 2, the SCWA provides retail potable water service to several unique service areas, as well as serving non-potable supplies to the South Service Area and wholesale potable water to EGWD. Tables 4-1(a) through 4-1(g) presents the SCWA's past retail customer water use by customer classification for 2016 through 2019 for each of its service areas. The SCWA records water use within six primary categories, though all six are not present in all service areas:

- Single-family residential
- Multi-family residential
- Commercial
- Government and Institutional
- Industrial
- Landscape Irrigation

The SCWA also records delivered water for non-potable (recycled) use as well as deliveries to EGWD and to the City of Sacramento. These demands are discussed in a subsequent section. Deliveries to the City of Sacramento are not reflected in this UWMP as they are intermittent and part of an interagency water supply sharing agreement that periodically has water moving between the City and the SCWA to facilitate a variety of activities, including facilitating recent groundwater substitution transfers.[48]

This historic data also provides insight into the relative ratio of differing retail customer classifications to each other as well as seasonal variations. For instance, the Zone 40 customer demands in most classifications have been slowly increasing from 2016 to 2019. This is likely a result of recovery in use following the recent 2013 through 2015 drought that forced the SCWA to mandate conservation measures imposed by the Governor's office as well as continued growth. And the monthly data illustrates the higher demand during summer months in most classifications, likely driven by landscape irrigation needs.

The annual historic data for the other service areas also offer useful information on trending and use. For instance, use in Arden Park Vista likely has peaked and is potentially starting to decrease as the SCWA continues its meter installation program. Metro Air Park, in contrast, is seeing increased demand, albeit much smaller total quantities, consistent with the growth in the small service area.

The Zone 40 single-family residential classification illustrates two important characteristics of the SCWA's water service: (1) it represents over 70% of the Zone 40 annual demand, and (2) it has summer demands that are two times the monthly volume needed in winter months. These seasonal variations and dominance as the highest retail water using classification, both in Zone 40 and when all service areas are considered, provide the SCWA with additional insight necessary for assessing the seasonal reliability of its water supplies and developing and quantifying successful water shortage contingency response actions, especially for the Zone 40 service area.

[48] For instance, in 2020, the SCWA pumped about 1,700 acre-feet of groundwater and served it into the City through the Franklin Intertie to facilitate the City's temporary transfer of its surface water rights to other water suppliers in the need of water. In subsequent periods, the City will push surface water to SCWA through this same intertie to offset the SCWA pumping.

Table 4-1(a): Zone 40 Retail Customer Use 2016 to 2019 (values in acre-feet)

	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-Family Residential	2016	812	769	762	983	1,304	1,875	2,083	2,239	2,102	1,662	1,087	877	16,556
	2017	877	823	724	949	1,371	2,156	2,294	2,486	2,303	1,930	1,494	992	18,399
	2018	988	961	880	966	1,487	1,998	2,250	2,317	2,271	1,871	1,710	1,070	18,770
	2019	950	843	773	929	1,537	1,874	2,295	2,440	2,327	2,017	1,732	1,242	18,961
Multi-Family Residential	2016	50	50	48	55	66	74	75	88	86	71	63	53	779
	2017	57	56	47	57	63	82	81	93	89	78	72	53	828
	2018	54	57	50	57	67	85	83	86	92	79	76	64	849
	2019	59	57	52	55	63	82	87	97	98	85	79	68	882
Commercial	2016	78	79	83	96	112	126	139	153	161	158	113	83	1,381
	2017	88	88	73	93	106	149	151	172	164	145	137	92	1,458
	2018	94	97	88	97	113	151	156	152	161	138	137	111	1,495
	2019	92	84	80	87	112	147	158	177	180	160	150	134	1,561
Institutional	2016	15	18	20	32	49	68	82	87	83	60	27	19	559
	2017	17	21	18	23	38	83	88	98	87	64	50	23	610
	2018	23	26	24	25	44	69	78	95	89	68	55	37	632
	2019	19	20	21	26	47	68	81	94	88	74	62	36	638
Industrial	2016	33	31	23	37	44	53	59	63	53	39	27	23	486
	2017	25	22	16	29	31	51	55	67	57	41	35	21	450
	2018	21	24	18	12	27	46	51	53	54	39	36	29	411
	2019	15	19	14	18	32	44	54	58	59	42	41	35	433
Irrigation	2016	21	21	23	96	257	422	556	630	557	365	93	30	3,072
	2017	20	18	19	95	251	541	604	670	600	464	245	44	3,571
	2018	43	44	42	70	294	532	652	656	610	452	357	100	3,852
	2019	30	26	21	42	335	457	633	714	640	496	378	157	3,929
Total Metered Deliveries	2016	1,008	967	959	1,300	1,833	2,618	2,994	3,259	3,044	2,355	1,410	1,086	22,833
	2017	1,084	1,028	897	1,246	1,860	3,062	3,273	3,586	3,300	2,722	2,033	1,225	25,316
	2018	1,223	1,209	1,101	1,227	2,033	2,882	3,269	3,358	3,277	2,648	2,369	1,411	26,009
	2019	1,165	1,050	961	1,158	2,127	2,672	3,308	3,580	3,391	2,875	2,441	1,674	26,403

Table 4-1(b): Arden Park Vista Customer Use 2016 to 2019 (values in acre-feet)

	2016	2017	2018	2019
Single Family Residential	9	15	17	153
Multi-Family Residential	n/a	n/a	n/a	11
Commercial/Institutional	72	83	89	115
Landscape Irrigation	36	63	37	45
Estimated Unmetered Use [mostly residential customers]	2,607	2,896	2,875	2,652
Total	2,724	3,057	3,018	2,976

Table 4-1(c): Northgate 880 Customer Use 2016 to 2019 (values in acre-feet)

	2016	2017	2018	2019
Commercial/Institutional	407	550	645	649
Industrial	237	301	326	272
Landscape Irrigation	80	103	132	110
Total	724	954	1,103	1,031

Table 4-1(d): Metro Air Park Customer Use 2016 to 2019 (values in acre-feet)

	2016	2017	2018	2019
Commercial/Institutional	3	15	14	15
Landscape Irrigation	4	29	28	29
Total	7	44	42	44

Table 4-1(e): Hood Water Maintenance District Customer Use 2016 to 2019 (values in acre-feet)

	2016	2017	2018	2019
Single Family Residential	18	17	20	19
Commercial/Institutional	5	7	4	4
Total	23	24	24	23

Table 4-1(f): East Walnut Grove Customer Use 2016 to 2019 (values in acre-feet)

	2016	2017	2018	2019
Single Family Residential	35	33	32	29
Multi-Family Residential	4	5	6	6
Commercial/Institutional	8	10	13	9
Landscape Irrigation	1	1	1	2
Total	48	49	52	46

Table 4-1(g): Southwest Tract Customer Use 2016 to 2019 (values in acre-feet)

	2016	2017	2018	2019
Single Family Residential	6	6	6	6
Multi-Family Residential	18	15	14	14
Commercial/Institutional	1	1	1	1
Total	25	22	21	21

4.1.2 Retail Customer Use in 2020

Retail customers served by the SCWA are metered at their connection to the distribution system, with the exception of many of the single-family residential customers in Arden Park Vista. These metered values are collected periodically for each customer account and summarized into the SCWA's annual reporting to the SWRCB Division of Drinking Water and to DWR.[49]

The 2020 actual retail customer use presented in Table 4-2(a) and Table 4-2(b) represents the summarized delivery to the retail customers in each SCWA service area. The tables do not, however, include the distribution system losses inherent in a pressurized water delivery system that occur during the efforts to treat, store and route water throughout an extensive distribution system to each customer's connection. The values also do not include wholesale deliveries to the Elk Grove Water District or within the non-potable system serving demands in the SSA.

Table 4-2(a): Zone 40 Retail Customer Water Use 2020 Actual (values in acre-feet)

Use Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-family Residential	1,007	1,029	1,264	1,359	1,952	2,420	2,767	2,852	2,812	2,313	2,010	1,334	23,120
Multi-family Residential	63	59	65	72	79	96	106	104	103	92	92	72	1,002
Commercial	103	102	108	89	89	122	139	152	159	151	143	106	1,462
Institutional	19	23	32	28	37	63	81	96	84	62	55	27	607
Industrial	23	34	29	26	33	49	58	62	62	57	50	33	515
Landscape Irrigation	33	35	166	123	347	574	704	773	679	476	358	127	4,395
Subtotal	1,247	1,283	1,664	1,697	2,537	3,324	3,855	4,040	3,897	3,151	2,707	1,700	31,102

Comparing to the values in Table 4-1(a) the total 2020 Zone 40 annual retail customer use is nearly 5,000 acre-feet greater than 2019. Comparing the specific customer classifications, the 2020 data displays two unique circumstances: (1) single-family residential use is 27% higher than the average over the last 4 years – or about 4,000 acre-feet higher, and (2) the industrial and landscape use is also about 20% higher. The other classifications are within the variations for each over the past several years.

The significantly higher single-family residential use in 2020 when compared to 2017 through 2019, which had been reasonably stable after recovering from drought conditions, results in the majority of the higher 2020 Zone 40 value. While a portion of this increase is from new housing starts, most is likely due to the pandemic that dominated 2020 and the multiple advisories and even government-imposed restrictions that resulted in many people working from, learning from, or simply staying at home.

The SCWA's other service areas saw a mix of similar use to 2018 and 2019 conditions to vastly increased use. The most notable increase was within Metro Air Park, where significant construction and increased commercial activity are on-going. But this increase is nominal when viewed within the entire SCWA customer use in 2020. Arden Park Vista, the second highest service area to Zone 40, stayed consistent with 2018 and 2019 values. As a primary residential suburb, this area would be assumed to have seen

[49] The annual SWRCB report is referred to as the 'electronic Annual Report' or eAR, and the annual DWR report is known as the Public Water System Statistics report.

an increase in single-family use, but the area is still undergoing meter installation so comparison within a customer classification is not viable as the data does not exist in the appropriate form. Table 4-2(b) provides the annual 2020 recorded values for each of these other service areas.[50]

Table 4-2(b): Other Service Area Customer Water Use 2020 Actual (values in acre-feet)

Classification	Arden Park Vista	Northgate 880	Metro Air Park	Hood	East Walnut Grove	Southwest Tract
Single-family Residential	2,446	--	--	22	36	6
Multi-family Residential	213	--	--	--	5	15
Commercial	457	660	52	5	8	--
Institutional	33	318	--	--	1	1
Industrial	--	35	--	--	--	--
Landscape Irrigation	41	139	55	--	1	--
Total	3,191	1,151	107	27	51	23

4.1.3 Zone 40 Wholesale Customer Use

In addition to the significant retail customer water services in Zone 40, SCWA also provides wholesale water supply to a portion of the service area of Elk Grove Water District (EGWD), which operates a retail water system serving customers within a portion of the City of Elk Grove. Table 4-3 details the history of deliveries to EGWD as reported by SCWA. While this wholesale service area has access to both the SCWA's groundwater and surface water resources, as a matter of practice, water served is almost entirely derived from the SCWA's production wells located within the EGWD's service area.

Table 4-3: Zone 40 Wholesale Deliveries 2016 to 2020 (values in acre-feet)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2016	162	81	84	105	157	232	295	289	267	232	114	89	2,107
2017	83	87	88	105	149	267	305	322	304	258	190	105	2,262
2018	98	97	104	101	162	263	310	321	299	238	203	132	2,327
2019	92	93	89	96	190	223	296	313	306	254	214	139	2,304
2020	98	99	137	122	206	269	329	372	315	267	218	140	2,572

Similar to circumstances seen with the residential-heavy retail customer service areas, water deliveries in 2020 to this part of EGWD were about 10% higher than the same service in 2018 and 2019, which had been reasonably stable after recovering from drought conditions. While some of this increase may be attributable to growth in the EGWD service area, likely the increase relates to increased residential use

[50] Most of the Arden Park Vista water use by customer classification is estimated since most residential customers are not metered. The estimate was made by comparing the small amount of metered use to the total water quantity supplied to the service area, accounting for distribution losses, then distributing the remainder among the non-metered service connections.

due to the pandemic that dominated 2020 and the multiple advisories and even government-imposed restrictions that resulted in many people working from, learning from, or simply staying at home.

4.1.4 Zone 40 Non-Potable Water Needs[51]

In 2017, SCWA completed the Recycled Water Feasibility Study. This study assessed SCWA's opportunities to obtain recycled water supplies from Sacramento Regional County Sanitation District (SRCSD) to meet customer demands in SCWA's service area. Beginning in 2003, SCWA obtained tertiary treated wastewater from SRCSD to meet the Phase 1 recycled water demands in the Laguna Vineyard system. The Phase 1 program has 54 user sites, including parks, schoolyards, commercial landscaping, and roadway medians. All operations are conducted in accordance with SRCSD's Master Reclamation Permit Waste Discharge Requirement No. 97-146. Phase 2 has conveyance facilities in the East Franklin Specific Plan planning subarea. Currently, the recycled water supplies have been used only in the Phase 1 area. Table 4-4 shows the historical water deliveries from 2016 through 2020.

Table 4-4: Zone 40 Non-Potable Deliveries 2016 to 2020 (values in acre-feet)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2016	7	6	8	50	85	129	144	136	94	44	9	7	720
2017	8	8	15	33	107	133	157	145	119	90	14	15	845
2018	14	14	13	36	106	143	156	143	110	82	31	14	861
2019	9	4	4	44	88	142	150	163	132	97	62	6	901
2020	2	18	24	53	101	168	180	167	113	84	38	14	962

4.1.5 Existing Distribution System Losses

Distribution system water losses (also known as "real losses") are the physical water losses from the SCWA's water distribution system up to the point of delivery to the customer's system (e.g. up to the residential water meter or wholesale delivery point).

Since 2016, the SCWA has been required to quantify its distribution system losses using the American Water Works Association Method (Title 23 California Code of Regulations Section 638.1 et seq.). An electronic copy of an audit in Excel format is to be submitted to the DWR by October 1 of each year for the prior year's estimated system losses, using DWR's online submittal tool pursuant to Code of Regulations Section 638.5. As represented in Table 4-5, the SCWA has estimated its losses across its systems in different ways over time. Initial reporting were for the entire Zone 41 service, then Zone 40 was separated from "non-Zone 40" areas, with more service area specific worksheets being prepared as of 2019. Copies of the SCWA's submittals for the last 5 years are available through DWR,[52] with the pertinent results shown in Table 4-5. The 2020 estimates for each service area have not been officially submitted to DWR as of the drafting of this UWMP. But Zone 40, the largest service area, is estimated to be approximately 5,300 acre-feet over the year, or about 14.6% of the water entering that

[51] Recycled Water Feasibility Report, July 2017. Information from this report was used to prepare the non-potable water needs description in this section.

[52] https://wuedata.water.ca.gov/awwa_plans

distribution system. Deliveries into the EGWD service area are assumed to be only 3%, since the accounting reflects minimal distribution systems from the SCWA owned wells to the EGWD owned distribution system.

Table 4-5: Distribution System Loss: 2016 through 2020[53]

Service Area	2016	2017	2018	2019	2020	Average
Zone 41 (all)	14.1%	[Reported separately for Zone 40 and Non-Zone 40]				14.1%
Zone 40		12.3%	10.0%	19.3%	14.6%	14.1%
Non-Zone 40		16.0%	12.8%	10.5%	14.1%	14.4%
Wholesale Delivery to Elk Grove Water District						3%

As can be anticipated given the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year-to-year and month to month. On average, however, the distribution system loss represents about 14% of the water entering the distribution system.

4.2 Compliance with 2020 Urban Water Use Target

Pursuant to California Water Code Section 10608.24(b)[54], the SCWA must demonstrate its 2020 water use met the GPCD target adopted in its 2015 UWMP. As set forth in the 2015 UWMP, the SCWA's 2020 GPCD target was established as 236 GPCD, derived as the "gross water use" divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under California Water Code Section 10608.20(b). The 2020 actual GPCD must use the same methodology to derive "gross water use" for 2020, then divide by the estimated 2020 population presented in Chapter 2.

As presented in the SCWA's 2015 UWMP, gross water was determined to be the total water supplied, minus water delivered to EGWD. For 2020, one added adjustment is made to account for additional water pumped and supplied to the City of Sacramento as part of the 2020 regional groundwater substitution transfer. This quantity, in addition to the quantity delivered to EGWD are both subtracted from the total as they are not used to meet the SCWA's serviceable population. The calculation, therefore, begins with the total "Potable Water" for 2020 as recorded by the SCWA, which was 50,868 acre-feet that entered the SCWA's distribution system. From this is subtracted 2,572 acre-feet wholesaled to EGWD, and 1,741 acre-feet sent to the City of Sacramento to aid with the transfer. The resulting "gross water use" for 2020 is 46,555 acre-feet. This value represents both the customer deliveries shown in Table 4-2(a) and Table 4-2(b) and the distribution system losses recorded in Table 4-5. As shown in Table 2-2, the SCWA's population in its service areas in 2020 was estimated to be 181,400 (not including the estimated population in the EGWD service area). This results in a calculated 2020 compliance value of 229 GPCD, which is less than the SCWA's established target. Thus, the SCWA is in compliance with CWC Section 10608.24(b). Table 4-6 provides a summary of this calculation.

[53] For 2016, SCWA prepared and submitted one table for all service areas. Beginning in 2017, analysis was submitted separately for Zone 40 from other service areas.

[54] 10608.24. (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

Table 4-6: Demonstration of Compliance with 2020 GPCD Target

2020 Volume into Distribution System =	50,868 acre-feet
Water Delivered to Others =	4,313 acre-feet
2020 Gross Water Use =	46,555 acre-feet
2020 Population =	181,400 people
2020 Actual GPCD =	229
2020 Target GPCD =	236
Compliance Achieved?	Yes

4.3 Demand Management Measures

Pursuant to California Water Code Section 10631(e), SCWA needs to provide a narrative discussion of the water demand management measures it has implemented, is currently implementing, and plans to implement. The historic and on-going measures can help SCWA understand the effectiveness of managing existing customer uses so as to help guide refinements, emphasis, or augmentation that will help position the Agency to best meet its to-be-established water use objective.[55] It should be noted that since SCWA is a retail and wholesale supplier it implements demand management measures with both its retail and wholesale customers.

The Agency's demand management measures are highlighted in this subsection.

4.3.1 Foundational Demand Management Measures

This section describes the foundational demand management measures (DMMs) that underpin the SCWA operations and customer deliveries. These particular DMMs represent adopted ordinances, policies, and long-standing budgeted conservation programs.

Water Waste Prevention Ordinances

SCWA's water code prohibits water waste by ordinance in SCWA Code Title 3 Section 3.40.120. Water use in a negligent or wasteful manner or in violation of the Water Shortage Contingency Plan of the Sacramento County Code, or state law or regulations is prohibited. Water waste can be reported by making a service request through the SCWA website or making a service call. Additionally, SCWA ordinance 3.40.130 prohibits unauthorized use of agency water by making unauthorized connection to the SCWA's water system. Full text of the ordinances can be found on SCWA's website.[56]

[55] Beginning in 2023, all urban water suppliers will be required to begin reporting their use compared to a "Water Use Objective" that is being established pursuant to the recently enacted California Water Code Section 10609.20.
[56] https://countycounsel.saccounty.net/Documents/Title3.pdf

Metering

About 90% of SCWA's retail customers are metered. The SCWA is currently in their last phase of meter installation in the Arden Park Vista service area with completion scheduled for the end of 2025. Part of the retail service area has AMI installed which allows real-time consumption and diagnostic data analysis that can help identify water waste and system loss. Wholesale interconnections that supply Elk Grove Water District are not currently metered due to the large number of interconnections and high cost of metering all of the interconnections. SCWA is investigating how to most efficiently meter all interconnections.

Conservation Pricing

SCWA has offered conservation pricing in accordance with California Urban Water Conservation Council's (CUWCC) 1991 MOU. The Agency continues to reward conservation by providing a conservation discount for metered residential customers in Zone 41. SCWA is also a member of the CUWCC successor organization, California Water Efficiency Partnership (CalWEP).

Public Education and Outreach

SCWA engages its customer base with a number of conservation and demand management outreach programs. Promoting water wise activities, watering schedules, and educational programs such as protecting water supply, are part of the Agency's regular outreach efforts.

In addition to local public education and outreach programs, SCWA also participates in a regional public education and outreach program through the Regional Water Authority. The Regional Water Authority (RWA) is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, El Dorado, Yolo and Sutter counties. In collaboration with 19 water provider members and other wastewater, stormwater and energy partners, RWA formed the Water Efficiency Program (WEP) in 2001 to bring cost effectiveness through economies of scale to public education and outreach activities. The main function of the WEP is to develop and distribute public outreach messages to customers in the region by collaborating with its water provider members. Additionally, the RWA Be Water Smart website[57] offers a comprehensive set of resources for individuals, educators and organizations. The 2020 Be Water Smart End-Year Recap report and detailed information about the regional WEP program, including a table of Regional Rebates and Installations from 2016-2020 is available on the RWA website.[58]

[57] https://bewatersmart.info/

[58] https://rwah2o.org/2019-water-efficiency-program-annual-report-available/

Programs to Assess and Manage Distribution System Real Loss

The SCWA's water loss assessment and management program includes annual water audits and an ongoing leak detection and repair. This includes an ongoing meter calibration and replacement program for all production and distribution meters. The SCWA's activities include:

- Annual water audit and water balance
- Well production meter data collection and validation
- Proactive leak identification and repair in SCWA distribution system
- Customer leak identification and repair assistance: A consulting water auditor assists customers in locating leaks both inside and outside the home or business. Free leak detection kits for residential customers are also offered through the RWEP Be Water Smart program.

Water Conservation Program Coordination and Staffing Support

Implementing and monitoring SCWA's water conservation activities is managed collectively across many staff positions. Ultimately, SCWA's Engineer enforces this water conservation program pursuant to the Sacramento County Code, Title 3, Section 3.40.120, however, SCWA does not have a dedicated Conservation Coordinator. In times of state declared drought, SCWA assigns the following staff to focus on necessary implementation activities:

- Public Information Officer (media/customer inquiry/website updates)
- Senior Civil Engineer (content development/enforcement)
- Associate Civil Engineer (2) (enforcement review/field inspection coordination)
- Assistant Civil Engineer (1) (enforcement processing/tracking/inspection)
- Senior Engineering Technician (3) (enforcement notification/tracking and inspection)
- Engineering Technician Level II (1) (inspection)

4.3.2 Recent DMM Activities

The SCWA implements other demand management measures, both within the SCWA and as a part of the RWA WEP. Table 4-7 describes DMM activities from 2016 through 2020. Program participation, costs and details can be found on SCWA's water conservation website.[59]

4.3.3 Planned DMM Activities

In its commitment to ongoing water conservation and proactive demand management activity, SCWA is developing a new set of programs and actions which will be used to achieve water use objectives in compliance with California Water Code Section 10609.20. Resources will be dedicated in SCWA budget for demand management activities which will help comply with these future water use objectives. Special consideration will be taken regarding changing urban water use patterns in the service area.

[59] https://waterresources.saccounty.net/scwa/Pages/WaterConservation.aspx

Table 4-7: Recent Demand Management Measures

Demand Management Measure	Description
Cash for Grass	Rebate for residential and commercial customers to convert existing grass/turf to native and drought tolerant landscaping
High Efficiency Clothes Washer	Rebate for purchase of a new high efficiency clothes washer
High Efficiency Toilet Rebates	Rebate for purchase of new high efficiency toilet
Home Water Audits	Leak detection and water use reduction
Mandatory Irrigation Guidelines	Weekly watering schedules for residential customers
Enforcement of State Water Board Prohibited Activities	Permanent potable water use restrictions

4.3.4 Wholesale Distribution System Asset Management

The SCWA's water system assets consist of pipelines, groundwater wells, pump stations, storage facilities, the surface water treatment plant, and groundwater treatment plants. The SCWA places a high priority on properly maintaining the water system assets to keep it as reliable as possible. The SCWA has a comprehensive inventory of all its infrastructure assets that is maintained on a database that can be accessed using GIS mapping tools. The SCWA actively assesses the condition of the water system and uses a computerized maintenance management system to help manage the ongoing maintenance of the water system. Asset needs are identified and included in the capital improvement plan that is updated annually.

4.3.5 Wholesale Supplier Assistance Programs

The SCWA and its retail agencies are members of the RWA and Sacramento Groundwater Authority. (SGA). These joint powers authorities provide mutually beneficial programs for member organizations. The SCWA's participation and financial contributions to these programs benefit the agencies to which the SCWA provides wholesale water. The SCWA collaborates on demand management measure implementation, best practices and results with its retail agencies.

4.4 Forecasting Customer Use

Forecasting future water demands begins with understanding existing customer demands and trends, recognizing the additional customers expected through growth, and considering the factors that will influence the water use of both existing and new customer well into the future – especially factors that directly affect the efficiency of water use.

Pursuant to California Water Code 10610.4(c), an urban water supplier "*shall be required to develop water management plans to actively pursue the efficient use of available supplies*." One challenge from this directive is reflecting how the pursuit of efficient use is best represented in the forecast water uses that are the cornerstone of good planning. As required by the Act, the future water uses of both existing customers and those added over the 25-year planning horizon should reflect the "efficient use" of water.

4.4.1 Representing Current Customer Water Use

Tables 4-1(a) through Table 4-1(g) and Tables 4-2(a) and Table 4-2(b) provided the actual monthly customer water use for 2016 through 2020. From this information, an estimate of the representative "current" water use by existing customers has been developed for each service area. Knowing that actual use by existing customers varies slightly year-to-year based on a variety of factors (e.g. total rainfall and the timing of spring rain events impacting when landscape irrigation may begin), the recent data provides a basis for estimating current water use. Applying a slight adjustment to the 2020 single-family customer use data, the remaining 2020 customer use data is used as a proxy for "current" water use for each customer classification, which allows a baseline from which to estimate the future use of these existing customers. Importantly, the 2020 single-family actual use was adjusted in estimating representative "current" water use, since it appears to have been skewed by pandemic conditions during 2020 (see subsection 4.1.2). For purposes of the proxy estimate, the 2020 single-family actual use was decreased by 5% for Zone 40 and for Arden Park Vista service areas.

Table 4-8(a) provides the representative monthly and annual current water use, including distribution system losses for the SCWA's Zone 40 service area. The monthly 2020 values were also rounded for each customer classification and the Zone 40 2020 distribution loss of 14.6% was applied to generate the proxy of total current gross water use.

Table 4-8(b) provides the estimated annual current water use for the remaining service areas. Values in this table were also rounded to reflect proxy values for use in customer forecasting.

Table 4-8(a): Zone 40 Representative Current Retail Water Use (acre-feet)

Use Category		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Current	Single-family Residential	960	980	1,200	1,290	1,850	2,300	2,630	2,710	2,670	2,200	1,910	1,270	21,970
	Multi-family Residential	60	60	60	70	80	100	110	100	100	90	90	70	990
	Commercial	100	100	110	90	90	120	140	150	160	150	140	110	1,460
	Institutional	20	20	30	30	40	60	80	100	80	60	50	30	600
	Industrial	20	30	30	30	30	50	60	60	60	60	50	30	510
	Landscape Irrigation	30	40	170	120	350	570	700	770	680	480	360	130	4,400
	Subtotal	1,190	1,230	1,600	1,630	2,440	3,200	3,720	3,890	3,750	3,040	2,600	1,640	29,930
	Distribution System Loss	203	210	274	279	417	547	636	665	641	520	445	280	5,118
	Total Gross Water Use	1,393	1,440	1,874	1,909	2,857	3,747	4,356	4,555	4,391	3,560	3,045	1,920	35,048

Table 4-8(b): Other Service Area Representative Current Retail Water Use (acre-feet)

Classification	Arden Park Vista	Northgate 880	Metro Air Park	Hood	East Walnut Grove	Southwest Tract
Single-family Residential	2,320	--	--	20	35	6
Multi-family Residential	210	--	--	--	5	15
Commercial	460	660	50	5	10	--
Institutional	30	320	--	--	1	1
Industrial	--	35	--	--	--	--
Landscape Irrigation	40	140	55	--	1	--
Customer Total	3,060	1,155	105	25	52	23
Distribution Loss	500	190	20	4	10	4
System Total	3,560	1,345	125	30	60	30

4.4.2 Factors Affecting Future Customer Use

There are several factors that affect the forecast of future customer use, ranging from State and local landscape regulations, building code requirements, and other water-use mandates, to changes in the types of housing products being offered. These factors are incorporated into determining appropriate per-dwelling unit or per customer connection water demand values for use in forecasting future water needs. Relevant characteristics of the factors are described here.

Water Conservation Objectives

In 2009, Governor Arnold Schwarzenegger signed Senate Bill No. 7 (SBX7-7), which established a statewide goal of achieving a 20 percent reduction in urban per capita water use by 2020 for urban retail water suppliers.[60] As presented previously, the SCWA has met this mandated target.

Furthermore, the efforts undertaken by the SCWA and its customers to meet these targets, as well as efforts throughout the State by other urban retail suppliers, have changed the availability and use of appliances, fixtures, landscapes and other water using features, through changes or additions to ordinances and/or through a continuing "conservation ethic."

In response to the 2013 to 2015 multi-year drought conditions, Governor Brown issued Executive Order B-37-16 in May 2016 entitled "*Making Water Conservation a California Way of Life*." In May 2018, Governor Brown signed into law SB 606 and AB 1668, which imposed additional statutory requirements above and beyond the 20 percent by 2020 target reflected in the 2009 legislation. This is expected to result in continued efforts to increase water use efficiency and ultimately to reduce water demands of existing water users and continue to influence the expected demands of future water users.

[60] California Water Code § 10608.20.

Requirements in California Code

Beginning in January 2010, the California Building Standards Commission adopted the statewide mandatory Green Building Standards Code (hereafter the "CAL Green Code") requiring the installation of water-efficient indoor and outdoor infrastructure for all new projects after January 1, 2011. The CAL Green Code was incorporated as Part 11 into Title 24 of the California Code of Regulations and was revised in 2013 and in 2016 to address changes to the State's Model Water Efficient Landscape Ordinance ("MWELO") adopted during the drought.[61] Revisions to the CAL Green Code in 2019 modified sections to direct users to MWELO regulations contained in other regulatory sections.[62]

The CAL Green Code applies to the planning, design, operation, construction, use and occupancy of every newly constructed or remodeled building or structure. All new residential and non-residential customers must meet the water use requirements of the CAL Green Code as well as the outdoor requirements described by MWELO. The CAL Green Code's requirements generally manifest through: (1) installation of plumbing fixtures and fittings that meet the 20 percent reduced flow rate specified in the CAL Green Code, or (2) by demonstrating a 20 percent reduction in water use from the building "water use baseline."[63] Future customers are expected to satisfy one of these two requirements through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, on-demand water heaters, or other fixtures as well as Energy Star and California Energy Commission-approved appliances.

California Model Water Efficient Landscape Ordinance and County Ordinance

The Water Conservation in Landscaping Act was enacted in 2006, and has since been revised and expanded multiple times by DWR resulting in today's MWELO.[64] In response to Governor Brown's executive order dated April 1, 2015, (EO B-29-15), DWR updated the MWELO and the California Water Commission approved the adoption and incorporation of the updated State standards for MWELO on July 15, 2015. MWELO requires a retail water supplier or a county to adopt the provisions of the MWELO or to enact its own provisions equal to or more restrictive than the MWELO provisions. The changes included a reduction to 55 percent of reference evapotranspiration rates for the maximum amount of water that may be applied to residential landscapes, and non-residential projects to 45

[61] The 2016 Triennial Code Adoption Cycle consisted primarily of the MWELO updates adopted in response to the drought. Indoor infrastructure changes were limited to some minor non-residential fixture changes and changes to the voluntary Tier 1 and Tier 2 requirements. Additionally, the Code was updated to match the new Title 20 Appliance Efficiency Regulations.

[62] The 2019 updated sections to direct CAL Green code users to Title 23 of the California Code of Regulations to allow Title 23 to be the sole location of MWELO requirements.

[63] See CAL Green Code. For Residential construction, Section 4.303.1 provides the residential water conservation standard and Table 4.303.2 identifies the infrastructure requirements to meet this standard. Table 4.303.1 and Worksheets WS-1 and WS-2 are to be used in calculating the baseline and the reduced water use if Option 2 is selected. For non-residential construction, Section 5.303.2.3 provides the water conservation standard as well as the baseline and reduced flow rate infrastructure standards. Note that Worksheets WS-1 and WS-2 incorporate both residential and non-residential fixtures, yet the water use is still to be analyzed by "building or structure" as specified in Chapter 1, Section 101.3.

[64] Gov. Code §§ 65591-65599

percent, which effectively reduces the landscape area that can be planted with high water use plants, such a turf. For residential projects, the allowable maximum coverage of high-water use plants is reduced to 25% of the landscaped area (down from 33%).

The newly updated MWELO also now applies to new construction with a landscape area greater than 500 square feet (the prior MWELO only applied to landscapes greater than 2,500 square feet).[65] Sacramento County's planning department reviews all new development for conformance with these standards as they are in affect for all new developments. This outdoor landscape calculation does not apply to existing landscapes.

Metering, Volumetric Pricing, and Water Budgets

California Water Code section 525 requires water purveyors to install meters on all new service connections after January 1, 1992. California Water Code Section 527 requires water purveyors to charge for water based upon the actual volume of water delivered if a meter has been installed. This action alone is not expected to substantially reduce water use. However, it is anticipated that the retail billing system will encourage and help maintain reasonable use (e.g., through implementation of a tiered rate structure and/or water budgets), so that individual customer water demands are reasonably not expected to increase over time.

4.4.3 Customer Water Use Forecast

The following subsections detail the assumptions used to forecast customer water use and gross water needs for the SCWA water service areas, separated into the needs of (a) existing customers, (b) new customers, (c) Elk Grove Water District Wholesale service, and (d) non-potable uses.

Existing Customer Future Use - Potable

As described in the prior paragraphs, there are many direct and indirect factors that continue to effect urban water use. For the existing customers served by the SCWA, these factors are anticipated to result in some minor continued conservation savings, generally resulting in lower overall demands in the future than those same customers demand today (especially after considering some return to "normal" use as represented in the determination of the current demand values).

To be conservative however, the SCWA only applies a 5% conservation savings to the single-family residential customer classifications. While actual savings may occur in any classification, this method captures the most likely customer class to achieve additional savings through replacement of fixtures and appliances, continued adoption of a conservation ethic, and modifications of irrigated landscapes, and through continued implementation of the SCWA's DMMs. All other current customer use values are maintained into the future, with two notable exceptions:

[65] CCR Title 23, Div. 2, Ch. 27, Sec. 490.1.

- Arden Park Vista – this service area still includes numerous unmetered customer connections. The SCWA is working to meet regulatory requirements to have all of these customers fully metered by 2025. The SCWA has recognized that per-connection water use generally declines once a customer is fully metered and billed based upon the metered consumption. With over 2,000 unmetered single-family connections reflecting the majority of the current use within this service area, SCWA anticipates there will be significant savings as these customers are metered. For conservative purposes, however, this savings is estimated to result in a 15% additional savings for only the single-family residential customers.
- Metro Air Park – this service area is seeing rapid growth in its warehouse, light industrial and commercial land use. As described in the SCWA's 2005 Zone 50 Master Plan,[66] this service area is forecast to have water use of slightly more than 5,000 acre-feet annually. While current demand is only 200 acre-feet, the SCWA is conservatively maintaining the previous water use forecast.

In addition to the small conservation forecast, two additional assumptions are made within Forecast water needs of existing customers is presented in the summary table at the end of this section.

New Customer Future Use - Potable

As described in Chapter 2, growth is primarily expected to occur within the Zone 40 service area with an associated increased demand placed upon the SCWA's water supplies. Forecasting the needs of these future customers is dependent upon the type and number of customer connections and the unit water demand factors associated with each customer connection.

As detailed in Table 2-6, the SCWA has previously defined an anticipated number of new connections at build-out within the SSA, CSA, and NSA, which will include a range of residential and non-residential uses, depending on the varied development proposals already approved (but not yet built) and to be proposed. Residential customers will include both single-family dwelling units built under a variety of densities and multi-family residential dwelling units. Non-residential uses are expected to include a blend of commercial, institutional, industrial and active landscapes, such as parks, in ratios similar to the current residential-to-non-residential connections in each of the Zone 40 subareas. Table 4-9 provides the assumed ratio of total connections spread among customer classifications for each of the Zone 40 subareas. These ratios mimic the existing ratios within each of the Zone 40 subareas.

Forecast water needs for each customer classification are based on new customer water use factors described in the following subsection.

New Residential Customer Water Use Factors

The SCWA anticipates new residential connections will be built in accordance with all applicable building codes including the Cal Green Code discussed previously, and relevant SCWA ordinances.

Distinct demand factors are provided for the following residential uses:

[66] https://waterresources.saccounty.net/scwa/Documents/Z50_MasterPlanDraft.pdf

- Indoor Residential Use – this category identifies the generally anticipated water use for single-family and multi-family dwelling units.
- Outdoor Residential Use – this category addresses the landscape water demands commonly anticipated for the two primary dwelling unit types.

Table 4-9: Anticipated New Zone 40 Connections by Customer Classification by Subarea

Sub Area Classification		Ratio	2025	2030	2035	2040	2045
NSA	Single-family Residential	80%	2,688	5,375	8,063	10,750	13,438
	Multi-family Residential	10%	336	672	1,008	1,344	1,680
	Commercial	8%	269	538	806	1,075	1,344
	Institutional	2%	67	134	202	269	336
	Total Connections	100%	3,359	6,719	10,078	13,438	16,797
CSA	Single-family Residential	95%	3,813	7,625	11,438	15,250	19,063
	Multi-family Residential	2%	80	161	241	321	401
	Commercial	2%	80	161	241	321	401
	Institutional	1%	40	80	120	161	201
	Total Connections	100%	4,013	8,026	12,040	16,053	20,066
SSA	Single-family Residential	95%	1,637	3,275	4,912	4,912	4,912
	Multi-family Residential	1%	17	34	52	52	52
	Commercial	2%	34	69	103	103	103
	Institutional	2%	34	69	103	103	103
	Total Connections	100%	1,724	3,447	5,171	5,171	5,171

For purposes of this UWMP, residential unit water demand factors are described as "the acre-feet of water use annually per dwelling unit" – or acre-feet/dwelling unit ("af/du").

Residential indoor water demands are estimated using an assumed value of 55 gallons-per person per day, multiplied by the assumed occupancy rates for anticipated residential densities for single-family or multi-family classifications in the SCWA. The assumed per-person rate of 55 gallons per day is derived from California Water Code Section 10609.4(a)(3), which states a value of 55 gallons per capita (i.e., per person) per day ("gpcd") be used for estimating indoor residential use targets.[67] If lower standards are required when the growth occurs, the forecast use would be expected to be lower than estimated in this UWMP.

Based on this per-capita assumption, the following indoor per-dwelling unit value is assumed for each new residential unit:

- Single-family residential indoor use: 0.20 acre-feet per year based upon an assumed occupancy of 3.27 people per unit (see Table 2-7).

[67] Water Code Section 10609.4(a) also establishes the indoor residential water use 'standard' to be 52.5 gpcd beginning in 2025 and as low as 50 gpcd by 2030, though the Water Code also provides provisions for the water use target to revert above 50 gpcd. For purposes of this UWMP, the higher value of 55 gpcd is assumed.

- Multi-family residential indoor use: 0.15 based on an assumed occupancy of 2.5 people per unit.

Outdoor residential water use is primarily a factor of lot size and the type and extent of landscaped area. The SCWA's anticipated growth will likely include a range of residential densities (e.g. houses per acre) and therefore an estimated "typical" lot is assumed for purposes of forecasting.

For purposes of this UWMP, each new single-family residential unit is anticipated to have a total gross area of 7,000 square-feet, with 3,500 square-feet anticipated to be irrigable (after accounting for the home footprint, driveways, other hardscapes, and non-irrigated areas). Multi-family units, which have shared common landscape areas, are assumed to have 400 square-feet of irrigable area per unit.

Outdoor demands for new residential dwelling units are calculated based on regulations defined under the MWELO. The MWELO provides for determining the Maximum Applied Water Allowance (MAWA) where the maximum is calculated as 55 percent of the reference evapotranspiration for the area for every square foot of landscaped area, resulting in the following equation:

> *MAWA = (ETo)(0.62)(0.55 x LA), where ETo is the reference evapotranspiration in inches per year, and LA is the landscape area in square-feet. 0.62 is a conversion factor to gallons. The resulting value is in "gallons per year."*

A primary factor in this calculation is evapotranspiration ("ET"). The methodology directs the use of ET from a reference crop, such as maintained grass – a value referred to as ETo. For this UWMP, the ETo is 52.6 inches per year (4.4 feet per year).[68]

Using the MAWA equation, outdoor demand factors for each residential lot category are calculated:

- Single-Family Residential – Anticipated single-family dwellings are conservatively assumed to be constructed on lots averaging 7,000 sf, with an average landscape area of 3,500 sf. The resulting outdoor demand factor is forecast to be 0.20 acre-feet per dwelling unit per year.

- Multi-Family Residential – Anticipated multi-family dwellings will have larger common areas, assumed to equate to 400 sf of landscape area per unit. The resulting outdoor demand factor is forecast to be 0.02 acre-feet per dwelling unit per year.

Combining the assumed indoor and outdoor residential demand factors results in the following estimated use for each new connection:

- Single-Family Residential – 0.20 af/du for indoor plus 0.20 af/du for outdoor combines for an annual demand factor of 0.40 af/du.
- Multi-Family Residential – 0.15 af/du for indoor plus 0.02 af/dur for outdoor combines for an annual demand factor of 0.17 af/du. However, as represented in the WSIP, each multi-family connection represents 10 to 15 dwelling units. For purposes of forecasting water use, the per-

[68] ETo is from the CIMIS Station 235 (Verona) available at: https://cimis.water.ca.gov/Default.aspx

unit value of 0.17 af/du is multiplied by 10 to reflect an annual demand factor of 1.70 af/connection.

New Non-Residential Customer Water Use Factors

Non-residential per-connection demand factors were also estimated for purposes of forecasting the water needs of anticipated commercial, institutional, industrial and irrigated landscape customers.

For purposes of this 2020 UWMP, demand factors were developed for two categories of non-residential use: Commercial, institutional, and industrial (CII), and Irrigated Landscape.

- CII Connections – this customer classification includes a wide array of different uses from neighborhood retail centers, to large retail centers, to office and government buildings, to light and even heavy industrial uses. To reflect this variety, each CII connection is assumed to occupy 2 gross acres, including hardscapes (e.g. parking), buildings, and ornamental landscaping. An estimated use of 1 acre-foot per gross acre is assumed, resulting in a per-connection factor of 2 acre-feet/connection.
- Irrigated Landscape – this classification includes passive and active parks, streetscapes, and other dedicated landscape areas. Each landscape connection is assumed to reflect 4 gross acres, with an average annual water need of 3.5 acre-feet per acre. This results in an estimated annual demand factor of 15 acre-feet per connection.

Elk Grove Water District Wholesale Service

The SCWA provides potable water supplies to Elk Grove Water District (EGWD) for its use in its Service Area 2. As indicated in Table 4-3, the SCWA delivers around 2,500 acre-feet for use by EGWD to directly meet customer needs. The forecast wholesale deliveries are provided in Table 4-10(a) and are based on coordination with Elk Grove Water District.

Non-Potable Uses

SCWA is currently serving its Phase 1 non-potable demands but plans to serve the non-potable demands included in its Phase 2 recycled water development plan. Although the exact progression of these demands manifesting is not precisely known, SCWA anticipates having 3,300 acre-feet of non-potable demand in its Phase 1 and Phase 2 areas served by recycled water supplies by 2045. For purposes of this UWMP, this growth is equally distributed over the planning horizon.

4.4.4 Summary of Forecast Water Use

Based upon the estimated water use of the existing and new customers, SCWA anticipates a doubling of use in Zone 40. With the exception of Metro Air Park, which is anticipated to see water use grow five-fold, SCWA anticipates nominal to no changes throughout the remaining service areas. Table 4-10(a) presents the forecast customer water use in Zone 40, including wholesale deliveries to EGWD. Although the forecast is presented on an annual basis in 5-year increments through 2045, the monthly pattern is

expected to mimic the current monthly pattern detailed in prior tables. This characterization is important when evaluating the SCWA's water service reliability as detailed in Chapter 5.

Table 4-10(a): Zone 40 Forecast Potable Water Use (acre-feet)

Classification	2025	2030	2035	2040	2045
Single-family Residential	22,988	22,957	22,925	22,894	22,862
Multi-family Residential	1,002	1,002	1,002	1,002	1,002
Commercial	1,462	1,462	1,462	1,462	1,462
Industrial	515	515	515	515	515
Institutional and Governmental	607	607	607	607	607
Landscape Irrigation	4,395	4,395	4,395	4,395	4,395
SFR Future	3,255	6,510	9,765	12,365	14,965
MFR Future	737	1,474	2,211	2,918	3,626
CII Future	767	1,534	2,301	2,999	3,697
Landscape Irrigation - Future	2,127	4,254	6,381	7,991	9,600
Elk Grove Annexation Area	692	1,383	1,383	1,383	1,383
Wholesale to EGWD	2,568	2,668	2,768	2,868	3,072
Customer Water Use Subtotal	41,115	48,761	55,715	61,399	67,187
Distribution System Water Loss	5,120	5,733	6,290	6,744	7,201
2020 Total Gross Water Use	46,235	54,494	62,006	68,143	74,388

As previously discussed, growth is not expected in the other service areas except for the Metro Air Park service area. Table 4-10(b) through Table 10(g) represents the anticipated annual forecast water use for 2025 through 2045 by each subarea reflecting the anticipated conditions in each service area.

Table 4-10(b): Arden Park Vista Forecast Potable Water Use (acre-feet)

	2025	2030	2035	2040	2045
Single Family Residential	2,221	2,170	2,102	2,034	2,017
Multi-Family Residential	213	213	213	213	213
Commercial/Institutional	491	491	491	491	491
Landscape Irrigation	43	43	43	43	43
Customer Total	2,967	2,916	2,849	2,781	2,764
Distribution System Water Loss	486	478	467	456	453
Total Gross Water Use	3,454	3,394	3,315	3,237	3,217

Table 4-10(c): Northgate 880 Forecast Potable Water Use (acre-feet)

	2025	2030	2035	2040	2045
Commercial/Institutional	978	978	978	978	978
Industrial	35	35	35	35	35
Landscape Irrigation	139	139	139	139	139
Customer Total	1,151	1,151	1,151	1,151	1,151
Distribution System Water Loss	214	214	214	214	214
Total Gross Water Use	1,365	1,365	1,365	1,365	1,365

Table 4-10(d): Metro Air Park Forecast Potable Water Use (acre-feet)

	2025	2030	2035	2040	2045
Commercial/Industrial	1,029	2,059	3,088	4,118	5,147
Landscape Irrigation	55	55	55	55	48
Customer Total	1,084	2,114	3,143	4,172	5,195
Distribution System Water Loss	108	211	314	417	520
Total Gross Water Use	1,193	2,325	3,457	4,590	5,715

Table 4-10(e): Hood Water Maintenance District Forecast Potable Water Use (acre-feet)

	2025	2030	2035	2040	2045
Single Family Residential	22	22	22	22	22
Commercial/Institutional	5	5	5	5	5
Customer Total	27	27	27	27	27
Distribution System Water Loss	4	4	4	4	4
Total Gross Water Use	31	31	31	31	31

Table 4-10(f): East Walnut Grove Forecast Potable Water Use (acre-feet)

	2025	2030	2035	2040	2045
Single Family Residential	36	36	36	36	36
Multi-Family Residential	5	5	5	5	5
Commercial/Institutional	9	9	9	9	9
Landscape Irrigation	1	1	1	1	1
Customer Total	51	51	51	51	51
Distribution System Water Loss	5	5	5	5	5
Total Gross Water Use	56	56	56	56	56

Table 4-10(g): Southwest Tract Forecast Potable Water Use (acre-feet)

	2025	2030	2035	2040	2045
Single Family Residential	6	6	6	6	6
Multi-Family Residential	14	14	14	14	14
Commercial/Institutional	1	1	1	1	1
Customer Total	21	21	21	21	21
Distribution System Water Loss	3	3	3	3	3
Total Gross Water Use	24	24	24	24	24

Table 4-10(h): Zone 40 Non-Potable Forecast Water Use (acre-feet)

	2025	2030	2035	2040	2045
Recycled Water System	1,420	1,890	2,360	2,830	3,300

Table 4-11 presents a complete summary of the entire customer water forecast on the SCWA water assets. This is the summation of values in Table 4-10(a) through 4-10(h).

Table 4-11: Total SCWA Forecast Water Use (acre-feet)

Service Area	2025	2030	2035	2040	2045
Zone 40	46,235	54,494	62,006	68,143	74,388
Arden Park Vista	3,454	3,394	3,315	3,237	3,217
Northgate 880	1,365	1,365	1,365	1,365	1,365
Metro Air Park	1,193	2,325	3,457	4,590	5,715
Hood	31	31	31	31	31
East Walnut Grove	56	56	56	56	56
Southwest Tract	24	24	24	24	24
Total Potable Water Use	52,358	61,690	70,254	77,446	84,796
Non-Potable Water Use	1,420	1,890	2,360	2,830	3,300
Total Water Use	53,778	63,580	72,614	80,276	88,096

4.4.5 Adjusting Water Use Forecasts for Single-Dry and Multiple Dry Conditions

The demand forecasts presented in the prior subsections represent expected water needs under normal hydrologic conditions. To credibly forecast potential maximum future water use, the forecasted normal-year water uses must be modified to reflect anticipated increases in demand during drier conditions.

Conservative modifications to the forecasted normal year water use to more likely reflect use conditions during drier and dry years are warranted to help adequately address water service reliability in Chapter 5. For purposes of this UWMP, the following adjustment is made:

- Single dry year: Landscape irrigation needs would increase to reflect the generalized earlier start of the landscape irrigation season due to limited rainfall in the single driest year. Since this

increase only applies to the outdoor portion of a customer's forecast use, an adjustment factor of 5% is applied to the total normal-year forecasts to conservatively reflect the expected increase in demand for water for landscaping.

- Multiple dry years: During multiple dry years, demands are also expected to increase similar to the single dry year. For multiple dry year conditions, the single dry year increase of 5% is held in each of the subsequent years such that each is 5% greater than the normal year condition. This is representative of an "unconstrained demand" as should be represented when evaluating whether Water Shortage Contingency Plan actions may be warranted.[69]

These values are reflected in tables provided for the Drought Risk Assessment and Annual Reliability Assessment presented in later subsections.

4.4.6 Climate Change Considerations

Including climate change into a water use analysis aids in understanding the potential effects on long-term reliability, which in turn, allows the SCWA to proactively begin planning appropriate responses. For example, hotter and drier weather may lead to an increased demand in landscape irrigation, especially during spring and fall months, increasing the pressure on water supplies that may have availability restrictions during these periods.

This potential is reflected in the consideration of the single dry year increase of 5% that is used for the water service reliability analysis, as discussed previously. Whether the elevated single dry year water forecast becomes more akin to the "normal" demand will become more apparent as SCWA continues to assess monthly water use trends throughout all of its service areas.

4.5 Forecasting Water Use for the DRA and Annual Assessment

The California Legislature created two new UWMP requirements to help suppliers assess and prepare for drought conditions: the Drought Risk Assessment,[70] and the Annual Water Supply and Demand Assessment.[71] These new planning requirements were established in part because of the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change.

The Drought Risk Assessment (DRA) requires assessing water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.

As a slight variant, the Annual Water Supply and Demand Assessment (Annual Assessment) undertakes a similar analytical exercise as the DRA but is to focus on actual, and not hypothetical, conditions

[69] California Water Code Section 10632(a)(2) states water suppliers should use "unconstrained demand" when performing their annual water supply and demand assessment.
[70] California Water Code Section 10635(b)
[71] California Water Code Section 10632.1

anticipated for the upcoming water year. The previously presented water use forecasts facilitate both of these planning exercises as described in the following subsections.

4.5.1 Projecting Water Use for 5-year Drought Risk Assessment

A critical component of new statutory language for the 2020 UWMP cycle is the requirement to prepare a five-year DRA using a supplier-defined hypothetical drought conditions expected to occur from 2021 through 2025. This drought condition is meant to allow suppliers to test the resiliency of their water supply portfolio and their Water Shortage Contingency Plan actions to meet severe conditions.

DWR recommends that suppliers first estimate expected water use for the next five years without drought conditions (also known as unconstrained demand). In other words, unconstrained demand is water demand absent any water supply restrictions and prior to implementing any short-term WSCP demand reduction actions. These estimates would then be adjusted to estimate the five-years' cumulative drought effects. If normal water use includes water conservation programs, either currently implemented or planned for implementation, estimated water use values would incorporate the effect of those conservation programs when reporting projected water use.

Total water use for 2021, for example, is developed by modifying the water use representation for "current" conditions (see Table 4-8(a) and Table 4-8(b)) taking into consideration the anticipated factors affecting water use, with each subsequent year further adjusted, as appropriate. Year-to-year adjustments reflect several factors SCWA anticipates may occur, including increases from growth and decreases from long-term conservation savings. To make these adjustments, the difference in annual water use between the "current" condition and the forecast use in 2025 is prorated equally across each of the years 2021 through 2025, so that the same 2025 forecast water use is matched.

With an initial annual estimate, each year is further adjusted to reflect anticipated increases in the "unconstrained demand" during a single dry year. As noted previously, this is reflected by applying a 5% increase to the total estimated demand.

Table 4-12(a): Zone 40 Forecast DRA Water Use for 2021 through 2025 (acre-feet)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2021	1,696	1,744	2,271	2,296	3,458	4,530	5,273	5,556	5,311	4,309	3,689	2,319	42,452
2022	1,757	1,806	2,352	2,378	3,582	4,693	5,462	5,755	5,502	4,463	3,822	2,403	43,976
2023	1,818	1,869	2,434	2,460	3,706	4,856	5,652	5,955	5,692	4,618	3,954	2,486	45,499
2024	1,879	1,931	2,516	2,543	3,831	5,018	5,841	6,154	5,883	4,772	4,086	2,569	47,023
2025	1,939	1,994	2,597	2,625	3,955	5,181	6,030	6,354	6,074	4,927	4,219	2,652	48,547

Table 4-12(b): Other Service Areas Forecast DRA Water Use for 2021 through 2025 (acre-feet)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2021	216	273	319	348	521	643	744	739	655	590	414	275	5,738
2022	218	273	319	351	523	648	753	752	677	623	449	291	5,877
2023	220	273	320	354	524	654	762	764	699	655	484	307	6,016
2024	222	273	320	357	526	659	771	776	720	688	518	324	6,155
2025	224	273	321	360	528	664	780	789	742	720	553	340	6,293

4.5.2 Projecting Water Use for Annual Reliability Assessments

SCWA will need to perform an Annual Assessment and submit the findings to DWR beginning in 2022. To evaluate the plausible water service reliability conditions for 2021 or 2022, described in Chapter 5, requires two separate representative "current" water use conditions to be developed. The first condition uses the "current" water use characterization included in Table 4-8(a) and 4-8(b). These demands represent the water use under a normal condition. Alternatively, a "single-dry year current" forecast is also calculated to provide SCWA with representative current unconstrained demands. This second characterization of current water use applies the same single-dry year adjustment described previously, represented by a 5% increase in the current water use values. Table 13(a) provides the Normal Year and Single Dry Year current water use for the Zone 40 water service area. Table 13(b) provides these same values for the other six water service areas. These values are used in Chapter 5.

Table 4-13(a): Zone 40 Normal and Single Dry Year "Current" Water Use (acre-feet)

Year Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Normal	1,557	1,601	2,085	2,108	3,175	4,160	4,842	5,101	4,876	3,956	3,387	2,130	38,979
Single Dry	1,635	1,681	2,189	2,213	3,334	4,368	5,084	5,357	5,120	4,154	3,557	2,236	40,928

Table 4-13(b): Other Service Areas Normal and Single Dry Year "Current" Water Use (acre-feet)

Year Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Normal	208	265	309	334	500	614	708	701	612	539	368	251	5,408
Single Dry	218	278	324	351	525	645	743	736	642	566	386	264	5,678

4.6 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, retail suppliers are required to include the projected water use for lower income households in 2020 UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household has an income below 80 percent of area median income, adjusted for family size. For purposes of this UWMP, annual median income was derived from 2019 U.S. Census Bureau and determined to be $72,017 for Sacramento County for approximately 560,000 county earners.[72]

[72] This data is from the Household Income in the Past 12 Months (In 2019 Inflation-adjusted Dollars) American Community Survey 1-year estimates. https://censusreporter.org/profiles/05000US06067-sacramento-county-ca/#income

Therefore, 80% of this is estimated to be about $57,600 per year. Based upon the median income dataset, approximately 40% of the earning population is at or below this earning level.

Absent more specific data correlating to SCWA's water service areas, this low-income percentage is applied to the total number of households within SCWA, resulting in an estimated number of existing and future new connections attributed to low-income households. As detailed previously, SCWA anticipates a total number of new residential connections over the planning horizon – representing both single-family and multiple family. The vast majority of new residential connections are expected within the Zone 40 service area. Therefore, for purposes of estimating the number of new low-income households, this County's overall low-income household percentage is applied to the expected new Zone 40 residential connections shown in Table 4-9 – resulting in an estimate of low-income households for each 5-year period to 2045. Using the demand factors presented in subsection 4.4.3, a demand for the new single-family to multiple family low-income households can be estimated. The resulting estimate is presented in Table 4-14.

Table 4-14: Estimated Low-Income Water Use Forecast (acre-feet)

	2025	2030	2035	2040	2045
Low-income Water Use Forecast	10,119	11,451	12,782	13,857	14,931
% of Zone 40 Water Use Forecast	25%	23%	23%	23%	22%

Chapter 5
Water System Reliability

This chapter provides the Sacramento County Water Agency's (SCWA) water system reliability findings as required under Water Code Section 10635 and provides reliability information the SCWA could use in completing an annual supply and demand assessment pursuant to Water Code Section 10632.1.

Assessing water service reliability is the fundamental purpose for SCWA in preparing its 2020 UWMP. Water service reliability reflects SCWA's ability to meet the water needs of its customers, including end-use customers and retail urban suppliers, with water supplies under varying conditions. SCWA's UWMP considers the reliability of meeting customer water use by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact SCWA's water supply and its customers' water uses. The reliability assessment looks beyond SCWA's past experience and considers what could be reasonably foreseen in the future. This chapter synthesizes the details imbedded in the Chapters 3 and 4 and provides a rational basis for future decision-making related to supply management, demand management, and project development. This chapter presents three system reliability findings:

- Five Year Drought Risk Assessment: The 2021 through 2025 Drought Risk Assessment (DRA) for all of SCWA's service areas
- Long-Term Service Reliability: The reliability findings for a Normal Year, Single Dry Year, and Five Consecutive Drought Years in five-year increments through 2045
- Annual Reliability Assessment: The reliability findings for an existing condition for both a Normal Year and Single Dry Year that can inform an annual supply and demand assessment for 2021 or 2022.

In short, SCWA has reliable water supplies available in all of its service areas.

5.1 Five Year Drought Risk Assessment

The Drought Risk Assessment is a new requirement for the 2020 UWMP cycle. The DRA requires a methodical assessment of water supplies and water uses under an assumed drought period that lasts five consecutive years. SCWA has prepared an independent monthly assessment of the water supplies and demands for its Zone 40 system because of the monthly variability associated with the surface water supplies that are used to serve that system. Moreover, SCWA has incorporated other constraints in its Zone 40 system, like infrastructure constraints at its pumping and treatment facilities, which may also influence the near-term management of Zone 40's water asset portfolio.

In SCWA's other service areas, the sources of water are less susceptible to hydrological and regulatory conditions. As such, the SCWA service areas beyond Zone 40 analyze their drought risks on a yearly basis. The following details the Zone 40 DRA as well as a combined DRA for SCWA's other service areas.

5.1.1 Zone 40 Drought Risk Assessment

Zone 40 has a unique water supply portfolio and system operations. Zone 40 currently has access to six sources of supply and anticipates access to two additional sources of supply by 2025. This diverse water supply portfolio creates a water management structure that requires careful consideration of hydrological, regulatory, and institutional variability. Specifically, some water assets are particularly susceptible to drought while other water assets have varying degrees of reliability based upon regulatory constraints and historical water use. Nevertheless, SCWA has organized and coordinated its Zone 40 water portfolio management to ensure water supply reliability in the event of a severe drought. The Zone 40 DRA represents a consolidation of its surface and groundwater water supplies into an organized monthly management action.

Table 5-1 below shows SCWA's Zone 40 DRA that integrates all of its supplies for 2021 through 2025 as described in Chapter 3 and reflects the dry year unconstrained water uses described in Chapter 4. As the table shows, SCWA has surplus water assets available in all months under its prescribed water management protocol.

Table 5-1: Zone 40 Five Year Drought Risk Assessment

Five Year Drought		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2021	Supply	9,678	9,689	10,086	10,182	6,562	7,491	8,166	8,403	8,239	7,377	11,455	10,214	107,542
	Demand	1,696	1,744	2,271	2,296	3,458	4,530	5,273	5,556	5,311	4,309	3,689	2,319	42,452
	Difference	7,982	7,946	7,815	7,886	3,104	2,961	2,893	2,847	2,928	3,069	7,765	7,895	65,090
2022	Supply	9,678	9,689	10,086	10,182	5,664	6,593	7,267	7,505	7,340	6,479	5,936	10,214	96,633
	Demand	1,757	1,806	2,352	2,378	3,582	4,693	5,462	5,755	5,502	4,463	3,822	2,403	43,976
	Difference	7,921	7,883	7,733	7,804	2,081	1,900	1,805	1,749	1,838	2,016	2,115	7,812	52,657
2023	Supply	9,678	9,689	10,086	3,934	4,934	5,863	6,537	6,775	6,610	5,749	5,206	10,214	85,274
	Demand	1,818	1,869	2,434	2,460	3,706	4,856	5,652	5,955	5,692	4,618	3,954	2,486	45,499
	Difference	7,860	7,820	7,652	1,473	1,227	1,007	886	820	918	1,131	1,252	7,728	39,775
2024	Supply	9,678	9,689	10,086	10,182	5,163	6,092	6,767	7,004	6,840	5,979	5,436	10,214	93,129
	Demand	1,879	1,931	2,516	2,543	3,831	5,018	5,841	6,154	5,883	4,772	4,086	2,569	47,023
	Difference	7,799	7,758	7,570	7,639	1,333	1,074	926	850	957	1,206	1,350	7,645	46,106
2025	Supply	9,678	9,689	10,086	10,182	6,053	6,982	7,657	7,894	7,730	6,868	11,455	10,214	104,488
	Demand	1,939	1,994	2,597	2,625	3,955	5,181	6,030	6,354	6,074	4,927	4,219	2,652	48,547
	Difference	7,738	7,695	7,489	7,557	2,098	1,801	1,627	1,540	1,656	1,941	7,236	7,562	55,940

5.1.2 Drought Risk Assessment for Other Service Areas

SCWA operates water systems in the other six service areas that are wholly independent from the surface and groundwater supplies that are used to serve Zone 40. As described in detail in other chapters of this 2020 UWMP, these service areas are: Arden Park Vista, Northgate 880, Metro Air Park, Southwest Tract, Hood Water Maintenance District (Hood), and East Walnut Grove. These six systems have independent water supplies. The supplies in these systems are mostly generated from groundwater assets. These groundwater assets are generally surplus to the needs of the individual water systems as discussed in Chapter 3. The Metro Air Park area is served through a contract with the City of Sacramento and has sufficient reliability to meet its long-term demands. Water use for the DRA condition reflects the dry year unconstrained demands anticipated necessary to meet the forecast water needs of customers in each of these service areas, as described in Chapter 4.

Table 5-2 below shows SCWA's DRA for 2021 through 2025 for the six service areas that are outside of Zone 40. The table combines the water supplies and demands from all six of these service areas because none of them demonstrate a monthly water deficiency. As such, combining the supplies and demands provides a more succinct assessment of each system's drought risk. Importantly, however, each system's supplies and demands are independently characterized in separate sections of this chapter as well as Chapters 3 and 4.

Table 5-2: Six Service Areas Five Year Drought Risk Assessment

Five Year Drought		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2021	Supply	216	273	319	348	521	643	744	739	655	590	414	275	5,738
	Demand	216	273	319	348	521	643	744	739	655	590	414	275	5,738
	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	Supply	218	273	319	351	523	648	753	752	677	623	449	291	5,877
	Demand	218	273	319	351	523	648	753	752	677	623	449	291	5,877
	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	Supply	220	273	320	354	524	654	762	764	699	655	484	307	6,016
	Demand	220	273	320	354	524	654	762	764	699	655	484	307	6,016
	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	Supply	222	273	320	357	526	659	771	776	720	688	518	324	6,155
	Demand	222	273	320	357	526	659	771	776	720	688	518	324	6,155
	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	Supply	224	273	321	360	528	664	780	789	742	720	553	340	6,293
	Demand	224	273	321	360	528	664	780	789	742	720	553	340	6,293
	Difference	0	0	0	0	0	0	0	0	0	0	0	0	0

5.2 Long Term Service Reliability

The Urban Water Management Planning Act directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2020 UWMP Guidebook recommends extending that period to 25 years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The following subsections describe the long-term water service reliability for Zone 40 and for the SCWA's other service areas through a 25 year planning horizon.

5.2.1 Zone 40 Long Term Potable Service Reliability

SCWA's long term service reliability for Zone 40 reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2020 through 2045.

Zone 40 Normal and Single Dry Conditions 2025-2045

Zone 40 future water supplies in normal and single dry conditions reflect the same hydrological, regulatory, and institutional criteria described in previous sections. In normal years, supplies are generally constrained only by their express limiting features. In dry years, additional hydrological, regulatory, and institutional issues will constrain the availability of water. However, future water supplies tend to grow in annualized volumes as annualized demands grow in parallel. All of this information is described in detail in Chapter 3 and is reflected in the tables below.

Zone 40 future water demands in normal and single dry conditions through 2045 reflect the same considerations described in previous sections of this chapter. In normal conditions, demands tend to reflect anticipated uses based upon normal hydrological conditions. But in dry conditions, demands increase to reflect dry conditions and additional application of water for outdoor irrigation. Future water demands are generally predicted to increase as land uses and populations within SCWA's Zone 40 area grow. All of this information is detailed in Chapter 4 and reflected in the numbers shown in the tables below.

Table 5-3 shows the normal year supplies and demands on an annual timestep from 2025 through 2045.

Table 5-3: Normal and Single Dry Year Water Supply and Demand in SCWA's Zone 40 through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	159,096	164,096	174,096	174,096	174,096
Demand	46,235	54,494	62,006	68,143	74,388
Difference	112,861	109,602	112,090	105,953	99,708

Single Dry Year	2025	2030	2035	2040	2045
Supply	87,199	92,676	103,926	105,176	107,676
Demand	48,547	57,219	65,106	71,551	78,107
Difference	38,652	35,457	38,820	33,625	29,569

Zone 40 Multiple Dry Years Reliability 2025 – 2045

SCWA defines drought condition lasting five consecutive years as one that constrains SCWA from obtaining some of its water supplies in its Zone 40 water supply portfolio due to hydrological, regulatory, and institutional constraints. These conditions include more restrictive regulatory constraints on its water rights, constrained conditions for its water supply contracts, yet no limitations on its ability to access groundwater resources. The restrictive conditions manifest in changes to the availability of SCWA's water assets on a monthly timestep. Moreover, these restrictive conditions also impact the increased uses of available supplies in the future that are associated with land use and population growth. These conditions are described in significant detail in Chapter 3 and reflected in the monthly tables below.

Five consecutive dry year demands include the anticipated demands based upon historical trends in water usage in drought conditions by SCWA's customers. Demands in extended dry conditions may increase as hydrological conditions generate additional customer uses for outdoor irrigation. As droughts persist, however, demands may decline as the realistic constraints on supply availability are realized at the customer level. Out of an abundance of caution to ensure supplies are available to meet projected demands, the fluctuating demand pattern is not reflected in this future reliability assessment. The gradual increase in demands also account for reasonable water conservation measures derived from improved efficiencies in indoor fixtures, improved management of outdoor landscape irrigation, and a general awareness of the value of long-term water conservation at the consumer level. In addition, the future dry conditions reflect increased land use and populations that would rely upon available supplies. These variable monthly conditions are described in significant detail in Chapter 4 and reflected in the tables below.

Table 5-4 below shows the water supply and demand conditions for SCWA's Zone 40 service area in five consecutive dry years from 2025 through 2045.

Table 5-4: Zone 40 Multiple Dry Year Reliability through 2045

Five Year Drought		2025	2030	2035	2040	2045
Year 1	Supply	111,954	118,386	132,136	135,886	143,386
	Demand	48,547	57,219	65,106	71,551	78,107
	Difference	63,407	61,167	67,030	64,335	65,279
Year 2	Supply	99,576	105,531	118,031	120,531	125,531
	Demand	48,547	57,219	65,106	71,551	78,107
	Difference	51,029	48,312	52,925	48,980	47,424
Year 3	Supply	87,199	92,676	103,926	105,176	107,676
	Demand	48,547	57,219	65,106	71,551	78,107
	Difference	38,652	35,457	38,820	33,625	29,569
Year 4	Supply	95,054	100,531	111,781	113,031	115,531
	Demand	48,547	57,219	65,106	71,551	78,107
	Difference	46,507	43,312	46,675	41,480	37,424
Year 5	Supply	107,431	113,386	125,886	128,386	133,386
	Demand	48,547	57,219	65,106	71,551	78,107
	Difference	58,884	56,167	60,780	56,835	55,279

5.2.2 Long Term Non-Potable Water Service in Zone 40

As described in Chapter 3, SCWA has a contract to obtain non-potable water supplies from Sacramento Regional County Sanitation District (SRCSD) to meet demands in a portion of SCWA's Zone 40 service area. These water supplies are wholly derived from indoor water uses throughout SRCSD's service area. This area includes significant areas that are beyond SCWA's Zone 40. As such, these non-potable water supplies are 100% reliable in normal, single dry, and five consecutive dry years from the 2020 through the 2045 planning horizon. Tables 5-5, 5-6, 5-7, and 5-8 shows the water supply reliability of SCWA's Zone 40 non-potable supply through 2045.

Table 5-5: Normal and Single Dry Non-Potable Water Supply and Demand in SCWA's Zone 40

Normal Year	Current
Supply	3,921
Demand	962
Difference	2,959

Single Dry Year	Current
Supply	3,921
Demand	1,010
Difference	2,911

Table 5-6: Five Consecutive Dry Non-Potable Water Supply and Demand in SCWA's Zone 40 through 2025

Five Year Drought	2021	2022	2023	2024	2025
Supply	3,921	3,921	3,921	3,921	3,921
Demand	1,010	1,010	1,010	1,010	1,010
Difference	2,911	2,911	2,911	2,911	2,911

Table 5-7: Normal and Single Dry Year Non-Potable Water Supply and Demand in SCWA's Zone 40 through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	3,921	3,921	3,921	3,921	3,921
Demand	1,420	1,890	2,360	2,830	3,300
Difference	2,501	2,031	1,561	1,091	621

Single Dry Year	2025	2030	2035	2040	2045
Supply	3,921	3,921	3,921	3,921	3,921
Demand	1,420	1,890	2,360	2,830	3,300
Difference	2,501	2,031	1,561	1,091	621

Table 5-8: Five Consecutive Dry Years Non-Potable Water Supply and Demand in SCWA's Zone 40 through 2045

Five Year Drought		2025	2030	2035	2040	2045
Year 1	Supply	3,921	3,921	3,921	3,921	3,921
	Demand	1,420	1,890	2,360	2,830	3,300
	Difference	2,501	2,031	1,561	1,091	621
Year 2	Supply	3,921	3,921	3,921	3,921	3,921
	Demand	1,420	1,890	2,360	2,830	3,300
	Difference	2,501	2,031	1,561	1,091	621
Year 3	Supply	3,921	3,921	3,921	3,921	3,921
	Demand	1,420	1,890	2,360	2,830	3,300
	Difference	2,501	2,031	1,561	1,091	621
Year 4	Supply	3,921	3,921	3,921	3,921	3,921
	Demand	1,420	1,890	2,360	2,830	3,300
	Difference	2,501	2,031	1,561	1,091	621
Year 5	Supply	3,921	3,921	3,921	3,921	3,921
	Demand	1,420	1,890	2,360	2,830	3,300
	Difference	2,501	2,031	1,561	1,091	621

5.2.3 Long Term Water Supply Reliability in Remaining Service Areas

SCWA operates water systems in other six service areas that are wholly independent from the surface and groundwater supplies that are used to serve Zone 40 described in the previous section. These service areas are: Arden Park Vista, Northgate 880, Metro Air Park, Southwest Tract, Hood, and East Walnut Grove. These six systems have independent water supplies. The supplies in these systems are mostly generated from groundwater assets. These groundwater assets are generally surplus to the needs of the individual water systems. The Metro Air Park area is served through a contract with the City of Sacramento and has sufficient reliability to meet its long-term demands. The following is a summary of the six service areas water supply reliability for a normal, single dry year, and for five consecutive dry years from 2025 through 2045.

Metro Air Park

The Metro Air Park area is wholly served by the City of Sacramento through the 2004 water supply contract as described in Chapter 3. This contract could provide up to 11.7 mgd of supply to the Metro Air Park under varying conditions to meet demands. The water supplies under this contract are available to meet the Metro Air Park demands under all conditions through 2045. Tables 5-9 and 5-10 show the long-term supply reliability for the Metro Air Park.

Table 5-9: Normal and Single Dry Year Water Supply and Demand in SCWA's Metro Air Park through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	1,193	2,325	3,457	4,590	5,715
Demand	1,193	2,325	3,457	4,590	5,715
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	1,252	2,441	3,630	4,819	6,000
Demand	1,252	2,441	3,630	4,819	6,000
Difference	0	0	0	0	0

Table 5-10: Five Consecutive Dry Years Water Supply and Demand in SCWA's Metro Air Park through 2045

5-Yr Drought		2025	2030	2035	2040	2045
Year 1	Supply	1,252	2,441	3,630	4,819	6,000
	Demand	1,252	2,441	3,630	4,819	6,000
	Difference	0	0	0	0	0
Year 2	Supply	1,252	2,441	3,630	4,819	6,000
	Demand	1,252	2,441	3,630	4,819	6,000
	Difference	0	0	0	0	0
Year 3	Supply	1,252	2,441	3,630	4,819	6,000
	Demand	1,252	2,441	3,630	4,819	6,000
	Difference	0	0	0	0	0
Year 4	Supply	1,252	2,441	3,630	4,819	6,000
	Demand	1,252	2,441	3,630	4,819	6,000
	Difference	0	0	0	0	0
Year 5	Supply	1,252	2,441	3,630	4,819	6,000
	Demand	1,252	2,441	3,630	4,819	6,000
	Difference	0	0	0	0	0

Southwest Tract

The Southwest Tract service area is wholly served by groundwater derived from a contract signed in 1970 with Fruitridge Vista Water Company. The contract has no constraints on reliability for the Southwest Tract and there have never been curtailments in supply reliability to the Southwest Tract. Accordingly, the groundwater supplies that are delivered under this agreement are available to meet the Southwest Tract demands under all conditions through 2045. Tables 5-11 and 5-12 show the long-term supply reliability for the Southwest Tract.

Table 5-11: Normal and Single Dry Year Water Supply and Demand in SCWA's Southwest Tract through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	23	23	23	23	23
Demand	23	23	23	23	23
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	24	24	24	24	24
Demand	24	24	24	24	24
Difference	0	0	0	0	0

Table 5-12: 5 Consecutive Dry Year Water Supply and Demand in SCWA's Southwest Tract through 2045

5-Yr Drought		2025	2030	2035	2040	2045
Year 1	Supply	24	24	24	24	24
	Demand	24	24	24	24	24
	Difference	0	0	0	0	0
Year 2	Supply	24	24	24	24	24
	Demand	24	24	24	24	24
	Difference	0	0	0	0	0
Year 3	Supply	24	24	24	24	24
	Demand	24	24	24	24	24
	Difference	0	0	0	0	0
Year 4	Supply	24	24	24	24	24
	Demand	24	24	24	24	24
	Difference	0	0	0	0	0
Year 5	Supply	24	24	24	24	24
	Demand	24	24	24	24	24
	Difference	0	0	0	0	0

Arden Park Vista

The Arden Park Vista service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the Arden Park Vista service area. Accordingly, the groundwater supplies are available to meet the Arden Park Vista demands under all conditions through 2045. Tables 5-13 and 5-14 show the long-term supply reliability for Arden Park Vista service area.

Table 5-13: Normal and Single Dry Year Water Supply and Demand in SCWA's Arden Park Vista through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	3,454	3,395	3,316	3,237	3,217
Demand	3,454	3,395	3,316	3,237	3,217
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	3,627	3,564	3,482	3,399	3,378
Demand	3,627	3,564	3,482	3,399	3,378
Difference	0	0	0	0	0

Table 5-14: Five Consecutive Dry Year Water Supply and Demands in SCWA's Arden Park Vista through 2045

5-Yr Drought		2025	2030	2035	2040	2045
Year 1	Supply	3,627	3,564	3,482	3,399	3,378
	Demand	3,627	3,564	3,482	3,399	3,378
	Difference	0	0	0	0	0
Year 2	Supply	3,627	3,564	3,482	3,399	3,378
	Demand	3,627	3,564	3,482	3,399	3,378
	Difference	0	0	0	0	0
Year 3	Supply	3,627	3,564	3,482	3,399	3,378
	Demand	3,627	3,564	3,482	3,399	3,378
	Difference	0	0	0	0	0
Year 4	Supply	3,627	3,564	3,482	3,399	3,378
	Demand	3,627	3,564	3,482	3,399	3,378
	Difference	0	0	0	0	0
Year 5	Supply	3,627	3,564	3,482	3,399	3,378
	Demand	3,627	3,564	3,482	3,399	3,378
	Difference	0	0	0	0	0

Northgate 880

The Northgate 880 service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the Northgate 880 service area. Accordingly, the groundwater supplies are available to meet the Northgate 880 demands under all conditions through 2045. Tables 5-15 and 5-16 show the long-term supply reliability for Northgate 880 service area.

Table 5-15: Normal and Single Dry Year Water Supply and Demand in SCWA's Northgate 880 through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	1,365	1,365	1,365	1,365	1,365
Demand	1,365	1,365	1,365	1,365	1,365
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	1,434	1,434	1,434	1,434	1,434
Demand	1,434	1,434	1,434	1,434	1,434
Difference	0	0	0	0	0

Table 5-16: Five Consecutive Dry Year Water Supply and Demands in SCWA's Northgate 880 through 2045

5-Yr Drought		2025	2030	2035	2040	2045
Year 1	Supply	1,434	1,434	1,434	1,434	1,434
	Demand	1,434	1,434	1,434	1,434	1,434
	Difference	0	0	0	0	0
Year 2	Supply	1,434	1,434	1,434	1,434	1,434
	Demand	1,434	1,434	1,434	1,434	1,434
	Difference	0	0	0	0	0
Year 3	Supply	1,434	1,434	1,434	1,434	1,434
	Demand	1,434	1,434	1,434	1,434	1,434
	Difference	0	0	0	0	0
Year 4	Supply	1,434	1,434	1,434	1,434	1,434
	Demand	1,434	1,434	1,434	1,434	1,434
	Difference	0	0	0	0	0
Year 5	Supply	1,434	1,434	1,434	1,434	1,434
	Demand	1,434	1,434	1,434	1,434	1,434
	Difference	0	0	0	0	0

Hood Water Maintenance District (Hood)

The Hood service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the Hood service area. Accordingly, the groundwater supplies are available to meet the Hood demands under all conditions through 2045. Tables 5-17 and 5-18 show the long-term supply reliability for Hood service area.

Table 5-17: Normal and Single Dry Year Water Supply and Demand in SCWA's Hood through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	31	31	31	31	31
Demand	31	31	31	31	31
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	33	33	33	33	33
Demand	33	33	33	33	33
Difference	0	0	0	0	0

Table 5-18: Five Consecutive Dry Year Water Supply and Demand in SCWA's Hood through 2045

5-Yr Drought		2025	2030	2035	2040	2045
Year 1	Supply	33	33	33	33	33
	Demand	33	33	33	33	33
	Difference	0	0	0	0	0
Year 2	Supply	33	33	33	33	33
	Demand	33	33	33	33	33
	Difference	0	0	0	0	0
Year 3	Supply	33	33	33	33	33
	Demand	33	33	33	33	33
	Difference	0	0	0	0	0
Year 4	Supply	33	33	33	33	33
	Demand	33	33	33	33	33
	Difference	0	0	0	0	0
Year 5	Supply	33	33	33	33	33
	Demand	33	33	33	33	33
	Difference	0	0	0	0	0

East Walnut Grove

The East Walnut Grove service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the East Walnut Grove service area. Accordingly, the groundwater supplies are available to meet the East Walnut Grove demands under all conditions through 2045. Tables 5-19 and 5-20 show the long-term supply reliability for East Walnut Grove service area.

Table 5-19: Normal and Single Dry Year Water Supply and Demand in SCWA's East Walnut Grove through 2045

Normal Year	2025	2030	2035	2040	2045
Supply	53	53	53	53	53
Demand	53	53	53	53	53
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	56	56	56	56	56
Demand	56	56	56	56	56
Difference	0	0	0	0	0

Table 5-20: Five Consecutive Dry Year Water Supply and Demands in SCWA's East Walnut Grove through 2045

5-Yr Drought		2025	2030	2035	2040	2045
Year 1	Supply	56	56	56	56	56
	Demand	56	56	56	56	56
	Difference	0	0	0	0	0
Year 2	Supply	56	56	56	56	56
	Demand	56	56	56	56	56
	Difference	0	0	0	0	0
Year 3	Supply	56	56	56	56	56
	Demand	56	56	56	56	56
	Difference	0	0	0	0	0
Year 4	Supply	56	56	56	56	56
	Demand	56	56	56	56	56
	Difference	0	0	0	0	0
Year 5	Supply	56	56	56	56	56
	Demand	56	56	56	56	56
	Difference	0	0	0	0	0

5.3 Annual Reliability Assessment

The SCWA may consider current supply and demand conditions and perform an annual water supply and demand assessment (Annual Assessment) pursuant to Water Code Section 10632.1 to evaluate real-time or near-term circumstances that are different than the DRA scenario. This assessment would evaluate actual current water supply and use conditions. For purposes of this UWMP, the "current" water use conditions as described in Chapter 4 are compared to the availability of SCWA's existing water supplies as described in Chapter 3. Two scenarios are illustrated for both the Zone 40 service area and the other services areas (combined):

- Normal Year condition: reflecting the availability of supplies under normal conditions and the "current" water uses
- Single-Dry Year condition: reflecting the availability of supplies under a severe, single-dry year and elevated "current" water uses reflecting increased demands expected in a single dry year.

5.3.1 Zone 40 Normal Year Supply and Current Water Use

SCWA defines a normal year condition as one that allows the agency to obtain water supplies from all sources under its Zone 40 water supply portfolio under normalized conditions. These conditions include normally anticipated regulatory constraints on its water rights, unconstrained conditions for its water supply contracts, and no limitations on its ability to access groundwater resources. These conditions are described in significant detail in Chapter 3 and reflected in the monthly supply determinations shown below.

Normal year demands include the anticipated demands based upon historical trends in water usage in non-drought conditions by SCWA's customers. Demands in normal conditions generally are lower in the wetter months and higher in the drier months. These demands may fluctuate over time as land uses and populations change within the Zone 40 service area. The monthly demands also account for reasonable water conservation measures derived from improved efficiencies in indoor fixtures, improved management of outdoor landscape irrigation, and a general awareness of the value of long-term water conservation at the consumer level. These demand conditions are described in significant detail in Chapter 4 and reflected in the monthly demand assessments shown below.

Table 5-21 below shows the normal year water supply and demand conditions for SCWA's Zone 40 service area on a monthly timestep.

Table 5-21: Normal Year Water Supply and Demand in SCWA's Zone 40

Normal Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Supply	14,169	14,181	14,577	14,673	15,674	8,748	9,422	9,659	9,495	16,489	15,946	14,706	157,740
Demand	1,557	1,601	2,085	2,108	3,175	4,160	4,842	5,101	4,876	3,956	3,387	2,130	38,979
Difference	12,612	12,580	12,492	12,566	12,498	4,588	4,580	4,558	4,618	12,533	12,559	12,577	118,761

5.3.2 Zone 40 Single Dry Year Supply and Dry-Year Current Demand

SCWA defines a single dry year condition as one that constrains SCWA from obtaining some of its water supplies in its Zone 40 water supply portfolio due to hydrological, regulatory, and institutional constraints. These conditions include more restrictive regulatory constraints on its water rights, constrained conditions for its water supply contracts, yet no limitations on its ability to access groundwater resources. The restrictive conditions manifest in changed availability of some Zone 40 water assets in various months depicted in the tables below. These changed monthly water supply conditions are described in significant detail in Chapter 3.

Single dry year demands include the anticipated demands based upon historical trends in water usage in drought conditions by SCWA's customers. Demands in dry conditions may increase in the normally wetter months as denuded hydrological conditions generate additional customer uses for outdoor irrigation. These conditions are described in significant detail in Chapter 4 and reflected in the monthly demand tables below. The analysis uses the "current" water use, adjusted as described in Chapter 4.

Table 5-22 below shows the single dry year water supply and demand conditions for SCWA's Zone 40 service area.

Table 5-22: Single Dry Year Water Supply and Demand in SCWA's Zone 40

Single Dry Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Supply	9,678	9,689	10,086	3,934	4,934	5,863	6,537	6,775	6,610	5,749	5,206	10,214	85,274
Demand	1,635	1,681	2,189	2,213	3,334	4,368	5,084	5,357	5,120	4,154	3,557	2,236	40,928
Difference	8,043	8,008	7,896	1,720	1,600	1,495	1,453	1,418	1,490	1,595	1,650	7,978	44,346

5.3.3 Other Service Areas Normal Year Supply and Current Demand

Similar to the Zone 40 predicted condition for current reliability, an analysis was completed for the six other water service areas considering this year or next reflect normal supply and water use conditions. This analysis uses the normal supply conditions described in Chapter 3 for these areas, as well as the "current" water use presented in Chapter 4.

Table 5-23: Normal Year Water Supply and Demand in SCWA's Non-Zone 40

Normal Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Supply	208	265	309	334	500	614	708	701	612	539	368	251	5,408
Demand	208	265	309	334	500	614	708	701	612	539	368	251	5,408
Difference	0	0	0	0	0	0	0	0	0	0	0	0	0

5.3.4 Other Service Areas Single Dry Year Supply and Dry-Year Current Demand

If conditions in 2021 or 2022 are considered to match a single dry year condition, the following assessment is provided. Supplies available to these other service areas are not expected to be constrained, as described in Chapter 3. The water use in the table reflects an increased "current" water use as described in Chapter 4.

Table 5-24: Single Dry Year Water Supply and Demand in SCWA's Non-Zone 40

Single Dry Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Supply	218	278	324	351	525	645	743	736	642	566	386	264	5,678
Demand	218	278	324	351	525	645	743	736	642	566	386	264	5,678
Difference	0	0	0	0	0	0	0	0	0	0	0	0	0

5.4 Water Supply Reliability Summary

Sacramento County Water Agency has a diverse and robust water supply portfolio capable of meeting the water demands in all of its service areas in normal, single dry, and five consecutive dry years from 2020 through 2045. Zone 40's diverse water supply portfolio coupled with the system's flexible operations render the supply reliable in all year types including reasonable planned growth through 2045. The six other independent service areas have minimal constraints on system operations and have planned supply conditions to handle reasonably expected urban and population growth through this 2020 UWMPs planning horizon.

Chapter 6
Water Shortage Contingency Plan

The Sacramento County Water Agency (SCWA) is reconstituting its Water Shortage Contingency Plan (WSCP) in a separate but parallel process. SCWA's 2020 WSCP will be adopted before or contemporaneously with SCWA's 2020 Urban Water Management Plan. SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. Accordingly, the revised WSCP is incorporated in its entirety as Appendix A to SCWA's 2020 UWMP.

Appendix A
Water Shortage Contingency Plan

This Sacramento County Water Agency's Water Shortage Contingency Plan is provided on the following pages.

Appendix B - Alternative Water Source Memorandum, Wood Rodgers

Technical Memorandum

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME

To:	Emma Patten, Sacramento County Planning an Environmental Review		
From:	Mike Motroni, PE MPH	**CC:**	Nick Avdis, Avdis & Cucchi Dan Cucchi, Avdis & Cucchi
Date:	October 15, 2025		
Subject:	Upper Westside Specific Plan – Alternative Water Source		

1.0 Introduction

1.1 Background

The purpose of this technical memorandum is to identify an alternative water source should the City of Sacramento (City) choose not to supply wholesale water to the Upper Westside (UWS) project. The alternative water source will allow the project to move forward with an alternative plan for water, if needed or desired. This will include Natomas Central Mutual Water Company (NMW) providing wholesale raw surface water to a new onsite surface water treatment plant capable of supplying UWS with potable water. Refer to attached **Figure 1** for a schematic of the proposed water infrastructure.

1.2 Natomas Central Mutual Water Company Alternative

Water Rights

NMW would be a wholesaler of raw water to the Sacramento County Water Agency (SCWA). NMW holds substantial water rights to serve agricultural needs within the Natomas Basin. These rights are a combination of various state permits and a United States Bureau of Reclamation (USBR) contract. NMW currently serves 43 growers across 284 fields. The state permits and USBR contract currently only allow for agricultural use. Amendments to both the state permits and USBR contract will be required to supply Municipal and Industrial (M&I) water to UWS.

New Surface Water Treatment Plant

The need for a new surface water treatment plant arises from the Upper Westside Specific Plan's requirement for an alternative water source if the City decides not to supply wholesale treated water to the project. NMW will provide wholesale raw surface water to a new onsite surface water treatment plant capable of supplying UWS. The surface

water treatment plant is essential to ensure a reliable and safe water supply for the development, as it will treat Sacramento River water for potable use. It is anticipated that the proposed surface water treatment plant will include processes such as grit removal, coagulation, flocculation, sedimentation, filtration, and disinfection to meet water quality standards. Included in this memorandum as **Figure 2** is a schematic design of the surface water treatment plant.

2.0 Water Sources

2.1 Existing Water Contracts / Permits

NMW maintains robust water rights for serving agricultural uses within the Natomas Basin. NMW does maintain select M&I rights for serving the Sacramento Airport and Metro Airpark. NMW currently serves 43 growers and 284 fields throughout the basin consisting of 30,000 acres[1]. Water rights are a combination of a United States Bureau of Reclamation contract and State permits. These rights are shown below in **Table 2.1**. Note that most of the permits, including USBR contract, are not available during the winter months between November and March. There is a May 1978 winter water permit that can provide surface water from the Sacramento River during those months. Historical NMW water use during the winter months varies from none to 9,950 acre-feet/year (AFY). The May 1978 permit allows up to 10,000 AFY between the months of November and March, it does not specify usage by month.

Water contract and rights currently only allow for agriculture use and limited M&I use. The USBR contract allows for an amendment to convert to M&I use while the state permits would need to be amended by the State Water Resources Control Board.[2] Additionally, the USBR contract will require amendment to allow for winter surface water deliveries.

[1] Email correspondence from Brett Gray at Natomas Central Mutual Water Company dated August 13, 2025.

[2] Email correspondence from Brett Gray at Natomas Central Mutual Water Company dated August 13, 2025.

Table 2.1: Natomas Central Mutual Water Company Water Rights
Source: Natomas Central Mutual Water Company dated August 13, 2025.

	USBR	Permit - State						
	Contract	**A000534**	**A001056**	**A001203**	**A001413**	**A015572**	**A022309**	**A025727**
Priority		Mar-1905	Aug-1918	Mar-1919	Aug-1919	Oct-1953	Oct-1965	May-1978
Source		River	River	River	River	River	Drain	Winter R&D
Permit Total (AF)	**120,200**	**15,394.2**	**16,205.2**	**58,394.2**	**36,655.1**	**11,846.0**	**2,627.0**	**10,000.0**
POU (Acres)		5,903.54	3,543.64	11,298.00	11,298.00	29,000.00	30,480.00	10,000.00
CFS		41.28	38	160	120	131	14	
October	2,000	N/A			N/A	N/A		
November	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
December	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
January	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
February	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
March	N/A	N/A		N/A	N/A	N/A		
April	14,000			N/A	N/A			N/A
May	27,700							N/A
June	23,000							N/A
July	18,700					N/A	N/A	N/A
August	18,700					N/A	N/A	N/A
September	16,100					N/A		N/A
Total	120,200							
N/A: Not available or not in contract / water right window.								

2.2 USBR Contract Curtailments

The USBR Contract is based on inflow to Shasta Lake. Historically there is a 25% curtailment in three out of every ten years. For years of critical droughts, considered 7 out of every 100 years, an additional 25% curtailment can be imposed under the Central Valley Project's Drought Protection Program. Refer to **Table 2.2** below showing the USBR Contract water under various curtailment scenarios.

Table 2.2: USBR Contract Water & Curtailments

USBR Contract Amount	25% Curtailment	50% Curtailment Drought Protection Program
120,200 AFY	90,150 AFY	60,100 AFY

3.0 Water Demands

3.1 Existing NMW Water Demand

As shown in Table 3.1 below, NMW's historical usage from years 2013 to 2024 ranges between 29,012 AFY to 81,580 AFY with an average during this time period of 68,099 AFY. NMW's USBR contract alone is 120,200 AFY which is more than the 2016 maximum diversion. Excluding drought years of 2014, 2015, 2021, and 2022 the average surface water use is 71,595 AFY.

Table 3.1: NMW Historical Annual Surface Water Use
Source: Email correspondence from Brett Gray, Natomas Central Mutual Water Company, dated August 15, 2025.

Year	Annual Surface Water (AFY)
2024	60,799
2023	72,593
2022	29,012
2021	74,450
2020	75,053
2019	63,188
2018	74,879
2017	63,763
2016	81,580
2015	67,618
2014	73,348
2013	80,903
Average	**68,099**
Non-Drought Average[3]	**71,595**

3.2 Existing NMW Water Demand Drought Years

For the drought years of 2014, 2015, 2021, and 2022 surface water use ranges from 29,012 AFY to 74,450 AFY with an average of 61,107 AFY. With a 25% curtailment of deliveries to NMW this equates to reduced maximum diversion of 90,150 AFY. This 25% curtailment is higher than the maximum diversion year based on 2013-2024 historical pumping by NMW.

[3] Average excluding drought years of 2014, 2015, 2021, and 2022.

3.3 Existing UWS Agriculture Water Demand

Within the Upper Westside urban area, NMW reports historical surface water use ranging from 1,307 AFY to 4,860 AFY with an average of 2,703 AFY. These ranges are reported from 2013 to 2024 as shown in **Table 3.2** below. The existing uses would cease to exist in the proposed development scenario and would be available for municipal uses upon USBR contract and state permit amendments. It is important to note that in the 2014, 2015, 2021 and 2022 drought years the existing use ranged from 1,307 AFY to 4,014 AFY with an average of 2,956 AFY. The average water use was higher in the drought years verses the overall 2013-2014 historical use.

Table 3.2: Summary of Riverside Use within UWS Area (acre-feet)
Source: Email correspondence from Brett Gray, Natomas Central Mutual Water Company, dated August 15, 2025.

Year / Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2024					216	542	599	584	58	364	1	0	2,365
2023				0	38	712	616	353	91	75	3	2	1,892
2022			307	389	133	165	335	220	59	7			1,307
2021			145	1,085	155	312	654	730	221	127			3,284
2020				63	325	341	204	229	160				1,321
2019						227	415	458	238	10			1,353
2018					247	739	944	699	367	6			3,002
2017					217	441	555	586	245				2,045
2016				90	539	935	951	758	430	80			3,782
2015				483	653	786	760	417	94	24			3,218
2014				174	843	1,104	969	733	162	28			4,014
2013				373	1,265	1,041	865	807	237	14		256	4,860
Minimum					4	165	204	220	58				**1,307**
Average			38	221	386	612	656	548	197	61	0	22	**2,703**
Maximum			307	1,085	1,265	1,104	969	807	430	364	3	256	**4,860**

3.4 Anticipated UWS NMW Water Demands

The proposed UWS project is anticipated to utilize 3,139 AFY of surface water for domestic uses[4]. Based on typical urban monthly water uses as shown in the SCWA's 2020 Urban Water Management Plan[5], the overall water use can be reduced to an anticipated monthly demand. **Table 3.3** below shows the anticipated monthly demand for the

[4] Table 8 per Upper Westside Specific Plan, Water Master Plan, dated September 26, 2023. Note that the Water Master Plan also provided a total project demand of 4,250 AFY utilizing the City's demand factors. Since this alternative assumes that SCWA would be the purveyor it utilizes the approved SCWA demand factors, not the City demand factors.

[5] Table 4-1(a) Total Metered Deliveries represents monthly water use for the years 2016-2019.

project. **Table 3.3** also shows the historical monthly average pumping from the Riverside Pump Station to within UWS. For the existing surface water usage during March, November, and December are all assumed to average zero since they only represent two or three historical years and are not representative of typical operations.

Table 3.3: Anticipated Water Demand by Month

Month	Proposed Surface Water Demand (acre-feet)	Average Existing Surface Water Usage[6] (acre-feet)	Additional Water Use Beyond Existing (acre-feet)
January	140	0	140
February	133	0	133
March	122	0	122
April	154	221	0
May	245	386	0
June	351	612	0
July	401	656	0
August	430	548	0
September	406	197	209
October	331	61	270
November	258	0	258
December	168	0	168
Yearly Total	**3,139**		**1,300**

When comparing existing water use within UWS to proposed water use, the proposed project will utilize more surface water during the cooler months between September and March. This is due to little to no water usage currently experienced during those months. As a result, there will be increased pumping of the Sacramento River during the months of September to October in the range of approximately 122 to 270 acre-feet per month with a total additional use of 1,300 AFY during those months. On an annualized basis the increase in surface water supply for UWS is 436 AFY.

3.5 Cumulative Water Demands

There are three other major projects that propose to utilize NMW surface water. These are the Sutter Pointe Specific Plan, GrandPark Southwest Specific Plan, and Grandpark Trails Specific Plan. Of the three projects, only Sutter Pointe is an approved project. According to Sutter Pointe's approved water supply assessment[7], at buildout Sutter

[6] Refer to **Table 3.2** for average existing surface water use between April and October.

[7] Refer to Section 5 – Conclusions of the Sutter Pointe Specific Plan SB 610 Water Supply Assessment by Tulley & Young, dated December 2008.

Pointe will utilize 12,128 AFY and 9,099 AFY in normal and dry years, respectively. This compares to a pre-project existing surface water use of 19,030 AFY and 14,270 AFY in normal and dry years, respectively. The reduction in surface water use is primarily since the pre-project land area consists of rice farming, a water intensive crop.

The GrandPark Southwest Specific Plan and Grandpark Trails Specific Plan projects are currently unapproved and are undergoing technical studies. According to NMW the two projects currently utilize an average of 15,821 AFY during non-drought years. Refer to **Table 3.4: Grandpark Existing NMW Surface** Water Usage below.

Table 3.4: Grandpark Existing NMW Surface Water Usage
Source: Email correspondence from Brett Gray, Natomas Central Mutual Water Company, dated October 14, 2025.

Year	GrandPark Southwest Total (AFY)	Grandpark Trails Total (AFY)
2024	5,902	10,093
2023	7,326	8,158
2022	2,812	10,126
2021	6,416	3,887
2020	6,810	8,869
2019	5,890	9,413
2018	7,062	8,142
2017	8,361	9,761
2016	7,626	11,557
2015	6,118	10,542
2014	6,049	8,457
2013	7,221	8,361
Average	**6,473**	**8,947**
Non-Drought Year Average[8]	**6,641**	**9,180**

Based on the currently available land use information for both Grandpark projects, the annual water demand was calculated utilizing SCWA demand factors. The calculations are shown in **Table A-1** and **Table A-2** as an attachment. For the GrandPark Southwest Specific Plan the proposed annual demand is 3,890 AFY. For the Grandpark Trails Specific Plan the proposed annual demand is 5,735 AFY. The two Grandpark projects will utilize a total of 9,625 AFY. Assuming both projects will fully utilize surface water to meet their proposed demand, there

[8] Average excluding drought years of 2014, 2015, 2021, and 2022.

will be a net decline of 6,196 AFY surface water usage for the Grandpark projects. Similar to Sutter Pointe, this is due to the existing land use consisting of rice farming.

Table 3.5 below provides a summary of NMW surface water use for the four major specific plan projects in both the existing / pre-project condition and the proposed developed conditions. Based on the currently available land use plans, it is estimated that the cumulative scenario will utilize 12,662 AFY less NMW surface water in the developed condition.

Table 3.5: Cumulative Annual Surface Water Use Summary verse Existing / Pre-Project Use

Specific Plan Project	Existing / Pre-Project (AFY)	Developed Conditions (AFY)	Change (AFY)
Sutter Pointe	19,030	12,128	(6,902)
GrandPark Southwest	6,641	3,890	(2,751)
Grandpark Trails	9,180	5,735	(3,445)
Upper Westside	2,703	3,139	436
Other Users	34,041	34,041	0
Total	**71,595**	**58,933**	**(12,662)**

3.6 Supply Delivery

Existing Plus Project

On an annual basis UWS will utilize 436 AFY more surface water than in the existing condition. **Table 3.6** below shows the existing plus project scenario and available surface water or deficient under normal years and curtailment years. During a 25% curtailment there is adequate water to meet all existing users with UWS. During a 50% curtailment NMW would be short 11,931 AFY in meeting existing plus project water demands. To mitigate this shortage NMW indicates that it would prioritize the project should curtailments occur[9].

Table 3.6: Annual Water Availability Existing plus Project Scenario

Supply	Normal Years (AFY)	25% Curtailment Years (AFY)	50% Curtailment Years (AFY)
Available Supply	120,200	90,150	60,100
Upper Westside Use	3,139	3,139	3,139
Existing Uses	68,892	68,892	68,892
Surplus (Deficit)	48,169	18,119	(11,931)

[9] Letter from NMW dated September 24, 2025 to Sacramento County. See attached.

Cumulative Scenario

Table 3.7 below is a summary of the cumulative water demands compared to the available sources during normal and curtailment years. While there is a reduction in supply during curtailment years, the maximum curtailment of 50% is 1,167 AFY greater than the cumulative surface water use once all projects are developed.

Table 3.7: Annual Water Availability Cumulative Scenario

Specific Plan Project	Normal Years (AFY)	25% Curtailment Years (AFY)	50% Curtailment Years (AFY)
Available Supply	120,200	90,150	60,100
Projected Cumulative Use	58,933	58,933	58,993
Surplus (Deficit)	61,267	31,217	1,167

4.0 Infrastructure

4.1 Existing Infrastructure

NMW maintains four river pumping plants and five wells for extracting and delivery of water to NMW customers. The closest pump station to UWS is the Riverside Pumping Plant located east of the Garden Highway and Radio Road intersection. From there Sacramento River water is pumped into the NMW distribution system. While the NMW irrigation system is integrated throughout the Natomas Basin, there is a newly constructed raw water pipeline that conveys water south adjacent to the proposed UWS project.

Riverside Pumping Plant

The Riverside Pumping Plant's proximity to UWS provides a unique opportunity to utilize NMW surface water from the Sacramento River. The Riverside Pumping Plant was recently reconstructed to accommodate the levee improvements of the Sacramento River as part of the American River Common Features, Natomas Basin Reach A project. Per the pump stations Basis of Design Report (BODR) the facility was designed with a new pump, electrical system, structure, and to meet current design standards. The facility also constructed a new cylindrical fish screen to prevent fish entrainment in conformance with state and federal fish screen requirements.[10]

According to the BODR report the minimum and maximum preferred operating range for the pump is approximately 33 and 47 cubic feet per second, respectively. This equates to a capacity of 14,800 to 21,100 gallons per minute.

[10] Riverside Pumping Plant Replacement, Basis of Design Report, by Jacobs, dated March 2022.

The pumping plant discharges into a concrete portion of the Riverside Canal that was also recently improved as part of the Natomas Basin Reach A levee improvement project.

Riverside Canal / Pipeline Lift Station

Approximately 125-feet south of the Riverside Pumping Plant discharge point is the Riverside Canal / Pipeline Lift Station. The newly constructed facility consists of valving, a 50-horsepower and 60-horesepower pump discharge into a new 48-inch HDPE pipeline. The 48-inch pipeline travels south transitioning to a 36-inch at existing Farm Road and then a 32-inch pipe at existing Parker Road. The pipeline ultimately discharges into an open canal that runs parallel to Interstate 80. The pipeline is currently utilized to serve agriculture water to existing NMW customers via periodic turnouts and discharges to open canals.[11]

4.2 Proposed Surface Water Infrastructure

The NMW alternative involves the conversion of agriculture water allocation to M&I water usage. UWS will receive NMW water conveyed via existing facilities as previously described. The alternative proposes a new domestic surface water treatment plant to treat Sacramento River water for potable use. Proposed preliminary infrastructure is shown in **Figure 1**.

Riverside Pumping Plant

The project alternative does not propose any changes to the Riverside Pumping Plant. However, operationally it will operate in the winter to provide surface water to the proposed surface water treatment plant. The additional monthly winter pumping ranges from an anticipated 122 to 270 acre-feet per month. The Riverside Pumping Plant will draw water at a rate of 33 to 47 CFS based on the existing pump and hydraulic head required to raise water over the levee. The pump will cycle throughout the day as water is required to serve the project. Averaging over a twenty-four-hour period the rate equates to four to nine cubic feet per second.

Riverside Canal / Pipeline Lift Station

The existing Riverside Canal / Pipeline Lift Station will utilize the existing 50- and 60-horsepower pumps to convey canal water to the existing Riverside Pipeline. The existing Riverside Pipeline will convey water to a new tie-in

[11] American River Common Features, Natomas Basin Reach B Volume 4, Riverside Canal Phase 2 Relocation Project improvement plans by Mead & Hunt, dated May 9, 2019.

location. Per conversation with NMW it is anticipated that the new tie-in would occur at their existing Riverside Pipeline near the west end of San Juan Road.

Surface Water Treatment Plant

The WTP is proposed for the north side of San Juan Road within the urban area of the project as shown in **Figure 1**. The anticipated capacity of the surface water treatment plant is approximately 7 million gallons per day and will be located on approximately 8-acres (subject to subsequent engineering and design). Typical surface water treatment plants consist of grit removal, followed by coagulation, flocculation, sedimentation, filtration and disinfection. In a water treatment facility, grit removal is the first step in the treatment process and reduces the solids loading of processes further downstream. A coagulant is added to the water after the grit basin and it is rapidly mixed, this is referred to as flash mix or rapid mix. This process is to make sure the coagulant is circulated throughout the water and relies on an injection pump for good dispersion. The coagulated water is either filtered directly through a medium filter (such as sand and gravel), a microfiltration or ultrafiltration membrane for higher quality waters, or it can be moved to a settling tank. In a settling tank, or clarifier, the heavy particles settle to the bottom and are removed, and the water moves on to the filtration step of the treatment process.

It is anticipated that a standard surface water treatment plant is sufficient and will include the following major aspects: Raw water conveyance to water treatment plant, grit removal, rapid / flash mix, flocculation, sedimentation, filtration, disinfection, backwash storage and pumps, miscellaneous supporting electrical and site features, and other features deemed necessary to provide treated water to the project. System redundancies would be included where customary. Those redundancies would be identified in subsequent design efforts. **Figure 2** is a schematic layout of how the surface water treatment plant may layout. Future design efforts will further define the site layout.

4.3 Change in Proposed Infrastructure

Onsite Water Storage and Booster Pump Station

The project proposes five million gallons of water storage and a booster pump station based on the factors shown in **Table 4.1** below. The storage is intended to be divided into two tanks of 2.5 million gallons each for redundancy and maintenance purposes. Redundancy of the booster pump station will be determined during subsequent design efforts. In this alternative the facility is located at or adjacent to the surface water treatment plant. Close proximity to the surface water treatment plant allows treated water to be discharged directly into the tank where it can then

be pumped into the project's transmission system. Placing the storage tank in line with the surface water treatment plant promotes turnover of the treated water which maintains water quality.

Table 4.1: Onsite Storage Sizing

Storage Criteria	Factor (gpm)	Storage (MG)
Operational Capacity: 20% of Maximum Day Demand for 24 hours	778	1.12
Fire Flow: 4,500 gpm for 4 hours[12]	4,500	1.08
Emergency: Average Day Demand[13]	1,946	2.80
Total Storage		**5.00**

Transmission System Layout

The transmission and distribution system for the project's preferred alternative will remain largely unchanged. However, there will be two additional 16-inch transmission mains conveying water from the proposed surface water treatment plant to the distribution system. The additional 16-inch transmission mains will convey potable water from the surface water treatment plant to the transmission and distribution mains at the intersection of San Juan Road and Bryte Bend Road. Two 16-inch transmission mains are proposed due to capacity while simultaneously providing for redundancies.

5.0 Regulatory & Permitting

5.1 State Water Resources Control Board

Amending water rights permits involves several steps to ensure compliance with regulatory requirements and to address the needs of the water rights holder. The process typically begins with the submission of a petition to the State Water Resources Control Board (SWRCB). This petition must detail the proposed changes to the water rights, such as modifications to the point of diversion, place of use, or purpose of use. The regulatory authority will then review the petition to ensure it meets all legal and environmental standards. Public notice of the proposed amendment is usually required, allowing for public comments and objections. If there are no significant objections and the proposed changes comply with all regulations, the regulatory authority will issue an amended permit. This

[12] While SCWA fire flow is 3,000 gpm for 3 hours, the plan area is served by the Natomas Fire Protection District which contracts to the City of Sacramento for fire service. Therefore, the City's higher fire flow requirement is utilized.

[13] SCWA criteria is one third of average day demand based on the assumption that groundwater pumping is available. Since the water plan does not propose to utilize groundwater, it utilizes a more conservative demand of full average day demand.

process ensures that water rights amendments are conducted transparently and in accordance with state and federal laws. It is anticipated that the project will need to amend permits to allow for M&I use.

5.2 United States Bureau of Reclamation Contract Amendment

Once water rights permits have been successfully amended, the next step is to amend the USBR water delivery contract to reflect these changes. This process begins with the submission of a formal request to the USBR, detailing the modifications made to the water rights permits and the desired changes to the water delivery contract. USBR will review the request to ensure it aligns with federal regulations and the terms of the existing contract.

It is anticipated that the USBR Contract will be amended to allow for two primary changes. They will require a conversion from agriculture to M&I use and to allow for winter delivers of surface water.

5.3 California Title 22 Permitting

The California Title 22 new water system permitting process involves several steps to ensure that new water systems meet the state's stringent water quality standards. The process begins with the submission of a permit application to the SWRCB. This application must include detailed information about the proposed water system, including its design, construction, and operation plans. The regulatory authority will review the application to ensure it complies with all applicable regulations and standards.

Once the application is deemed complete, the regulatory authority will conduct a thorough review, which may include site inspections and consultations with other agencies. Public notice of the proposed new water system is usually required, allowing for public comments and objections. If there are no significant objections and the proposed system meets all regulatory requirements, the regulatory authority will issue a permit to construct and operate the new water system. This process ensures that new water systems are designed and operated in a manner that protects public health and complies with state and federal laws.

6.0 Conclusion

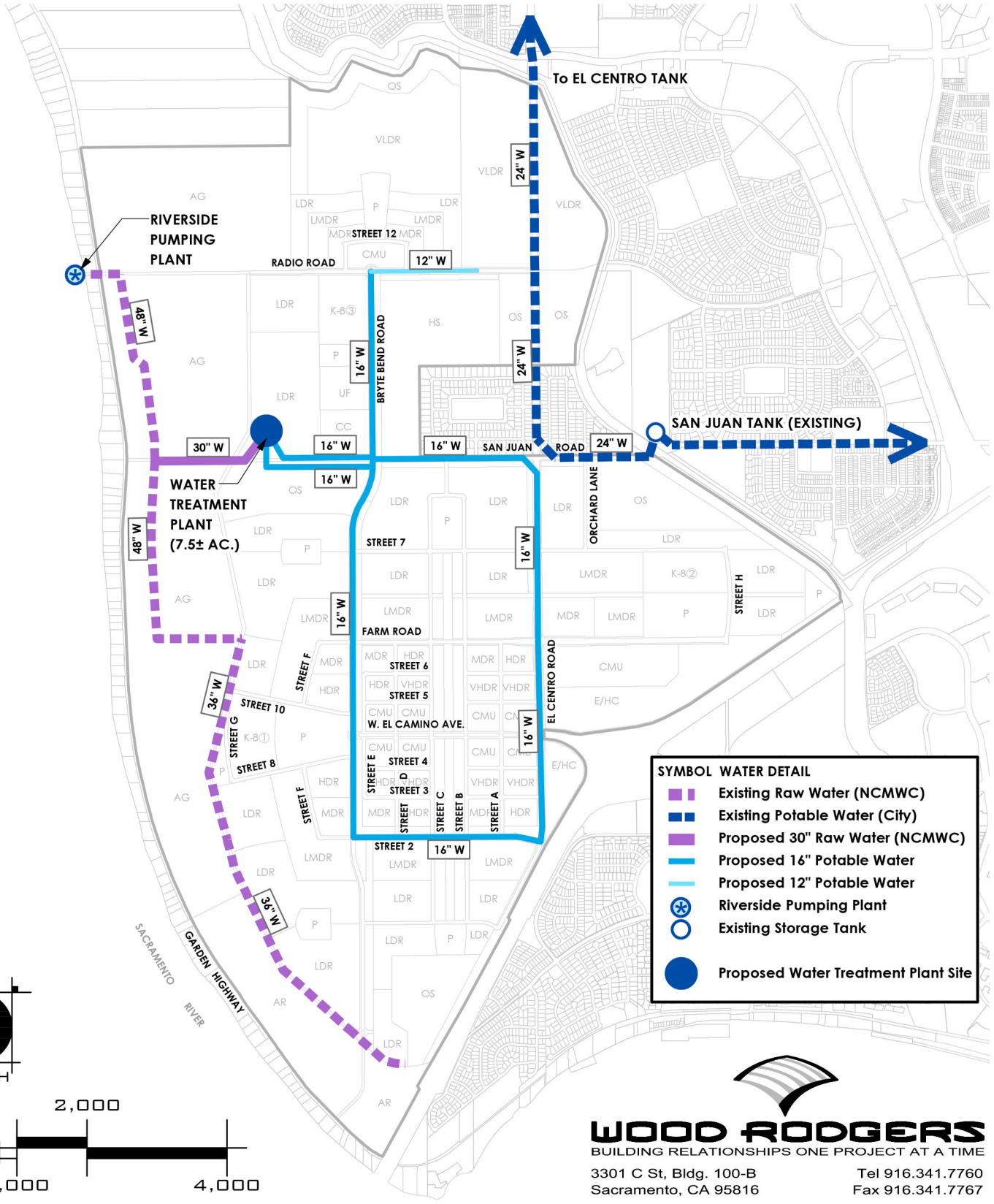
In conclusion, the Upper Westside Specific Plan has identified a viable alternative water source. The proposed solution involves utilizing NMW to provide wholesale raw surface water to a new onsite surface water treatment plant. This approach leverages NMW's substantial water rights and existing infrastructure, ensuring a reliable and safe water supply for the Upper Westside project.

The implementation of a new surface water treatment plant, capable of treating Sacramento River water to meet potable standards, is a critical component of this alternative. The surface water treatment plant will incorporate advanced treatment processes such as grit removal, coagulation, flocculation, sedimentation, filtration, and disinfection. The anticipated water demand for the Upper Westside project is approximately 3,139 AFY for domestic uses. This demand is 436 AFY more than what is typically applied to UWS in existing conditions. Upon NMW successfully applying for amendment of water rights to allow for M&I use, their USBR contract can be amended to allow for M&I use and winter deliveries.

Attachments

1. Figure 1 – Water Plan Alternative
2. Figure 2 – Schematic Surface Water Treatment Plant Site Plan
3. Table A-1 – GrandPark Southwest Specific Plan Annual Water Demands
4. Table A-2 – Grandpark Trails Specific Plan Annual Water Demands
5. Natomas Central Mutual Water Company letter to Sacramento County, dated September 24, 2025

FIGURE 1
WATER PLAN ALTERNATIVE
COUNTY OF SACRAMENTO, CALIFORNIA
SEPTEMBER 25, 2025

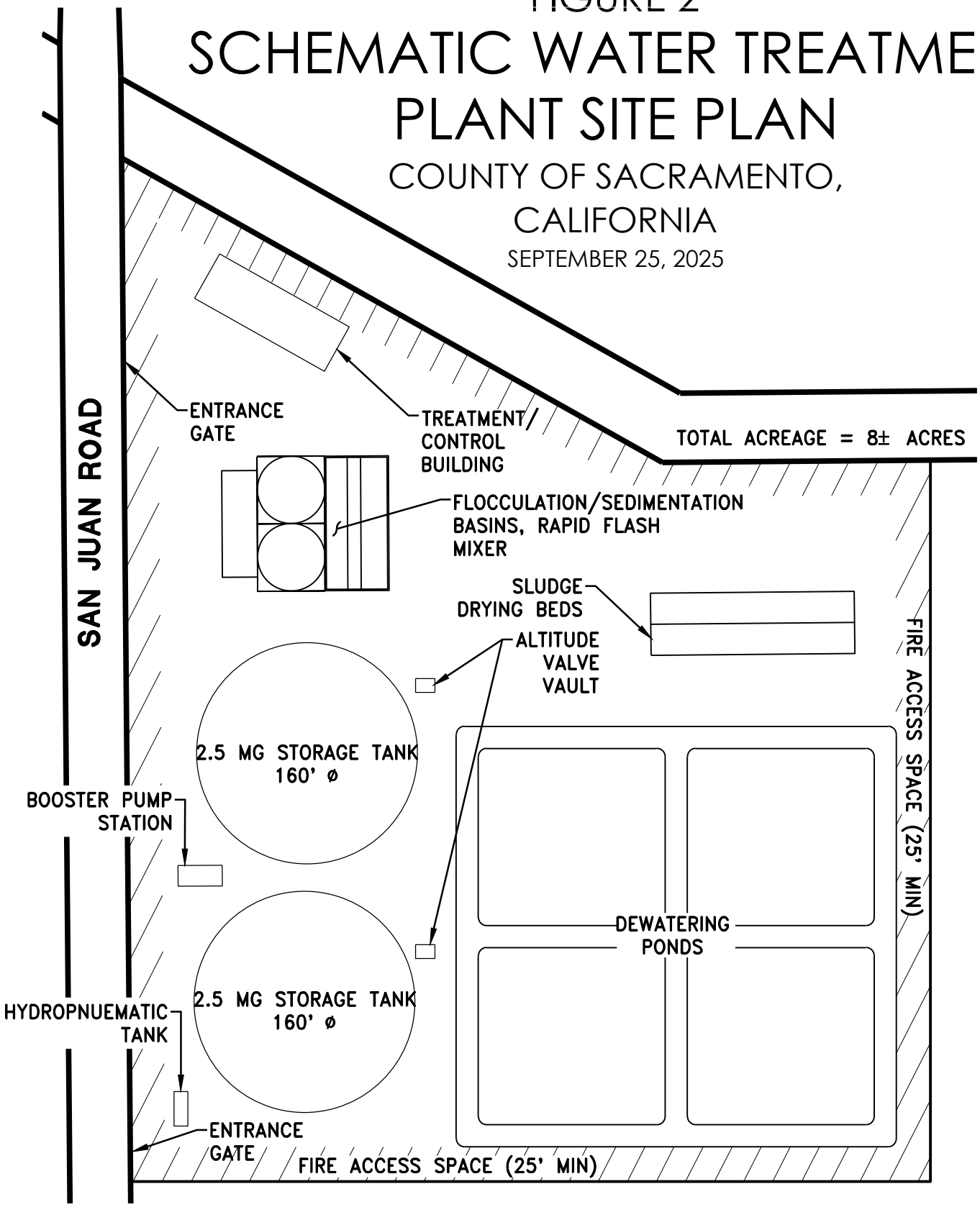


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FIGURE 1: WATER PLAN ALTERNATIVE - UPPER WESTSIDE

FIGURE 2
SCHEMATIC WATER TREATMENT PLANT SITE PLAN
COUNTY OF SACRAMENTO, CALIFORNIA
SEPTEMBER 25, 2025



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Fax 916.341.7767

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TABLE A-1: GRANDPARK SOUTHWEST SPECIFIC PLAN - LAND USE SUMMARY

LAND USE	DENSITY RANGE	TARGET DENSITY (DU/AC)	ACRES (±)	ESTIMATED DWELLING UNITS	SCWA EQUIVALENT LAND USE	AVERAGE ANNUAL WATER DEMAND FACTOR (AF/ACRE/YEAR)	AVERAGE ANNUAL WATER DEMAND FACTOR (INCLUDING 7.5% WATER LOSS) (AF/ACRE/YEAR)	AVERAGE ANNUAL WATER DEMAND (INCLUDING 7.5% WATER LOSS) (AF/YEAR)
LOW DENSITY RESIDENTIAL (GSSP-LDR)	4-8 DU/AC	5.5	595.2	2,945	RURAL ESTATE	1.37	1.47	876.6
ACTIVE ADULT (GSSP-AAR)	5-9 DU/AC	6.5	164.9	965	SINGLE FAMILY	2.13	2.29	377.6
MEDIUM DENSITY RESIDENTIAL (GSSP-MDR)	7-13 DU/AC	9	117.1	948	MULTI-FAMILY - LOW DENSITY	2.44	2.62	307.2
MEDIUM HIGH DENSITY RESIDENTIAL (GSSP-MHDR)	10-20 DU/AC	14	52.1	656	MULTI-FAMILY - LOW DENSITY	2.44	2.62	136.7
HIGH DENSITY RESIDENTIAL (GSSP-HDR)	20-40 DU/AC	30	82.4	2,225	MULTI-FAMILY - HIGH DENSITY	3.33	3.58	295.0
RESIDENTIAL SUBTOTAL			**1,011.7**	**7,739**				
HEALTH & HOSPITALITY MIXED USE (GSSP-HHMU)	20-40 DU/AC		133.8	550	MULTI-FAMILY - HIGH DENSITY & COMMERCIAL	5.35	5.75	769.5
OFFICE & ENTERTAINMENT MIXED USE (GSSP-OEMU)	20-40 DU/AC		99.7	150	MULTI-FAMILY - HIGH DENSITY & COMMERCIAL	5.35	5.75	573.4
NEIGHBORHOOD MIXED USE (GSSP-NMU)	20-40 DU/AC		26.0	150	MULTI-FAMILY - HIGH DENSITY & COMMERCIAL	5.35	5.75	149.5
NEIGHBORHOOD COMMERCIAL (GTSP-NC)			22.4	-	COMMERCIAL	2.02	2.17	48.6
MIXED-USE/COMMERCIAL SUBTOTAL			**281.9**	**850**				
SCHOOL (GSSP-TK-8)			25.3	-	PUBLIC	0.81	0.87	22.0
SCHOOL SUBTOTAL			**25.3**					
PARKS AND RECREATION (GSSP-OS-P)			107.6	-	PUBLIC RECREATION	2.70	2.90	312.3
OPEN SPACE (GSSP-OS)			335.6	-	NON-IRRIGATED	-	-	0.0
OPEN SPACE SUBTOTAL			**443.2**					
MAJOR R/W			**109.1**	**-**	RIGHT-OF-WAY	0.18	0.19	21.1
TOTAL			**1,871.2**	**8,589**				**3,889.5**
			AC.	**DU**				**AF/YR**

TABLE A-2: GRANDPARK TRAILS SPECIFIC PLAN - LAND USE SUMMARY

LAND USE	DENSITY RANGE	ACRES	ESTIMATED DWELLING UNITS	SCWA EQUIVALENT LAND USE	AVERAGE ANNUAL WATER DEMAND FACTOR (AF/ACRE/YEAR)	AVERAGE ANNUAL WATER DEMAND FACTOR (INCLUDING 7.5% WATER LOSS) (AF/ACRE/YEAR)	AVERAGE ANNUAL WATER DEMAND (INCLUDING 7.5% WATER LOSS) (AF/YEAR)
ESTATE RESIDENTIAL (GTSP-ER)	0-4 DU/AC	107.3	107	RURAL ESTATE	1.37	1.47	158.0
LOW DENSITY RESIDENTIAL (GTSP-LDR)	4-8 DU/AC	1,019.6	6,118	SINGLE FAMILY	2.13	2.29	2334.6
MEDIUM DENSITY RESIDENTIAL (GTSP-MDR)	7-13 DU/AC	457.7	4,119	MULTI-FAMILY - LOW DENSITY	2.44	2.62	1200.5
MEDIUM HIGH DENSITY RESIDENTIAL (GTSP-MHDR)	10-20 DU/AC	54.5	763	MULTI-FAMILY - LOW DENSITY	2.44	2.62	143.0
HIGH DENSITY RESIDENTIAL (GTSP-HDR)	20-40 DU/AC	148.0	4,439	MULTI-FAMILY - HIGH DENSITY	3.33	3.58	529.8
RESIDENTIAL SUBTOTAL		**1,787.1**	**15,546**				
COMMUNITY MIXED-USE (GTSP-CMU)		81.8	330	MULTI-FAMILY - HIGH DENSITY & COMMERCIAL	5.35	5.75	470.5
NEIGHBORHOOD MIXED USE (GTSP-NMU)		29.7	180	MULTI-FAMILY - HIGH DENSITY & COMMERCIAL	5.35	5.75	170.8
NEIGHBORHOOD COMMERCIAL (GTSP-NC)		4.0		COMMERCIAL	2.02	2.17	8.7
MIXED-USE/COMMERCIAL SUBTOTAL		**115.5**	**510**				
SCHOOL (GTSP-PQP-SCHOOL)		48.1	-	PUBLIC	0.81	0.87	41.9
PUBLIC/QUASI PUBLIC SUBTOTAL		**48.1**					
PARKS AND RECREATION (GTSP-OS-P)		220.2	-	PUBLIC RECREATION	2.70	2.90	639.1
OPEN SPACE (GTSP-OS)		1,149.0	-	NON-IRRIGATED	-	-	0.0
OPEN SPACE SUBTOTAL		**1,369.2**					
MAJOR R/W		**197.0** -		RIGHT-OF-WAY	0.18	0.19	38.1
TOTAL		**3,516.8**	**16,056**				**5,735.0**
		AC.	**DU**				**AF/YR**

Natomas Central Mutual Water Company

2601 W. Elkhorn Blvd.
Rio Linda, CA 95673
916 419 5936

September 24, 2025

County of Sacramento
Planning and Environmental Review
Attn: Ms. Emma Patten
827 7th Street, Room 225
Sacramento, CA 95814

Dear Ms. Patten:

The purpose of this letter is to articulate Natomas Central Mutual Water Company's (NCMWC) interest to provide wholesale raw water to the Sacramento County Water Agency for the purposes of supplying surface water to the Upper Westside (UWS) project. We have been working closely with the Applicant in identifying adequate surface water supplies to serve the project. At the request of the County's comments to the Applicant we are providing additional information as it relates to curtailment of our water rights and the prioritizing of municipal and industrial (M&I) water usage.

We understand that UWS is proposing to utilize 100% surface water. As a result, it is important that we provide M&I water on a year-round basis, including in critical drought years. It is anticipated that our water shortage program will prioritize surface water for M&I use during drought and critical drought years. NCMWC anticipates making available surface water for priority needs at current market prices. Therefore, surface water can be prioritized for this project.

NCMWC will apply to amend our existing United States Bureau of Reclamation (USBR) contract and State Water Quality Control Board permits to allow for M&I water usage. Our USBR contract already contemplates future M&I water usage. Our current USBR contract allows for curtailment of 25% in critical drought years. If further curtailments were to occur NCMWC would prioritize this project. These USBR contract deliveries could also be reallocated to winter months to ensure adequate water delivery to NCMWC during winter months. We expect the process to amend our permits and contract to take approximately two years to complete.

Should you have any further questions we would be happy to discuss further with you our willingness to be a provider of M&I surface water to UWS.

Sincerely,

Brett Gray
General Manager

Cc: Nick Avdis, Avdis & Cucchi
Dan Cucchi, Avdis & Cucchi
Mike Motroni, Wood Rodgers

Appendix C - USBR Settlement Agreement with Natomas Central Mutal Water Company

United States Department of the Interior

BUREAU OF RECLAMATION
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

IN REPLY
REFER TO:
MP-440
WTR-4.00

MAY 10 2005

Board of Directors
Natomas Central Mutual Water Company
2601 West Elkhorn Boulevard
Rio Linda, California 95673

Subject: Long-Term Renewal Contract No. 14-06-200-885A-R-1 Between the United States and Natomas Central Mutual Water Company (Company), Diverter of Water From Sacramento River Sources, Settling Water Rights Disputes and Providing for Project Water - Sacramento River Division – Central Valley Project, California

Dear Board Members:

Enclosed is an executed original of the subject contract for your records. This contract is effective April 1, 2005, through March 31, 2045. The Bureau of Reclamation appreciates the effort expended by the Company and its representatives relative to this contract.

If there are any questions, please contact Mr. Don Bultema, Supervisory Repayment Specialist, at 530-934-1361 (TDD 530-934-1345).

Sincerely,

Kirk C. Rodgers
Regional Director

Enclosure

cc: Mr. David Aladjem
Downey Brand Associates
555 Capitol Mall 10th Floor
Sacramento, CA 95814
(w/c encls)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

CONTRACT BETWEEN THE UNITED STATES AND NATOMAS CENTRAL MUTUAL WATER COMPANY, DIVERTER OF WATER FROM SACRAMENTO RIVER SOURCES, SETTLING WATER RIGHTS DISPUTES AND PROVIDING FOR PROJECT WATER

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Exhibit A	Schedule of Monthly Diversions of Water
Exhibit B	Map of Contractor's Ownership
Exhibit C	Unit Duty
Exhibit D	Water Rates and Charges

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

CONTRACT BETWEEN THE UNITED STATES AND
NATOMAS CENTRAL MUTUAL WATER COMPANY,
DIVERTER OF WATER FROM SACRAMENTO RIVER SOURCES,
SETTLING WATER RIGHTS DISPUTES AND
PROVIDING FOR PROJECT WATER

THIS CONTRACT, hereinafter referred to as "Settlement Contract," is entered into by THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, made this 10th day of May, 2005, pursuant to the applicable authority granted to it generally in the Act of June 17, 1902 (32 Stat. 388), and acts amendatory or supplementary thereto, including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented, including, but not limited to, Sections 9 and 14 thereto, July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706), all collectively hereinafter referred to as Federal Reclamation law, and NATOMAS CENTRAL MUTUAL WATER COMPANY, hereinafter referred to as the Contractor, a corporation, acting pursuant to Sections 12003 and 12004 of the California Water Code, with its principal place of business in California;

WITNESSETH, that:

EXPLANATORY RECITALS

[1st] WHEREAS, the United States has constructed and is operating the Central Valley Project, California, for multiple purposes pursuant to its statutory authority; and

[2nd] WHEREAS, the Contractor has rights to divert, is diverting, and will continue to divert for reasonable beneficial use, water from the natural flow of the Sacramento River and tributaries thereto, that would have been flowing therein if the Central Valley Project were not in existence;

[3rd] WHEREAS, the construction and operation of the integrated and coordinated Central Valley Project has changed and will further change the regimen of the Sacramento, American, San Joaquin, and Trinity Rivers and the Sacramento-San Joaquin Delta from unregulated flow to regulated flow; and

[4th] WHEREAS, the United States has rights to divert, is diverting, and will continue to divert waters from said Rivers and said Delta in connection with the operation of said Central Valley Project; and

[5th] WHEREAS, the Contractor and the United States had a dispute over the respective rights of the parties to divert and use water from the regulated flow of the Sacramento River which threatened to result in litigation, and as a means to settle that dispute entered into Contract No. 14-06-200-885A, as revised, hereinafter referred to as the Existing Contract, which established terms for the delivery to the Contractor of Central Valley Project Water, and the quantities of Base Supply the United States and the Contractor agreed may be diverted by the Contractor from the Sacramento River pursuant to such contract; and

[6th] WHEREAS, the United States and the Contractor disagree with respect to the authority of the United States to change the quantities of Base Supply and/or Project Water

specified as available for diversion in this Settlement Contract from the quantities specified in the Existing Contract, and other issues related thereto. That dispute was the subject of litigation in a lawsuit entitled *Glenn-Colusa Irrigation District, et al. v. United States, et al.* [Civ. No. S-01-1816 GEB/JFM (E.D. Cal.)], but that litigation was dismissed, without prejudice, pursuant to a stipulation of dismissal filed by the parties thereto on August 29, 2002. Notwithstanding that dismissal, the Contractor and the United States enter into this Settlement Contract to renew the Existing Contract, pursuant to the terms of the Existing Contract, Federal Reclamation law, and the laws of the State of California; and

[7th] WHEREAS, to assure the Contractor of the enjoyment and use of the regulated flow of the said Rivers and the Delta, and to provide for the economical operation of the Central Valley Project by, and the reimbursement to, the United States for expenditures made for said Project.

NOW, THEREFORE, in consideration of the performance of the herein contained provisions, conditions, and covenants, it is agreed as follows:

DEFINITIONS

1. When used herein, unless otherwise expressed or incompatible with the intent hereof, the term:

(a) "Base Supply" shall mean the quantity of Surface Water established in Articles 3 and 5 which may be diverted by the Contractor from the Sacramento River each month during the period April through October of each Year without payment to the United States for such quantities diverted;

(b) "Basin-Wide Water Management Plan" shall mean the mutually agreeable Sacramento River Basinwide Water Management Plan, dated October 11, 2004, developed by

Glenn-Colusa Irrigation District, Maxwell Irrigation District, Natomas Central Mutual Water Company, Pelger Mutual Water Company, Princeton-Codora-Glenn Irrigation District, Provident Irrigation District, Reclamation District 108, Sutter Mutual Water Company, Anderson-Cottonwood Irrigation District, Meridian Farms Water Company, Reclamation District 1004, and the U.S. Bureau of Reclamation;

(c) "Charges" shall mean the payments for Project Water that the Contractor is required to pay to the United States in addition to the "Rates" specified in this Settlement Contract. The Contracting Officer will, on an annual basis, determine the extent of these Charges. The type and amount of each Charge shall be specified in Exhibit D;

(d) "Contract Total" shall mean the sum of the Base Supply and Project Water available for diversion by the Contractor for the period April 1 through October 31;

(e) "Critical Year" shall mean any Year in which either of the following eventualities exists:

(1) The forecasted full natural inflow to Shasta Lake for the current Water Year, as such forecast is made by the United States on or before February 15 and reviewed as frequently thereafter as conditions and information warrant, is equal to or less than 3.2 million acre-feet; or

(2) The total accumulated actual deficiencies below 4 million acre-feet in the immediately prior Water Year or series of successive prior Water Years each of which had inflows of less than 4 million acre-feet, together with the forecasted deficiency for the current Water Year, exceed 800,000 acre-feet.

For the purpose of determining a Critical Year, the computation of inflow to Shasta Lake shall be performed in a manner that considers the extent of upstream development

above Shasta Lake during the year in question, and shall be used as the full natural flow to Shasta Lake. In the event that major construction has occurred or occurs above Shasta Lake after September 1, 1963, and which has materially altered or alters the regimen of the stream systems contributing to Shasta Lake, the computed inflow to Shasta Lake used to define a Critical Year will be adjusted to eliminate the effect of such material alterations. After consultation with the State of California, the National Weather Service, and other recognized forecasting agencies, the Contracting Officer will select the forecast to be used and will make the details of it available to the Contractor. The same forecasts used by the United States for the operation of the Project shall be used to make the forecasts hereunder;

(f) "CVPIA" shall mean the Central Valley Project Improvement Act, Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

(g) "Eligible Lands" shall mean all lands to which Project Water may be delivered in accordance with Section 204 of the Reclamation Reform Act of October 12, 1982 (96 Stat. 1263), as amended, hereinafter referred to as RRA;

(h) "Excess Lands" shall mean all lands in excess of the limitations contained in Section 204 of the RRA, other than those lands exempt from acreage limitation under Federal Reclamation law;

(i) "Full Cost Rate" shall mean that water rate described in Sections 205(a)(3) or 202(3) of the RRA, whichever is applicable;

(j) "Ineligible Lands" shall mean all lands to which Project Water may not be delivered in accordance with Section 204 of the RRA;

(k) "Landholder" shall mean a party that directly or indirectly owns or leases nonexempt land, as provided in 43 CFR 426.2;

(l) "Project" shall mean the Central Valley Project owned by the United States and managed by the Department of the Interior, Bureau of Reclamation;

(m) "Project Water" shall mean all Surface Water diverted or scheduled to be diverted each month during the period April through October of each Year by the Contractor from the Sacramento River which is in excess of the Base Supply. The United States recognizes the right of the Contractor to make arrangements for acquisition of water from projects of others than the United States for delivery through the Sacramento River and tributaries subject to written agreement between Contractor and the United States as to identification of such water which water when so identified shall not be deemed Project Water under this Settlement Contract;

(n) "Rates" shall mean the payments for Project Water determined annually by the Contracting Officer in accordance with the then current applicable water ratesetting policies for the Project, as described in subdivision (a) of Article 8 of this Settlement Contract;

(o) "Secretary" or "Contracting Officer" shall mean the Secretary of the Interior, a duly appointed successor, or an authorized representative acting pursuant to any authority of the Secretary and through any agency of the Department of the Interior;

(p) "Surface Water" shall mean only those waters that are considered as surface water under California law;

(q) "Water Year" shall mean the period commencing with October 1 of one year and extending through September 30 of the next; and

(r) "Year" shall mean a calendar year.

TERM OF SETTLEMENT CONTRACT

2. (a) This Settlement Contract shall become effective April 1, 2005, and shall remain in effect until and including March 31, 2045; Provided, that under terms and conditions mutually agreeable to the parties hereto, renewals may be made for successive periods not to exceed 40 years each. The terms and conditions of each renewal shall be agreed upon not later than one year prior to the expiration of the then existing Settlement Contract.

(b) With respect to Project Water and the portions of this Settlement Contract pertaining thereto, upon written request by the Contractor of the Secretary made not later than one year prior to the expiration of this Settlement Contract, whenever, account being taken of the amount then credited to the costs of construction of water supply works, the remaining amount of construction costs of water supply work which is properly assignable for ultimate return by the Contractor as established by the Secretary of the Interior pursuant to (3) of Section 1 of Public Law 643 (70 Stat. 483), probably can be repaid to the United States within the term of a contract under subsection 9(d) of the 1939 Reclamation Project Act (53 Stat. 1187), the relevant portions of this Settlement Contract may be converted to a contract under said subsection 9(d) upon terms and conditions mutually agreeable to the United States and the Contractor. The Secretary shall make a determination ten years after the date of execution of this Settlement Contract, and every five years thereafter, of whether a conversion to a contract under said subsection 9(d) can be accomplished pursuant to Public Law 643. Notwithstanding any provision of this Settlement Contract, the Contractor reserves and shall have all rights and benefits under Public Law 643.

WATER TO BE FURNISHED TO CONTRACTOR

3. (a) Subject to the conditions, limitations, and provisions hereinafter expressed, the Contractor is hereby entitled and authorized to divert from the Sacramento River

at the locations shown in Exhibit A, for beneficial use within the area delineated on Exhibit B, (both Exhibits are attached hereto and made a part hereof), the Contract Total designated in Exhibit A, or any revision thereof, in accordance with the monthly operating schedule required by Article 3(c) of this Settlement Contract. The quantity of any water diverted under this Settlement Contract from the Sacramento River, during the period April through October, for use on any lands delineated on Exhibit B, by the owner of such lands or otherwise shall constitute a part of the Contract Total as shown on Exhibit A and shall be subject to all the provisions of this Settlement Contract relating to such Contract Total as if such diversion were made by the Contractor.

(b) The Contractor may have acquired rights to divert water from the Sacramento River during the period April through October, that were obtained after the date of execution of the Existing Contract, or the Contractor may acquire such rights in the future. All diversions made from the Sacramento River, pursuant to such rights, during the period April through October, shall not be considered a part of the quantity of Base Supply and Project Water specified in Exhibit A; Provided, that the quantities diverted pursuant to the above rights shall be identified on the schedule submitted pursuant to Article 3(c) below, and shall not be substituted for any Base Supply or Project Water; Provided, further, that any such identified quantities of other acquired rights may be diverted by the Contractor before incurring any fee pursuant to Article 3(c)(1), below.

(c) Before April 1 and before the first day of each month thereafter when a revision is needed, the Contractor shall submit a written schedule to the Contracting Officer indicating the Contract Total to be diverted by the Contractor for agricultural and municipal and industrial purposes during each month under this Settlement Contract. The United States shall

furnish water to the Contractor in accordance with the monthly operating schedule or any revisions thereof. However, the United States recognizes the need of the Contractor to change from time to time its monthly diversions of water from the quantities shown in Exhibit A; the Contractor may make such changes, provided:

(1) that for the quantity of Base Supply diverted in excess of the monthly quantity shown in Exhibit A, and as may be reduced in accordance with Article 5(a), during June, July, August, September, or October of any Water Year, the Contractor shall be charged a rescheduling fee equal to 50 percent of the sum of the storage operations and maintenance rate and the storage capital rate components of the Project ratesetting policy.

(2) that in no event shall the total quantity scheduled for diversion by the Contractor from the Sacramento River:

(i) During the period April through October exceed the aggregate of the Contract Total for that period shown in Exhibit A or any revision thereof;

(ii) During the period July through September exceed the aggregate of the Contract Total for that period shown in Exhibit A or any revision thereof.

(d) In the event conditions warrant, the Contracting Officer reserves the right to require the Contractor to submit, at least 72 hours prior to the beginning of each weekly period, its estimate of daily diversion requirements for each such period from the Sacramento River; Provided, however, that changes during any such period may be made upon the giving of 72 hours' notice thereof to the Contracting Officer.

(e) No sale, transfer, exchange, or other disposal of any of the Contract Total designated in Exhibit A or the right to the use thereof for use on land other than that shown on Exhibit B shall be made by the Contractor without first obtaining the written consent of the Contracting Officer. Such consent will not be unreasonably withheld and a decision will be rendered in a timely manner. For short-term actions that will occur within one year or less, the decision will be rendered within 30 days after receipt of a complete written proposal. For long-term actions that will occur in a period longer than one year, the decision will be rendered within 90 days after receipt of a complete written proposal. For a proposal to be deemed complete by the Contracting Officer, it must comply with all provisions required by State and Federal law, including information sufficient to enable the Contracting Officer to comply with the National Environmental Policy Act, the Endangered Species Act, and applicable rules or regulations then in effect; Provided, that such consent does not authorize the use of Federal facilities to facilitate or effectuate the sale, transfer, exchange, or other disposal of Base Supply. Such use of Federal facilities will be the subject of a separate agreement to be entered into between the Contractor and Reclamation.

(f) For the purpose of determining whether Section 3405(a)(1)(M) of the CVPIA applies to the Contractor as a transferor or transferee of Project Water, the Contracting Officer acknowledges that the Contractor is within a county, watershed, or other area of origin, as those terms are utilized under California law.

(g) Nothing herein contained shall prevent the Contractor from diverting water during the months of November through March for beneficial use on the land shown on Exhibit B or elsewhere to the extent authorized under the laws of the State of California.

(h) The United States assumes no responsibility for and neither it nor its officers, agents, or employees shall have any liability for or on account of:

(1) The quality of water to be diverted by the Contractor;

(2) The control, carriage, handling, use, disposal, or distribution of water diverted by the Contractor outside the facilities constructed and then being operated and maintained by or on behalf of the United States;

(3) Claims of damage of any nature whatsoever, including but not limited to, property loss or damage, personal injury, or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of said water outside of the hereinabove referred to facilities; and

(4) Any damage whether direct or indirect arising out of or in any manner caused by a shortage of water whether such shortage be on account of errors in operation, drought, or unavoidable causes.

(i) In addition to the provisions of subdivision (h) of Article 3 of this Contract, if there is a shortage of Project Water because of actions taken by the Contracting Officer to meet legal obligations then, except as provided in subdivision (a) of Article 30 of this Contract, no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom.

RETURN FLOW

4. Nothing herein shall be construed as an abandonment or a relinquishment by the United States of any right it may have to the use of waste, seepage, and return flow water derived from water diverted by the Contractor hereunder and which escapes or is discharged beyond the boundaries of the lands shown on Exhibit B; Provided, that this shall not be construed as

claiming for the United States any right to such water which is recovered by the Contractor pursuant to California law from within the boundaries of the lands shown on Exhibit B, and which is being used pursuant to this Settlement Contract for surface irrigation or underground storage for the benefit of the lands shown on Exhibit B by the Contractor.

CONSTRAINTS ON THE AVAILABILITY OF WATER

5. (a) In a Critical Year, the Contractor's Base Supply and Project Water agreed to be diverted during the period April through October of the Year in which the principal portion of the Critical Year occurs and, each monthly quantity of said period shall be reduced by 25 percent.

(b) The amount of any overpayment by the Contractor shall, at its option, be refunded or credited upon amounts to become due to the United States from the Contractor under the provisions hereof in the ensuing Year. To the extent of such deficiency such adjustment of overpayment shall constitute the sole remedy of the Contractor.

INTEGRATED WATER MANAGEMENT AND PARTNERSHIPS

6. The Contractor and United States desire to work together to maximize the reasonable beneficial use of water for their mutual benefit. As a consequence, the United States and the Contractor will work in partnership and with others within the Sacramento Valley, including other contractors, to facilitate the better integration within the Sacramento Valley of all water supplies including, but not limited to, the better management and integration of surface water and groundwater, the development and better utilization of surface water storage, the effective utilization of waste, seepage and return flow water, and other operational and management options that may be identified in the future.

USE OF WATER FURNISHED TO CONTRACTOR

7. (a) The parties anticipate that, during the term of this Settlement Contract, a gradual change in the purpose of use of water will occur within the place of water use shown in Exhibit B from predominantly agricultural purposes to a mixture of municipal and industrial, wildlife habitat and agricultural purposes, and the parties agree to work cooperatively to accommodate and facilitate such change. Project Water furnished to the Contractor pursuant to this Settlement Contract may be delivered or furnished by the Contractor for agricultural or municipal and industrial purposes; Provided, however, that the Contractor shall not deliver or furnish Project Water for municipal and industrial purposes outside those areas delineated on Exhibit B, as approved for such purposes by the Contracting Officer, without the written consent of the Contracting Officer. Such consent will not be unreasonably withheld and a decision will be provided in a timely manner following completion of any environmental review required under applicable law. For purposes of this Settlement Contract, "agricultural purposes" includes, but is not restricted to, the irrigation of crops, the watering of livestock, incidental domestic use including related landscape irrigation, and underground water replenishment; and "municipal and industrial purposes" includes, but is not limited to, the watering of landscaping or pasture for animals (e.g., horses) which are kept for personal enjoyment or water delivered to landholdings operated in units of less than five acres unless the Contractor establishes to the satisfaction of the Contracting Officer that the use of Project Water is for agricultural purposes.

(b) The Contractor shall comply with requirements applicable to the Contractor in biological opinion(s) prepared as a result of a consultation regarding the execution of this Settlement Contract undertaken pursuant to Section 7 of the Endangered Species Act of 1973, as amended, that are within the Contractor's legal authority to implement. The Existing

Contract, which evidences in excess of 40 years of diversions, for agricultural uses, of the quantities of water provided for in Article 3, and the underlying water rights of the Contractor will be considered in developing an appropriate base-line for the Biological Assessment prepared pursuant to the Endangered Species Act, and in any other needed environmental review. Nothing herein shall be construed to prevent the Contractor from challenging or seeking judicial relief in a court of competent jurisdiction with respect to any biological opinion or other environmental documentation referred to in this Article.

RATE AND METHOD OF PAYMENT FOR WATER

8. (a) The Contractor shall make payments to the United States as provided in this Article for all Project Water shown in Exhibit A as follows:

(1) 75 percent of the amount shown as Project Water shall be paid for by the Contractor in each Year; and in addition

(2) the Contractor shall pay for Project Water actually diverted in excess of 75 percent of the amount shown as Project Water.

Such payments shall be at Rates and Charges established in accordance with: (i) the Secretary's then-current ratesetting policies for the Project; and (ii) applicable Reclamation law and associated rules and regulations, or policies; Provided, that if the Contractor desires to use Project Water for other than agricultural purposes the Rates and Charges set forth above will be adjusted by the Contracting Officer to the applicable Rates and Charges for such purposes; Provided, further, that to enable the Contracting Officer to compute the applicable Rates and Charges for Project Water diverted by the Contractor for other than agricultural use, including, but not limited to diversions for municipal and industrial uses and diversions for direct application to wildlife habitat (not including re-use of tailwater for habitat purposes), prior to

initiating any such diversions, the Contractor shall provide the Contracting Officer with an estimate of the annual quantities of Project Water to be diverted or furnished for such purposes through the end of the CVP repayment period as identified in the then-current ratesetting policies. The Rates and Charges applicable to the Contractor upon execution of this Settlement Contract are set forth in Exhibit D, as may be revised annually. The Secretary's ratesetting policies for the Project shall be amended, modified, or superseded only through a public notice and comment procedure. The Contracting Officer shall adjust the amount of Project Water for which payment is required to the extent of any reduction in diversions of Project Water made in accordance with the water conservation provisions of Article 29(e).

(b) The Contracting Officer shall notify the Contractor of the Rates and Charges as follows:

(1) Prior to July 1 of each Year, the Contracting Officer shall provide the Contractor an estimate of the Charges for Project Water that will be applied to the period October 1, of the current Year, through September 30, of the following Year, and the basis for such estimate. The Contractor shall be allowed not less than two months to review and comment on such estimates. On or before September 15 of each Year, the Contracting Officer shall notify the Contractor in writing of the Charges to be in effect during the period October 1 of the current Year, through September 30, of the following Year, and such notification shall revise Exhibit D.

(2) Prior to October 1 of each Year, the Contracting Officer shall make available to the Contractor an estimate of the Rates for Project Water for the following Year and the computations and cost allocations upon which those Rates are based. The Contractor shall be allowed not less than two months to review and comment on such computations and cost allocations. By December 31 of each Year, the Contracting Officer shall provide the Contractor

with the final Rates to be in effect for the upcoming Year, and such notification shall revise Exhibit D.

(c) The Contractor shall pay the United States for Project Water in the following manner:

(1) With respect to Rates, prior to May 1 of each Year, the Contractor shall pay the United States one-half the total amount payable pursuant to subdivision (a) of this Article and the remainder shall be paid prior to July 1 or such later date or dates as may be specified by the United States in a written notice to the Contractor; Provided, however, that if at any time during the Year the amount of Project Water diverted by the Contractor shall equal the amount for which payment has been made, the Contractor shall pay for the remaining amount of such water as shown in Exhibit A in advance of any further diversion of Project Water.

(2) With respect to Charges, the Contractor shall also make a payment to the United States, in addition to the Rate(s) in subdivision (c)(1) of this Article, at the Charges then in effect, before the end of the month following the month of delivery or transfer. The payments shall be consistent with the quantities of Project Water delivered or transferred. Adjustment for overpayment or underpayment of Charges shall be made through the adjustment of payments due to the United States for Charges for the next month. Any amount to be paid for past due payment of Charges shall be computed pursuant to Article 13 of this Settlement Contract.

(d) Payments to be made by the Contractor to the United States under this Settlement Contract may be paid from any revenues available to the Contractor. All revenues received by the United States from the Contractor relating to the delivery of Project Water or the delivery of non-Project Water through Project facilities shall be allocated and applied in

accordance with Federal Reclamation law and the associated rules or regulations, and the then current Project ratesetting policies for irrigation water.

(e) The Contracting Officer shall keep its accounts pertaining to the administration of the financial terms and conditions of its long-term water service and Settlement Contracts, in accordance with applicable Federal standards, so as to reflect the application of Project costs and revenues. The Contracting Officer shall, each Year upon request of the Contractor, provide to the Contractor a detailed accounting of all Project and Contractor expense allocations, the disposition of all Project and Contractor revenues, and a summary of all water delivery information. The Contracting Officer and the Contractor shall enter into good faith negotiations to resolve any discrepancies or disputes relating to accountings, reports, or information.

(f) The parties acknowledge and agree that the efficient administration of this Settlement Contract is their mutual goal. Recognizing that experience has demonstrated that mechanisms, policies, and procedures used for establishing Rates and Charges and/or for making and allocating payments, other than those set forth in this Article may be in the mutual best interest of the parties, it is expressly agreed that the parties may enter into agreements to modify the mechanisms, policies, and procedures for any of those purposes while this Settlement Contract is in effect without amendment of this Settlement Contract.

(g) For the term of this Settlement Contract, Rates under the respective ratesetting policies for the Project will be established to recover only reimbursable operation and maintenance (including any deficits) and capital costs of the Project, as those terms are used in the then current Project ratesetting policies, and interest, where appropriate, except in instances where a minimum Rate is applicable in accordance with the relevant Project ratesetting policy.

Proposed changes of significance in practices which implement the ratesetting policies for the Project will not be implemented until the Contracting Officer has provided the Contractor an opportunity to discuss the nature, need, and impact of the proposed change. The Contractor retains all rights to challenge the validity of Rates and Charges imposed pursuant to this Settlement Contract, including but not limited to operation and maintenance expenses and operation and maintenance deficits, in an appropriate administrative or judicial proceeding.

(h) Except as provided in subsection 3405(a)(1)(B) of the CVPIA, the Rates for Project Water transferred, exchanged, or otherwise disposed of, by the Contractor shall be the Contractor's Rates adjusted upward or downward to reflect the changed costs of delivery (if any) of the transferred, exchanged, or otherwise disposed of Project Water to the transferee's point of delivery in accordance with the then-current ratesetting policies for the Project. Except as provided in subsection 3407(d)(2)(A) of the CVPIA, the Charges for Project Water transferred, exchanged, or otherwise disposed of, by the Contractor shall be the Contractor's Charges specified in Exhibit D. If the Contractor is receiving lower Rates and Charges because of inability to pay and is transferring, exchanging, or otherwise disposing of Project Water to another entity whose Rates and Charges are not adjusted due to inability to pay, the Rates and Charges for transferred, exchanged, or otherwise disposed of Project Water shall be the Contractor's Rates and Charges unadjusted for ability to pay.

(i) Pursuant to the Act of October 27, 1986 (100 Stat. 3050), the Contracting Officer is authorized to adjust determinations of ability to pay every five years.

(j) Each payment to be made pursuant to subdivisions (a) and (c) of this Article shall be made at the office of the Bureau of Reclamation, MP Region: Mid-Pacific,

P.O. Box 894242, Los Angeles, CA 90189-4242, or at such other place as the United States may designate in a written notice to the said Contractor. Payments shall be made by cash transaction, wire, or any other mechanism as may be agreed to in writing by the Contractor and the Contracting Officer. In the event there should be a default in the payment of the amount due, the delinquent payment provisions of Article 13 shall apply. The Contractor shall not be relieved of the whole or any part of its said obligation by, on account of, or notwithstanding, as the case may be:

(1) Its failure, refusal, or neglect to divert 75 percent of the quantity of Project Water shown on Exhibit A;

(2) The default in payment to it by any water user of assessments, tolls, or other charges levied by or owing to said Contractor;

(3) Any judicial determination that any assessment, toll, or other charge referred to in subsection 8(c)(2) of this Settlement Contract is irregular, void, or ineffectual; or

(4) Any injunctive process enjoining or restraining the Contractor from making or collecting any such assessment, toll, or other charge referred to in subsection 8(c)(2) of this Settlement Contract.

AGREEMENT ON WATER QUANTITIES

9. (a) During the term of this Settlement Contract and any renewals thereof:

(1) It shall constitute full agreement as between the United States and the Contractor as to the quantities of water and the allocation thereof between Base Supply and Project Water which may be diverted by the Contractor from the Sacramento River for beneficial use on the land shown on Exhibit B from April 1 through October 31, which said diversion, use,

and allocation shall not be disturbed so long as the Contractor shall fulfill all of its obligations hereunder;

(2) Neither party shall claim any right against the other in conflict with the provisions of Article 9(a)(1) hereof.

(b) Nothing herein contained is intended to or does limit rights of the Contractor against others than the United States or of the United States against any person other than the Contractor; Provided, however, that in the event the Contractor, the United States, or any other person shall become a party to a general adjudication of rights to the use of water of the Sacramento River system, this Settlement Contract shall not jeopardize the rights or position of either party hereto or of any other person and the rights of all such persons in respect to the use of such water shall be determined in such proceedings the same as if this Settlement Contract had not been entered into, and if final judgment in any such general adjudication shall determine that the rights of the parties hereto are different from the rights as assumed herein, the parties shall negotiate an amendment to give effect to such judgment. In the event the parties are unable to agree on an appropriate amendment they shall, within 60 days of determining that there is an impasse, employ the services of a neutral mediator, experienced in resolving water rights disputes, to assist in resolving the impasse. The cost of the mediation will be shared equally. A failure to reach agreement on an amendment within 60 days of the end of mediation will cause the immediate termination of this Settlement Contract.

(c) In the event that the California State Water Resources Control Board or a court of competent jurisdiction issues a final decision or order modifying the terms and conditions of the water rights of either party to this Settlement Contract in order to impose Bay-Delta water quality obligations, the Contractor and the United States shall promptly meet to

455 determine whether or not to modify any of the terms of this Settlement Contract to comply with
456 the final decision or order, including, but not limited to, the applicability of the rescheduling
457 charge in Article 3(c)(1) of this Settlement Contract. If within 60 days of the date of the issuance
458 of the final decision or order the parties are not able to reach agreement regarding either the need
459 to modify this Settlement Contract or the manner in which this Settlement Contract is to be
460 modified, the parties shall promptly retain a neutral mediator, experienced in resolving water
461 right disputes, to assist the parties in resolving their dispute. The cost of the mediator shall be
462 shared equally. In the event that either of the parties to this Settlement Contract determines that
463 the parties will not be able to develop mutually-agreeable modification(s) to this Settlement
464 Contract even with the assistance of a mediator, either of the parties to this Settlement Contract
465 may attempt to resolve the impasse by seeking appropriate judicial relief including, but not
466 limited to, filing a general adjudication of the rights to the use of water in the Sacramento River
467 system. The foregoing provisions of this sub-article shall only apply to the incremental
468 obligations contained within a final decision or order of the State Water Resources Control
469 Board that reflects a modification to the obligations imposed in State Water Resources Control
470 Board Revised Water Rights Decision 1641 dated March 15, 2000, and its associated 1995 Water
471 Quality Control Plan which, taken together, will be considered the baseline for the application of
472 the provisions of this sub-article.

473 (d) In the event this Settlement Contract terminates, the rights of the parties to
474 thereafter divert and use water shall exist as if this Settlement Contract had not been entered into;
475 and the fact that as a compromise settlement of a controversy as to the respective rights of the
476 parties to divert and use water and the yield of such rights during the term hereof, this Settlement
477 Contract places a limit on the Contract Total to be diverted annually by the Contractor during the

Settlement Contract term and segregates it into Base Supply and Project Water shall not jeopardize the rights or position of either party with respect to its water rights or the yield thereof at all times after the Settlement Contract terminates. It is further agreed that the Contractor at all times will first use water to the use of which it is entitled by virtue of its own water rights, and neither the provisions of this Settlement Contract, action taken thereunder, nor payments made thereunder to the United States by the Contractor shall be construed as an admission that any part of the water used by the Contractor during the term of this Settlement Contract was in fact water to which it would not have been entitled under water rights owned by it nor shall receipt of payments thereunder by the United States from the Contractor be construed as an admission that any part of the water used by the Contractor during the term of this Settlement Contract was in fact water to which it would have been entitled under water rights owned by it.

MEASUREMENT OF WATER

10. (a) All water diverted by the Contractor from the Sacramento River will be diverted at the existing point or points of diversion shown on Exhibit A or at such other points as may be mutually agreed upon in writing by the Contracting Officer and the Contractor.

(b) All water diverted from the Sacramento River pursuant to this Settlement Contract will be measured or caused to be measured by the United States at each point of diversion with existing equipment or equipment to be installed, operated, and maintained by the United States, and/or others, under contract with and at the option of the United States. The equipment and methods used to make such measurement shall be in accordance with sound engineering practices. Upon request of the Contractor, the accuracy of such measurements will be investigated by the Contracting Officer and any errors appearing therein will be corrected.

(c) The right of ingress to and egress from all points of diversion is hereby granted to all authorized employees of the United States. The Contractor also hereby grants to the United States the right to install, operate, maintain, and replace such equipment on diversion or carriage facilities at each point of diversion as the Contracting Officer deems necessary.

(d) The Contractor shall not modify, alter, remove, or replace diversion facilities or do any other act which would alter the effectiveness or accuracy of the measuring equipment installed by the United States or its representatives unless and until the Contracting Officer has been notified with due diligence and has been given an opportunity to modify such measuring equipment in such manner as may be necessary or appropriate. In the event of an emergency the Contractor shall notify the United States within a reasonable time thereafter as to the existence of the emergency and the nature and extent of such modification, alteration, removal, or replacement of diversion facilities.

(e) The Contractor shall pay the United States for the costs to repair, relocate, or replace measurement equipment when the Contractor modifies, alters, removes, or replaces diversion or carriage facilities.

(f) Contractor and Contracting Officer shall develop a mutually agreeable surface water delivery water measurement program which shall be implemented by the Contractor, and such measurement program shall be consistent with the conservation and efficiency criteria for evaluating water conservation plans as provided in Article 29(a).

(g) All new surface water delivery systems installed within the lands delineated on Exhibit B after the effective date of this Settlement Contract shall also comply with the measurement provisions described in this Article.

(h) The Contractor shall inform the Contracting Officer on or before the 10th calendar day of each month of the quantity of Contract Total diverted or furnished for agricultural and municipal and industrial purposes during the preceding month.

RULES AND REGULATIONS

11. The parties agree that the delivery of Project Water for irrigation use or use of Federal facilities pursuant to this Settlement Contract is subject to Federal Reclamation law, including but not limited to, the Reclamation Reform Act of 1982 (43 U.S.C. 390aa et seq.), as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Federal Reclamation law.

GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

12. (a) The obligation of the Contractor to pay the United States as provided in this Settlement Contract is a general obligation of the Contractor notwithstanding the manner in which the obligation may be distributed among the Contractor's water users and notwithstanding the default of individual water users in their obligations to the Contractor.

(b) The payment of Charges becoming due hereunder is a condition precedent to receiving benefits under this Settlement Contract. The United States shall not make water available to the Contractor through Project facilities during any period in which the Contractor may be in arrears in the advance payment of water Rates due the United States. The Contractor shall not furnish water made available pursuant to this Settlement Contract for lands or parties which are in arrears in the advance payment of water rates levied or established by the Contractor.

(c) With respect to subdivision (b) of this Article, the Contractor shall have no obligation to require advance payment for water Rates which it levies.

CHARGES FOR DELINQUENT PAYMENTS

13. (a) The Contractor shall be subject to interest, administrative and penalty charges on delinquent installments or payments. When a payment is not received by the due date, the Contractor shall pay an interest charge for each day the payment is delinquent beyond the due date. When a payment becomes 60 days delinquent, the Contractor shall pay an administrative charge to cover additional costs of billing and processing the delinquent payment. When a payment is delinquent 90 days or more, the Contractor shall pay an additional penalty charge of six percent per year for each day the payment is delinquent beyond the due date.

Further, the Contractor shall pay any fees incurred for debt collection services associated with a delinquent payment.

(b) The interest charge rate shall be the greater of the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of one-half of one percent per month prescribed by Section 6 of the Reclamation Project Act of 1939 (Public Law 76-260). The interest charge rate shall be determined as of the due date and remain fixed for the duration of the delinquent period.

(c) When a partial payment on a delinquent account is received, the amount received shall be applied, first to the penalty, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.

QUALITY OF WATER

14. The operation and maintenance of Project facilities shall be performed in such manner as is practicable to maintain the quality of raw water made available through such facilities at the highest level reasonably attainable as determined by the Contracting Officer. The United States does not warrant the quality of water and is under no obligation to construct or furnish water treatment facilities to maintain or better the quality of water.

WATER AND AIR POLLUTION CONTROL

15. The Contractor, in carrying out this Settlement Contract, shall comply with all applicable water and air pollution laws and regulations of the United States and the State of California, and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities.

EQUAL OPPORTUNITY

16. During the performance of this Settlement Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of payment or other

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

17. (a) The Contractor shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d), Section 504 of the Rehabilitation Act of 1975 (P.L. 93-112, as amended), the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) and any other applicable civil rights laws, as well as with their respective implementing regulations and guidelines imposed by the U.S. Department of the Interior and/or Bureau of Reclamation.

(b) These statutes require that no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation. By executing this Settlement Contract, the Contractor agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

(c) The Contractor makes this agreement in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other Federal financial assistance extended after the date hereof to the Contractor by the Bureau of Reclamation, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Contractor recognizes and agrees that such Federal assistance will be extended in reliance on the representations and agreements made in this Article, and that the United States reserves the right to seek judicial enforcement thereof.

MINGLING OF CONTRACTOR'S PROJECT AND NON-PROJECT WATER

18. (a) Project Water must of necessity be transported by the Contractor to its water users by means of the same works and channels used for the transport of its non-Project Water including Base Supply. Notwithstanding such mingling of water, the provisions of Article 11 hereof shall be applicable only to Project Water, and such mingling of water shall not in any manner subject to the provisions of Article 11 hereof the Contractor's non-Project Water including Base Supply.

(b) If required in accordance with subdivision (c) of this Article, the Contractor shall install and maintain such measuring equipment and distribution facilities and maintain such records as may be necessary to determine the amounts of water delivered to Excess Lands served by the Contractor. The Contractor shall not within any month deliver to

Ineligible Lands water in excess of the non-Project Water, including Base Supply, for that month. The Contracting Officer or authorized representative shall have the right at all reasonable times to inspect such records and measuring equipment.

(c) The Contractor will not be considered in violation of the requirement that Project Water be delivered only to Eligible Lands during any month of the irrigation season that the water requirement for beneficial use on Eligible Lands for that month is equal to or in excess of the Project Water for that month as shown on Exhibit A or any revision thereof pursuant to subdivision (c) of Article 3. The water requirement for beneficial use on Eligible Lands will be determined by multiplying:

(1) the number of irrigable acres of the particular types of crops grown in that year on the acreage designated as eligible by

(2) the Unit Duties as set forth in Exhibit C attached hereto and made a part hereof, or by such other Unit Duties mutually agreed upon by the Contractor and the Contracting Officer. In order to make the computation of the water requirement for Eligible Lands, on April 1 of each Year and concurrently with its order for water for the irrigation season, the Contractor shall designate the acreage of and type of crops to be grown on its Eligible Lands that irrigation season. During any month the water requirement as above determined for crops growing on Eligible Lands during such month is equal to or in excess of the Project Water for that month as provided herein the Contractor shall not be required to measure the water delivered to Excess Lands. Any month the said water requirement is less than the amount of Project Water as provided herein, the Contractor will be required to measure water delivered to excess land in accordance with subdivision (b) hereof.

BOOKS, RECORDS, AND REPORTS

19. The Contractor shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Settlement Contract, including: the Contractor's financial transactions, water supply data, and Project land and right-of-way agreements; the water users' land-use (crop census), land ownership, land-leasing and water use data; and other matters that the Contracting Officer may require. Reports thereon shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this Settlement Contract shall have the right during office hours to examine and make copies of each other's books and official records relating to matters covered by this Settlement Contract.

CHANGE OF PLACE OF USE OR ORGANIZATION

20. (a) Unless the written consent of the United States is first obtained no change shall be made in the place of water use shown on Exhibit B.

(b) While this Settlement Contract is in effect, no change shall be made in the area of the Contractor as shown on its Exhibit B, by inclusion, exclusion, annexation, or detachment of lands, by dissolution, consolidation, or merger or otherwise, except upon the Contracting Officer's written consent thereto. Such consent will not be unreasonably withheld and a decision will be provided in a timely manner.

(c) In the event lands are annexed to or detached from the area of the Contractor, as provided herein, the quantity of Project Water to be diverted may be increased or decreased, as may be appropriate, pursuant to a supplemental agreement to be executed in respect thereto.

CONSOLIDATION OF CONTRACTING ENTITIES

21. Consolidation of Contractors may be approved by the Contracting Officer provided: (i) the Contracting Officer approves the form and organization of the resulting entity and the utilization by it of the Contract Total; and (ii) the obligations of the Contractors are assumed by such entity.

No such consolidation shall be valid unless and until approved by the Contracting Officer.

NOTICES

22. Any notice, demand, or request authorized or required by this Settlement Contract shall be deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid, or delivered to the Area Manager, Northern California Area Office, Bureau of Reclamation, 16349 Shasta Dam Boulevard, Shasta Lake, California 96019, and on behalf of the United States, when mailed, postage prepaid, or delivered to the Board of Directors of the Natomas Central Mutual Water Company, 2601 West Elkhorn Boulevard, Rio Linda, California 95673. The designation of the addressee or the address may be changed by notice given in the same manner as provided in this Article for other notices.

ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

23. (a) The provisions of this Settlement Contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Settlement Contract or any right or interest therein shall be valid until approved in writing by the Contracting Officer.

(b) The assignment of any right or interest in this Settlement Contract by either party shall not interfere with the rights or obligations of the other party to this Settlement Contract absent the written concurrence of said other party.

(c) The Contracting Officer shall not unreasonably condition or withhold his approval of any proposed assignment.

OFFICIALS NOT TO BENEFIT

24. (a) No Member of or Delegate to Congress, Resident Commissioner, or official of the Contractor shall benefit from this Settlement Contract other than as a water user or landowner in the same manner as other water users or landowners.

(b) No officer or member of the governing board of the Contractor shall receive any benefit that may arise by reason of this Settlement Contract other than as a landowner within the Contractor's Service Area and in the same manner as other landowners within the said service area.

CONTINGENT UPON APPROPRIATION OR ALLOTMENT OF FUNDS

25. The expenditure or advance of any money or the performance of any obligation of the United States under this Settlement Contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the Contractor from any obligations under this Settlement Contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

CONFIRMATION OF SETTLEMENT CONTRACT

26. The Contractor, after the execution of this Settlement Contract, shall promptly seek to secure a decree of a court of competent jurisdiction of the State of California, if appropriate, confirming the execution of this Settlement Contract. The Contractor shall furnish the United States a certified copy of the final decree, the validation proceedings, and all pertinent supporting records of the court approving and confirming this Settlement Contract, and decreeing and adjudging it to be lawful, valid, and binding on the Contractor. This Settlement Contract shall not be binding on the United States until such final decree has been secured.

UNAVOIDABLE GROUNDWATER PERCOLATION

27. To the extent applicable, the Contractor shall not be deemed to have delivered Project Water to Excess Lands or Ineligible Lands if such lands are irrigated with groundwater that reaches the underground strata as an unavoidable result of the delivery of Project Water by the Contractor to Eligible Lands.

PRIVACY ACT COMPLIANCE

28. (a) The Contractor shall comply with the Privacy Act of 1974 (5 U.S.C. 552a) (the Act) and the Department of the Interior rules and regulations under the Act (43 CFR 2.45 et seq.) in maintaining Landholder acreage certification and reporting records, required to be submitted to the Contractor for compliance with Sections 206 and 228 of the Reclamation Reform Act of 1982 (96 Stat. 1266), and pursuant to 43 CFR 426.18.

(b) With respect to the application and administration of the criminal penalty provisions of the Act (5 U.S.C. 552a(i)), the Contractor and the Contractor's employees responsible for maintaining the certification and reporting records referenced in (a) above are considered to be employees of the Department of the Interior. See 5 U.S.C. 552a(m).

(c) The Contracting Officer or a designated representative shall provide the Contractor with current copies of the Interior Department Privacy Act regulations and the Bureau of Reclamation Federal Register Privacy Act System of Records Notice (Acreage Limitation--Interior, Reclamation-31) which govern the maintenance, safeguarding, and disclosure of information contained in the Landholder's certification and reporting records.

(d) The Contracting Officer shall designate a full-time employee of the Bureau of Reclamation to be the System Manager who shall be responsible for making decisions on denials pursuant to 43 CFR 2.61 and 2.64 amendment requests pursuant to 43 CFR 2.72. The Contractor is authorized to grant requests by individuals for access to their own records.

(e) The Contractor shall forward promptly to the System Manager each proposed denial of access under 43 CFR 2.64; and each request for amendment of records filed under 43 CFR 2.71; notify the requester accordingly of such referral; and provide the System Manager with information and records necessary to prepare an appropriate response to the requester. These requirements do not apply to individuals seeking access to their own certification and reporting forms filed with the Contractor pursuant to 43 CFR 426.18, unless the requester elects to cite the Privacy Act as a basis for the request.

WATER CONSERVATION

29. (a) Prior to the diversion of Project Water, the Contractor shall be implementing an effective water conservation and efficiency program based on the Basin-Wide Water Management Plan and/or Contractor's water conservation plan that has been determined by the Contracting Officer to meet the conservation and efficiency criteria for evaluating water conservation plans established under Federal law. The water conservation and efficiency program shall contain definite water conservation objectives, appropriate economically feasible water conservation measures, and time schedules for meeting those objectives. Continued diversion of Project Water pursuant to this Settlement Contract shall be contingent upon the Contractor's continued implementation of such water conservation program. In the event the Contractor's water conservation plan or any revised water conservation plan completed pursuant to subdivision (c) of Article 29 of this Settlement Contract have not yet been determined by the Contracting Officer to meet such criteria, due to circumstances which the Contracting Officer determines are beyond the control of the Contractor, Project Water deliveries shall be made under this Settlement Contract so long as the Contractor diligently works with the Contracting Officer to obtain such determination at the earliest practicable date, and thereafter the Contractor

immediately begins implementing its water conservation and efficiency program in accordance with the time schedules therein.

(b) The Contractor shall submit to the Contracting Officer a report on the status of its implementation of the water conservation plan on the reporting dates specified in the then existing conservation and efficiency criteria established under Federal law.

(c) At five-year intervals, the Contractor shall revise its water conservation plan to reflect the then current conservation and efficiency criteria for evaluating water conservation plans established under Federal law and submit such revised water management plan to the Contracting Officer for review and evaluation. The Contracting Officer will then determine if the water conservation plan meets Reclamation's then current conservation and efficiency criteria for evaluating water conservation plans established under Federal law.

(d) If the Contractor is engaged in direct groundwater recharge, such activity shall be described in the Contractor's water conservation plan.

(e) In order to provide incentives for water conservation, the Contractor may reduce the amount of Project Water for which payment is required under Article 8(a) in accordance with the provisions of this Article 29(e).

(1) On or before February 15 of any Water Year, the Contractor may file with Reclamation an offer to reduce Project Water use, hereinafter referred to as Offer. The Offer shall specify the maximum quantity of Project Water to be diverted by the Contractor for each month that Project Water is available for that Water Year under this Settlement Contract. The Contracting Officer shall provide the Contractor with a decision, in writing, to the Offer on or before March 15 of that Water Year. The dates specified in this Article 29(e)(1) can be changed if mutually agreed to, in writing, by the Contractor and Contracting Officer.

(2) If Reclamation accepts the Offer, the Contractor's payment obligation under Article 8(a)(1) shall be reduced to the maximum quantity of Project Water to be diverted by the Contractor as specified in the Offer. The Contractor shall not divert Project Water in excess of the quantities set forth in the Offer; Provided, however, if the Contractor's diversions of Project Water exceed the quantities set forth in the Offer, the Contractor shall pay to Reclamation the applicable Rates and Charges plus an amount equal to the applicable Rates and Charges, unadjusted for ability to pay, for each acre-foot of Project Water diverted in excess of the quantities set forth in the Offer.

(3) If Reclamation decides not to accept the Offer, the Contractor's payment obligation will remain as specified in Article 8(a)(1).

(4) The provisions of this Article 29(e) shall be in addition to and shall not affect the provisions of Article 3(e) pertaining to the sale, transfer, exchange, or other disposal of the Contract Total designated in Exhibit A.

OPINIONS AND DETERMINATIONS

30. (a) Where the terms of this Settlement Contract provide for actions to be based upon the opinion or determination of either party to this Settlement Contract, said terms shall not be construed as permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or determinations. Both parties, notwithstanding any other provisions of this Settlement Contract, expressly reserve the right to seek relief from and appropriate adjustment for any such arbitrary, capricious, or unreasonable opinion or determination. Each opinion or determination by either party shall be provided in a timely manner. Nothing in subdivision (a) of Article 30 of this Settlement Contract is intended to or shall affect or alter the

standard of judicial review applicable under Federal law to any opinion or determination implementing a specific provision of Federal law embodied in statute or regulation.

(b) The Contracting Officer shall have the right to make determinations necessary to administer this Settlement Contract that are consistent with the provisions of this Settlement Contract, the laws of the United States and of the State of California, and the rules and regulations promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with the Contractor to the extent reasonably practicable.

CONTRACTOR TO PAY CERTAIN MISCELLANEOUS COSTS

31. (a) In addition to all other payments to be made by the Contractor pursuant to this Settlement Contract, the Contractor shall pay to the United States, within 60 days after receipt of a bill and detailed statement submitted by the Contracting Officer to the Contractor for such specific items of direct cost incurred by the United States for work requested by the Contractor associated with this Settlement Contract plus indirect costs in accordance with applicable Bureau of Reclamation policies and procedures. All such amounts referred to in this Article shall not exceed the amount agreed to in writing in advance by the Contractor. This Article shall not apply to costs for routine contract administration.

(b) All advances for miscellaneous costs incurred for work requested by the Contractor pursuant to Article 31 of this Settlement Contract shall be adjusted to reflect the actual costs when the work has been completed. If the advances exceed the actual costs incurred, the difference will be refunded to the Contractor. If the actual costs exceed the Contractor's advances, the Contractor will be billed for the additional costs pursuant to Article 31 of this Settlement Contract.

WAIVER OF DEFAULT

32. The waiver by either party to this Settlement Contract as to any default shall not be construed as a waiver of any other default or as authority of the other party to continue such default or to make, do, or perform, or not to make, do, or perform, as the case may be, any act or thing which would constitute a default.

IN WITNESS WHEREOF, the parties hereto have executed this Settlement Contract as of the day and year first hereinabove written.

THE UNITED STATES OF AMERICA

APPROVED AS TO LEGAL FORM AND SUFFICIENCY
OFFICE OF REGIONAL SOLICITOR
DEPARTMENT OF THE INTERIOR

By: _____
Regional Director, Mid-Pacific Region
Bureau of Reclamation

(SEAL)

NATOMAS CENTRAL MUTUAL WATER COMPANY

By: _____
President

ATTEST:

_____
Secretary

(H:\public\Sac River Final LTRC's\2005-01-31 Natomas Central MWC Final Draft Contract with exhibits.doc)

Exhibit A

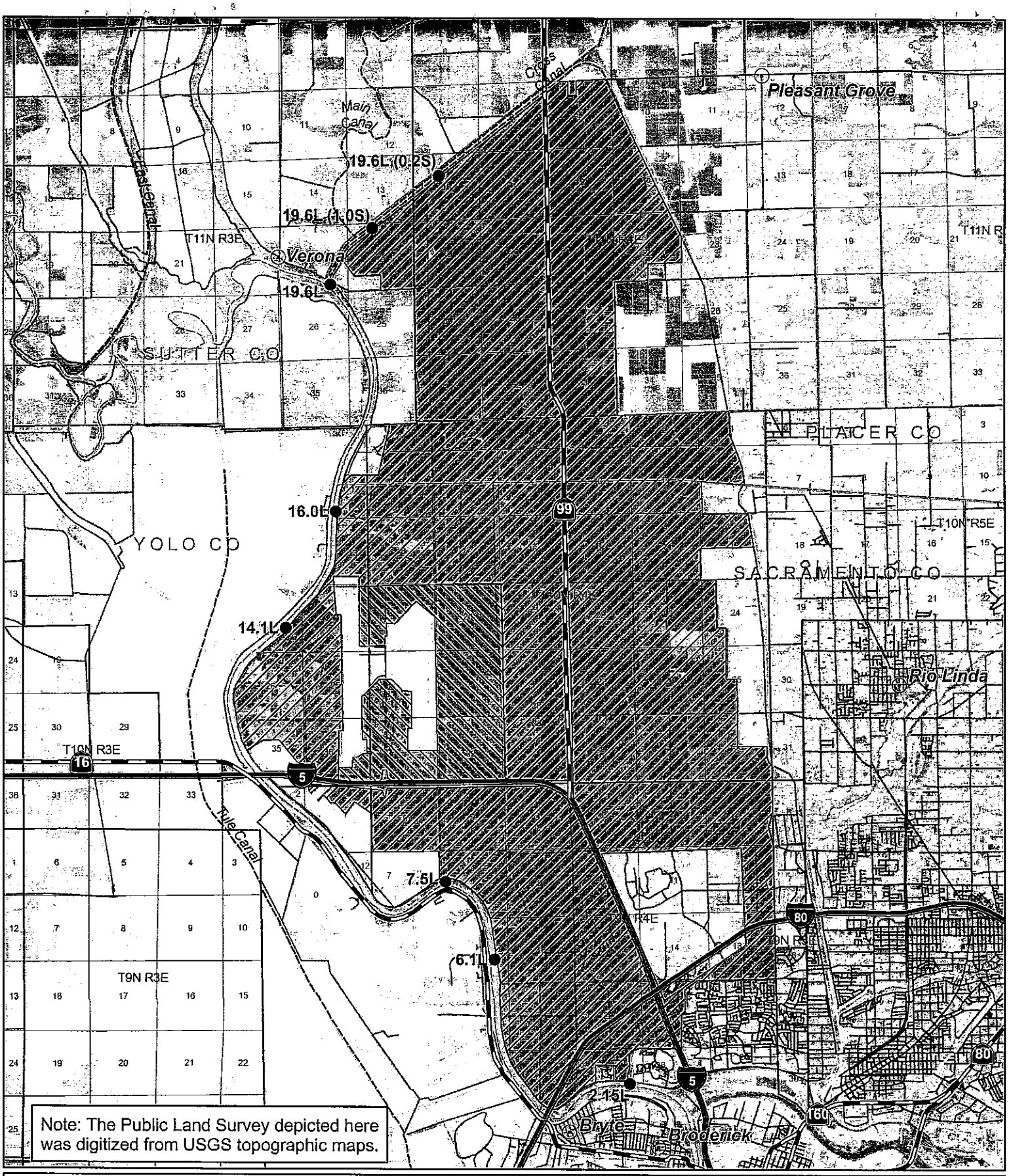
NATOMAS CENTRAL MUTUAL WATER COMPANY
Sacramento River

SCHEDULE OF MONTHLY DIVERSIONS OF WATER

	Base Supply (acre-feet)	Project Water (acre-feet)	Contract Total (acre-feet)
April	14,000	0	14,000
May	27,700	0	27,700
June	23,000	0	23,000
July	11,500	7,200	18,700
August	3,900	14,800	18,700
September	16,100	0	16,100
October	2,000	0	2,000
Total	98,200	22,000	120,200

Points of Diversion: 2.15L, 6.1L, 7.5L, 14.1L, 16.0L, 19.6L (Cross Canal 1.0S & 2.0S)

Dated: 01-31-2005



Contractor's Service Area - Ag Only
Contractor's Service Area - Ag and/or M&I
District Boundary
Point of Diversion

Natomas Central Mutual Water Co.

Contract No. 14-06-200-885A-R-1
Exhibit B

Miles
0 0.5 1 2 3

Date: 3/7/05, Revised 4/11/05
File Name: N:\districts\contracts\natomas_central\natomas_central.mxd

725-202-35

Exhibit C

NATOMAS CENTRAL MUTUAL WATER COMPANY
Sacramento River

UNIT DUTY

(In Acre-Feet Per Acre)

	Rice	Alfalfa and Irrigated Pasture	General Crops
June	1.70	0.80	0.60
July	1.80	1.00	0.70
August	1.70	0.80	0.70
September	0.50	0.60	0.40

Dated: 01-31-2005

Exhibit D

NATOMAS CENTRAL MUTUAL WATER COMPANY
Sacramento River
2005 Water Rates and Charges per Acre-Foot

	Cost of Service		Calculated Payment Capacity 1/
	Irrigation	M&I	Irrigation
COST OF SERVICE RATES:			
Capital Rate			
Storage	$4.57	$9.70	$0.00
O&M Rates:			
Water Marketing	$6.61	$3.89	$6.61
Storage	$5.93	$6.67	$5.93
Deficit Rates:			
Interest Bearing	$0.00	$0.00	$0.00
CFO/PFR Adjustment Rate 2/	$0.00	$0.00	$0.00
TOTAL	$17.11	$20.26	$12.54
RESCHEDULING FEE:	$5.59	$8.19	$5.59
FULL-COST RATES:			
Section 202(3) Rate is applicable to a Qualified Recipient or to a Limited Recipient receiving irrigation water on or before October 1, 1981.	$21.47	N/A	$21.47
Section 205(a)(3) Rate is applicable to a Limited Recipient that did not receive irrigation water on or before October 1, 1981.	$23.82	N/A	$23.82
CHARGES UNDER P.L. 102-575 TO THE RESTORATION FUND 3/			
Restoration Payments (3407(d)(2)(A))	$7.93	$15.87	$0.00

1/ Established pursuant to the Sutter, Natomas and Pelger MWC Payment Capacity Analysis dated October, 2001.

2/ Chief Financial Officer (CFO) adjustment and Provision for Replacement (PFR) expense is being distributed over a 5-year period beginning in FY 2003 for those contractors that requested those costs be deferred.

3/ These surcharges are payments in addition to the water rates and are determined pursuant to Title XXXIV of P.L. 102-575. Restoration Fund surcharges under P.L. 102-575 are on a fiscal year basis (10/1 -9/30). Contractors with ability to pay relief do not pay Restoration Fund charges for agricultural water.

BOARD OF DIRECTORS

NATOMAS CENTRAL MUTUAL WATER COMPANY

RESOLUTION NO. 2005-03-02

RESOLUTION APPROVING LONG-TERM RENEWAL OF CONTRACT BETWEEN THE UNITED STATES AND NATOMAS CENTRAL MUTUAL WATER COMPANY, DIVERTER OF WATER FROM SACRAMENTO RIVER SOURCES, SETTLING WATER RIGHTS DISPUTES AND PROVIDING FOR PROJECT WATER

WHEREAS Natomas Central Mutual Water Company (the "Company") has, since 1964, held a settlement contract with the United States Department of the Interior, Bureau of Reclamation ("Reclamation") bearing Contract No. 14-06-200-885A (the "Original Contract").

WHEREAS the Original Contract would have expired on March 31, 2004.

WHEREAS in advance of that expiration, the Company and Reclamation entered into negotiations for a long-term renewal of the Original Contract.

WHEREAS by Act of Congress, the Original Contract was extended for a period of two years, because the negotiations and related procedures had not been completed by March 31, 2004.

WHEREAS the negotiations and related procedures have now been completed, and Reclamation has presented to the Company the agreed-upon final form of renewal contract bearing Contract No. 14-06-200-885A-R1 (the "Renewal Contract").

WHEREAS the Board of Directors of the Company finds and determines that it is in the best interest of the Company to approve the Renewal Contract and to authorize the General Manager and staff of the Company to carry out any actions necessary to implement the Renewal Contract.

NOW, THEREFORE, BE IT RESOLVED that:

1. The Board of Directors of the Company hereby approves the Renewal Contract between Reclamation and the Company with the correction of Exhibit B to include the 428 acres of airport land into Natomas' contractual service area.

2. The General Manager and staff of the Company are authorized and directed to take any other action necessary to implement the terms of the Renewal Contract.

PASSED AND ADOPTED by unanimous written consent of the Board of Directors on April 21, 2005.

By _____
Dan F. Spangler
President, Board of Directors

By _____
Herb Niederberger, Jr.
Vice President, Board of Directors

By _____
Mark Enes
Secretary, Board of Directors

By _____
Jim Sopwith
Board of Directors

By _____
Doug Ose
Board of Directors

By _____
Michael George
Board of Directors

By _____
Rod Rosa
Board of Directors

Appendix D - USBR Settlement Agreement with Sacramento River Settlement Contractors to establish a Drought Protection Program

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

AGREEMENT BETWEEN THE UNITED STATES BUREAU OF RECLAMATION, THE SACRAMENTO RIVER SETTLEMENT CONTRACTORS, A CALIFORNIA NONPROFIT MUTUAL BENEFIT CORPORATION, AND INDIVIDUAL SACRAMENTO RIVER SETTLEMENT CONTRACTORS FOR THE ESTABLISHMENT OF A DROUGHT PROTECTION PROGRAM

THIS AGREEMENT, made this 10th day of January, 2025, pursuant to the Reclamation Act of 1939 (53 Stat. 1187), the Reclamation Reform Act of 1982 (P.L. 97-293), and the Inflation Reduction Act of 2022 (P.L. 117-169), between the UNITED STATES BUREAU OF RECLAMATION, hereinafter the United States or Reclamation, and represented by the officer executing this Agreement, the SACRAMENTO RIVER SETTLEMENT CONTRACTORS, a California nonprofit mutual benefit corporation, hereinafter referred to as the SRSC Corp., acting for and on behalf of its members and any other non-member Sacramento River settlement contractor that receives funding pursuant to this Agreement, and individual Sacramento River settlement contractors that have executed this Agreement.

EXPLANATORY RECITALS

[1st] WHEREAS, the United States has constructed and is operating the Central Valley Project (Project) for diversion, storage, carriage, and distribution of waters of the Sacramento

River, the American River, the Trinity River, and the San Joaquin River and their tributaries for irrigation and other beneficial uses to serve Project purposes; and

[2nd] WHEREAS, Reclamation has entered into contracts with senior water right holders on the Sacramento River, known as the Sacramento River settlement contractors, for the settlement of claimed water rights; and

[3rd] WHEREAS, Reclamation and the Sacramento River settlement contractors renewed these contracts in or around 2005, which among other things provide for a 25% reduction of water available for diversion in a Critical Year as defined in the contracts; and

[4th] WHEREAS, on September 30, 2021, Reclamation requested reinitiation of consultation with the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service regarding the long-term operations of the Central Valley Project and the State Water Project pursuant to 50 C.F.R. § 402.16 of the federal Endangered Species Act;

[5th] WHEREAS, on November 9, 2023, Reclamation issued a "Biological Assessment for the 2021 Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and the State Water Project";

[6th] WHEREAS, Reclamation issued a Final Environmental Impact Statement (EIS) for the Long-Term Operation of the Central Valley Project and the State Water Project on November 15, 2024;

[7th] WHEREAS, Reclamation issued a Record of Decision on the Long-Term Operation of the Central Valley Project and State Water Project on December 20, 2024;

[8th] WHEREAS, in anticipation of Reclamation's operational commitments in the LTO Biological Assessment, Reclamation and the undersigned Sacramento River settlement contractors agree to a Drought Protection Program under specific hydrologic conditions;

[9th] WHEREAS, the undersigned Sacramento River settlement contractors agree to a Drought Protection Program, to be implemented in two phases, based on the parties' commitment to improve spawning, rearing, and migratory conditions for salmon species in the Upper Sacramento River, hatchery operations, and other spawning locations in tributaries like Battle Creek, and to otherwise support the recovery of salmon species;

[10th] WHEREAS, the undersigned Sacramento River settlement contractors agree to a second phase of a Drought Protection Program based on anticipated investments in drought resiliency projects;

[11th] WHEREAS, the SRSC Corp. will coordinate activities among its members and other Sacramento River settlement contractors and distribute funding to the undersigned Sacramento River settlement contractors as set forth in the articles to follow;

[12th] WHEREAS, the SRSC Corp. will accept funding and coordinate activities in support of the Winter-Run Action Plan and to assist the United States in achieving the milestones to support recovery of salmon species in the Upper Sacramento River; and

[13th] WHEREAS, the U.S. Fish and Wildlife Service issued a biological opinion on the Sacramento River Settlement Contractors Drought Protection Program, on January 7, 2025; and

[14th] WHEREAS, Reclamation completed an Environmental Assessment for the Sacramento River Settlement Contractors Drought Protection Program, and signed a Finding of No Significant Impact, on January 8, 2025,

[15th] WHEREAS, on December 30, 2024, Glenn-Colusa Irrigation District, as lead agency, certified the Final Environmental Impact Report for the Drought Protection Program Agreement Between the Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation, Individual Sacramento River Settlement Contractors, and the U.S. Bureau of Reclamation, adopted Findings of Fact and a Statement of Overriding Considerations, adopted a Mitigation Monitoring and Reporting Program, and approved the project, and other Sacramento River settlement contractors, as responsible agencies, approved execution of this Agreement in reliance on the Final Environmental Impact Report.

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, the parties agree as follows:

1. DEFINITIONS

When used herein unless otherwise distinctly expressed, or manifestly incompatible with the intent of the parties as expressed in this Agreement, the term:

(a) "Agreements to Support Healthy Rivers and Landscapes" shall mean the suite of plans and voluntary agreements proposed by signatory state agencies, Reclamation, public water agencies, and other water users as an alternative program of implementation for achieving water quality objectives for the Sacramento River, tributaries, and the Delta as part of the California State Water Resources Control Board's update of its Bay-Delta Water Quality Control Plan;

(b) "Base Supply" shall mean the quantity of Surface Water established in Articles 3 and 5 of the Settlement Contracts, and listed in Exhibit A of each Settlement Contract, which may be diverted by the Contractor from the Sacramento River or its Source of Supply without payment to the United States for such quantities diverted;

(c) "Contract Totals" shall mean the sum of the Base Supply and Project Water available for diversion under the Settlement Contracts held by the Settlement Contractors that have executed this Agreement;

(d) "Critical Year" shall have the same meaning as the term "Critical Year" in the Settlement Contracts, which, as stated in the Settlement Contracts, means any Year in which either of the following eventualities exists:

(i) The forecasted full natural inflow to Shasta Lake for the current Water Year, as such forecast is made by the United States on or before February 15 and reviewed as frequently thereafter as conditions and information warrant, is equal to or less than 3.2 MAF; or

(ii) The total accumulated actual deficiencies below 4.0 million acre-feet in the immediately prior Water Year or series of successive prior Water Years each of which had inflows of less than 4.0 million acre-feet, together with the forecasted deficiency for the current Water Year, exceed 800,000 acre-feet.

For the purpose of determining a Critical Year, the computation of inflow to Shasta Lake shall be performed in a manner that considers the extent of upstream development above Shasta Lake during the year in question, and shall be used as the full natural flow to Shasta Lake. In the event that major construction has occurred or occurs above Shasta Lake after September 1, 1963, and which has materially altered or alters the regimen of the stream systems contributing to Shasta Lake, the computed inflow to Shasta Lake used to define a Critical Year will be adjusted to eliminate the effect of such material alterations. After consultation with the State of California, the National Weather Service, and other recognized forecasting agencies, the Contracting Officer will select the

forecast to be used and will make the details of it available to the Settlement Contractors. The same forecasts used by the United States for the operation of the Project shall be used to make the forecasts hereunder;

(e) "Contracting Officer" will mean Reclamation's Regional Director (unless otherwise stated) or his duly authorized representative;

(f) "CVPIA" shall mean the Central Valley Project Improvement Act, Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

(g) "Drought Resiliency Projects" shall mean an integrated, broad range of actions intended to strengthen the resilience of the Settlement Contractors' water system and long-term water delivery capabilities, thereby assisting Reclamation and the Settlement Contractors to withstand and recover from climatic variability in order to support healthy rivers and landscapes (including but not limited to terrestrial ecosystems) and create durable water savings while sustaining a more drought-resilient economy that retains its vitality. Drought Resiliency Projects include but are not limited to the following actions: 1) protecting and enhancing natural systems through habitat projects and other environmental stewardship; 2) making investments to conserve water supplies over the long-term; 3) diversifying water supplies; and 4) enhancing water management actions with improved data, forecasting, conveyance, and administration under the Settlement Contracts;

(h) "Effective Date" shall mean January 10, 2025.

(i) "Exhibit A" shall mean the listing of those Settlement Contractors that have executed this Agreement, which Exhibit may be modified by the SRSC Corp. without amendment of this Agreement if and when those entities or persons that hold a Settlement

Contract with Reclamation as originally executed in or about 1964, and as renewed in or about 2005, execute this Agreement after the Effective Date but on or before July 31, 2025.

(j) "Final EIR" shall mean the Final Environmental Impact Report to support a Drought Protection Program Agreement Between the Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation, Individual Sacramento River Settlement Contractors, and the U.S. Bureau of Reclamation, certified by Glenn-Colusa Irrigation District on December 30, 2024.

(k) "Five Agency Memorandum of Understanding" shall mean the "Memorandum of Agreement for the Purpose of the Recovery of Winter-Run Chinook Salmon Pursuant to the Winter-Run Action Plan by and among United States Fish and Wildlife Service, National Marine Fisheries Service, Bureau of Reclamation, California Department of Water Resources, California Department of Fish and Wildlife, and Sacramento River Settlement Contractors Corporation" dated _____ _____, 2025.

(l) "Inflation Reduction Act" or "Act" shall mean Public Law No. 117-169, 136 Stat. 1818 (2022).

(m) "LTO Biological Assessment" means the "Biological Assessment for the 2021 Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and the State Water Project" issued by Reclamation on November 9, 2023.

(n) "Parties" shall mean the United States or Reclamation, SRSC Corp., and the Settlement Contractors that have executed this Agreement.

(o) "Phase One" shall mean the period that lasts ten years from the date of the execution of this Agreement when the provisions of Article 3 of this Agreement are effective.

(p) "Phase One Program Year" shall mean when all the following conditions are satisfied by April 15 in any Year during Phase One:

(i) Based on Bin 3B Indicators in the LTO Biological Assessment, forecasted end-of-April Shasta Lake storage is less than 3.0 million acre-feet;

(ii) Based on Bin 3B Indicators in the LTO Biological Assessment, forecasted end-of-September Shasta Lake storage is less than 2.0 million acre-feet;

(iii) Combined actual and forecasted natural inflow to Shasta Lake from October 1 through April 30 is less than 2.5 million acre-feet; and

(iv) Reclamation forecasts a Critical Year under the Settlement Contracts.

Forecasts to determine whether conditions (i)-(iv) are satisfied shall be based on a 90% exceedance.

(q) "Phase Two" shall mean the period following the expiration of Phase One through February 28, 2045, when the provisions of Article 4 of this Agreement are effective.

(r) "Phase Two Program Year" shall mean when all the following conditions are satisfied by April 15 in any Year during Phase Two:

(i) Combined actual and forecasted natural inflow to Shasta Lake from October 1 through April 30 is less than 2.5 million acre-feet; and

(ii) Reclamation forecasts a Critical Year under the Settlement Contracts.

Forecasts to determine whether conditions (i)-(ii) are satisfied shall be based on a 90% exceedance.

(s) "Program Water" shall mean the total quantity reduced under all Settlement Contracts participating in the Drought Protection Program during a Phase One Program Year, not to exceed a combined 500,000 acre-feet per Phase One Program Year, in order to result in a

forecasted end-of-September storage in Shasta Lake of up to 2.0 million acre-feet; the total reduction shall be in addition to reductions under Article 5 of the Settlement Contracts.

(t) "Project" shall mean the Central Valley Project owned by the United States and managed by the Department of Interior, Bureau of Reclamation;

(u) "Project Water" shall have the same meaning as the term "Project Water" in the Settlement Contracts, which, as stated in the Settlement Contracts, means all Surface Water diverted or scheduled to be diverted each Year by the Contractor from the Sacramento River which is in excess of the Base Supply. The United States recognizes the right of the Contractor to make arrangements for acquisition of water from projects of others than the United States for delivery through the Sacramento River and tributaries subject to written agreement between Contractor and the United States as to identification of such water which water when so identified shall not be deemed Project Water under this Settlement Contract;

(v) "Rates" shall have the same meaning as the term "Rates" in the Settlement Contracts, which, as stated in the Settlement Contracts, means the payments for Project Water determined annually by the Contracting Office in accordance with the then current applicable water ratesetting Policies for the Project, as described in subdivision (a) of Article 8 of the Settlement Contract.

(w) "Reclamation Program Water" shall mean any Program Water made available for use by Reclamation pursuant to this Agreement;

(x) "Record of Decision" shall mean the decision document issued on December 20, 2024, in which Reclamation selected an alternative for the long-term operations of the Central Valley Project and State Water Project based on the analysis of the range of alternatives analyzed

in the EIS titled "Long-Term Operations of the Central Valley Project and State Water Project", posted on November 15, 2024.

(y) "Recoverable SRS Contractor Program Water" shall mean the quantity of SRS Contractor Program Water that is available for use in accordance with Article 3(g)-(i); except that portion determined by Reclamation as Recoverable SRS Contractor Program Water Spill;

(z) "Recoverable SRS Contractor Program Water Spill" shall mean Recoverable SRS Contractor Program Water that, upon determination by Reclamation, is irrecoverably lost from Reclamation's control at Shasta Reservoir;

(aa) "Rescheduling Fee" shall have the same meaning as the term "Rescheduling Fee" in the Settlement Contracts, which, as stated in the Settlement Contracts, means the payments required for each acre-foot of Base Supply rescheduled pursuant to subdivision (c)(l) of Article 3 of the Settlement Contract, as determined annually by the Contracting Officer in accordance with the then-current applicable water rate setting policies for the Project;

(bb) "SRS Contractor Program Water" shall mean any Program Water that is not made available for use by Reclamation as Reclamation Program Water;

(cc) "Secretary" shall mean the Secretary of the Interior, a duly appointed successor, or an authorized representative acting pursuant to any authority of the Secretary and through any agency of the Department of the Interior;

(dd) "Settlement Contractor(s)" shall mean those entities or persons that hold a Settlement Contract with Reclamation as originally executed in or about 1964, and as renewed in or about 2005, and who have agreed to participate in the Drought Protection Program by executing this Agreement.

(ee) "Settlement Contract(s)" shall mean the Sacramento River Settlement Contracts as originally executed in or about 1964, and as renewed in or about 2005.

(ff) "Surface Water" shall have the same meaning as the term "Surface Water" in the Settlement Contracts, which, as stated in the Settlement Contracts, means only those waters that are considered as surface water under California law;

(gg) "Drought Protection Program" shall mean the program implementing reductions to Contract Totals in Phase One pursuant to Article 3 of this Agreement and in Phase Two pursuant to Article 4 of this Agreement.

(hh) "Water Year" shall have the same meaning as the term "Water Year" in the Settlement Contracts, which, as stated in the Settlement Contracts, means the period commencing with October 1 of one year and extending through September 30 of the next;

(ii) "Winter-Run Action Plan" or "WRAP" shall mean the plan that has been developed collaboratively among representatives from Reclamation, National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Water Resources, California Department of Fish and Wildlife, and the SRSC Corp. as an integrated plan to improve the survival and viability of Winter-run Chinook salmon that functions alongside planned operation of Shasta Reservoir, and as the plan is identified and described in Sections 3.13.3.2 and 3.16.1 of the LTO Biological Assessment; and

(jj) "Year" shall have the same meaning as the term "Year" in the Settlement Contracts, which, as stated in the Settlement Contracts means a calendar year.

2. DURATION OF CONTRACTUAL OBLIGATIONS

Except for Reclamation's obligations under Article 7 of this Agreement, the Parties' respective rights, responsibilities and performance obligations during Phase One of the Drought

Protection Program shall remain in effect from February 1, 2025, through February 15, 2035. The Parties' respective rights, responsibilities and performance obligations during Phase Two of the Drought Protection Program shall begin on February 16, 2035, and shall remain in effect through February 28, 2045.

3. PHASE ONE OF THE DROUGHT PROTECTION PROGRAM

(a) Reclamation will establish a Drought Protection Program to reduce water furnished to Settlement Contractors in certain years and under specific hydrologic conditions as defined in this Agreement. The Drought Protection Program will be implemented in two phases, with each phase lasting approximately ten years. This article prescribes the terms of Phase One of the Drought Protection Program.

(b) Reclamation will identify whether any Year is a Phase One Program Year, as defined in Article 1(p), and the amount of Program Water based on the following forecasts and process:

(i) On March 15 of each Year, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors as to whether the conditions for a Phase One Program Year are forecasted to be satisfied, and if so, will identify the initial quantity of Program Water.

(ii) On April 15 of each Year, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors as to whether the conditions for a Phase One Program Year are satisfied, and if so, will identify the final amount of Program Water.

(iii) Reclamation may not increase the amount of Program Water after April 15 under this Agreement. The Settlement Contractors may voluntarily agree to an increase in the quantity of Program Water subject to a separate agreement with Reclamation.

(iv) The forecast provided by Reclamation on April 15 will be the final notice to Settlement Contractors as to whether it is a Phase One Program Year.

(c) In addition to reductions under Article 5 of the Settlement Contracts, in a Phase One Program Year, Reclamation will reduce the Contract Totals for the Settlement Contractors by the final amount of Program Water identified on April 15; the reduction to Contract Totals because of reductions for Program Water shall be distributed among the Settlement Contractors as identified in Exhibit A. The Settlement Contractors may redistribute the reductions to Contract Totals among the Settlement Contractors, provided that the total amount of Program Water identified by Reclamation is met by the combined reduction to Contract Totals of the Settlement Contractors. Any water reductions pursuant to this subdivision shall be deemed equivalent to a reasonable beneficial use of water to the extent of the reduction in supply, do not reflect any change to the underlying water rights of the Settlement Contractors, and will not be considered by Reclamation as a reduction in water use or demand during any renewal of the Settlement Contracts, unless otherwise mutually agreed.

(d) By April 15 of any Phase One Program Year, Reclamation shall have the first right to make Program Water available for use by Reclamation upon a mutually agreed upon amount of funding made available to the Settlement Contractors; such water shall be "Reclamation Program Water." Program Water not funded by Reclamation by April 15 shall be "SRS Contractor Program Water."

(e) Between April 15 and July 15 in a Phase One Program Year, the Settlement Contractors may voluntarily provide an option to Reclamation to provide funding for use of SRS Contractor Program Water by Reclamation at an amount agreed upon in the future by Reclamation and the Settlement Contractors.

(f) In a Phase One Program Year, no later than July 15, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors that identifies the forecasted end-of-September Shasta Lake storage:

(i) If the forecasted end-of-September Shasta Lake storage is greater than 2.0 million acre-feet, then the SRS Contractor Program Water will become "Recoverable SRS Contractor Program Water" and may be used in accordance with subdivisions (g)-(i) of this Article 3. Recoverable SRS Contractor Program Water will be distributed among the Settlement Contractors in accordance with Exhibit A.

(ii) If the forecasted end-of-September Shasta Lake storage is less than 2.0 million acre-feet, then Reclamation and the Settlement Contractors will meet and confer on operations for the remaining period of the Water Year in accordance with Article 6 of this Agreement.

(g) Each Settlement Contractor may use its amount of Recoverable SRS Contractor Program Water for the following purposes and subject to Reclamation's operational constraints:

(i) Diversion and use within a Settlement Contractor Service Area identified in Exhibit B of a Settlement Contract;

(ii) Settlement Contractor flow contributions or other actions under the Agreements to Support Healthy Rivers and Landscapes;

(iii) Subject to Reclamation's right of first refusal to provide funding to make Recoverable SRS Contractor Program Water available for use by Reclamation, request assignment and delivery to Project water service and/or repayment contractors or National Wildlife Refuges, or

(iv) Subject to Reclamation's right of first refusal to provide funding to make Recoverable SRS Contractor Program Water available for use by Reclamation, transfer to non-Project contractors in accordance with Article 3(e) of the Settlement Contracts.

Use of Recoverable SRS Contractor Program Water plus quantities diverted or transferred under the Settlement Contracts in each Year shall not exceed the Contract Totals.

(h) Requested use of Recoverable SRS Contractor Program Water shall not result in a forecasted end-of-September Shasta Lake storage of less than 2.0 million acre-feet during the year of the requested use.

(i) Requests by Settlement Contractors to use Recoverable SRS Contractor Program Water for the purposes in subdivision (g)(i)-(iv) of this Article 3 shall be submitted to Reclamation at least two weeks prior to the date of the requested use. Reclamation and the Settlement Contractors shall cooperate to reach agreement on a schedule for the requested use, subject to Reclamation's operational constraints, within two weeks of submittal of a request.

(j) After October 1 of each Year, SRS Contractor Program Water shall become Recoverable SRS Contractor Program Water. Any Recoverable SRS Contractor Program Water shall be carried over in Shasta Lake subject to the following:

(i) Reclamation shall have the right to provide funding to make any Recoverable SRS Contractor Program Water available for use by Reclamation beginning October 1. Any Recoverable SRS Contractor Program Water that Reclamation does not

fund by April 15 of the following year shall remain Recoverable SRS Contractor Program Water.

(ii) In the event the following year is not a Phase One Program Year, Settlement Contractors may use Recoverable SRS Contractor Program Water for the purposes and subject to the conditions in subdivision (g) of this Article 3. Requested use of Recoverable SRS Contractor Program Water shall not result in a forecasted end-of-September Shasta Lake storage of less than 2.0 million acre-feet during the Year of the requested use.

(iii) Recoverable SRS Contractor Program Water that is carried over may become Recoverable SRS Contractor Program Water Spill. The determination of Recoverable SRS Contractor Program Water Spill will be made by Reclamation.

(iv) Reclamation shall provide an accounting of Recoverable SRS Contractor Program Water Spill with a notification to SRS Contactors within 45 days its determination.

(v) Recoverable SRS Contractor Program Water Spill shall be accounted as meeting the Settlement Contractors' obligations to provide flow contributions under the Agreements to Support Healthy Rivers and Landscapes to the extent possible.

(k) Recoverable SRS Contractor Program Water remaining in Shasta at the end of Phase One, if any, will be carried over in Shasta for future use for the purposes and subject to the conditions in subdivision (g).

4. PHASE TWO OF THE DROUGHT PROTECTION PROGRAM

(a) This article prescribes the terms of Phase Two of the Drought Protection Program. Phase Two shall expire on February 28, 2045, unless otherwise extended by mutual agreement.

(b) Reclamation will identify whether any Year is a Phase Two Program Year, as defined in Article 1(r), based on the following forecasts and process:

(i) On March 15 of each Year during Phase Two, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors as to whether the conditions for a Phase Two Program Year are forecasted to be satisfied; and

(ii) If the conditions for a Phase Two Program Year are forecasted to be satisfied on March 15, then Reclamation and the Settlement Contractors will begin to meet and confer on whether a reduction, in addition to reductions under Article 5 of the Settlement Contracts, is necessary to promote the survival and recovery of federally endangered or threatened species in the Sacramento River below Shasta Dam above I Street Bridge.

(iii) On April 15 of each year during Phase Two, Reclamation will provide a forecast based on a 90% exceedance to Settlement Contractors as to whether the conditions for a Phase Two Program Year are satisfied. The forecast provided by Reclamation on April 15 will be the final notice to Settlement Contractors as whether it is a Phase Two Program Year.

(c) If Reclamation determines that is a Phase Two Program Year on April 15, and, as a result of the meet and confer process described in Article 6, Reclamation and the Settlement Contractors agree that a reduction in addition to reductions under Article 5 of the Settlement Contracts is necessary to achieve temperature control in the Upper Sacramento River, then the Settlement Contractors will voluntarily reduce the Contract Totals under the Settlement Contracts by up to 100,000 acre-feet.

(d) The Settlement Contractors may distribute the reductions to Contract Totals among the Settlement Contractors, provided that the total amount of up to 100,000 acre-feet is met by the combined reduction to Contract Totals by the Settlement Contractors.

(e) Any water reductions pursuant to Article 4(c) shall be deemed equivalent to a reasonable beneficial use of water to the extent of the reduction in supply, do not reflect any change to the underlying water rights of the Settlement Contractors, and will not be considered by Reclamation as a reduction in water use or demand during any renewal of the Settlement Contracts, unless otherwise mutually agreed.

(f) Reclamation will utilize any water savings resulting from the reductions by the Settlement Contractors under Article 4(c) of this Agreement for non-reimbursable purposes necessary to promote the survival and recovery of federally endangered or threatened species in the Sacramento River below Shasta Dam above I Street Bridge and will not make these savings available for water supply allocations to CVP contractors in a Phase Two Program Year.

(g) The Parties agree that during Phase Two any voluntary reductions in water furnished to the Settlement Contractors beyond the reductions provided for in Article 4(c) of this Agreement shall be subject to a separate agreement with Reclamation.

5. SETTLEMENT CONTRACT PERFORMANCE

(a) Reclamation agrees to the following terms during a Phase One Program Year or a Phase Two Program Year:

(i) Reclamation will allow Settlement Contractors to reschedule the amounts of Base Supply not diverted in a month into any other months, including into the critical months defined in the Settlement Contracts, or otherwise as needed to accommodate the demand shift pattern.

(ii) Reclamation shall ensure that water furnished under the Settlement Contracts is available on a pattern that allows the Settlement Contractors to make use of the entire Contract Total, with applicable reductions under the Settlement Contracts and this Agreement.

(iii) Reclamation will waive the requirement of Article 3(c)(2)(ii) of the Settlement Contracts.

(iv) Reclamation will allow the accounting order for diversion schedules for each month to be regular monthly Base Supply, then unused Base Supply rescheduled from another month, and then Project Water.

(v) Reclamation shall waive fees for the rescheduling of Base Supply into other months as set forth in Article 3(c)(1) of the Settlement Contracts.

(vi) Reclamation will waive the take or pay provisions in Article 8(a)(1) of the Settlement Contracts.

(vii) For the purpose of future water transfers related to groundwater substitution or crop idling/shifting, Reclamation will account for baseline conditions only in years that do not involve reductions to Contract Totals beyond those described in Article 5 of the Settlement Contracts.

(viii) Both Base Supply and Project Water shall be available for use in water transfers consistent with sections 3403(f) and 3405(a)(1)(M) of the CVPIA.

(b) In the event of a conflict between the terms in subdivision (a) of Article 5 of this Agreement and the terms of a Settlement Contract, the terms in subdivision (a) of Article 5 of this Agreement shall govern.

(c) To the maximum extent possible, the terms in subdivision (a) of Article 5 of this Agreement will also apply to the use of Recoverable SRS Contractor Program Water if it becomes available for use in a Phase One Program Year in Phase One of the Drought Protection Program.

6. MEET AND CONFER

The Settlement Contractors will meet and confer with Reclamation as appropriate to determine if there is any additional role for the Settlement Contractors in connection with Reclamation's operational decision-making for Shasta Reservoir annual operations in Phase One Program Years and Phase Two Program Years. This determination will include consideration of what actions are feasible, consistent with the terms of this Agreement and the Settlement Contracts. In addition to the reduction during Critical Years as set forth in the Settlement Contracts, and the reductions under Articles 3 and 4 of this Agreement, the types of actions that may be considered include, but are not necessarily limited to: (1) the scheduling of spring diversions by the Settlement Contractors; (2) voluntary, compensated water transfers by the Settlement Contractors subject to Reclamation approval; and (3) smoothed diversions by the Settlement Contractors during the fall months. Any mutually agreeable proposed actions resulting from these meet-and-confer discussions must be consistent with the terms of this Agreement and the Settlement Contracts and subject to other regulatory approvals.

7. FUNDING FOR THE DROUGHT PROTECTION PROGRAM

(a) Reclamation will fund the Drought Protection Program by providing the following payment to SRSC Corp.:

(i) $250 million upon the Effective Date of this Agreement, in a one-time, non-refundable payment to the SRSC Corp., with funds available to Reclamation under the Inflation Reduction Act.

(ii) The Settlement Contractors shall use the majority of the proceeds from Article 7(a)(i) to invest in Drought Resiliency Projects. For purposes of this provision, Drought Resiliency Projects include actions taken by Settlement Contractors and costs of those actions incurred from August 16, 2022, the date of enactment of the Inflation Reduction Act, to December 20, 2024, up to $30 million. The balance of the proceeds (less than the majority of funds from the Inflation Reduction Act) may be used for any lawful Settlement Contractor purposes.

(iii) The proceeds from Article 7(a), once transferred to the Settlement Contractors under Article 11, are eligible to meet any local agency cost share for a matching funds requirement.

(b) In accordance with Article 2 of this Agreement, Reclamation has the right to the first 275,000 acre-feet of Program Water during Phase One. Reclamation shall have the right to take actions to make additional quantities of Program Water or SRS Contractor Program Water available for use by Reclamation as set forth in subdivisions (d), (e), and (g) of Article 3 of this Agreement in exchange for a mutually agreed payment or payments to the Settlement Contractors based upon future negotiations between Reclamation and the Settlement Contractors.

(c) The funds described in subdivision (a) of this Article will be distributed by the SRSC Corp. to the Settlement Contractors in accordance with Exhibit A. The SRSC Corp. will retain 5% of the funds described in subdivision (a) of Article 7 as consideration for its obligations arising under this Agreement and as an administrative fee for managing such

funds. The SRSC Corp. will make the balance of such funds available to Settlement Contractors who are party to this Agreement proportionately based on a Settlement Contractor's share of Contract Totals.

(d) The Settlement Contractors agree to comply with any mitigation requirements contained in the Final EIR associated with the water reductions described in Articles 3 and 4 and Drought Resiliency Projects described in Article 7(a)(ii).

8. SUPPORT OF THE WINTER RUN ACTION PLAN

(a) During Phase One of the Drought Protection Program, and upon Reclamation acquiring a cumulative Program Water quantity of 500,000 acre-feet under Article 3 of this Agreement, any additional Program Water is contingent on completing mutually agreed Winter Run Action Plan (WRAP) deadlines, milestones, and timely deliverables for each WRAP priority action, as set forth in the mutually agreeable schedule to be developed by Reclamation and the Settlement Contractors consistent with section 4.10 of the Five Agency Memorandum of Understanding, or as otherwise agreed upon between Reclamation and the SRSC Corp.

(b) To support the Winter Run Action Plan, Reclamation will use its rate-setting policies and reduce the Rates for Project Water by $10 per acre-foot for all Project Water charged to each Settlement Contractor during Phase One. Reclamation will notify each Settlement Contractor of the $10 per acre-foot reduction in accordance with the procedures in Article 8(b) of the Settlement Contract. Each Settlement Contractor will pay Rates for Project Water, reduced by $10 per acre-foot, in accordance with the schedule set forth in Article 8(c) of the Settlement Contract.

(c) The SRSC Corp. will invoice each Settlement Contractor based on the amount of Project Water that Reclamation charges the Settlement Contractor in Reclamation's final water

account record for the Water Year in acre-feet and multiply that amount by $10. Each Settlement Contractor shall pay the amount invoiced, based on this formula, to the SRSC Corp. annually. The funds collected by the SRSC Corp. will be managed by the SRSC Corp. and provided either through contract, grant, or direct funding for studies and programs that support the Winter-Run Action Plan.

(d) All funds collected under this Article 8 are non-reimbursable.

9. RESERVATION OF RIGHTS

Reclamation and the Settlement Contractors agree to enter into this Agreement in anticipation of Reclamation's operational commitments in the LTO Biological Assessment and Record of Decision. In the event that there are legal actions concerning the Record of Decision in any forum, the Settlement Contractors reserve their rights to participate in such actions to ensure consistency with and the performance of this Agreement or the Settlement Contracts. Nothing in this Agreement shall limit the Settlement Contractors from defending any actions brought against this Agreement or the Settlement Contracts.

In the event a court of competent jurisdiction finds that the Record of Decision, or any portion thereof, is unlawful, this Agreement shall continue to remain in effect in accordance with Article 2 of this Agreement.

During the term of this Agreement, Reclamation will not voluntarily take any actions or seek any relief, over any objection of the Settlement Contractors, that would result in further water reductions under the Settlement Contracts beyond those reductions agreed to in this

Agreement or consistent with the Settlement Contracts, unless required by applicable law or court order.

10. DISCLAIMER OF LIABILITY

Subject to the conditions, limitations, and provisions hereinafter expressed, the Settlement Contractors agree to hold harmless, and the United States and its officers, agents, or employees assume no responsibility for any damage whether direct or indirect arising out of or in any manner caused by reducing Contract Totals in a Phase One Program Year by the amount of Program Water determined in accordance with Article 3 of this Agreement, or a Phase Two Program Year in accordance with Article 4 of this Agreement.

11. METHOD OF PAYMENT

(a) The SRSC Corp. shall register at the U.S Federal District Registration System for Award Management (SAM) website at www.sam.gov prior to receipt of payment. The SRSC Corp. will notify Reclamation when it has successfully established a SAM account and provide Reclamation the necessary routing information for prompt payment.

(b) All payment made by the United States under this Agreement shall be made by electronic funds transfer (EFT) using the EFT information contained in the SAM database. The SRSC Corp. is responsible during the term of this Agreement for the accuracy and completeness of the data within the SAM database, and for any liability resulting from the United States or Reclamation's reliance on inaccurate or incomplete data. To remain registered in the SAM database after initial registration, the SRSC Corp. is required to review and update on an annual basis, from the date of initial registration or subsequent updates, its information in the SAM database to ensure it is current, and complete.

(c) The SRSC Corp. will disburse the funds to the Settlement Contractors in accordance with Exhibit A.

(d) Any funds not distributed in accordance with subsection (c) of this Article 9 shall be retained by the SRSC Corp.

12. NO ARGUMENT, PRECEDENT, OR ADMISSION

Nothing in this Agreement shall be offered for or against a Party (or any of the Settlement Contractors) as argument, admission, admission of wrongdoing, liability, waiver, acquiescence, or precedent regarding any issue of fact or law, including but not limited to issues related to the interpretation or future performance of the Settlement Contracts, in any mediation, arbitration, litigation, or other administrative or legal proceeding, except that this Agreement may be used in any future proceeding to interpret or enforce the terms of this Agreement, consistent with applicable law. No actions under this Agreement shall be evidence of lack of beneficial use of the subject water supplies, or shall in any way prejudice any of the Settlement Contractors' water rights or Reclamation's water rights.

13. AUTHORIZATION

The Parties represent and warrant that the persons executing this Agreement on behalf of each respective Party has full power and authority to enter this Agreement and that the Parties are authorized by law to perform the services and actions set forth herein.

14. NO COUNTERPARTS CLAUSE

This Agreement may be executed in counterparts with the same force and effect as if executed in one complete document by all Parties. Sacramento River settlement contractors may become party to this Agreement by delivering a signed counterpart to SRSC Corp. on or before July 31, 2025, and thereby be a Settlement Contractor under this Agreement. The SRSC Corp.

will assemble any such counterparts and attach them to the final Agreement and distribute copies of the final Agreement to the parties.

15. PROTECTION OF WATER AND AIR QUALITY

The SRSC Corp. shall comply with all applicable water and air pollution laws and regulations of the United States and state law; and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities necessary for the delivery of water by the Settlement Contractors; and shall be responsible for compliance with all Federal, State, and local water quality standards applicable to surface and subsurface drainage and/or discharges generated through the use of Central Valley Project facilities or Settlement Contractor facilities or water provided by the Settlement Contractor within its water service area.

This article shall not affect or alter any legal obligations of the Secretary of the Interior to provide drainage or other discharge services.

16. BOOKS, RECORDS, AND REPORTS

The SRSC Corp. and Settlement Contractors shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Agreement, including as applicable the SRSC Corp.'s and Settlement Contractors' financial transactions; water supply data; Project operation, maintenance, and replacement logs; Project land and rights-of-way use agreements; the water users' land-use (crop census), landownership, land-leasing, and water-use data; and other matters that the Contracting Officer may require. Reports shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this Agreement shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Agreement.

17. ASSIGNMENT LIMITED - SUCCESSORS AND ASSIGNS OBLIGATED

The provisions of this Agreement shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Agreement or any right or interest therein by either party shall be valid until approved in writing by the other party.

18. OFFICIALS NOT TO BENEFIT

No Member of or Delegate to the Congress, Resident Commissioner, or official of the SRSC Corp. and the Settlement Contractors shall benefit from this Agreement other than as a water user or landowner in the same manner as other water users or landowners.

19. NOTICES

All notices and other communications required under this Agreement shall be in writing and shall be deemed to have been duly given on the date of service, if served personally, on the person to whom notice is to be given, or on the third (3rd) day after mailing, if mailed to the party to whom notice is to be given by first class mail, registered or certified, postage-prepaid, and properly addressed as follows:

To SRSC Corp.:
P.O. Box 150
Willows, CA 95988

To Reclamation: U.S. Bureau of Reclamation
California Great Basin Region
Resources Management Division
Attention: Regional Resources Manager, CGB-400
2800 Cottage Way
Sacramento, California 95842

To Settlement Contractors:
c/o SRSC Corp.
P.O. Box 150
Willows, CA 95988

20. CONTRACT DRAFTING CONSIDERATIONS

This Agreement has been negotiated and reviewed by the parties hereto, each of whom is sophisticated in the matters to which this Agreement pertains. The double-spaced articles of this Agreement have been drafted, negotiated, and reviewed by the Parties, and no one party shall be considered to have drafted the stated articles.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

UNITED STATES OF AMERICA

By: _____
Regional Director
Interior Region 10 California- Great Basin
Bureau of Reclamation

THE SACRAMENTO RIVER SETTLEMENT CONTRACTORS, A CALIFORNIA NONPROFIT MUTUAL BENEFIT CORPORATION

By: _____
President, Board of Directors

627 EXHIBIT A

628 (January 10, 2025 version)

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF) **	SRSC Funding (Based on 500,000 AF)
Glenn-Colusa Irrigation District	14-06-200-855A-R-1	825,000	39.501%	197,505	$93,814,682.75
Reclamation District No. 108	14-06-200-876A-R-1	232,000	11.108%	55,541	$26,381,825.94
Sutter Mutual Water Company	14-06-200-815A-R-1	226,000	10.821%	54,104	$25,699,537.34
Anderson-Cottonwood Irrigation District	14-06-200-3346A-R-1	125,000	5.985%	29,925	$14,214,345.87
Natomas Central Mutual Water Company	14-06-200-885A-R-1	120,200	5.755%	28,776	$13,668,514.99
Reclamation District No. 1004	14-06-200-890A-R-1	71,400	3.419%	17,093	$8,119,234.36
Princeton-Codora-Glenn Irrigation District	14-06-200-849A-R-1	67,810	3.247%	16,234	$7,710,998.35
Provident Irrigation District	14-06-200-856A-R-1	54,730	2.620%	13,102	$6,223,609.20
Conaway Preservation Group, LLC	14-06-200-7422A-R-1	40,862	1.956%	9,782	$4,646,612.81
Meridian Farms Water Company	14-06-200-838A-R-1	35,000	1.676%	8,379	$3,980,016.84
Sycamore Mutual Water Company	14-06-200-2146A-R-1	31,800	1.523%	7,613	$3,616,129.59
RRG Garden Properties, LLC	14-06-200-878A-R-1	29,800	1.427%	7,134	$3,388,700.06
Pleasant Grove Verona Mutual Water Company	14-06-200-5520A-R-1	26,290	1.259%	6,294	$2,989,561.22
Redding, City of	14-06-200-2871A-R-1	21,000	1.005%	5,027	$2,388,010.11

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF) **	SRSC Funding (Based on 500,000 AF)
Maxwell Irrigation District	14-06-200-6078A-R-1	17,980	0.861%	4,304	$2,044,591.51
M&T Chico Ranch, Inc.	14-06-200-940A-R-1	17,956	0.860%	4,299	$2,041,862.36
Woodland-Davis	14-06-200-7422X-R-1	10,000	0.479%	2,394	$1,137,147.67
Pelger Road 1700	14-06-200-1286A-R-1	10,070	0.482%	2,411	$1,145,107.70
Tisdale Irrigation and Drainage Company	14-06-200-2781A	9,900	0.474%	2,370	$1,125,776.19
Pelger Mutual Water Company	14-06-200-2073A	8,860	0.424%	2,121	$1,007,512.84
Carter Mutual Water Company	14-06-200-2401A	7,122	0.341%	1,705	$809,876.57
Lomo Cold Storage	14-06-200-931A	7,110	0.340%	1,702	$808,511.99
Baber, Jack, et al	14-06-200-1604A	6,260	0.300%	1,499	$711,854.44
RD Heer Capital, LLC	14-06-200-2427A	4,740	0.227%	1,135	$539,008.00
Robert's Ditch Irrigation Company	14-06-200-935A	4,440	0.213%	1,063	$504,893.57
Windswept Land & Livestock	14-06-200-2045A	4,040	0.193%	967	$459,407.66
TeVelde Family Revocable Trust	14-06-200-2149A	4,000	0.192%	958	$454,859.07
Knights Landing Investors, LLC	14-06-200-4604A	3,640	0.174%	871	$413,921.75
Andreotti Associates	14-06-200-1898A	3,620	0.173%	867	$411,647.46
Oji Brothers Farm, Inc.	14-06-200-3753A	3,200	0.153%	766	$363,887.25

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF) **	SRSC Funding (Based on 500,000 AF)
Saeed, Faraz A.	8-07-20-W0117	3,160	0.151%	757	$359,338.66
Eastside Mutual Water Company	14-06-200-1053A	2,804	0.134%	671	$318,856.21
Richter Brothers, et al	14-06-200-4362A	2,780	0.133%	666	$316,127.05
Howald Farms, Inc.	14-06-200-1042A	2,760	0.132%	661	$313,852.76
Griffin & Prater Tenancy-in-Common	14-06-200-2895A	2,760	0.132%	661	$313,852.76
Tarke, Stephen	14-06-200-1949A	2,700	0.129%	646	$307,029.87
Dennis, L.C. (Canal Farms)	14-06-200-2896A	1,815	0.087%	435	$206,392.30
Giusti, Richard, et al	14-06-200-4076A	1,610	0.077%	385	$183,080.77
T&P Farms	14-06-200-2993A	1,560	0.075%	373	$177,395.04
Thiara Family Trust	14-06-200-7691A	1,533	0.073%	367	$174,324.74
Van Ruiten Bros.	14-06-200-880A	1,485	0.071%	356	$168,866.43
MCM Properties, Inc.	14-06-200-7827A	1,470	0.070%	352	$167,160.71
Byrd, Anna C. and Jane Osborne	14-06-200-1595A	1,265	0.061%	303	$143,849.18
Lonon, Michael, et al	14-06-200-8658A	1,155	0.055%	277	$131,340.56
Kary, Carol	14-06-200-2520A	1,000	0.048%	239	$113,714.77
Lauppe, Burton	14-06-200-1289A	950	0.045%	227	$108,029.03

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF) **	SRSC Funding (Based on 500,000 AF)
Henle Family Limited Partnership	14-06-200-932A	935	0.045%	224	$106,323.31
Green Valley Corporation (Swenson Farms, LLC)	14-06-200-5210A	890	0.043%	213	$101,206.14
Swenson Farms, LLC	14-06-200-5211A	880	0.042%	211	$100,068.99
Jaeger, William, et al	7-07-20-W0002	870	0.042%	208	$98,931.85
Wallace, Kenneth L. Living Trust	14-06-200-1175A-X	867	0.042%	208	$98,590.70
O'Brien, Frank J., Family Trust	14-06-200-4105X	839	0.040%	201	$95,406.69
Driscoll Strawberry Associates, Incorporated	14-06-200-4736A	820	0.039%	196	$93,246.11
Exchange Bank (TNC)	14-06-200-3774A	780	0.037%	187	$88,697.52
Lake California Property Owners Association	14-06-200-4961A	780	0.037%	187	$88,697.52
River Partners (Forry)	14-06-200-7691X	752	0.036%	180	$85,513.50
Sacramento, County of	14-06-200-2404A	750	0.036%	180	$85,286.08
Chesney, Adona, Bypass Trust et al	14-06-200-930A	700	0.034%	168	$79,600.34
Leviathan, Inc.	14-06-200-7308A	700	0.034%	168	$79,600.34
Butte Creek Farms (P)	14-06-200-7744X	640	0.031%	153	$72,777.45
Odysseus Farms Partnership	14-06-200-8574A	630	0.030%	151	$71,640.30
Yolo Land Trust	14-06-200-2148A	630	0.030%	151	$71,640.30

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF) **	SRSC Funding (Based on 500,000 AF)
Van Ruiten Bros.	14-06-200-880X	584	0.028%	140	$66,409.42
Heidrick & McGinnis Properties, L.P.	14-06-200-1176A	560	0.027%	134	$63,680.27
Dyer, Jeffrey E. and Jan Wing	14-06-200-2486A	520	0.025%	124	$59,131.68
Four Corners Farmland Fund Yolo, LLC	14-06-200-991A	520	0.025%	124	$59,131.68
J.B. Unlimited, Inc.(Flynn Farmlands, LLC)	14-06-200-2519A	510	0.024%	122	$57,994.53
Quad H Ranches	14-06-200-2153A	500	0.024%	120	$56,857.38
Riverby Ranches, LLC	14-06-200-934A	500	0.024%	120	$56,857.38
Natomas Basin Conservancy	14-06-200-1364A	490	0.023%	117	$55,720.24
Anderson, Art, et al	14-06-200-3591A	490	0.023%	117	$55,720.24
Seaver, Charles	14-06-200-3296A	480	0.023%	115	$54,583.09
Reische, Laverne C., et ux	14-06-200-1150A	450	0.022%	108	$51,171.65
Butler, Dianne E., Revocable Intervivos Trust	14-06-200-2365A	434	0.021%	104	$49,352.21
Yocha Dehe Wintun Nation (formerly Heidrick)	14-06-200-8322A	430	0.021%	103	$48,897.35
Lockett, William P. & Jean B.	14-06-200-4105A	417	0.020%	100	$47,419.06
Reclamation District #1000	14-06-200-1779A	404	0.019%	97	$45,940.77
Tuttle, Charles W. - Trust	14-06-200-7296A	390	0.019%	93	$44,348.76

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF) **	SRSC Funding (Based on 500,000 AF)
Ehrke, Allen A., et ux	14-06-200-8330A	380	0.018%	91	$43,211.61
Wilson Ranch Partnership	14-06-200-4520A	370	0.018%	89	$42,074.46
Wallace, Joseph and Janine	14-06-200-5200A	355	0.017%	85	$40,368.74
Lauppe, B & K	14-06-200-1364X	350	0.017%	84	$39,800.17
Van Ruiten Bros.	14-06-200-1415A	325	0.016%	78	$36,957.30
Charter, Nickolas J. and Charter, Michael J.	14-06-200-8118A	300	0.014%	72	$34,114.43
Cummings, William C.	7-07-20-W0054	300	0.014%	72	$34,114.43
Riverview Golf & Country Club	14-06-200-8286A	280	0.013%	67	$31,840.13
Morehead, Joseph A., et ux	14-06-200-5789A	255	0.012%	61	$28,997.27
Gomes, Frank & Judy - Trust	14-06-200-1827X	246	0.012%	59	$27,973.83
Anderson Properties L.P., R and J	14-06-200-1726A	237	0.011%	57	$26,950.40
Driver Family Trust	14-06-200-1314A	230	0.011%	55	$26,154.40
Kaelin, Cameron C. Trust (Gillaspy)	14-06-200-8117A	210	0.010%	50	$23,880.10
Fedora, Sib, et al	14-06-200-2916A	210	0.010%	50	$23,880.10
Redding Rancheria Tribe	7-07-20-W0006	205	0.010%	49	$23,311.53
Butte Creek Farms (M)	14-06-200-1976A	204	0.010%	49	$23,197.81

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Western Almonds, LLC (Knights Landing Properties)	14-06-200-889A	200	0.010%	48	$22,742.95
Jansen, Peter & Sandy	14-06-200-1426A	190	0.009%	45	$21,605.81
Empire Group, LLC	14-06-200-2145A	181	0.009%	43	$20,582.37
Cachil Dehe Band of Wintun Indians of the Colusa Indian Community	14-06-200-7206A	180	0.009%	43	$20,468.66
Penner, Roger & Leona	14-06-200-960A	180	0.009%	43	$20,468.66
KLSY, LLC	14-06-200-7556A	170	0.008%	41	$19,331.51
ZelMar Ranches	14-06-200-1827A	164	0.008%	39	$18,649.22
Van Ruiten Bros.	14-06-200-5200X	160	0.008%	38	$18,194.36
Driver, William Trust, et al	14-06-200-939A-1	160	0.008%	38	$18,194.36
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Nelson Family Trust	14-06-200-1954A	136	0.007%	33	$15,465.21
Churkin, Michael, et al	14-06-200-7227A	130	0.006%	31	$14,782.92
Hale & Marks	14-06-200-7572A	130	0.006%	31	$14,782.92
Micke, Daniel	14-06-200-7995A	100	0.005%	24	$11,371.48
Butte Creek Farms (A)	14-06-200-5206A	95	0.005%	23	$10,802.90

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Willey, Edwin & Marjorie, Revocable Trust	14-06-200-3556A	95	0.005%	23	$10,802.90
Reische, Eric	14-06-200-1150X	90	0.004%	22	$10,234.33
Yocha Dehe Wintun Nation (formerly Heidrick)	14-06-200-1616A	85	0.004%	20	$9,665.76
Davis, Grover L., et ux	14-06-200-1851A	85	0.004%	20	$9,665.76
Howard, Theodore	14-06-200-1976X	76	0.004%	18	$8,642.32
Hale & Marks	14-06-200-1638A	75	0.004%	18	$8,528.61
Eggleston, Ronald H., et ux	14-06-200-7339A	65	0.003%	16	$7,391.46
B & D Family Partnership	14-06-200-4178A	60	0.003%	14	$6,822.89
Leonard, James C.	14-06-200-1175A	53	0.003%	13	$6,026.88
Butte Creek Farms (Y)	14-06-200-2851A	36	0.002%	9	$4,093.73
Wisler, John Jr.	14-06-200-5215A	35	0.002%	8	$3,980.02
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Hatfield, Robert and Bonnie	14-06-200-2365X	26	0.001%	6	$2,956.58
King, Laura	14-06-200-1086Z	26	0.001%	6	$2,956.58
Alexander, Thomas, et ux	14-06-200-7754A	22	0.001%	5	$2,501.72
Driver, Gregory E.	14-06-200-939A-2	20	0.001%	5	$2,274.30

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF) **	SRSC Funding (Based on 500,000 AF)
Lauppe, Alan, et al (ELH)	14-06-200-1364Y	20	0.001%	5	$2,274.30
Daniell, Harry	14-06-200-4348A	20	0.001%	5	$2,274.30
King, Ben	14-06-200-1086Y	19	0.001%	5	$2,160.58
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Rubio, Exequiel & Elsa	14-06-200-2368A	16	0.001%	4	$1,819.44
Gjermann, Hal	14-06-200-4010A	12	0.001%	3	$1,364.58
Burdick 1999 Family Trust	14-06-200-2552A	10	0.000%	2	$1,137.15
Total	**133 Contracts**	**2,088,559**	**100%**	**500,000**	**$237,500,000**
**If the Program Water amount identified during any Phase One Program Year is less than 500,000 AF, then there will be proportionate reductions to the amounts shown in this column for each contractor. During any Phase Two Program Year, there will be proportionate reductions based on Contract Totals to meet the obligation in Article 4(c).				**5% SRSC**	**$12,500,000**
				IRA Funding	**$250,000,000**

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EXHIBIT A

SRSC	Contract No.	Contract Total (af)	% of SRSC Contract Total	Program Water Reduction (Based on 500,000 AF)- see note below**	SRSC Funding (Based on 500,000 AF)
Glenn-Colusa Irrigation District	14-06-200-855A-R-1	825,000	39.501%	197,505	$93,814,682.75
Reclamation District No. 108	14-06-200-876A-R-1	232,000	11.108%	55,541	$26,381,825.94
Sutter Mutual Water Company	14-06-200-815A-R-1	226,000	10.821%	54,104	$25,699,537.34
Anderson-Cottonwood Irrigation District	14-06-200-3346A-R-1	125,000	5.985%	29,925	$14,214,345.87
Natomas Central Mutual Water Company	14-06-200-885A-R-1	120,200	5.755%	28,776	$13,668,514.99
Reclamation District No. 1004	14-06-200-890A-R-1	71,400	3.419%	17,093	$8,119,234.36
Princeton-Codora-Glenn Irrigation District	14-06-200-849A-R-1	67,810	3.247%	16,234	$7,710,998.35
Provident Irrigation District	14-06-200-856A-R-1	54,730	2.620%	13,102	$6,223,609.20
Conaway Preservation Group, LLC	14-06-200-7422A-R-1	40,862	1.956%	9,782	$4,646,612.81
Meridian Farms Water Company	14-06-200-838A-R-1	35,000	1.676%	8,379	$3,980,016.84
Sycamore Mutual Water Company	14-06-200-2146A-R-1	31,800	1.523%	7,613	$3,616,129.59
RRG Garden Properties, LLC	14-06-200-878A-R-1	29,800	1.427%	7,134	$3,388,700.06
Pleasant Grove Verona Mutual Water Company	14-06-200-5520A-R-1	26,290	1.259%	6,294	$2,989,561.22
Redding, City of	14-06-200-2871A-R-1	21,000	1.005%	5,027	$2,388,010.11
Maxwell Irrigation District	14-06-200-6078A-R-1	17,980	0.861%	4,304	$2,044,591.51
M&T Chico Ranch, Inc.	14-06-200-940A-R-1	17,956	0.860%	4,299	$2,041,862.36
Woodland-Davis	14-06-200-7422X-R-1	10,000	0.479%	2,394	$1,137,147.67
Pelger Road 1700	14-06-200-1286A-R-1	10,070	0.482%	2,411	$1,145,107.70
Tisdale Irrigation and Drainage Company	14-06-200-2781A	9,900	0.474%	2,370	$1,125,776.19
Pelger Mutual Water Company	14-06-200-2073A	8,860	0.424%	2,121	$1,007,512.84
Carter Mutual Water Company	14-06-200-2401A	7,122	0.341%	1,705	$809,876.57
Lomo Cold Storage	14-06-200-931A	7,110	0.340%	1,702	$808,511.99
Baber, Jack, et al	14-06-200-1604A	6,260	0.300%	1,499	$711,854.44
RD Heer Capital, LLC	14-06-200-2427A	4,740	0.227%	1,135	$539,008.00
Robert's Ditch Irrigation Company	14-06-200-935A	4,440	0.213%	1,063	$504,893.57
Windswept Land & Livestock	14-06-200-2045A	4,040	0.193%	967	$459,407.66
TeVelde Family Revocable Trust	14-06-200-2149A	4,000	0.192%	958	$454,859.07
Knights Landing Investors, LLC	14-06-200-4604A	3,640	0.174%	871	$413,921.75
Andreotti Associates	14-06-200-1898A	3,620	0.173%	867	$411,647.46
Oji Brothers Farm, Inc.	14-06-200-3753A	3,200	0.153%	766	$363,887.25
Saeed, Faraz A.	8-07-20-W0117	3,160	0.151%	757	$359,338.66
Eastside Mutual Water Company	14-06-200-1053A	2,804	0.134%	671	$318,856.21
Richter Brothers, et al	14-06-200-4362A	2,780	0.133%	666	$316,127.05
Howald Farms, Inc.	14-06-200-1042A	2,760	0.132%	661	$313,852.76
Griffin & Prater Tenancy-in-Common	14-06-200-2895A	2,760	0.132%	661	$313,852.76
Tarke, Stephen	14-06-200-1949A	2,700	0.129%	646	$307,029.87
Dennis, L.C. (Canal Farms)	14-06-200-2896A	1,815	0.087%	435	$206,392.30
Giusti, Richard, et al	14-06-200-4076A	1,610	0.077%	385	$183,080.77
T&P Farms	14-06-200-2993A	1,560	0.075%	373	$177,395.04
Thiara Family Trust	14-06-200-7691A	1,533	0.073%	367	$174,324.74
Van Ruiten Bros.	14-06-200-880A	1,485	0.071%	356	$168,866.43
MCM Properties, Inc.	14-06-200-7827A	1,470	0.070%	352	$167,160.71
Byrd, Anna C. and Jane Osborne	14-06-200-1595A	1,265	0.061%	303	$143,849.18
Lonon, Michael, et al	14-06-200-8658A	1,155	0.055%	277	$131,340.56
Kary, Carol	14-06-200-2520A	1,000	0.048%	239	$113,714.77
Lauppe, Burton	14-06-200-1289A	950	0.045%	227	$108,029.03
Henle Family Limited Partnership	14-06-200-932A	935	0.045%	224	$106,323.31
Green Valley Corporation (Swenson Farms, LLC)	14-06-200-5210A	890	0.043%	213	$101,206.14
Swenson Farms, LLC	14-06-200-5211A	880	0.042%	211	$100,068.99
Jaeger, William, et al	7-07-20-W0002	870	0.042%	208	$98,931.85
Wallace, Kenneth L. Living Trust	14-06-200-1175A-X	867	0.042%	208	$98,590.70

O'Brien, Frank J., Family Trust	14-06-200-4105X	839	0.040%	201	$95,406.69
Driscoll Strawberry Associates, Incorporated	14-06-200-4736A	820	0.039%	196	$93,246.11
Exchange Bank (TNC)	14-06-200-3774A	780	0.037%	187	$88,697.52
Lake California Property Owners Association	14-06-200-4961A	780	0.037%	187	$88,697.52
River Partners (Forry)	14-06-200-7691X	752	0.036%	180	$85,513.50
Sacramento, County of	14-06-200-2404A	750	0.036%	180	$85,286.08
Chesney, Adona, Bypass Trust et al	14-06-200-930A	700	0.034%	168	$79,600.34
Leviathan, Inc.	14-06-200-7308A	700	0.034%	168	$79,600.34
Butte Creek Farms (P)	14-06-200-7744X	640	0.031%	153	$72,777.45
Odysseus Farms Partnership	14-06-200-8574A	630	0.030%	151	$71,640.30
Yolo Land Trust	14-06-200-2148A	630	0.030%	151	$71,640.30
Van Ruiten Bros.	14-06-200-880X	584	0.028%	140	$66,409.42
Heidrick & McGinnis Properties, L.P.	14-06-200-1176A	560	0.027%	134	$63,680.27
Dyer, Jeffrey E. and Jan Wing	14-06-200-2486A	520	0.025%	124	$59,131.68
Four Corners Farmland Fund Yolo, LLC	14-06-200-991A	520	0.025%	124	$59,131.68
J.B. Unlimited, Inc.(Flynn Farmlands, LLC)	14-06-200-2519A	510	0.024%	122	$57,994.53
Quad H Ranches	14-06-200-2153A	500	0.024%	120	$56,857.38
Riverby Ranches, LLC	14-06-200-934A	500	0.024%	120	$56,857.38
Natomas Basin Conservancy	14-06-200-1364A	490	0.023%	117	$55,720.24
Anderson, Art, et al	14-06-200-3591A	490	0.023%	117	$55,720.24
Seaver, Charles	14-06-200-3296A	480	0.023%	115	$54,583.09
Reische, Laverne C., et ux	14-06-200-1150A	450	0.022%	108	$51,171.65
Butler, Dianne E., Revocable Intervivos Trust	14-06-200-2365A	434	0.021%	104	$49,352.21
Yocha Dehe Wintun Nation (formerly Heidrick)	14-06-200-8322A	430	0.021%	103	$48,897.35
Lockett, William P. & Jean B.	14-06-200-4105A	417	0.020%	100	$47,419.06
Reclamation District #1000	14-06-200-1779A	404	0.019%	97	$45,940.77
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UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

Central Valley Project, California

AGREEMENT BETWEEN THE UNITED STATES BUREAU OF RECLAMATION, THE SACRAMENTO RIVER SETTLEMENT CONTRACTORS, A CALIFORNIA NONPROFIT MUTUAL BENEFIT CORPORATION, AND INDIVIDUAL SACRAMENTO RIVER SETTLEMENT CONTRACTORS FOR THE ESTABLISHMENT OF A DROUGHT PROTECTION PROGRAM

THIS AGREEMENT, made this _____ day of ~~*insert month and year*~~January, 2025, pursuant to the Reclamation Act of 1939 (53 Stat. 1187), the Reclamation Reform Act of 1982 (P.L. 97-293), and the Inflation Reduction Act of 2022 (P.L. 117-169), between the UNITED STATES BUREAU OF RECLAMATION, hereinafter the United States or Reclamation, and represented by the officer executing this Agreement, the SACRAMENTO RIVER SETTLEMENT CONTRACTORS, a California nonprofit mutual benefit corporation, hereinafter referred to as the SRSC Corp., acting for and on behalf of its members and any other non-member Sacramento River settlement contractor that receives funding pursuant to this Agreement, and individual Sacramento River settlement contractors that have executed this Agreement.

DRAFT

EXPLANATORY RECITALS

[1st] WHEREAS, the United States has constructed and is operating the Central Valley Project (Project) for diversion, storage, carriage, and distribution of waters of the Sacramento River, the American River, the Trinity River, and the San Joaquin River and their tributaries for irrigation and other beneficial uses to serve Project purposes; and

[2nd] WHEREAS, Reclamation has entered into contracts with senior water right holders on the Sacramento River, known as the Sacramento River settlement contractors, for the settlement of claimed water rights; and

[3rd] WHEREAS, Reclamation and the Sacramento River settlement contractors renewed these contracts in or around 2005, which among other things provide for a 25% reduction of water available for diversion in a Critical Year as defined in the contracts; and

[4th] WHEREAS, on September 30, 2021, Reclamation requested reinitiation of consultation with the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service regarding the long-term operations of the Central Valley Project and the State Water Project pursuant to 50 C.F.R. § 402.16 of the federal Endangered Species Act;

[~~X~~5th] WHEREAS, on November 9, 2023, Reclamation issued a "Biological Assessment for the 2021 Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and the State Water Project";

[~~X~~6th] WHEREAS, Reclamation issued a Final Environmental Impact Statement (EIS) for the Long-Term Operation of the Central Valley Project and the State Water Project on November 15, 2024;

DRAFT

[~~X~~7th] WHEREAS, Reclamation issued a ~~[~~Record of Decision~~]~~ on the Long-Term Operation of the Central Valley Project and State Water Project on December ~~__~~20, 2024;

[~~X~~8th] WHEREAS, in anticipation of Reclamation's operational commitments in the LTO Biological Assessment, Reclamation and the undersigned Sacramento River settlement contractors agree to a Drought Protection Program under specific hydrologic conditions;

[~~X~~9th] WHEREAS, the undersigned Sacramento River settlement contractors agree to a Drought Protection Program, to be implemented in two phases, based on the parties' commitment to improve spawning, rearing, and migratory conditions for salmon species in the Upper Sacramento River, hatchery operations, and other spawning locations in tributaries like Battle Creek, and to otherwise support the recovery of salmon species;

[~~X~~10th] WHEREAS, the undersigned Sacramento River settlement contractors agree to a second phase of a Drought Protection Program based on anticipated investments in drought resiliency projects;

[~~X~~11th] WHEREAS, the SRSC Corp. will coordinate activities among its members and other Sacramento River settlement contractors and distribute funding to the undersigned Sacramento River settlement contractors as set forth in the articles to follow;

[~~X~~12th] WHEREAS, the SRSC Corp. will accept funding and coordinate activities in support of the Winter-Run Action Plan and to assist the United States in achieving the milestones to support recovery of salmon species in the Upper Sacramento River; and

[13th] WHEREAS, the U.S. Fish and Wildlife Service issued a biological opinion on the Sacramento River Settlement Contractors Drought Protection Program, on January 7, 2025; and

[~~X~~14th] WHEREAS, ~~the United States has~~Reclamation completed an Environmental Assessment ~~titled "~~for the Sacramento River Settlement Contractors Drought Protection

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Program~~"~~, and signed a Finding of No Significant Impact ~~dated *Month* _____, 202*X*~~, on January 8, 2025,

[~~Xth~~15th] WHEREAS, ~~[Notice of Preparation or Completion EIR for CEQA];~~on December 30, 2024, Glenn-Colusa Irrigation District, as lead agency, certified the Final Environmental Impact Report for the Drought Protection Program Agreement Between the Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation, Individual Sacramento River Settlement Contractors, and the U.S. Bureau of Reclamation, adopted Findings of Fact and a Statement of Overriding Considerations, adopted a Mitigation Monitoring and Reporting Program, and approved the project, and other Sacramento River settlement contractors, as responsible agencies, approved execution of this Agreement in reliance on the Final Environmental Impact Report.

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, the parties agree as follows:

1. DEFINITIONS

When used herein unless otherwise distinctly expressed, or manifestly incompatible with the intent of the parties as expressed in this Agreement, the term:

(a) "Agreements to Support Healthy Rivers and Landscapes" shall mean the suite of plans and voluntary agreements proposed by signatory state agencies, Reclamation, public water agencies, and other water users as an alternative program of implementation for achieving water quality objectives for the Sacramento River, tributaries, and the Delta as part of the California State Water Resources Control Board's update of its Bay-Delta Water Quality Control Plan;

(b) "Base Supply" shall mean the quantity of Surface Water established in Articles 3 and 5 of the Settlement Contracts, and listed in Exhibit A of each Settlement Contract, which

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may be diverted by the Contractor from the Sacramento River or its Source of Supply without payment to the United States for such quantities diverted;

(c) "Contract Totals" shall mean the sum of the Base Supply and Project Water available for diversion under the Settlement Contracts held by the Settlement Contractors that have executed this Agreement;

(d) "Critical Year" shall have the same meaning as the term "Critical Year" in the Settlement Contracts, which, as stated in the Settlement Contracts, means any Year in which either of the following eventualities exists:

(i) The forecasted full natural inflow to Shasta Lake for the current Water Year, as such forecast is made by the United States on or before February 15 and reviewed as frequently thereafter as conditions and information warrant, is equal to or less than 3.2 MAF; or

(ii) The total accumulated actual deficiencies below 4.0 million acre-feet in the immediately prior Water Year or series of successive prior Water Years each of which had inflows of less than 4.0 million acre-feet, together with the forecasted deficiency for the current Water Year, exceed 800,000 acre-feet.

For the purpose of determining a Critical Year, the computation of inflow to Shasta Lake shall be performed in a manner that considers the extent of upstream development above Shasta Lake during the year in question, and shall be used as the full natural flow to Shasta Lake. In the event that major construction has occurred or occurs above Shasta Lake after September 1, 1963, and which has materially altered or alters the regimen of the stream systems contributing to Shasta Lake, the computed inflow to Shasta Lake used to define a Critical Year will be adjusted to eliminate the effect of such

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material alterations. After consultation with the State of California, the National Weather Service, and other recognized forecasting agencies, the Contracting Officer will select the forecast to be used and will make the details of it available to the Settlement Contractors. The same forecasts used by the United States for the operation of the Project shall be used to make the forecasts hereunder;

(e) "Contracting Officer" will mean Reclamation's Regional Director (unless otherwise stated) or his duly authorized representative;

(f) "CVPIA" shall mean the Central Valley Project Improvement Act, Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

(g) "Drought Resiliency Projects" shall mean an integrated, broad range of actions intended to strengthen the resilience of the Settlement Contractors' water system and long-term water delivery capabilities, thereby assisting Reclamation and the Settlement Contractors to withstand and recover from climatic variability in order to support healthy rivers and landscapes (including but not limited to terrestrial ecosystems) and create durable water savings while sustaining a more drought-resilient economy that retains its vitality. Drought Resiliency Projects include but are not limited to the following actions: 1) protecting and enhancing natural systems through habitat projects and other environmental stewardship; 2) making investments to conserve water supplies over the long-term; 3) diversifying water supplies; and 4) enhancing water management actions with improved data, forecasting, conveyance, and administration under the Settlement Contracts;

(h) "Effective Date" shall mean January ~~_____~~10, 2025.

(i) "Exhibit A" shall mean the listing of those Settlement Contractors that have executed this Agreement, which Exhibit may be modified by the SRSC Corp. without

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amendment of this Agreement if and when those entities or persons that hold a Settlement Contract with Reclamation as originally executed in or about 1964, and as renewed in or about 2005, execute this Agreement after the Effective ~~date~~Date but on or before ~~_____~~July 31, 2025.

(j) "Final EIR" shall mean the ~~"~~Final Environmental Impact Report to ~~Support~~support a Drought Protection Program Agreement Between the Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation, Individual Sacramento River Settlement Contractors, and the U.S. Bureau of Reclamation,~~" dated~~ certified by Glenn-Colusa Irrigation District on December 30, 2024.

(k) "Five Agency Memorandum of Understanding" shall mean the "Memorandum of Agreement for the Purpose of the Recovery of Winter-Run Chinook Salmon Pursuant to the Winter-Run Action Plan by and among United States Fish and Wildlife Service, National Marine Fisheries Service, Bureau of Reclamation, California Department of Water Resources, California Department of Fish and Wildlife, and Sacramento River Settlement Contractors Corporation" dated ~~[date]~~_____, 2025.

(l) "Inflation Reduction Act" or "Act" shall mean Public Law No. 117-169, 136 Stat. 1818 (2022).

(m) "LTO Biological Assessment" means the "Biological Assessment for the 2021 Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and the State Water Project" issued by Reclamation on November 9, 2023.

(n) "Parties" shall mean the United States or Reclamation, SRSC Corp., and the Settlement Contractors that have executed this Agreement.

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(o) "Phase One" shall mean the period that lasts ten years from the date of the execution of this Agreement when the provisions of Article 3 of this Agreement are effective.

(p) "Phase One Program Year" shall mean when all the following conditions are satisfied by April 15 in any Year during Phase One:

(i) Based on Bin 3B Indicators in the LTO Biological Assessment, forecasted end-of-April Shasta Lake storage is less than 3.0 million acre-feet;

(ii) Based on Bin 3B Indicators in the LTO Biological Assessment, forecasted end-of-September Shasta Lake storage is less than 2.0 million acre-feet;

(iii) Combined actual and forecasted natural inflow to Shasta Lake from October 1 through April 30 is less than 2.5 million acre-feet; and

(iv) Reclamation forecasts a Critical Year under the Settlement Contracts.

Forecasts to determine whether conditions (i)-(iv) are satisfied shall be based on a 90% exceedance.

(q) "Phase Two" shall mean the period following the expiration of Phase One through February 28, 2045, when the provisions of Article 4 of this Agreement are effective.

(r) "Phase Two Program Year" shall mean when all the following conditions are satisfied by April 15 in any Year during Phase Two:

(i) Combined actual and forecasted natural inflow to Shasta Lake from October 1 through April 30 is less than 2.5 million acre-feet; and

(ii) Reclamation forecasts a Critical Year under the Settlement Contracts.

Forecasts to determine whether conditions (i)-(ii) are satisfied shall be based on a 90% exceedance.

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(s) "Program Water" shall mean the total quantity reduced under all Settlement Contracts participating in the Drought Protection Program during a Phase One Program Year, not to exceed a combined 500,000 acre-feet per Phase One Program Year, in order to result in a forecasted end-of-September storage in Shasta Lake of up to 2.0 million acre-feet; the total reduction shall be in addition to reductions under Article 5 of the Settlement Contracts.

(t) "Project" shall mean the Central Valley Project owned by the United States and managed by the Department of Interior, Bureau of Reclamation;

(u) "Project Water" shall have the same meaning as the term "Project Water" in the Settlement Contracts, which, as stated in the Settlement Contracts, means all Surface Water diverted or scheduled to be diverted each Year by the Contractor from the Sacramento River which is in excess of the Base Supply. The United States recognizes the right of the Contractor to make arrangements for acquisition of water from projects of others than the United States for delivery through the Sacramento River and tributaries subject to written agreement between Contractor and the United States as to identification of such water which water when so identified shall not be deemed Project Water under this Settlement Contract;

(v) "Rates" shall have the same meaning as the term "Rates" in the Settlement Contracts, which, as stated in the Settlement Contracts, means the payments for Project Water determined annually by the Contracting Office in accordance with the then current applicable water ratesetting Policies for the Project, as described in subdivision (a) of Article 8 of the Settlement Contract.

(w) "Reclamation Program Water" shall mean any Program Water made available for use by Reclamation pursuant to this Agreement;

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(x) "Record of Decision" shall mean the decision document issued on ~~[DATE]~~ ~~for~~December 20, 2024, in which Reclamation ~~has~~ selected an alternative for the long-term operations of the Central Valley Project and State Water ~~Projects~~Project based on the analysis of the range of alternatives analyzed in the EIS titled "Long-Term Operations of the Central Valley Project and State Water Project", posted on November 15, 2024.

(y) "Recoverable SRS Contractor Program Water" shall mean the quantity of SRS Contractor Program Water that is available for use in accordance with Article 3(g)-(i); except that portion determined by Reclamation as Recoverable SRS Contractor Program Water Spill;

(z) "Recoverable SRS Contractor Program Water Spill" shall mean Recoverable SRS Contractor Program Water that, upon determination by Reclamation, is irrecoverably lost from Reclamation's control at Shasta Reservoir;

(aa) "Rescheduling Fee" shall have the same meaning as the term "Rescheduling Fee" in the Settlement Contracts, which, as stated in the Settlement Contracts, means the payments required for each acre-foot of Base Supply rescheduled pursuant to subdivision (c)(l) of Article 3 of the Settlement Contract, as determined annually by the Contracting Officer in accordance with the then-current applicable water rate setting policies for the Project;

(bb) "SRS Contractor Program Water" shall mean any Program Water that is not made available for use by Reclamation as Reclamation Program Water;

(cc) "Secretary" shall mean the Secretary of the Interior, a duly appointed successor, or an authorized representative acting pursuant to any authority of the Secretary and through any agency of the Department of the Interior;

(dd) "Settlement Contractor(s)" shall mean those entities or persons that hold a Settlement Contract with Reclamation as originally executed in or about 1964, and as renewed in

or about 2005, and who have agreed to participate in the Drought Protection Program by executing this Agreement.

(ee) "Settlement Contract(s)" shall mean the Sacramento River Settlement Contracts as originally executed in or about 1964, and as renewed in or about 2005.

(ff) "Surface Water" shall have the same meaning as the term "Surface Water" in the Settlement Contracts, which, as stated in the Settlement Contracts, means only those waters that are considered as surface water under California law;

(gg) "Drought Protection Program" shall mean the program implementing reductions to Contract Totals in Phase One pursuant to Article 3 of this Agreement and in Phase Two pursuant to Article 4 of this Agreement.

(hh) "Water Year" shall have the same meaning as the term "Water Year" in the Settlement Contracts, which, as stated in the Settlement Contracts, means the period commencing with October 1 of one year and extending through September 30 of the next;

(ii) "Winter-Run Action Plan" or "WRAP" shall mean the plan that has been developed collaboratively among representatives from Reclamation, National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Water Resources, California Department of Fish and Wildlife, and the SRSC Corp. as an integrated plan to improve the survival and viability of Winter-run Chinook salmon that functions alongside planned operation of Shasta Reservoir, and as the plan is identified and described in Sections 3.13.3.2 and 3.16.1 of the LTO Biological Assessment; and

(jj) "Year" shall have the same meaning as the term "Year" in the Settlement Contracts, which, as stated in the Settlement Contracts means a calendar year.

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2. DURATION OF CONTRACTUAL OBLIGATIONS

Except for Reclamation's obligations under Article 7 of this Agreement, the Parties' respective rights, responsibilities and performance obligations during Phase One of the Drought Protection Program shall remain in effect from February 1, 2025, through February 15, 2035. The Parties' respective rights, responsibilities and performance obligations during Phase Two of the Drought Protection Program shall begin on February 16, 2035, and shall remain in effect through February 28, 2045.

3. PHASE ONE OF ~~THEDROUGHT~~THE DROUGHT PROTECTION PROGRAM

(a) Reclamation will establish a Drought Protection Program to reduce water furnished to Settlement Contractors in certain years and under specific hydrologic conditions as defined in this Agreement. The Drought Protection Program will be implemented in two phases, with each phase lasting approximately ten years. This article prescribes the terms of Phase One of the Drought Protection Program.

(b) Reclamation will identify whether any Year is a Phase One Program Year, as defined in Article 1(p), and the amount of Program Water based on the following forecasts and process:

(i) On March 15 of each Year, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors as to whether the conditions for a Phase One Program Year are forecasted to be satisfied, and if so, will identify the initial quantity of Program Water.

(ii) On April 15 of each Year, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors as to whether the conditions for a Phase

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One Program Year are satisfied, and if so, will identify the final amount of Program Water.

(iii) Reclamation may not increase the amount of Program Water after April 15 under this Agreement. The Settlement Contractors may voluntarily agree to an increase in the quantity of Program Water subject to a separate agreement with Reclamation.

(iv) The forecast provided by Reclamation on April 15 will be the final notice to Settlement Contractors as to whether it is a Phase One Program Year.

(c) In addition to reductions under Article 5 of the Settlement Contracts, in a Phase One Program Year, Reclamation will reduce the Contract Totals for the Settlement Contractors by the final amount of Program Water identified on April 15; the reduction to Contract Totals because of reductions for Program Water shall be distributed among the Settlement Contractors as identified in Exhibit A. The Settlement Contractors may redistribute the reductions to Contract Totals among the Settlement Contractors, provided that the total amount of Program Water identified by Reclamation is met by the combined reduction to Contract Totals of the Settlement Contractors. Any water reductions pursuant to this subdivision shall be deemed equivalent to a reasonable beneficial use of water to the extent of the reduction in supply, do not reflect any change to the underlying water rights of the Settlement Contractors, and will not be considered by Reclamation as a reduction in water use or demand during any renewal of the Settlement Contracts, unless otherwise mutually agreed.

(d) By April 15 of any Phase One Program Year, Reclamation shall have the first right to make Program Water available for use by Reclamation upon a mutually agreed upon amount of funding made available to the Settlement Contractors; such water shall be

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"Reclamation Program Water." Program Water not funded by Reclamation by April 15 shall be "SRS Contractor Program Water."

(e) Between April 15 and July 15 in a Phase One Program Year, the Settlement Contractors may voluntarily provide an option to Reclamation to provide funding for use of SRS Contractor Program Water by Reclamation at an amount agreed upon in the future by Reclamation and the Settlement Contractors.

(f) In a Phase One Program Year, no later than July 15, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors that identifies the forecasted end-of-September Shasta Lake storage:

(i) If the forecasted end-of-September Shasta Lake storage is greater than 2.0 million acre-feet, then the SRS Contractor Program Water will become "Recoverable SRS Contractor Program Water" and may be used in accordance with subdivisions (g)-(i) of this Article 3. Recoverable SRS Contractor Program Water will be distributed among the Settlement Contractors in accordance with Exhibit A.

(ii) If the forecasted end-of-September Shasta Lake storage is less than 2.0 million acre-feet, then Reclamation and the Settlement Contractors will meet and confer on operations for the remaining period of the Water Year in accordance with Article 6 of this Agreement.

(g) Each Settlement Contractor may use its amount of Recoverable SRS Contractor Program Water for the following purposes and subject to Reclamation's operational constraints:

(i) Diversion and use within a Settlement Contractor Service Area identified in Exhibit B of a Settlement Contract;

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(ii) Settlement Contractor flow contributions or other actions under the Agreements to Support Healthy Rivers and Landscapes;

(iii) Subject to Reclamation's right of first refusal to provide funding to make Recoverable SRS Contractor Program Water available for use by Reclamation, request assignment and delivery to Project water service and/or repayment contractors or National Wildlife Refuges, or

(iv) Subject to Reclamation's right of first refusal to provide funding to make Recoverable SRS Contractor Program Water available for use by Reclamation, transfer to non-Project contractors in accordance with Article 3(e) of the Settlement Contracts.

Use of Recoverable SRS Contractor Program Water plus quantities diverted or transferred under the Settlement Contracts in each Year shall not exceed the Contract Totals.

(h) Requested use of Recoverable SRS Contractor Program Water shall not result in a forecasted end-of-September Shasta Lake storage of less than 2.0 million acre-feet during the year of the requested use.

(i) Requests by Settlement Contractors to use Recoverable SRS Contractor Program Water for the purposes in subdivision (g)(i)-(iv) of this Article 3 shall be submitted to Reclamation at least two weeks prior to the date of the requested use. Reclamation and the Settlement Contractors shall cooperate to reach agreement on a schedule for the requested use, subject to Reclamation's operational constraints, within two weeks of submittal of a request.

(j) After October 1 of each Year, SRS Contractor Program Water shall become Recoverable SRS Contractor Program Water. Any Recoverable SRS Contractor Program Water shall be carried over in Shasta Lake subject to the following:

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(i) Reclamation shall have the right to provide funding to make any Recoverable SRS Contractor Program Water available for use by Reclamation beginning October 1. Any Recoverable SRS Contractor Program Water that Reclamation does not fund by April 15 of the following year shall remain Recoverable SRS Contractor Program Water.

(ii) In the event the following year is not a Phase One Program Year, Settlement Contractors may use Recoverable SRS Contractor Program Water for the purposes and subject to the conditions in subdivision (g) of this Article 3. Requested use of Recoverable SRS Contractor Program Water shall not result in a forecasted end-of-September Shasta Lake storage of less than 2.0 million acre-feet during the Year of the requested use.

(iii) Recoverable SRS Contractor Program Water that is carried over may become Recoverable SRS Contractor Program Water Spill. The determination of Recoverable SRS Contractor Program Water Spill will be made by Reclamation.

(iv) Reclamation shall provide an accounting of Recoverable SRS Contractor Program Water Spill with a notification to SRS Contactors within 45 days its determination.

(v) Recoverable SRS Contractor Program Water Spill shall be accounted as meeting the Settlement Contractors' obligations to provide flow contributions under the Agreements to Support Healthy Rivers and Landscapes to the extent possible.

(k) Recoverable SRS Contractor Program Water remaining in Shasta at the end of Phase One, if any, will be carried over in Shasta for future use for the purposes and subject to the conditions in subdivision (g).

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4. PHASE TWO OF THE DROUGHT PROTECTION PROGRAM

(a) This article prescribes the terms of Phase Two of the Drought Protection Program. Phase Two shall expire on February 28, 2045, unless otherwise extended by mutual agreement.

(b) Reclamation will identify whether any Year is a Phase Two Program Year, as defined in Article 1(r), based on the following forecasts and process:

(i) On March 15 of each Year during Phase Two, Reclamation will provide a forecast based on a 90% exceedance to the Settlement Contractors as to whether the conditions for a Phase Two Program Year are forecasted to be satisfied; and

(ii) If the conditions for a Phase Two Program Year are forecasted to be satisfied on March 15, then Reclamation and the Settlement Contractors will begin to meet and confer on whether a reduction, in addition to reductions under Article 5 of the Settlement Contracts, is necessary to promote the survival and recovery of federally endangered or threatened species in the Sacramento River below Shasta Dam above I Street Bridge.

(iii) On April 15 of each year during Phase Two, Reclamation will provide a forecast based on a 90% exceedance to Settlement Contractors as to whether the conditions for a Phase Two Program Year are satisfied. The forecast provided by Reclamation on April 15 will be the final notice to Settlement Contractors as whether it is a Phase Two Program Year.

(c) If Reclamation determines that is a Phase Two Program Year on April 15, and, as a result of the meet and confer process described in Article 6, Reclamation and the Settlement Contractors agree that a reduction in addition to reductions under Article 5 of the Settlement Contracts is necessary to achieve temperature control in the Upper Sacramento River, then the

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Settlement Contractors will voluntarily reduce the Contract Totals under the Settlement Contracts by up to 100,000 acre-feet.

(d) The Settlement Contractors may distribute the reductions to Contract Totals among the Settlement Contractors, provided that the total amount of up to 100,000 acre-feet is met by the combined reduction to Contract Totals by the Settlement Contractors.

(e) Any water reductions pursuant to Article 4(c) shall be deemed equivalent to a reasonable beneficial use of water to the extent of the reduction in supply, do not reflect any change to the underlying water rights of the Settlement Contractors, and will not be considered by Reclamation as a reduction in water use or demand during any renewal of the Settlement Contracts, unless otherwise mutually agreed.

(f) Reclamation will utilize any water savings resulting from the reductions by the Settlement Contractors under Article 4(c) of this Agreement for non-reimbursable purposes necessary to promote the survival and recovery of federally endangered or threatened species in the Sacramento River below Shasta Dam above I Street Bridge and will not make these savings available for water supply allocations to CVP contractors in a Phase Two Program Year.

(g) The Parties agree that during Phase Two any voluntary reductions in water furnished to the Settlement Contractors beyond the reductions provided for in Article 4(c) of this Agreement shall be subject to a separate agreement with Reclamation.

5. SETTLEMENT CONTRACT PERFORMANCE

(a) Reclamation agrees to the following terms during a Phase One Program Year or a Phase Two Program Year:

(i) Reclamation will allow Settlement Contractors to reschedule the amounts of Base Supply not diverted in a month into any other months, including into the critical

months defined in the Settlement Contracts, or otherwise as needed to accommodate the demand shift pattern.

(ii) Reclamation shall ensure that water furnished under the Settlement Contracts is available on a pattern that allows the Settlement Contractors to make use of the entire Contract Total, with applicable reductions under the Settlement Contracts and this Agreement.

(iii) Reclamation will waive the requirement of Article 3(c)(2)(ii) of the Settlement Contracts.

(iv) Reclamation will allow the accounting order for diversion schedules for each month to be regular monthly Base Supply, then unused Base Supply rescheduled from another month, and then Project Water.

(v) Reclamation shall waive fees for the rescheduling of Base Supply into other months as set forth in Article 3(c)(1) of the Settlement Contracts.

(vi) Reclamation will waive the take or pay provisions in Article 8(a)(1) of the Settlement Contracts.

(vii) For the purpose of future water transfers related to groundwater substitution or crop idling/shifting, Reclamation will account for baseline conditions only in years that do not involve reductions to Contract Totals beyond those described in Article 5 of the Settlement Contracts.

(viii) Both Base Supply and Project Water shall be available for use in water transfers consistent with sections 3403(f) and 3405(a)(1)(M) of the CVPIA.

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(b) In the event of a conflict between the terms in subdivision (a) of Article 5 of this Agreement and the terms of a Settlement Contract, the terms in subdivision (a) of Article 5 of this Agreement shall govern.

(c) To the maximum extent possible, the terms in subdivision (a) of Article 5 of this Agreement will also apply to the use of Recoverable SRS Contractor Program Water if it becomes available for use in a Phase One Program Year in Phase One of the Drought Protection Program.

6. MEET AND CONFER

The Settlement Contractors will meet and confer with Reclamation as appropriate to determine if there is any additional role for the Settlement Contractors in connection with Reclamation's operational decision-making for Shasta Reservoir annual operations in Phase One Program Years and Phase Two Program Years. This determination will include consideration of what actions are feasible, consistent with the terms of this Agreement and the Settlement Contracts. In addition to the reduction during Critical Years as set forth in the Settlement Contracts, and the reductions under Articles 3 and 4 of this Agreement, the types of actions that may be considered include, but are not necessarily limited to: (1) the scheduling of spring diversions by the Settlement Contractors; (2) voluntary, compensated water transfers by the Settlement Contractors subject to Reclamation approval; and (3) smoothed diversions by the Settlement Contractors during the fall months. Any mutually agreeable proposed actions resulting from these meet-and-confer discussions must be consistent with the terms of this Agreement and the Settlement Contracts and subject to other regulatory approvals.

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7. FUNDING FOR THE DROUGHT PROTECTION PROGRAM

(a) Reclamation will fund the Drought Protection Program by providing the following payment to SRSC Corp.:

(i) $250 million upon the Effective Date of this Agreement, in a one-time, non-refundable payment to the SRSC Corp., with funds available to Reclamation under the Inflation Reduction Act.

(ii) The Settlement Contractors shall use the majority of the proceeds from Article 7(a)(i) to invest in Drought Resiliency Projects. For purposes of this provision, Drought Resiliency Projects include actions taken by Settlement Contractors and costs of those actions incurred from August 16, 2022, the date of enactment of the Inflation Reduction Act, to December 20, 2024, up to $30 million. The balance of the proceeds (less than the majority of funds from the Inflation Reduction Act) may be used for any lawful Settlement Contractor purposes.

(iii) The proceeds from Article 7(a), once transferred to the Settlement Contractors under Article 11, are eligible to meet any local agency cost share for a matching funds requirement.

(b) In accordance with Article 2 of this Agreement, Reclamation has the right to the first 275,000 acre-feet of Program Water during Phase One. Reclamation shall have the right to take actions to make additional quantities of Program Water or SRS Contractor Program Water available for use by Reclamation as set forth in subdivisions (d), (e), and (g) of Article 3 of this Agreement in exchange for a mutually agreed payment or payments to the Settlement Contractors based upon future negotiations between Reclamation and the Settlement Contractors.

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(c) The funds described in subdivision (a) of this Article will be distributed by the SRSC Corp. to the Settlement Contractors in accordance with Exhibit A. The SRSC Corp. will retain 5% of the funds described in subdivision (a) of Article 7 as consideration for its obligations arising under this Agreement and as an administrative fee for managing such funds. The SRSC Corp. will make the balance of such funds available to Settlement Contractors who are party to this Agreement proportionately based on a Settlement Contractor's share of Contract Totals.

(d) The Settlement Contractors agree to comply with any mitigation requirements contained in the Final EIR associated with the water reductions described in Articles 3 and 4 and Drought Resiliency Projects described in Article 7(a)(ii).

8. SUPPORT OF THE WINTER RUN ACTION PLAN

(a) During Phase One of the Drought Protection Program, and upon Reclamation acquiring a cumulative Program Water quantity of 500,000 acre-feet under Article 3 of this Agreement, any additional Program Water is contingent on completing mutually agreed Winter Run Action Plan (WRAP) deadlines, milestones, and timely deliverables for each WRAP priority action, as set forth in the mutually agreeable schedule to be developed by Reclamation and the Settlement Contractors consistent with section 4.10 of the Five Agency Memorandum of Understanding, or as otherwise agreed upon between Reclamation and the SRSC Corp.

(b) To support the Winter Run Action Plan, Reclamation will use its rate-setting policies and reduce the Rates for Project Water by $10 per acre-foot for all Project Water charged to each Settlement Contractor during Phase One. Reclamation will notify each Settlement Contractor of the $10 per acre-foot reduction in accordance with the procedures in Article 8(b) of the Settlement Contract. Each Settlement Contractor will pay Rates for Project

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Water, reduced by $10 per acre-foot, in accordance with the schedule set forth in Article 8(c) of the Settlement Contract.

(c) The SRSC Corp. will invoice each Settlement Contractor based on the amount of Project Water that Reclamation charges the Settlement Contractor in Reclamation's final water account record for the Water Year in acre-feet and multiply that amount by $10. Each Settlement Contractor shall pay the amount invoiced, based on this formula, to the SRSC Corp. annually. The funds collected by the SRSC Corp. will be managed by the SRSC Corp. and provided either through contract, grant, or direct funding for studies and programs that support the Winter-Run Action Plan.

(d) All funds collected under this Article 8 are non-reimbursable.

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9. RESERVATION OF RIGHTS

Reclamation and the Settlement Contractors agree to enter into this Agreement in anticipation of Reclamation's operational commitments in the LTO Biological Assessment and Record of Decision. In the event that there are legal actions concerning the Record of Decision in any forum, the Settlement Contractors reserve their rights to participate in such actions to ensure consistency with and the performance of this Agreement or the Settlement Contracts. Nothing in this Agreement shall limit the Settlement Contractors from defending any actions brought against this Agreement or the Settlement Contracts.

In the event a court of competent jurisdiction finds that the Record of Decision, or any portion thereof, is unlawful, this Agreement shall continue to remain in effect in accordance with Article 2 of this Agreement.

During the term of this Agreement, Reclamation will not voluntarily take any actions or seek any relief, over any objection of the Settlement Contractors, that would result in further water reductions under the Settlement Contracts beyond those reductions agreed to in this Agreement or consistent with the Settlement Contracts, unless required by applicable law or court order.

10. DISCLAIMER OF LIABILITY

Subject to the conditions, limitations, and provisions hereinafter expressed, the Settlement Contractors agree to hold harmless, and the United States and its officers, agents, or employees assume no responsibility for any damage whether direct or indirect arising out of or in any manner caused by reducing Contract Totals in a Phase One Program Year by the amount of Program Water determined in accordance with Article 3 of this Agreement, or a Phase Two Program Year in accordance with Article 4 of this Agreement.

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11. METHOD OF PAYMENT

(a) The SRSC Corp. shall register at the U.S Federal District Registration System for Award Management (SAM) website at www.sam.gov prior to receipt of payment. The SRSC Corp. will notify Reclamation when it has successfully established a SAM account and provide Reclamation the necessary routing information for prompt payment.

(b) All payment made by the United States under this Agreement shall be made by electronic funds transfer (EFT) using the EFT information contained in the SAM database. The SRSC Corp. is responsible during the term of this Agreement for the accuracy and completeness of the data within the SAM database, and for any liability resulting from the United States or Reclamation's reliance on inaccurate or incomplete data. To remain registered in the SAM database after initial registration, the SRSC Corp. is required to review and update on an annual basis, from the date of initial registration or subsequent updates, its information in the SAM database to ensure it is current, and complete.

(c) The SRSC Corp. will disburse the funds to the Settlement Contractors in accordance with Exhibit A.

(d) Any funds not distributed in accordance with subsection (c) of this Article 9 shall be retained by the SRSC Corp.

12. NO ARGUMENT, PRECEDENT, OR ADMISSION

Nothing in this Agreement shall be offered for or against a Party (or any of the Settlement Contractors) as argument, admission, admission of wrongdoing, liability, waiver, acquiescence, or precedent regarding any issue of fact or law, including but not limited to issues related to the interpretation or future performance of the Settlement Contracts, in any mediation, arbitration, litigation, or other administrative or legal proceeding, except that this Agreement may be used in

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any future proceeding to interpret or enforce the terms of this Agreement, consistent with applicable law. No actions under this Agreement shall be evidence of lack of beneficial use of the subject water supplies, or shall in any way prejudice any of the Settlement Contractors' water rights or Reclamation's water rights.

13. AUTHORIZATION

The Parties represent and warrant that the persons executing this Agreement on behalf of each respective Party has full power and authority to enter this Agreement and that the Parties are authorized by law to perform the services and actions set forth herein.

14. NO COUNTERPARTS CLAUSE

This Agreement may be executed in counterparts with the same force and effect as if executed in one complete document by all Parties. Sacramento River settlement contractors may become party to this Agreement by delivering a signed counterpart to SRSC Corp. on or before ~~_____~~July 31, 2025, and thereby be a Settlement Contractor under this Agreement. The SRSC Corp. will assemble any such counterparts and attach them to the final Agreement and distribute copies of the final Agreement to the parties.

15. PROTECTION OF WATER AND AIR QUALITY

The SRSC Corp. shall comply with all applicable water and air pollution laws and regulations of the United States and state law; and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities necessary for the delivery of water by the Settlement Contractors; and shall be responsible for compliance with all Federal, State, and local water quality standards applicable to surface and subsurface drainage and/or discharges generated through the use of Central Valley Project facilities or Settlement Contractor facilities or water provided by the Settlement Contractor within its water service area.

This ~~Article~~article shall not affect or alter any legal obligations of the Secretary of the Interior to provide drainage or other discharge services.

16. BOOKS, RECORDS, AND REPORTS

The SRSC Corp. and Settlement Contractors shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Agreement, including as applicable the SRSC Corp.'s and Settlement Contractors' financial transactions; water supply data; Project operation, maintenance, and replacement logs; Project land and rights-of-way use agreements; the water users' land-use (crop census), landownership, land-leasing, and water-use data; and other matters that the Contracting Officer may require. Reports shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this Agreement shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Agreement.

17. ASSIGNMENT LIMITED - SUCCESSORS AND ASSIGNS OBLIGATED

The provisions of this Agreement shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Agreement or any right or interest therein by either party shall be valid until approved in writing by the other party.

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18. OFFICIALS NOT TO BENEFIT

No Member of or Delegate to the Congress, Resident Commissioner, or official of the SRSC Corp. and the Settlement Contractors shall benefit from this Agreement other than as a water user or landowner in the same manner as other water users or landowners.

19. NOTICES

All notices and other communications required under this Agreement shall be in writing and shall be deemed to have been duly given on the date of service, if served personally, on the person to whom notice is to be given, or on the third (3rd) day after mailing, if mailed to the party to whom notice is to be given by first class mail, registered or certified, postage-prepaid, and properly addressed as follows:

To SRSC Corp.:
~~[Add Address/Attn: to]~~
P.O. Box 150
Willows, CA 95988

To Reclamation: U.S. Bureau of Reclamation
California Great Basin Region
Resources Management Division
Attention: Regional Resources Manager, CGB-400
2800 Cottage Way
Sacramento, California 95842

To Settlement Contractors:
c/o SRSC Corp.
P.O. Box 150
Willows, CA 95988

20. CONTRACT DRAFTING CONSIDERATIONS

This Agreement has been negotiated and reviewed by the parties hereto, each of whom is sophisticated in the matters to which this Agreement pertains. The double-spaced articles of this Agreement have been drafted, negotiated, and reviewed by the Parties, and no one party shall be considered to have drafted the stated articles.

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IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

UNITED STATES OF AMERICA

By:

Regional Director
Interior Region 10 California- Great Basin
Bureau of Reclamation

THE SACRAMENTO RIVER SETTLEMENT CONTRACTORS, A CALIFORNIA NONPROFIT MUTUAL BENEFIT CORPORATION

By:

President, Board of Directors

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642 EXHIBIT A

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645 SETTLEMENT CONTRACTOR COUNTERPART

646 Date:_____ Settlement Contractor Name:
647 GLENN-COLUSA IRRIGATION DISTRICT
648 By:_____
649 Jeffrey P. Sutton, General Manager

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SETTLEMENT CONTRACTOR COUNTERPART

Date:_____

Settlement Contractor Name:
RECLAMATION DISTRICT NO. 108

~~Type of Entity:~~_____

By:_____

Lewis Bair, General Manager

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660 SETTLEMENT CONTRACTOR COUNTERPART

661 Date: _____ Settlement Contractor Name:
662 SUTTER MUTUAL WATER COMPANY
663 By: _____
664 William F. Henle, Board President

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SETTLEMENT CONTRACTOR COUNTERPART

Date: _____

Settlement Contractor Name:
ANDERSON-COTTONWOOD IRRIGATION DISTRICT
By: _____
Daniel Ruiz, General Manager

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SETTLEMENT CONTRACTOR COUNTERPART

Date: _____

Settlement Contractor Name:
NATOMAS CENTRAL MUTUAL WATER COMPANY
By: _____
Tom Ramos, Board President

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683 SETTLEMENT CONTRACTOR COUNTERPART

684 Date:_____ Name of Contractor:_____
685 By:_____
686 Name:
687 _____
688 _____
689 Title:_____

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692 ~~EXHIBIT A~~

693 ~~[This appendix will include a table of signatory Settlement Contractors and the allocations of~~
694 ~~Program Water reductions, Recoverable SRS Contractor Program Water, payments, and funds~~
695 ~~retained by the SRSC Corp. for administration and the Winter Run Action Plan.]~~

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Summary report: Litera Compare for Word 11.10.0.38 Document comparison done on 1/9/2025 8:48:26 AM	
Style name: Default Style	
Intelligent Table Comparison: Active	
Original filename: 12052024 DRAFT Drought Protection Program Agreement (00172695-22xD2C75)(4520458.1).docx	
Modified filename: 01082025 FINAL DRAFT Drought Protection Program Agreement (00172695-27xD2C75) (002).docx	
Changes:	
Add	89
~~Delete~~	48
~~Move From~~	0
Move To	0
Table Insert	0
~~Table Delete~~	0
Table moves to	0
~~Table moves from~~	0
Embedded Graphics (Visio, ChemDraw, Images etc.)	1
Embedded Excel	0
Format changes	0
Total Changes:	138

December 2024
State Clearinghouse Number: 2024050834

Drought Protection Program Agreement Between the Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation, Individual Sacramento River Settlement Contractors, and the U.S. Bureau of Reclamation Project

Mitigation Monitoring and Reporting Program

Prepared for the Glenn-Colusa Irrigation District

December 2024
State Clearinghouse Number: 2024050834

Drought Protection Program Agreement Between the Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation, Individual Sacramento River Settlement Contractors, and the U.S. Bureau of Reclamation Project

Mitigation Monitoring and Reporting Program

Prepared for
Glenn-Colusa Irrigation District
P.O. Box 150
Willows, California 95988

Prepared by
Anchor QEA
33 New Montgomery Street, Suite 1210
San Francisco, California 94105

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ABBREVIATIONS

BMP	best management practice
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
EIR	Environmental Impact Report
ESA	Endangered Species Act
FEIR	Final Environmental Impact Report
GCID	Glenn-Colusa Irrigation District
GGS	giant garter snake
GSP	Groundwater Sustainability Plan
HCP	Habitat Conservation Plan
IDP	Inadvertent Discovery Plan
MMRP	Mitigation and Monitoring Reporting Program
mph	mile per hour
MRZ	mineral resource zone
NPDES	National Pollutant Discharge Elimination System
OHP	Office of Historic Preservation
Reclamation	U.S. Bureau of Reclamation
RWQCB	Regional Water Quality Control Board
SGMA	Sustainable Groundwater Management Act
SRSC	Sacramento River Settlement Contractors
SRSCNC	Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1 Introduction

On December 30, 2024, the Glenn-Colusa Irrigation District (GCID), in compliance with the California Environmental Quality Act (CEQA; California Public Resources Code, Division 13, Section 21000 et seq.) and CEQA Guidelines (14 California Code of Regulations [CCR] 15000 et seq.) certified a Final Environmental Impact Report (FEIR) to support the approval of the Drought Protection Program Agreement[1] (project or Agreement) between the Sacramento River Settlement Contractors Nonprofit Mutual Benefit Corporation (SRSCNC), individual Sacramento River Settlement Contractors (SRSC), and the U.S. Bureau of Reclamation (Reclamation). Under the project, the SRSCNC and individual members of the SRSC will enter into an Agreement with Reclamation to forego a larger percentage of their contract supply in specified drought years under two phases. In addition, the SRSC will engage in drought-resiliency projects to address potential water loss and strengthen the resilience of the SRSC's water system and long-term water delivery capabilities. The project would occur within the SRSC service areas in eight counties: Shasta, Tehama, Glenn, Butte, Sutter, Colusa, Yolo, and Sacramento.

CEQA (PRC Section 21081.6) requires a Lead or Responsible Agency to adopt a Mitigation Monitoring and Reporting Program (MMRP) when approving or carrying out a project. The purpose of this program is to ensure that when an environmental document, either an Environmental Impact Report (EIR) or a negative declaration, identifies measures to reduce potential adverse environmental impacts to less-than-significant levels, that those measures are implemented as detailed in the environmental document. As lead agency for the EIR, GCID is responsible for implementation of this MMRP.

The EIR prepared for the project addresses the potential environmental impacts and, where appropriate, recommends measures to mitigate these impacts. As such, this MMRP is required to ensure that adopted mitigation measures are successfully implemented and a monitoring strategy was prepared for each mitigation measure. Once GCID adopts the MMRP, the individual SRSC members signing the Agreement would be required to comply with these mitigation measures as enforceable conditions of the Agreement. Individual SRSC members must document their compliance with all applicable mitigation measures and provide proof of compliance to the SRSCNC, which shall maintain a record of compliance that is available for inspection and verification by GCID.

Therefore, in accordance with the aforementioned requirements, this document lists each mitigation measure, describes the methods for implementation, and identifies the responsible party or parties.

[1] Prior to its approval, the Drought Protection Program Agreement was previously known as the Water Reduction Program Agreement.

2 Monitoring Program

This MMRP was prepared and is accompanied by the associated reporting forms used to verify compliance with individual mitigation measures. This MMRP identifies each mitigation measure by discipline, the entity or organization responsible for implementation, and the monitoring phase required for each measure. Certain inspections and reports may require preparation by qualified individuals; these are specified as needed.

Table 1
Mitigation and Monitoring Program

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
MM-AGR-1: Site Drought-Resiliency Projects Outside of Forest Lands. Drought-resiliency projects will not be sited in forest lands.	The SRSC member implementing the drought-resiliency project shall review all proposed drought-resiliency project locations to ensure that none are sited in forest lands.	During planning for drought-resiliency projects.
MM-AIR-1: Construction Truck Idling Requirements. During construction of drought resiliency projects, SRSC contractors will require construction contractors to minimize heavy-duty construction equipment idling time to 2 minutes where feasible. Currently, the In-Use Off-Road Diesel Vehicle Rule restricts construction equipment idling to 5 minutes. This measure would further reduce the time allowance for idling to 2 minutes to reduce emissions. Exceptions include equipment that needs to idle to perform work, vehicles being serviced, or vehicles in a queue waiting for work consistent with the In-Use Off-Road Diesel Vehicle Rule.	This measure shall be incorporated into any applicable construction contracts initiated by an individual SRSC for a drought-resiliency project.	Prior to commencement of and during all drought-resiliency project construction events.
MM-AIR-2: Dust Reduction Measures. • During drought-resiliency project construction in non-Agreement Years, the following dust control measures will be implemented as applicable to the drought-resiliency project: – Active construction areas will be watered at least twice daily. – Haul trucks will maintain at least two feet of freeboard. – Trucks hauling soil, sand, and other loose materials will be covered. – Non-toxic binders (e.g., latex acrylic copolymer) will be applied to exposed areas after cut-and-fill operations and hydroseed area. – Inactive storage piles will be covered. • During Agreement Years, a 20-mph speed limit for vehicles driving on unpaved roads or farmland devoid of crops will be established and enforced. Speed limits will be posted and workers will be notified in writing of restrictions. In addition, the	This measure shall be incorporated into any applicable construction contracts initiated by an individual SRSC for a drought-resiliency project.	Prior to commencement of drought-resiliency project construction in non-Agreement Years and during all Agreement Years, as specified in the measure.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
following measures will be implemented as applicable to the drought-resiliency project: – Haul trucks will maintain at least 2 feet of freeboard. – Trucks hauling soil, sand, and other loose materials will be covered. – Non-toxic binders (e.g., latex acrylic copolymer) will be applied to exposed areas after cut-and-fill operations and hydroseed area. – Inactive storage piles will be covered.		
MM-BIO-1: Conduct Desktop Special Status Wildlife Species, Plant Species, and Aquatic Resources Evaluation for Drought-Resiliency Projects. Prior to implementing a drought-resiliency project that involves grading, vegetation removal, or other form of construction in irrigation and drainage canals or upland areas outside of established agricultural croplands with a history of discing, planting, and maintenance, a qualified biologist will conduct a desktop evaluation of the site using digital web-based aerial photography. The purpose of the desktop evaluation will be to determine the potential for special status wildlife and plant species habitat or aquatic resources subject to regulation by the USACE, RWQCB, or CDFW to occur on site. A qualified biologist will also perform a review of the USFWS Information for Planning and Consultation, CNDDB, CNPS, and Calflora databases to identify known records or potential for special status plant or wildlife species to occur in the project vicinity. If through this assessment, the biologist determines that potential habitat for special status wildlife or plants or jurisdictional aquatic resources exist, then site-specific survey(s) will be conducted per MM-BIO-2, MM-BIO-3, MM-BIO-4, MM-BIO-5, and MM-BIO-6, as applicable.	If a drought-resiliency project involves grading, vegetation removal, or other form of construction in irrigation and drainage canals or upland areas outside of established agricultural croplands with a history of discing, planting, and maintenance, the SRSC implementing the project shall complete a desktop special status wildlife species, plant species, and aquatic resources evaluation.	During planning for and prior to construction of drought-resiliency projects.
MM-BIO-2: Conduct Special Status Plant Species Surveys and Avoidance for Drought-Resiliency Projects. If the drought-resiliency project site survey indicates that the project site contains suitable habitat for special-status plant species, surveys using USFWS, CDFW, and California Native Plant Society protocols will be	If a drought-resiliency project site contains suitable habitat for special-status plant species, the SRSC implementing the project shall ensure that surveys by a qualified biologist are conducted	During planning for, prior to construction of, and after completing construction for drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
conducted by a qualified biologist. If present, special-status plant species will be flagged for avoidance. If avoidance is not possible, USFWS and/or CDFW will be consulted to determine the appropriate approach for minimizing impacts to special-status plant species and compensating for unavoidable impacts, and the project proponents will implement all necessary minimization and compensation measures.	and that if present, special-status plant species are flagged for avoidance by the qualified biologist. If avoidance is not possible, the SRSC implementing the project shall consult with USFWS and/or CDFW regarding the appropriate approach for minimizing impacts to special status plant species and compensating for unavoidable impacts. The SRSC implementing the project shall implement all necessary minimization and compensation measures as applicable or required for drought-resiliency projects undertaken as part of the Agreement.	
MM-BIO-3: Conduct Special Status Wildlife Species Surveys and Avoidance for Drought-Resiliency Projects. If the drought-resiliency project site survey indicates that the project site provides habitat for special-status wildlife, site-specific pre-construction surveys using USFWS and/or CDFW protocols will be conducted by a qualified biologist. If special-status wildlife species are actively using an area within the site, work shall not be permitted to occur within 100 feet until the animals have left on their own or, if necessary, are relocated in accordance with MM-BIO-5. Setback areas will be flagged. A qualified biologist shall be present during construction to monitor construction activities.	If a drought-resiliency project site contains suitable habitat for special status wildlife species, the SRSC implementing the project shall ensure that surveys by a qualified biologist are conducted. If wildlife is actively using the area, the SRSC shall verify the work area is flagged with setbacks until the animals have left on their own or are relocated in accordance with mitigation measure MM-BIO-5. Avoidance requirements in accordance with measure shall be incorporated into any applicable construction contracts initiated by an individual SRSC for a drought-resiliency project.	During planning for, prior to construction of, and during construction of drought-resiliency projects.
MM-BIO-4: Conduct Nesting Bird Species Surveys and Avoidance for Drought-Resiliency Projects. If the drought-resiliency project site survey indicates that the project site provides habitat for nesting birds that may be affected by construction and construction would occur between March 1 and September 15, pre-construction nesting bird surveys (two site visits at least one week apart) will be conducted by a qualified biologist within 14 days prior	If the drought-resiliency project site contains suitable habitat for nesting birds that may be affected by construction, the SRSC implementing the project shall ensure pre-construction nesting bird surveys are completed by a qualified biologist. If an active nest is found, the SRSC shall ensure an appropriate buffer zone is established	During planning for, within 14 days prior to commencement of construction activities for, and during construction of drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
to construction to detect the presence of nesting birds. If an active nest is found, then the qualified biologist will establish an appropriate buffer (minimum 100 feet for non-raptors and 250 feet for raptors) based on site-specific factors such as the topography, the type of work to be performed, natural visual and/or auditory barriers between the nest and proposed work area, and the species. If work must be performed within the established buffer zone, a qualified biologist should monitor the nest prior to work activities to determine baseline nesting behaviors. Work shall be permitted to occur within the buffer zone with a qualified biologist present to monitor the work for signs of disturbance, to adjust (increase) the buffer size as needed, and to exercise stop work authority if nest disturbance is observed. No further work may occur within the buffer zone until nesting birds have fledged from nests on their own. Setback areas will be flagged.	by a qualified biologist. If work must occur within the buffer zone, the SRSC shall ensure that a qualified biologist monitors the nest prior to construction, is present during all construction activities within the buffer zone, and flags all setback areas. Avoidance requirements in accordance with measure shall be incorporated into any applicable construction contracts initiated by an individual SRSC for a drought-resiliency project.	
MM-BIO-5: Implement General Biological Resources Protection Measures during Drought-Resiliency Project Construction. The construction contractor and operations personnel shall implement the following general biological resources protection measures during drought-resiliency project construction: • Limit construction and operations activities to daylight hours to the extent feasible. If nighttime activities are unavoidable, then workers shall direct all lights for nighttime lighting into the work area and shall minimize the lighting of natural habitat areas adjacent to the work area. Light glare shields shall be used to reduce the extent of illumination into sensitive habitats. If the work area is located near surface waters, the lighting shall be shielded such that it does not shine directly into the water. • Vegetation clearing will be limited to only those areas necessary for construction. • Any excavated and stockpiled soils will be placed outside of designated special status species habitat. • Dispose of cleared vegetation and soils at a location that will not create habitat for special status wildlife species.	The SRSC implementing a drought-resiliency project shall ensure that the general biological resources protection measures are implemented in constructing drought-resiliency projects. The general biological resources protection measures shall be incorporated into any applicable construction contracts initiated by an individual SRSC for a drought-resiliency project.	During planning for and prior to construction of drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
• Dispose of food-related and other garbage in wildlife-proof containers and remove the garbage from the project area daily during construction. Vehicles carrying trash will be required to have loads covered and secured to prevent trash and debris from falling onto roads and adjacent properties. • Store all construction-related vehicles and equipment in the designated staging areas. These areas shall not contain native or sensitive vegetation communities and shall not support sensitive plant or wildlife species. • Construction-related vehicles and equipment will not exceed a 20 mile-per-hour speed limit at the construction site, staging areas, or on unpaved roads. • The qualified biologist will provide the contractor with worker environmental awareness training. • Prior to the initiation of work each day, the contractor will inspect construction pipes, culverts, or similar features; construction equipment; or construction debris left overnight in areas that may be occupied by special-status species that could occupy such structures prior to being used for construction. • Avoid wildlife entrapment by completely covering or providing escape ramps for all excavated steep-walled holes or trenches more than 1 foot deep at the end of each construction work day. The qualified biologist shall inspect open trenches and holes and shall remove or release any trapped wildlife found in the trenches or holes prior to filling by the construction contractors. Capture and relocation of trapped or injured wildlife listed under ESA or CESA can only be performed by personnel with appropriate state and/or federal permits. Any sightings and any incidental take (mortality) shall be reported to CDFW via email within one working day of the discovery. Notification shall include the date, time, and location (U.S. Geological Survey (USGS) 7.5-minute quadrangle and/or similar map at a scale that will allow others to find the location in the field) of the incident or of the discovery of an individual special-status species that is dead or injured (type of		

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
injury shall be included). For each special-status species encountered, the biologist shall submit a completed CNDDB field survey form (or equivalent) to CDFW no more than 90 days after completing the last field visit to the project site.		
MM-BIO-6: Implement GGS Avoidance Measures for Drought-Resiliency Projects. If the need for a drought-resiliency project site survey is identified as part of MM-BIO-1, and the initial assessment indicates that that the project site provides habitat for GGS, avoidance measures must be implemented to avoid GGS during construction. Construction activities within GGS habitat will be restricted to between May 1 and October 1, to the extent feasible. If work must be conducted within GGS habitat between October 2 and April 30, two GGS pre-construction surveys will be conducted in any area within 200 feet of GGS aquatic habitat by a qualified biologist. The first survey will occur within 15 days prior to onset of construction and the second will occur within 24 hours prior to the onset of construction. The information collected from the first pre-construction survey will serve primarily to alert the biologist and construction crews of the general level of GGS activity at the site and borrow area, and the second survey will serve to minimize potential for take of GGS. If GGS is found in the project area, then to avoid direct impacts on GGS, the following measures will be implemented during construction of the drought-resiliency project: • Temporary fencing will be installed to exclude GGS from the work area. The design of the fence will be approved by the CDFW prior to installation. • Fence installation will be supervised by a qualified biologist. • The qualified biologist will provide the contractor with worker environmental awareness training, including instructing the contractor on how to inspect the exclusion fence. • Prior to the initiation of work each day, the contractor will inspect the exclusion fence to ensure it is functional for the intended purpose.	The SRSC implementing the project shall ensure that the GGS avoidance measures are implemented in constructing drought-resiliency projects. Avoidance requirements in accordance with this measure shall be incorporated into any applicable construction contracts initiated by an individual SRSC for a drought-resiliency project.	During planning for and prior to construction of drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
If GGS is observed within the temporary fencing around the construction site, the contractor will stop work and allow the species to leave the site of its own volition or the snake will be captured by a qualified biologist with appropriate collecting/handling permits and relocated to the nearest suitable habitat beyond the influence of the project work area. "Take" of a state or federal special status species is prohibited without appropriate permits from the USFWS and CDFW.		
MM-BIO-7: Obtain Incidental Take Authorization for Take of Listed Species from Drought-Resiliency Project Impacts. If species avoidance is not expected to be possible through implementation of MM-BIO-1, MM-BIO-3, MM-BIO-4, MM-BIO-5, or MM-BIO-6, USFWS and/or CDFW will be consulted to determine the appropriate approach for minimizing impacts to special-status wildlife species and compensating for potential incidental take. Impacts will be compensated for through purchase of mitigation credits at an approved conservation bank and/or on or offsite restoration and enhancement. Incidental take authorization will be obtained for take of listed species resulting from construction of a drought-resiliency project.	The SRSC implementing the project shall ensure that incidental take authorization is obtained if special status species avoidance is not possible for constructing drought-resiliency projects.	Prior to the commencement of construction activities for drought-resiliency projects.
MM-BIO-8: Compensate for Permanent Loss of Special Status Wildlife Species Habitat from Drought-Resiliency Projects. If it is determined through implementation of MM-BIO-1 and MM-BIO-3 that a drought-resiliency project site includes high-quality foraging or breeding habitat for special status wildlife species and there will be a permanent loss of such habitat resulting from construction, impacts will be compensated for through onsite and/or offsite restoration, enhancement, and/or purchase of mitigation credits at an approved conservation bank. Based on the findings of MM-BIO-3, the qualified biologist will prepare a plan that outlines proposed compensatory mitigation and coordinate with USFWS and CDFW. Compensatory lands will be of similar or better quality than habitat lost, preferably located in the vicinity of the drought-resiliency project site, and be permanently preserved through a conservation	The SRSC implementing the project shall ensure that compensatory mitigation is provided for permanent loss of special status species habitat from construction of drought-resiliency projects.	After implementation of mitigation measures MM-BIO-1 and MM-BIO-3 for drought-resiliency project sites that include high-quality foraging or breeding habitat for special status wildlife species and where there will be a permanent loss of such habitat resulting from construction.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
easement. The plan will identify conservation actions to ensure that the compensatory lands are managed to provide for the continued existence of the species. The plan will also identify an approach for funding assurance for the long-term management of the conserved land, as relevant.		
MM-BIO-9: Tree Replanting Requirements for Drought-Resiliency Projects. Avoid native tree removal where practicable through adjustments to the alignment of ditches, pipelines, or other construction features. If protected or heritage native tree removal is not avoidable, local county requirements for replacement would be prescribed at the ratio specified in their general plan. Replanting ratios vary between counties. For trees known to be used by nesting raptors, preservation efforts shall be pursued to the maximum extent possible. Nest tree losses in HCP covered areas could be subject to replacement at 15:1 such as in the Natomas Basin HCP.	The SRSC implementing the project shall ensure that trees are replanted in accordance with this measure to compensate for any tree removal required for construction or operation of drought-resiliency projects.	During drought-resiliency project planning and prior to any tree removal associated with a drought-resiliency project.
MM-BIO-10: Timing Requirements for Discing in Fallow Fields During Agreement Years. If discing occurs in idled croplands during an Agreement Year, the following will be adhered to: • Between February 15 and September 15, discing will occur when vegetation is on average 12 inches or less in height. • Between September 15 and February 15, discing may occur without vegetation height restriction.	During Agreement Years, all SRSC members idling croplands shall ensure that the timing requirements stated in this measure are complied with when discing croplands fallowed under the Agreement.	Prior to discing croplands idled as a result of the Agreement.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
MM-BIO-11: Maintain Minimum Water Depth in Irrigation and Drainage Canals in Key Areas During Agreement Years. Certain croplands abut or are immediately adjacent to areas with known important GGS populations that may be in or connected to areas with specific management plans for GGS either for mitigation or as wildlife refuges. Croplands abutting or immediately adjacent to the following areas are considered important GGS populations: • Butte Creek between Upper Butte Basin and Gray Lodge Wildlife areas • Colusa Basin drainage canal between Delevan and Colusa National Wildlife Refuges • Gilsizer Slough • Colusa Drainage Canal • Land side of the Toe Drain along the Sutter Bypass • Willow Slough and Willow Slough Bypass in Yolo County • Hunters and Logan Creeks between Sacramento and Delevan National Wildlife Refuges • Lands in the Natomas Basin To the extent practicable, irrigation and drainage canal water depths in areas that are considered important GGS populations will be similar to years when the Agreement is not in effect or, where information on baseline water depths is limited, at least 2 feet deep.	During Agreement Years and to the extent practicable, all SRSC members idling croplands shall ensure that any croplands abutting or immediately adjacent to the areas specified in this measure maintain irrigation and drainage canal water depths of at least 2 feet deep.	Prior to cropland idling during Agreement Years.
MM-BIO-12: Conduct Aquatic Resources Surveys and Avoidance for Drought-Resiliency Projects If the drought-resiliency project site survey identified in MM-BIO-1 indicates that the project site contains potentially jurisdictional aquatic resources, including wetlands, other waters, and riparian habitat, that may be affected by construction, an aquatic resources delineation to identify and delineate wetlands and other waters shall be conducted. Wetlands and waters identified on site will be flagged as environmentally sensitive areas and avoided to the extent practicable. Permanent impacts to jurisdictional aquatic resources will be mitigated per MM-BIO-13.	The SRSC implementing the project shall ensure that aquatic resources surveys and avoidance measures are implemented for drought-resiliency projects.	During planning for and prior to construction of drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
MM-BIO-13: Obtain Required Permits and Implement Wetland Mitigation for Drought-Resiliency Projects. If impacts to wetlands and waters cannot be avoided, then required permits, potentially including permits from the USACE, RWQCB, and CDFW would be obtained and complied with per MM-BIO-13. Mitigation for project-related permanent impacts to jurisdictional wetlands or other waters will be provided at a minimum 1:1 ratio through onsite and/or offsite restoration, enhancement, and/or purchase of mitigation credits at an approved bank.	The SRSC implementing the project shall ensure that required USACE, RWQCB, and CDFW permits are obtained and that mitigation for permanent impacts to waters and wetlands is provided at a minimum 1:1 ratio for drought-resiliency projects. This measure shall be incorporated into any applicable construction contracts initiated by any SRSC for a proposed drought-resiliency project.	Prior to construction of, during construction of, and after construction of drought-resiliency projects.
MM-HYD-1: Implement Erosion and Spill Control Measures for Drought-Resiliency Projects. To ensure that contaminants are not accidentally introduced into irrigation ditches and canals, the following measures will be implemented during construction of drought-resiliency projects: • Use of BMPs (e.g., filter fabric or sandbags) to prevent pollutants from entering drainage channels • Equipment be inspected daily for leaks or spills • Materials for cleanup of spills be available on site • Flammable materials be stored in appropriate containers • Spill prevention kits be in close proximity when using hazardous materials • Spills and leaks be cleaned up immediately and disposed of in accordance with local, state, and federal regulations • Vehicles and equipment be kept clean • Construction personnel to be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills For drought-resiliency projects involving over an acre of land disturbance, a NPDES Construction Stormwater General Permit will be obtained and a construction Stormwater Pollution Prevention Plan (SWPPP) will be prepared.	This measure and all listed BMPs shall be incorporated into any applicable construction contracts initiated by a SRSC member for any drought-resiliency project and enforced by the SRSC. Implementation of the measures and listed BMPs shall be documented by the SRSC implementing the project.	Prior to commencement of and during construction of drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
MM-HYD-2: Install and Operate Groundwater Wells in Accordance with Groundwater Sustainability Plans (GSPs) and the SGMA for all Groundwater Pumping Activities undertaken under the Agreement. The installation of any new groundwater wells and the operation of existing and new groundwater wells will be in accordance with targets and requirements set by applicable GSPs managed by Groundwater Sustainability Agencies in the project area, as well as the requirements set forth by SGMA, including the submittal of annual reports regardless of determination status following adoption of a GSP or alternative.	The implementing SRSC shall ensure that any installation and operation of new wells, and operation of existing wells, is in accordance with GSPs and SGMA.	During planning for any new groundwater wells; ongoing for continued compliance for existing groundwater wells.
MM-CUL-1: Conduct CHRIS Review and Desktop Evaluation for Drought-Resiliency Projects. Prior to the start of any drought-resiliency project, a qualified historian/archaeologist will request information regarding cultural resources already recorded in CHRIS to determine whether a drought-resiliency project may be located in an area where cultural resources are recorded. If through this review, a cultural resource is identified within resiliency project area or the historian/archaeologist determines through desktop review that the specific project area has potential to contain cultural resources, then implementation of MM-CUL-2 will be required.	The SRSC implementing the project shall verify that a CHRIS review and desktop evaluation has been completed for the drought-resiliency projects by a qualified historian/archaeologist. If a cultural resource is identified or it is determined that the project area has the potential to contain cultural resources, the SRSC shall ensure implementation of mitigation measure MM-CUL-2.	During planning for and prior to the construction of any drought-resiliency project.
MM-CUL-2: Conduct Pre-Construction Surveys and Establish Buffers for Drought-Resiliency Projects. If determined required by the qualified historian/archaeologist in MM-CUL-1, a site-specific pre-construction field survey will be conducted by a qualified historian/archeologist prior to the start of construction activities. The pre-construction survey will be designed to identify historic structures, archaeological sites, and potential Tribal cultural resources that may be present at the specific location of the drought-resiliency project that is to be implemented. Reports would be made available to the Office of Historic Preservation (OHP) and Native American Tribes that have requested consultation (if any), and these entities would be afforded an opportunity to comment prior to the start of construction. Any historical or archaeological	If a qualified historian/archeologist determines that a site-specific pre-construction survey is required prior to the start of construction of a drought-resiliency project, the implementing SRSC shall ensure that a site-specific pre-construction survey is conducted. Reports on historic structures, archeological sites, and potential Tribal cultural resources that may be present a specific drought-resiliency project site shall be made available to OHP and Native American Tribes that have requested consultation and any resource shall be recorded and flagged with a 30-foot buffer (or appropriate).	Prior to the start of construction for drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
resources identified during the survey would be recorded and flagged with a 30-foot buffer (or based on topography and access points to protect the find, as determined appropriate by the qualified historian/archeologist).	This measure shall be written in applicable contracts for drought-resiliency projects.	
MM-CUL-3: Develop and Implement Applicable Monitoring and Mitigation for Drought-Resiliency Project Impacts. If the pre-construction survey conducted in MM-CUL-2 identifies any historic or archaeological resources and a Tribe(s) has requested consultation, then that Tribe(s) will be notified. If historic structures, archaeological sites, and potential Tribal cultural resources are identified and flagged, but impacts cannot be avoided or adequately minimized, then OHP and Tribes that have requested consultation (if any) will be provided a project-specific monitoring and mitigation plan. Impacts will be mitigated through implementation of this plan, with mitigation expected to include but not be limited to monitoring, resource investigation, documentation, recovery, or preservation as well as interpretive measures.	If historic or archaeological resources are identified in a project area and a Tribe(s) has requested consultation, the SRSC implementing the project shall confirm that requesting Tribe(s) are properly notified; that resources are identified and flagged and impacts are minimized and avoided; or, if needed, a project-specific monitoring and mitigation plan is developed and shared with requesting Tribe(s). This measure shall be written in applicable contracts for drought-resiliency projects.	Prior to the start of construction for drought-resiliency projects.
MM-CUL-4: Develop Inadvertent Discovery Plan (IDP) to be Implemented if Prehistoric or Historical Archaeological Resources Are Encountered during Drought-Resiliency Project Construction. A qualified archaeologist will develop an IDP for the proposed project to be provided to onsite personnel involved in drought-resiliency projects that involve excavation below depths routinely disced or disturbed through routine agricultural operations. The IDP will include steps to be taken in the event that cultural resources, any artifact, or an unusual amount of bone, shell, or non-native stone are identified during construction. Work will immediately stop and activities will be relocated to another area beyond 10 meters (30 feet) of the discovery. In the case of potential human remains, the find must be reported to local law enforcement. The IDP will specify steps to notify and consult with the OHP and Tribes. If the resources are found to be significant, they would be avoided or if avoidance is not possible, mitigated in accordance with MM-CUL-3.	For drought-resiliency projects that involve excavation below depths routinely disced or disturbed, the SRSC implementing the project shall ensure an IDP is prepared by a qualified archaeologist and that it is implemented if prehistoric or historical archaeological resources are encountered during construction. Plans for all drought-resiliency projects that involve excavation shall include the IDP to be provided to onsite personnel, this measure shall be written in applicable contracts.	Prior to the start of construction for drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
MM-GEO-1: Needed Implementation of Geotechnical Recommendations for Drought-Resiliency Projects. Recommendations from geotechnical assessments or reports for specific project elements would be implemented as needed, including use of materials and construction techniques specifically addressing potential seismic and geologic hazards.	The SRSC implementing the project shall ensure that geotechnical assessments or reports are consulted or prepared to verify the need for specific project elements, if any, to ensure seismic and geological hazards requirements are included in the final drought-resiliency project design.	During planning for drought-resiliency projects.
MM-GEO-2: Unstable Area Buffer for Drought-Resiliency Projects. Within a 50-foot-wide buffer around unstable areas regardless of percent slope, no drought-resiliency project construction would occur without approval from an earth sciences/physical sciences professional.	The SRSC implementing the project shall engage an earth sciences/physical sciences professional to determine the need for and, if needed, establish a 50-foot buffer around any unstable areas regardless of percent slope. If needed, the implementing SRSC shall ensure this requirement is included in final drought-resiliency project plans.	Prior to construction of any drought-resiliency project that includes unstable areas as determined by an earth sciences/physical sciences professional.
MM-GEO-3: Adhere to Applicable Seismic Design Parameters for Drought-Resiliency Projects. Drought-resiliency projects would adhere to all applicable seismic design parameters.	The SRSC implementing the project shall ensure that a drought-resiliency project is compliant with all applicable seismic design parameters and that these parameters are included in final drought-resiliency project plans.	During planning for any drought-resiliency project.
MM-HAZ-1: Soil Testing in Accordance with Disposal Site Requirements. To address potential impacts to people and the environment from management of potentially contaminated soils, any excavated soils that would not be reused on site would be tested in accordance with disposal site requirements.	For drought-resiliency projects that will not reuse excavated soils on site, the SRSC implementing the project shall require that applicable construction contracts and plans include a requirement to test excavated spoils in accordance with disposal site requirements.	During planning for any drought-resiliency project.
MM-HAZ-2: Spill Kits. All heavy construction equipment vehicles would maintain spill kits with oil-absorbent material and tarps to contain minor releases.	For drought-resiliency projects that involve use of heavy construction equipment vehicles, the SRSC implementing the project shall require that plans and contracts include a requirement to maintain spill kits with oil-absorbent material and tarps at all times to contain minor releases.	During planning for any drought-resiliency project.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
MM-HAZ-3: Site Drought-Resiliency Projects Away from Active Cleanup Sites. Drought-resiliency projects will be sited away from active cleanup sites.	The SRSC implementing the project shall ensure that a drought-resiliency project is sited away from active cleanup sites.	During planning for any drought-resiliency project.
MM-MIN-1: Avoid Siting Drought-Resiliency Projects in Mineral Resource Zones. Site drought-resiliency projects away from areas mapped as MRZ to the extent practicable.	The SRSC implementing the project shall ensure that a drought-resiliency project is not sited in areas mapped as MRZ to the extent practicable.	During planning for any drought-resiliency project.
MM-NOI-1: Notification Requirements to Off-site Noise-sensitive Receptors for Drought-Resiliency Projects. Written notification of project activities would be provided to all off-site noise-sensitive receptors (e.g., residential land uses) located within 500 feet of drought-resiliency project locations. Notification would include anticipated dates and hours during which activities are anticipated to occur and contact information of the project representative, including a daytime telephone number.	The SRSC implementing the project shall ensure written notification of drought-resiliency project activities is provided to all off-site noise-sensitive receptors located within 500 feet of a drought-resiliency project site.	Prior to commencement of drought-resiliency project construction activities.
MM-NOI-2: Power Equipment Use and Maintenance Requirements for Drought-Resiliency Projects. All powered heavy equipment and power tools will be used and maintained according to manufacturer specifications. All diesel- and gasoline-powered equipment will be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations.	Plans for all drought-resiliency projects shall include this requirement in all construction contracts that include the use of power equipment and power tools.	During planning for drought-resiliency projects and during drought-resiliency project construction activities.
MM-NOI-3: Heavy Equipment Must Operate at Least 25 Feet from Neighboring Structures for Drought-Resiliency Projects. Drought-resiliency projects involving the use of heavy equipment (such as a large bulldozer) will be sited to occur at least 25 feet from neighboring historical buildings and structures that are extremely susceptible to vibration damage.	If a project is sited near historic buildings or structures that are extremely susceptible to vibration damage, and the drought-resiliency project would use heavy equipment, the implementing SRSC shall review final project plans to ensure that the project is not sited within 25 feet of those historic buildings or structures.	During planning for drought-resiliency projects.

Mitigation Measures		
Measure	**Responsible Party and Implementation**	**Timing and Monitoring**
MM-UTI-1: Notify Utility Companies of Drought-Resiliency Projects. Prior to construction of the drought-resiliency projects, utility companies will be contacted to determine whether the potential for utility line crossing or conflict exists. Notice of construction of the drought-resiliency projects will be provided to utility providers to request additional information on the location, if any, of private cables or utilities.	The SRSC implementing the project shall notify all relevant utility companies in the vicinity of project activities to determine possible construction conflicts. The implementing SRSC shall verify this measure is included in final drought-resiliency project plans.	Prior to construction of a drought-resiliency project.
MM-UTI-2: Conduct Utility Surveys and Coordinate with Utility Companies for Drought-Resiliency Projects if Needed. During the design phase for each of the drought-resiliency projects and if coordination with utility companies reveals the potential for utility lines to be in the project area, site specific utilities surveys will be completed to locate, understand, and avoid conflicts with existing utilities. In addition, all overhead and buried utility lines will be demarcated and avoided unless modifications are required. Modifications will be coordinated with the utility company.	The SRSC implementing the project shall conduct utility surveys to locate, understand, and avoid conflicts with existing utilities and coordinate with utility companies for modifications, as necessary. This measure shall be incorporated into any applicable design and engineering contracts for all proposed drought-resiliency projects undertaken under the Agreement.	During planning for drought-resiliency projects.

DPP and HR - Natomas Info

USBR DPP Funds	13,668,516
HR Funding	
Upfront	4,284,000
Water	4,488,686
Total	22,441,202

Supply	**Reductions (AF)**		
Total (AF)	25%	DPP	HR
120,200	30,050	29,933	5,757

DPP - AF produced and Acres Fallowed					
Wells (AF)	Fallow (AF)	Total (AF)		Fallowed Acres	% Rice
15,000	15,000	30,000		3,750	22.7%

HR - AF produced and Acres Fallowed		
AF	Acres	% Rice
5,757	1,439	8.7%

DPP/LTO Funding Program

USBR DPP Funds	13,668,516
HR Funding	
Upfront	4,284,000
Water Payments	4,488,686
Total	22,441,202

	Qty	Price	Total		Benefit
Tax					Potential tax, Hold for 3 years
DPP			4,100,555		
HR			2,631,806		
Solar/Office			1,600,000		Stabilize power costs, Long term stability, Safety
Well Program					
Program Development			200,000		Creates support for our periodic groundwater usage
Well Construction	5	500,000	2,500,000		Produces water during shortages
GIS			200,000		Modernize land ownership records and organization
Flume Lining			2,200,000		Reliability, water savings
Pipeline					
Elkhorn			4,000,000		Reliability, water savings, labor savings
Lat 13			500,000		Reliability, water savings, labor savings
Drought					
Rate Reduction	3	1,000,000	3,000,000		Funding to help during drought years
Water Purchases	3	500,000	1,500,000		Purchase or pump well water during VA years
Total			22,432,361		

Appendix E - Water Shortage Contingency Plan, Sacramento County Water Agency

Sacramento County Water Agency Water Shortage Contingency Plan (ver 4-19-21)

Water Shortage Contingency Plan Overview

This Water Shortage Contingency Plan (WSCP) addresses the requirements in Water Code Section 10632 of the Urban Water Management Planning Act (The Act). The WSCP is incorporated into the 2020 Urban Water Management Plan (UWMP) and used by Sacramento County Water Agency (SCWA) to respond to water shortages as they may arise. This WSCP consists of the following required elements:

1. An analysis of water supply reliability
2. Procedures for conducting an annual water supply and demand assessment
3. Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage, including Triggers and Actions aligned with defined shortage levels.
4. Supply Augmentation Actions
5. Water Supply Operational Changes, Water Use Evaluation, Catastrophic Events, Local Hazard Mitigation Plan, and Oher Shortage Response Actions
6. Communication protocols and procedures
7. Compliance and Enforcement Procedures
8. Legal Authorities
9. Financial consequences of the WSCP
10. Monitoring and reporting requirements
11. Reevaluation and improvement procedures
12. Special Water Feature Distinction
13. Plan Adoption, Submittal, and Availability

This WSCP is included as an Appendix in the UWMP as a standalone plan that may be amended or refined and readopted as needed over coming months and years independently from the UWMP.

1. Water Supply Reliability Analysis

See Section 5 of the UWMP.

2. Annual Water Supply and Demand Assessment Procedures

SCWA's procedural methodology for managing shortages is developing its Annual Water Supply and Demand Assessment (WSDA). The WSDA will include an annual analysis of anticipated water reliability for the current year and one additional dry year. The WSDA is to be submitted to DWR by July 1 each year with the first WSDA due July 1, 2022.

The WSDA will be prepared at the beginning of each calendar year to evaluate near-term water supply reliability and determine what, if any, water shortages stages may be triggered during the required period. The WSDA will be used by SCWA decision-makers to prepare for and initiate implementation of any needed response actions, as well as to inform customers, the general public, interested parties, and local, regional, and state governments entities to prepare for such required actions, if necessary.

Analytical and Decision-making Processes

SCWA plans to conduct its WSDA according to the following timeline and process:

By February 1	Initial data collection and analysis
By March 1	Preliminary Draft WSDA subject to internal review and revisions
By April 1	Draft WSDA and results briefing for SCWA decision-makers
By May 1	Approval of WSDA SCWA Decision-makers
By June 1	Public Release of WSDA and Public Notifications
By June 15	Submit WSDA to DWR in advance of July 1 deadline

SCWA will submit its WSDA to DWR no later than July 1 each year.

3. Six Standard Water Shortage Stages, Triggers, Actions and Watering Schedule

Water Shortage Stages			
Stage	**Recommended Conservation (Water Use Reduction)**	**Suggested Actions**	**Water Savings Estimate Range**
1	Up to 10%	Fix leaks or faulty sprinklers in a timely manner.	0-1%
		Decorative water features (water fountains, etc.) must recirculate water and shall be leak proof.	0-1%
		Landscape watering shall be confined to a user's property and shall not runoff onto adjacent properties, roadsides or gutters.	0-5%
		No landscape watering shall occur while it is raining or snowing.	0-5%
		Use a shutoff nozzle on hoses.	0-1%
		Washing down impervious surfaces such as driveways and sidewalks is prohibited unless for public health and safety purposes.	0-1%
		Unauthorized use of hydrants is prohibited. Authorization for use must be obtained from water supplier.	0-1%
		Encourage customers to wash only full loads when washing dishes or clothes.	0-1%
		Encourage customers to use pool covers to minimize evaporation.	0-1%
		Encourage restaurants to only serve water to customers on request.	
		Irrigation is allowed based on the Stage 1 watering schedule. Plant containers, trees, shrubs, and vegetable gardens may be watered additional days using only drip irrigation or hand watering.	5-10%
2	Up to 20%	Fix leaks or faulty sprinklers in a timely manner.	0-1%
		Request restaurants to only serve water to customers on request.	0-1%
		No restrictions on landscape watering with non-potable water.	Not applicable
		Irrigation is allowed based on the Stage 2 watering schedule using potable water. Plant containers, trees, shrubs, and vegetable gardens may be watered additional days using only drip irrigation or hand watering.	5-10%
3	Up to 30%	Fix leaks or faulty sprinklers in a timely manner.	0-1%
		Decorative water features that use potable water must be drained and kept dry.	0-1%
		Car washing is only permitted using a commercial carwash that recirculates water or by high pressure/low volume wash systems.	0-1%
		Warm/Dry Season	
		Irrigation is allowed on the Stage 3 watering schedule using potable water.	5-20%
		Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering.	Not applicable
		Cool/Wet Season	
		Turf shall not be watered unless utilizing non-potable water during extended dry spells.	1-5%
		Plant containers, trees, shrubs and vegetable gardens shall be watered only by drip irrigation or hand watering.	0-1%
4	Up to 40%	Fix leaks or faulty sprinklers in a timely manner.	0-1%
		Existing pools shall not be emptied and refilled using potable water unless required for public health and safety purposes.	0-1%
		Warm/Dry Season	
		Irrigation is allowed on the Stage 4 watering schedule using potable water.	10-30%
		Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering.	Not applicable
		Cool/Wet Season	
		Turf shall not be watered unless utilizing non-potable water during extended dry spells.	1-5%
		Plant containers, trees, shrubs and vegetable gardens shall be watered only by drip irrigation or hand watering.	0-1%
5	Up to 50%	Water use for public health and safety purposes only.	
6	Greater than 50%	Water use for public health and safety purposes only. Customer rationing may be implemented.	

Stage 1 and Stage 2 Watering Schedule:

The following watering schedule is in effect within areas served by SCWA. Failure thereto constitutes 'water waste', and is an unauthorized use of SCWA water pursuant to Water Agency Code Sections 3.40.120 and 3.40.130.

- **Residential and Commercial Irrigation Schedule** - Irrigation is permitted based on the last digit of customer addresses, in accordance with the schedule below:

Stage 1 and Stage 2 - Irrigation Schedule

Addresses Ending In	Watering Days	Time of Day
Even Number (0, 2, 4, 6, 8)	Wednesday, Friday, Sunday	Between 8 p.m. and 8 a.m.
Odd Number (1, 3, 5, 7, 9)	Tuesday, Thursday, Saturday	

Stage 3 Water Schedule:

The following regulations are in effect during Stage 2, and are in addition to, or supersede where conflicting, Irrigation is permitted **2 days per week** based on the last digit of customer addresses, in accordance with the below schedule:
STAGE 3 - Irrigation Schedule include those in effect during the Stages 1-2:

Irrigation Restrictions

Addresses Ending In	Watering Days	Time of Day
Even Number (0, 2, 4, 6, 8)	Wednesday, Sunday	Between 8 p.m. and 8 a.m.
Odd Number (1, 3, 5, 7, 9)	Tuesday, Saturday	

Stage 4 Irrigation Schedule:

During Stage 4 conditions the following regulations go into effect during Stage 4, which are either in addition to, or supersede, those in effect during Stages 1-3.

- **Irrigation Restrictions** - Irrigation is permitted **1 day per week** based on the last digit of customer addresses, in accordance with the below schedule:

Addresses Ending In	Watering Days	Time of Day
Even Number (0, 2, 4, 6, 8)	Sunday	Between 8 p.m. and 8 a.m.
Odd Number (1, 3, 5, 7, 9)	Saturday	

Stage 5 and Stage 6 Irrigation Schedule:

During Stage 5 and Stage 6 conditions a Water Emergency will be issued by the Agency to its customers. The following regulations go into effect during Stage 5 and Stage 6, which are either in addition to, or supersede where conflicting, those in effect during the Stages 1-4:

- **Irrigation Restrictions** -All residential and commercial outdoor irrigation is **prohibited**.

4. Supply Augmentation Actions

The following water supply augmentation action may be used as response actions for the appropriate Water Shortage Stage. SCWA has access to 8,900 acre-ft per year from a remediated water sources that is not subject to Term 91. This water source is available when other water supply contracts are subject to cutbacks.

5. Operational Changes

The following water system operational changes may be used for appropriate Water Shortage Stages.

Landscape Irrigation

Landscape irrigation reductions focus on less watering and reducing or avoiding water waste during irrigation. Landscape irrigation reductions may vary by user class or customer type depending on water shortage conditions and ability to meet overall water use reduction targets. Water allocation or budget concepts may be applied by SCWA to equitably reduce landscape water use while minimizing customer impact.

Commercial, Industrial, and Institutional (CII)

The CII category of customers is diversified and may require a tailored approach for meeting specified water use reduction targets. This could include focusing on large landscape irrigation, or other means to meet CII water use reduction targets. The ability of CII customers to conserve water during a water shortage condition would be considered depending on which stage has been triggered and how much water use has already been reduced during previous stages. SCWA would work collaboratively with CII customers so water use cutbacks will not impact business operations and solvency.

Emergency Response Plan for Catastrophic Water Shortages

This section identifies actions to be undertaken by SCWA to prepare for, and implement during, a catastrophic interruption of water supplies. A catastrophic interruption could result from any event (either natural or man-made) that causes a water shortage severe enough to trigger a Stage 4-6 water supply shortage condition.

In order to prepare for catastrophic events, SCWA has prepared an Emergency Response Plan (ERP) in accordance with other state and federal regulations. The purpose of the ERP is to design actions necessary to minimize the impacts of supply interruptions due to catastrophic events.

The ERP coordinates overall company response to a disaster in any and all of its districts. In addition, the ERP requires each district to have a local disaster plan that coordinates emergency responses with other agencies in the area. The ERP also provides details on actions to be undertaken during specific catastrophic events. The following is a summary of actions cross-referenced against specific catastrophes for three of the most common possible catastrophic events: regional power outage (such as Public Safety Power Shutoff or “PSPS” events), natural disasters (such as earthquake, flood or storm damage, or fire), and malevolent acts.

Summary of Actions for Catastrophic Events	
Possible Catastrophe	**Summary of Actions**
Regional Power Outage	• Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water. • Establish water distribution points and ration water if necessary. • If water service is restricted, attempt to provide potable water tankers or bottled water to the area. • Make arrangements to conduct bacteriological tests, in order to determine possible contamination. • Utilize backup power supply to operate pumps in conjunction with elevated storage.
Natural Disaster	• Assess the condition of the water supply system. • Complete the damage assessment checklist for reservoirs, water treatment plants, wells and boosters, system transmission and distribution. • Coordinate with Cal EMA utilities group or fire district to identify immediate firefighting needs. • Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water. • Prepare report of findings, report assessed damages, advise as to materials of immediate need and identify priorities including hospitals, schools and other emergency operation centers. • Take actions to preserve storage. • Determine any health hazard of the water supply and issue any “Boil Water Order” or “Unsafe Water Alert” notification to the customers. • Cancel the order or alert information after completing comprehensive water quality testing. • Make arrangements to conduct bacteriological tests, in order to determine possible contamination.
Malevolent acts	• Assess threat or actual intentional contamination of the water system. • Notify local law enforcement to investigate the validity of the threat. • Get notification from public health officials if potential water contamination • Determine any health hazard of the water supply and issue any “Boil Water Order” or “Unsafe Water Alert” notification to the customers, if necessary. • Assess any structural damage from an intentional act. • Isolate areas that will take the longest to repair and or present a public health threat. Arrange to provide emergency water.

In addition to specific actions to be undertaken during a catastrophic event, SCWA performs maintenance activities, such as annual inspections for earthquake safety, and budgets for emergency items, such as auxiliary generators, to prepare for potential events.

Seismic Risk Assessment and Mitigation Plan

SCWA intends to submit a copy of the Sacramento County Local Hazardous Mitigation Plan.

Other Shortage Response Actions

Other shortage response actions may be considered by SCWA as required to meet specific water shortage conditions. Before these actions can be implemented, an amendment to this WSCP may be required.

6. Communication Protocols

SCWA will communicate when the WSCP is implemented and inform SCWA's customers. The intent of the communication protocol is to inform SCWA's customers and wholesale customers of the voluntary and mandatory water conservation activities.

SCWA will seek to engage customers and provide notice on the voluntary or mandatory water conservation actions. These locally-relevant actions may include:

- Publishing information on SCWA's website.
- Providing bill inserts and direct mailings above and beyond those legally required.
- Developing materials for non-English speaking customers.
- Preparing social media posts to communicate SCWA actions.
- Advertising actions on other media.

Taken together, all of these communication actions will result in an effectively implemented SCWA's WSCP.

7. Compliance and Enforcement Procedures

See attached Sacramento County Water Agency Code, Title 1, Chapter 1.25, and Enforcement. The SCWA Code is located at the following web page: https://countycounsel.saccounty.net/Pages/WaterAgencyCode.aspx.

8. Legal Authorities

SCWA is empowered to implement and enforce its shortage response actions specified in this section through its enabling legislation, see attached Sacramento

County Water Agency Code, Title 1, Chapter 1.30.020, Agency Act. https://countycounsel.saccounty.net/Documents/Title1_1.pdf.

9. Financial Consequences of WSCP

Implementation of this WSCP will likely have financial impacts to SCWA. Specifically, SCWA has established water rates that support its capital projects as well as its operation and maintenance activities. The rates are tied to SCWA's customers' normal water consumption activities that may be reduced through voluntary or mandatory water conservation activities. In this way, there may be revenue reductions to SCWA. In addition to the revenue reductions, SCWA may also see an increase in expenses resulting from augmented communication actions, increased enforcement activities, and overall water shortage management actions. This section addresses aspects of revenue reduction, expense increases, and additional costs that may arise during implementation of this WSCP.

Revenue and Expenditure Impacts

There may be a revenue impact during a shortage condition as customers are required to utilize less water. Under this case, SCWA may need to reprioritize spending priorities, develop reserves to compensate for decreased revenue, consider rate increases, or a drought surcharge during the water shortage.

10. Monitoring and Reporting

SCWA is committed to monitoring and reporting updates in implementing the WSCP. In order to determine the effectiveness of water management actions, SCWA will aggregate metered data and assess SCWA monitoring actions. Moreover, SCWA will update its customers in its communication protocols.

SCWA's monitoring and reporting actions may include the following, as locally necessary:

- Gathering customer water use data
- Assessments of customer water use
- Review trends in water supply availability
- Assess water conservation activities and enforcement actions, as applicable to achieving conservation objectives.
- Preparing written reports and presentations, as necessary, for SCWA management

11. Re-evaluation and Improvement Procedures

SCWA will review and assess its procedures for implementing the WSCP. Improvement procedures will include developing reports, memoranda, and presentations that assess the effectiveness of water conservation actions and the WSCP.

12. Special Water Feature Distinction

For purposes of water shortage contingency planning and implementation within the Laguna-Vineyard, Sunrise-Mather, and County Creek Estates, SCWA defines as "special water features" those that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains. Such special water features are considered distinct from swimming pools and spas (as defined in subdivision (a) of Section 115921 of the Health and Safety Code).

Water shortage response actions would focus on health and safety issues and tempering these uses based on the severity of the water shortage condition. The relative total water use from these sources would be a consideration for how special water features and swimming pool uses could be curtailed during specific water shortage conditions. Generally swimming pool filling and refilling would be impacted in the later stages of a water shortage condition. SCWA has determined that special water features are a relatively small discretionary use but would be restricted during a Stage 3 or higher water shortage condition.

13. Plan Adoption, Submittal, and Availability

The WSCP has been adopted, submitted, and is available as required by the Urban Water Management Planning Act. As a stand-alone document, the WSCP is also subject to the following separate adoption, submittal, and availability processes, and whenever it is separately amended or revised in the future. SCWA may refine each service area's WSCP through SCWA's governing procedures in altering each service area's WSCP. SCWA has followed all applicable law in adopting the WSCPs. The current adopted WSCP for the Zone 40 System shall be available to its customers at www.SCWA.net. Alternately, a copy of the WSCP can be obtained by calling (916) 874-4517.

Appendix F - NCMWC Letter of Interest to provide wholesale water to SCWA for UWSP Area

Natomas Central Mutual Water Company

2601 W. Elkhorn Blvd.
Rio Linda, CA 95673
916 419 5936

September 24, 2025

County of Sacramento
Planning and Environmental Review
Attn: Ms. Emma Patten
827 7th Street, Room 225
Sacramento, CA 95814

Dear Ms. Patten:

The purpose of this letter is to articulate Natomas Central Mutual Water Company's (NCMWC) interest to provide wholesale raw water to the Sacramento County Water Agency for the purposes of supplying surface water to the Upper Westside (UWS) project. We have been working closely with the Applicant in identifying adequate surface water supplies to serve the project. At the request of the County's comments to the Applicant we are providing additional information as it relates to curtailment of our water rights and the prioritizing of municipal and industrial (M&I) water usage.

We understand that UWS is proposing to utilize 100% surface water. As a result, it is important that we provide M&I water on a year-round basis, including in critical drought years. It is anticipated that our water shortage program will prioritize surface water for M&I use during drought and critical drought years. NCMWC anticipates making available surface water for priority needs at current market prices. Therefore, surface water can be prioritized for this project.

NCMWC will apply to amend our existing United States Bureau of Reclamation (USBR) contract and State Water Quality Control Board permits to allow for M&I water usage. Our USBR contract already contemplates future M&I water usage. Our current USBR contract allows for curtailment of 25% in critical drought years. If further curtailments were to occur NCMWC would prioritize this project. These USBR contract deliveries could also be reallocated to winter months to ensure adequate water delivery to NCMWC during winter months. We expect the process to amend our permits and contract to take approximately two years to complete.

Should you have any further questions we would be happy to discuss further with you our willingness to be a provider of M&I surface water to UWS.

Sincerely,

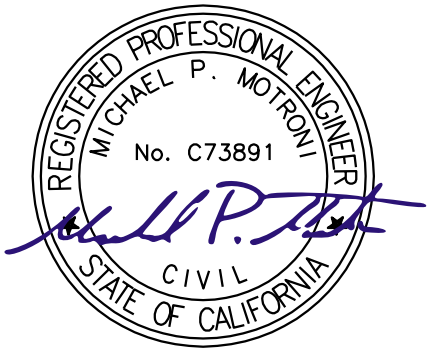
Brett Gray
General Manager

Cc: Nick Avdis, Avdis & Cucchi
Dan Cucchi, Avdis & Cucchi
Mike Motroni, Wood Rodgers

Appendix G - Upper West Side Specific Plan Water Supply Master Plan

Upper Westside Specific Plan
Water Master Plan

September 26, 2023



WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C Street, Bldg 100-B
Sacramento, CA 95816
Tel: 916.341.7760
Fax: 916.341.7767

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1.0 BACKGROUND

The Upper Westside Specific Plan (Upper Westside, UWS, Plan Area) encompasses 2,066 acres in Natomas, situated between the Sacramento River and I-5, and immediately north of I-80. UWS is a master planned community that features a dynamic town center, a canal amenity, schools, a 10-acre Urban Farm, and a connected greenbelt system. Land use designations range from very low to very high residential, commercial mixed use, greenspace and agricultural areas. Land use designations are shown in **Exhibit 1**.

Domestic water for UWS can be supplied by either the Natomas Mutual Water Company (NMWC), via the Sacramento River, or from the City of Sacramento (City) as part of the American River Place of Use (POU). The City's authorized POU includes all land within the City limits, as well as defined areas adjacent to the City for other water purveyors, including the UWS Plan Area. This is shown in **Exhibit 5**. Water supplied from NMWC would require an on-site treatment plant to convert raw water to domestic water. Water supplied from the City would already be treated, and the City has existing infrastructure within the UWS area. The City operates an existing 24-inch transmission main in El Centro Road and San Juan Road, north and east of their intersection, and a 3-million gallon (MG) tank on San Juan Road, which is used for fire flow, operational uses (peaking), and for emergencies. These facilities are shown in **Exhibit 1**.

It is expected that either the Sacramento County Water Agency (SCWA) or the City's Department of Utilities (DOU) will be the water retailer for UWS. As a result the design criteria for each agency was analyzed, and the most conservative factors were utilized to develop the plan.

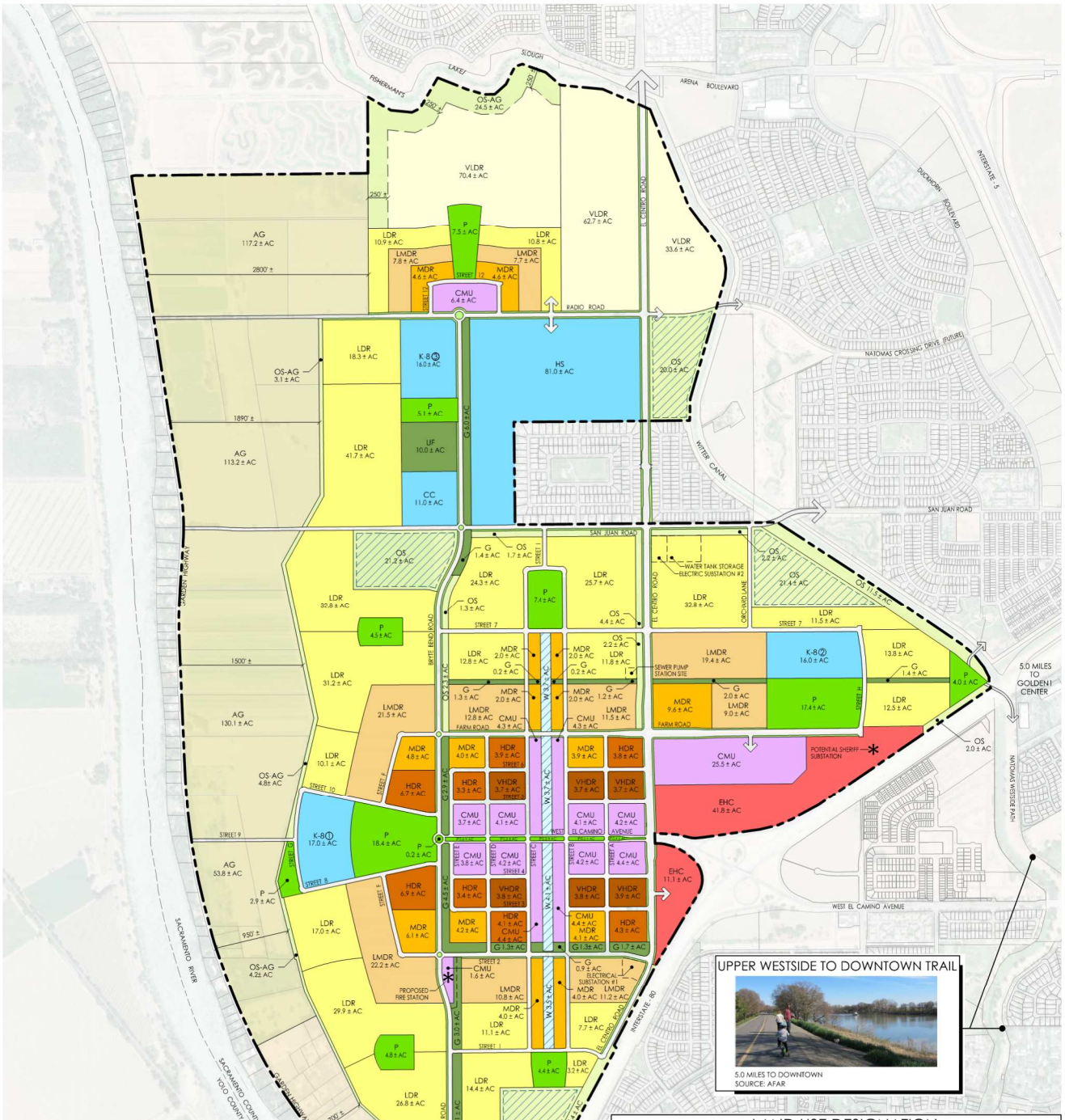
The purpose of this Water Master Plan is to analyze and identify the water distribution sizing requirements to serve UWS. A hydraulic model was built and evaluated to determine the size and layout of the distribution system required to meet the proposed water demands under the established system criteria. The criteria, water demand estimate, and water system improvement analysis are described in **Sections 2.0, 3.0,** and **4.0**. Additional discussion includes the following:

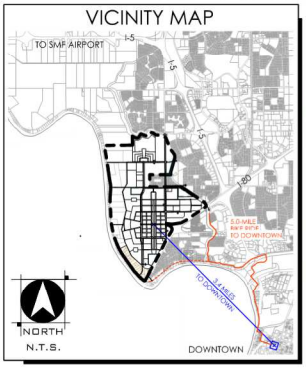
- Description of water supply sources and availability for the Plan Area (**Section 5.0**)

- Water supply analysis (**Section 6.0**)
- Description of the Sustainable Groundwater Management Act (**Section 7.0**)
- Capital Improvement Program and Fee Development (**Section 8.0**)

EXHIBIT 1

PRELIMINARY LAND USE PLAN
UPPER WESTSIDE
COUNTY OF SACRAMENTO, CALIFORNIA
JULY 2023





LAND USE DESIGNATION

COLOR	LAND USE DISTRICT	COMPARABLE ZONE OR DENSITY RANGE	TARGET DENSITY OR F.A.R.	ACRES ±	% OF ACRES	ESTIMATED DWELLING UNITS	% OF DWELLING UNITS	ESTIMATED SQ. FT. ±
VLDR	VERY LOW DENSITY RESIDENTIAL	RD-1 TO RD-3	1.3 DU/AC	166.7	8.1%	223 DU	2.4%	
LDR	LOW DENSITY RESIDENTIAL	RD-4 TO RD-7	5.5 DU/AC	495.9	90.6%	9,598 DU	95.0%	
LMDR	LOW/MEDIUM DENSITY RESIDENTIAL	RD-6 TO R-10	8.0 DU/AC	133.9	6.5%	1,071 DU	11.4%	
MDR	MEDIUM DENSITY RESIDENTIAL	RD-8 TO RD-20	12.0 DU/AC	61.9	3.0%	742 DU	7.9%	
HDR	HIGH DENSITY RESIDENTIAL	RD-20 TO RD-40	25.0 DU/AC	36.4	1.8%	910 DU	9.7%	
VHDR	VERY HIGH DENSITY RESIDENTIAL	RD-30 TO RD-30+	35.0 DU/AC	22.6	1.1%	791 DU	8.5%	
CMU	COMMERCIAL MIXED USE	CMU (RD-30 TO RD-100)+40.0 DU/AC | 0.60 FAR		83.6 [5]	4.0%	3,280 DU	35.1%	2,184,970 SF [3]
EHC	EMPLOYMENT/HIGHWAY COMMERCIAL	E/HC	0.40 FAR	52.9	2.6%			921,730 SF [3]
S	SCHOOL	K-8, HS, CC		141.0	6.8%			
P	PARK	P		79.1	3.8%			
G/UF	GREEN BELT / URBAN FARM	AG-B		44.0	2.1%			
OS	OPEN SPACE (BASINS & CHANNELS)	NR		117.6	5.7%			
OS-AG	OPEN SPACE (AG-BUFFER)	NR		36.6	1.8%			
AG-C	AG-CROPLAND [4]	AG		414.3	20.1%			
AR	AG-RESIDENTIAL [4]	AR		86.1	4.2%			
W	OPEN SPACE WATER (CANAL)	P		15.0	0.7%			
LSC	LANDSCAPE CORRIDOR			28.0	1.4%			
	MAJOR ROADS A	ROW		115.9	5.6%			
	MAJOR ROADS B (WITHIN AG-BUFFER) [4]	ROW		5.4	0.3%			
	TOTAL			2066.2	100%	9,356 DU'S		3,106,700 SF

NOTES
(1) NET ACREAGE BASED ON PRELIMINARY LAND USE PLAN GENERATED IN GIS/AUTOCAD BY WOOD RODGERS APRIL 2020. THIS PLAN IS SUBJECT TO CHANGE. ARTERIALS, COLLECTORS AND PRIMARY RESIDENTIAL STREETS, AND LANDSCAPE CORRIDORS AS SHOWN ON MAP ARE NETTED OUT.
(2) ESTIMATED POPULATION CALCULATION UTILIZING 3.0 PERSONS PER HOUSEHOLD (pph) FOR SINGLE-FAMILY AND 2.5 pph FOR MULTI-FAMILY (HDR AND HIGHER), RESULTING IN 25,578± PEOPLE [(4,981 DU x 2.5 pph)+(4,375 DU x 3.0 pph)=25,578 POPULATION]. THIS IS A PRELIMINARY ESTIMATE AND SUBJECT TO CHANGE.
(3) THE ALLOCATED SQUARE FOOTAGE (SF) IS IN ADDITION TO EXISTING COMMERCIAL LAND USES.
(4) AGRICULTURAL RESIDENTIAL (AR), AGRICULTURAL CROPLAND (AG). OPEN SPACE (OS) BUFFER TO THE NORTH AND WEST, AND MAJOR ROADS B AREAS ARE NOT INCLUDED IN PROPOSED 1,532-ACRE DEVELOPMENT AREA OR THE LPA/ESB EXPANSION REQUEST. IT IS ASSUMED THE "AG-BUFFER" AREA WILL REMAIN AS IS AND NO UNITS ARE ALLOCATED.
(5) THE 1.6-ACRE CMU SITE LOCATED SOUTHWEST OF THE TOWN CENTER IS DESIGNATED FOR A FIRE STATION AND THEREFORE WAS NOT ALLOCATED RESIDENTIAL UNITS OR COMMERCIAL SF.

NORTH
0 600 1200 2400

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
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2.0 SYSTEM CRITERIA

SCWA and the City each have established criteria for the sizing and analysis of domestic water systems. These criteria relate to water main sizes, system pressure, velocities, and roughness coefficients, as well as fire flow and storage volume. Since the water retailer for Upper Westside has not yet been determined, each water agencies criteria were compared, as discussed in the sections below. When designing the water system to serve UWS, the more restrictive of each agency's criteria was considered, unless the less restrictive criteria is determined to be reasonable, as explained below.

2.1 Water Main Criteria

SCWA and the City both have separate criteria for transmission mains (see **Table 1**) versus distribution mains (see **Table 2**). The SCWA criteria for system pressures is generally higher than the criteria published by the City DOU. However, both the City and SCWA require a minimum residual pressure of 20 psi in a distribution main during a fire flow event. Other criteria vary slightly as shown.

The minimum pressure criteria is 30 psi for both transmission and distribution mains, if the City becomes the water purveyor for the project. If SCWA becomes the water purveyor, minimum pressure allowed is 40 psi for transmission mains and 35 psi for distribution mains. These criteria would be met for SCWA by installing a booster pump at the point of connection to the City water supply. The tables herein have been highlighted to identify the criteria utilized for the UWS development area.

Table 1. Transmission Main Criteria Comparison

Criteria	SCWA	City
Water Main Size	16-inches and greater(5)	18-inches or greater(5)
Hazen Williams "C" Factor (roughness)	125	130
Maximum Pressure	75 psi	80 psi
Minimum Pressure	40 psi	30 psi(6)
Minimum Pressure During Fire Flow(1)	25 psi	Not specified
Maximum Velocity During ADD(2)	Not specified	3 fps
Maximum Velocity During MDD(3)	5 fps	5 fps
Maximum Velocity During PHD(4)	7 fps	Not specified
Maximum Velocity During Fire Flow(1)	10 fps	Not specified
Minimum Velocity	Not specified	0.10 fps
Maximum Head Loss	5 ft / 1000 ft	3 ft / 1000 ft

(1) Fire Flow is modeled concurrently with MDD
(2) (ADD) Average Day Demand
(3) (MDD) Maximum Day Demand
(4) (PHD) Peak Hour Demand
(5) Section 13 of the City of Sacramento standards defines a Transmission Main as "Water Mains larger than 12-inches in diameter that are used to convey large volumes of water from treatment plants, where the water is produced, to selected points throughout the Water System as well as to (and from) storage reservoirs to meet fluctuating daily and seasonal demands." The DOU indicates 18-in as the next size up from 12-in. Although the City will therefore require at minimum 18-inch pipes for their T-mains, 16-inch pipes (SCWA minimum T-main size) were modeled at this time in order to that the more hydraulically restrictive design. If the City becomes the water purveyor for this project, proposed 16-inch pipes will be upsized to 18-inch pipes.
(6) City system pressure at point of connection is below 40 psi during PHD flow at UWS. Therefore, 30 psi is used as the criteria if City becomes purveyor. If SCWA becomes purveyor, 40 psi minimum pressure applies.

Table 2. Distribution Main Criteria Comparison

Criteria	SCWA	City
Water Main Size	8-inches general minimum	• 12-inches on one square mile grid; 8-inches(2) in all other cases • Industrial minimum: 12 inches • Distribution to fire hydrants: 8 inches
Hazen Williams "C" Factor	125	130
Maximum Pressure	65 psi	80 psi
Minimum Pressure	35 psi	30 psi(3)
Minimum Pressure During Fire Flow(1)	20 psi	20 psi
Maximum Velocity During ADD	Not specified	5 fps
Maximum Velocity During MDD	5 fps	Not specified
Maximum Velocity During PHD	7 fps	7 fps
Maximum Velocity During Fire Flow(1)	10 fps	10 fps
Minimum Velocity	Not specified	0.10 fps
Maximum Head Loss (Non-Fire Scenario)	5 ft / 1000 ft	7 ft / 1000 ft
Maximum Head Loss During Fire Flow(1)	Not specified	10 ft / 1000 ft

(1) Fire Flow is modeled concurrently with MDD
(2) 6-inch may apply where minimum velocities aren't met. Cul-de-sacs and dead-ends have 6-inch, or 4-inch where minimum velocities aren't met and the dead-end is no longer than 250 feet.
(3) City system pressure at point of connection is 37.6 psi during PHD flow at UWS, upstream of meter. Therefore, the less restrictive criteria of 30 psi is used if City becomes purveyor; 35 psi minimum if SCWA becomes purveyor.

2.2 Fire Flow and Storage

For both possible water retailers, fire flow requirements are summarized in **Table 3.**

Table 3. Fire Flow Comparison

Fire Flow Requirement	SCWA	City
Single Family Residential (<3,600 sf)	1,500 gpm, 2 hours	1,500 gpm, 2 hours
Single Family Residential (>3,600 sf)	2,000 gpm, 2 hours	Not specified
Multi-Family Residential	Not specified [1]	2,500 gpm, 2 hours
Commercial	3,000 gpm, 3 hours	3,500 gpm, 4 hours
Industrial	4,000 gpm, 4 hours	4,500 gpm, 4 hours
Institutional	Not specified	4,500 gpm, 4 hours

(1) SCWA Water Study Approval Guidelines Table 5 does not list a required fire flow for Multi-Family Residential. Depending on the project specifics, the Commercial fire flow may be substituted.

For single family homes greater than 3,600 square feet, SCWA requires a larger fire flow than the City. For all other types of structures, the City requires a larger fire flow than SCWA.

Storage criteria differ between SCWA and the City. Both require some operational capacity, fire flow, and emergency water to be stored. Operational or equalization storage meets diurnal demand conditions including peak hour fluctuations, and allows the City's water supply sources to operate at a uniform rate throughout the day. Fire flow storage required is calculated for one event based on the flow rate and duration shown in **Table 3**. Emergency storage required generally varies widely by purveyor, as each agency's ability to treat and store water is different. SCWA for instance recommends emergency storage equivalent to 1/3 of average day demand. It is also possible that excess storage in the City system can be utilized. Further analysis and City input is needed to determine the total storage volume needed at UWS.

2.3 Conclusion

At this time, it is not known which of the two agencies will be the water purveyor for UWS. Therefore, both agencies' criteria for a water system were evaluated and compared. The more restrictive of each agency's operating criteria will be applied when evaluating and sizing the proposed on-site system, unless the less restrictive criteria is determined to be reasonable. The required fire flow is the largest of all estimates, and the storage facility shall be sized to meet the worst-case fire flow, as well as operational and emergency needs.

3.0 WATER DEMAND ESTIMATE

Wood Rodgers developed water demand projections for Upper Westside utilizing the most current land use information and demand factors. In this section, demand factors based on the guidelines of SCWA and the City are compared to assess the differences and to select the most appropriate factors for developing the water demand estimates. Water demand estimates are presented at full buildout as well as by project phasing.

3.1 Land Use

The proposed land use for UWS is shown in **Exhibit 1**. The proposed land use has sixteen different land use descriptions, whereas SCWA has fourteen and the City has six corresponding land use categories for the water demand factors. **Table 4** below lists the project land uses and their assumed equivalents related to the SCWA and City demand factor categories.

Table 4. Land Use

Proposed Specific Plan			SCWA Category	City Category (1)
Land Use Designation	**Land Use (Zoning)**	**Area (acre)**		
RW	Roads	122.0	Right-Of-Way	--
AG	Agricultural Reserve	410.2	Agricultural(3)	--
AG/RES	General Agriculture	86.1	Agricultural(3)	--
CC	Commercial & Office	1.2	Commercial	Commercial/Office
CMU	Mixed Use	82.0	Multi-Family-High-Density + Commercial (2)	Residential Medium (2)
E/HC	Commercial & Office	52.9	Commercial	Commercial/Office
HDR	High Density Residential (RD-25)	36.4	Multi-Family-High-Density	Residential Medium
LC	Landscape Corridor	38.2	Public Recreation	Park
LDR	Low Density Residential (RD-5)	429.2	Single Family	Residential Low
LMDR	Low Density Residential (RD-7)	133.0	Single Family	Residential Low
MDR	Medium Density Residential (RD-10)	62.5	Multi-Family-High-Density	Residential Medium
P	Recreation	82.3	Public Recreation	Park
SCHOOL	Public/Quasi-Public	141.1	Public	Mixed Use
UF	Agricultural Urban Reserve	45.1	Public Recreation	Park
VHDR	High Density Residential (RD-40)	22.6	Multi-Family-High-Density	Residential Medium
VLDR	Low Density Residential (RD-2)	164.5	Rural Estate	Residential Low
W(4)	Water/Public/Quasi-Public	15.0	Non-irrigated	--
WTLND(4)	Open Space	141.9	Non-irrigated	--

(1) City's use factors include 15% to account for rights-of-way and streets.
(2) See Section 3.2 (Demand Factors) for an explanation of demand factors chosen to represent proposed Mixed Use for UWS.
(3) Served by NMWC untreated water.
(4) The Lake Basins and Westside Canal may need make-up water in the late summer and fall during dry years to maintain a consistent water surface. Ideally, untreated water from NMWC is utilized for this purpose.

3.2 Demand Factors

With two potential water retailers for UWS, two published sets of water demand factors were reviewed and considered: SCWA demand factors (see **Table 5**) and City demand factors (see **Table 6**).

SCWA Zone 40's gross unit water demand factors are the 2030 Unit Water Demand Factors, found in the SCWA Water Study Guidelines Document, v.9.18. These are the same values presented as Buildout factors in the Zone 40 Water System Infrastructure Plan (WSIP) Update of 2016. The numbers are based on SCWA's study of county land use and water use data and are meant to be applied to gross land areas that have not been adjusted to remove streets and right of way areas. Water system losses are not included in these factors and are estimated to be an additional 7.5% per the WSIP[1]. System losses such as this are a result of leaking infrastructure, fire hydrants (flushing or fire protection), illegal water takes, adjustments for meter accuracy and other untracked water use.

[1] The City's Urban Water Management Plan reports higher historical retail water losses, averaging around 10%, possibly due to the age of its water infrastructure.

Table 5. SCWA Demand Factors

SCWA Land Use	Gross Unit Demand Factor (ac-ft/acre/year)	+ 7.5 % for losses (ac-ft/acre/year)	Factor Utilized (acre-ft /acre/year)
Rural Estate (RE) (1) (2)	1.37	1.47	1.47
Single Family (SF) (1) (2)	2.13	2.29	2.29
Multi-Family-Low-Density (MFLD) (1) (2)	2.44	2.62	2.62
Multi-Family-High-Density (MFHD) (1) (2)	3.33	3.58	3.58
Commercial (COM) (1) (2)	2.02	2.17	2.17
Industrial (IND) (1) (2)	2.02	2.17	2.17
Public (PUB) (1) (2)	0.81	0.87	0.87
Public Recreation (REC) (1) (2)	2.80	3.01	3.01
Mixed Land Use (MLU) (1) (2)	2.15	2.31	5.75 (3)
Right-Of-Way (ROW) (1) (2)	0.18	0.19	0.19
Self-supported/supplied by others (2)	0	0	0
Non-irrigated (2)	0	0	0
Industrial-unutilized (IUN) (1) (2)	0	0	0
Agricultural (2)	0	0	0
Water System Losses (7.5% of total sales)			

(1) Source: 2030 Unit Water Demand Factors, SCWA Water Study Approval Guideline, Table 1
(2) Source: Zone 40 WSIP Update 2016, Table 3-11
(3) See below for explanation of specially selected factor for UWS Commercial Mixed Use.

In comparison, the Gross Unit Water Use Factors for Study Areas per the City's Water Distribution System Criteria table, updated November 2016, are in broader categories and have higher residential factors. These factors include 10% for unaccounted water and 15% to account for rights-of-way and streets.

Table 6. City Demand Factors

City Land Use (1)	Gross Unit Water Use Factors for Study Areas (acre-ft/acre/year)	Factor Utilized (acre-ft/acre/year)
Residential Low (2)	3.6	3.6
Residential Medium (2)	3.8	3.8
Mixed Use	2.0	3.8 (3)
Commercial/Office	1.5	1.5
Industrial	0.9	0.9
Park	3.0	3.0
Water System Losses (10%, included in the above)		

(1) Source: City Water Distribution System Criteria Table, from their 2018 Water Study Design Manual
(2) The City's Design Manual (see Note 1) specifies water use factors for low and medium density but not high density. See Table 4 for how the proposed Specific Plan land uses were equated to City land use categories.
(3) See below for explanation of specially selected factor for UWS Commercial Mixed Use.

For this project, a special consideration is made for selecting a demand factor for Commercial Mixed Use land use areas. Areas that are assigned this land use are anticipated to be more similar to existing office/hotel and retail/residential spaces in the City than to a typical mixed use parcel, with densities closer to that of the Residential Medium designation. These areas will likely be a combination of office, hotel, retail, and residential, with a proposed land use density of 40 dwelling units per acre for multi-family residential, and 0.60 or 0.40 floor area ratio allowed for commercial (0.60 Town Center / 0.40 elsewhere). To account for this higher density, SCWA's demand factors for Multi Family – High Density and for Commercial land use are summed for a custom Mixed Use factor of 5.35 acre-ft/acre/year, or 5.75 acre-ft/acre/year including losses (see **Table 5**, above). Similarly, the City's demand factor for Mixed Use is raised from the typical 2.0 acre-ft/acre/year to match the Residential Medium factor of 3.8 acre-ft/acre/year (see **Table 6**, above).

3.3 Peaking Factors

The gross unit water use factors in **Table 5** and **Table 6** above are multiplied by the land use area to determine the Annual Demand and Average Day Demand (ADD). To calculate the Maximum Day Demand (MDD) and Peak Hour Demand (PHD), peaking factors are applied. SCWA and the City have different peaking factors as shown in **Table 7**.

Table 7. Demand Peaking Factors by Agency

Scenarios	SCWA (1)	City of Sacramento (2)
ADD to MDD	2	1.8
MDD to PHD	2	2
ADD to PHD	4	3.6

(1) Source: 2030 Unit Water Demand Factors, SCWA Water Study Approval Guideline, Table 1

(2) Source: City of Sacramento Department of Utilities based on recent data, due to landscape irrigation being restricted to two days per week. These factors differ from the City of Sacramento Water Distribution System Criteria Table, from their 2018 Water Study Design Manual

3.4 Water Demands

Land use areas, demand factors, and peaking factors were multiplied to find the Annual Demand, ADD, MDD, and PHD for both the SCWA and the City criteria. See **Table 8** below for a summary of the demand calculations. **Figure 1** compares the demand calculations between SCWA and the City. The full demand table is found in **Appendix 1**.

Table 8. Domestic Water Demand

	SCWA	City	Delta
Annual Demand (ac-ft/yr)	3,139	4,250	1,111
Average Day Demand (gpm)	1,946	2,635	689
Maximum Day Demand (gpm)	3,892	4,742	850
Peak Hour Demand (gpm)	7,784	9,485	1,701

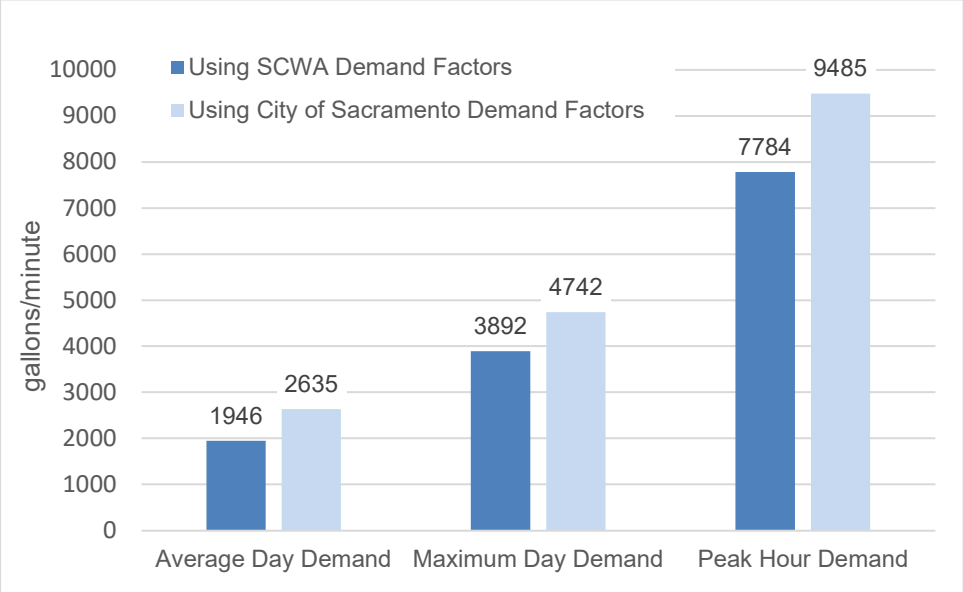


Figure 1. Comparison of Demands Based on SCWA and City Factors

The demand estimates are significantly higher using City criteria than SCWA criteria, for the following reasons:

- SCWA has a wider range of gross unit factors (1.37 to 3.33 ac-ft/ac/yr) to capture various residential densities from rural estate to multi-family high-density. The City, in contrast, uses 3.6 to 3.8 ac-ft/ac/yr for all residential land use, resulting in 57% higher Annual Demand for low density residential land use and 45% higher for medium density residential land use.

- City guidelines do not include a factor for public or school use (Institutional), therefore the Mixed Use factor was assumed.

- City guidelines include 10% for system losses, while the system losses for SCWA is assumed as 7.5%.

- For PHD, the City uses a peaking factor of 3.6 times the ADD, compared to SCWA's 4.0 x ADD. This makes the City projection of PHD 22% greater than SCWA's estimate, whereas the City projection of ADD is 36% greater than the SCWA's estimate of ADD.

For Average Day Demand, Maximum Day Demand, and Peak Hour Demand, the City factor-based demands will be used for conservative water system planning and analysis, since the domestic water demands as a result of the City's demand and peaking factors are higher than those using SCWA's factors (see **Figure 1)**. The selected domestic water demands are shown in **Table 9**.

Table 9 Domestic Water Demand Selection

	UWS Demands
Annual Demand (ac-ft/yr)	4,250
Average Day Demand (gpm)	2,635
Maximum Day Demand (gpm)	4,742
Peak Hour Demand (gpm)	9,485

3.5 Water Demands by Project Phase

UWS is currently proposed to be built out in four phases. See **Exhibit 2** for the current phasing plan. **Table 10** shows the area and land use that is proposed to be developed in each phase. Note that portions of the Plan Area will remain undeveloped for agriculture. The agricultural buffer along the west side of the Plan Area is proposed to be outside the Urban Services Boundary (USB). These areas are included in the Other column and are not anticipated to utilize urban domestic water. Therefore, they are not included in this Water Master Plan.

Table 10. Land Use Area Breakdown by Phase

Land Use	Phase 1 (ac)	Phase 2 (ac)	Phase 3 (ac)	Phase 4 (ac)	Other (ac)	Total (ac)
Roads	32	25	37	23	5	122
Agricultural Reserve	0	0	0	0	410	410
General Agriculture	0	0	0	0	86	86
Mixed Use	0	9	23	50	0	82
Commercial & Office	0	0	12	42	0	54
High Density Residential (RD-25)	7	15	0	15	0	36
Landscape Corridor	12	5	8	13	0	38
Low Density Residential (RD-5)	128	83	218	0	0	429
Low Density Residential (RD-7)	45	33	56	0	0	133
Medium Density Residential (RD-10)	14	9	31	8	0	63
Recreation	22	18	41	1	0	82

Land Use	Phase 1 (ac)	Phase 2 (ac)	Phase 3 (ac)	Phase 4 (ac)	Other (ac)	Total (ac)
Public/Quasi-Public	9	8	43	81	0	141
Agricultural Urban Reserve	10	6	23	6	0	45
High Density Residential (RD-40)	0	8	8	7	0	23
Low Density Residential (RD-2)	0	0	68	96	0	165
Public/Quasi-Public	4	2	2	8	0	15
Open Space	26	27	53	0	36	142
Total	**308**	**247**	**624**	**351**	**537**	**2,066**

Based on the proposed phasing, **Table 11** below is the annual water demand expected from each phase of development, using the City water use factors. Roads, Agricultural Reserve, General Agriculture, Public/Quasi-Public, and Natural Reserve areas are excluded as the City demand factor is zero. See **Figure 2** for a breakdown of water use by land use category at each phase.

Table 11. Annual Water Demand by Phase

Land Use Designation	Project Land Use (Zoning)	Phase1 (AFY)	Phase 2 (AFY)	Phase 3 (AFY)	Phase 4 (AFY)	Buildout (AFY)
RW	Roads	0(1)	0(1)	0(1)	0(1)	0(1)
CC	Commercial & Office	0.0	0.0	1.8	0.0	1.8
CMU	Mixed Use	0.0	32.6	89.0	190.0	311.6
E/HC	Commercial & Office	0.0	0.0	16.7	62.7	79.4
HDR	High Density Residential (RD-25)	26.2	56.0	0.0	56.1	138.3
LC	Landscape Corridor	36.8	15.1	23.9	38.9	114.7
LDR	Low Density Residential (RD-5)	462.1	298.2	785.0	0.0	1545.2
LMDR	Low Density Residential (RD-7)	160.3	117.8	200.6	0.0	478.7
MDR	Medium Density Residential (RD-10)	54.1	33.1	119.5	31.0	237.6
P	Recreation	66.4	53.5	122.6	4.3	246.8
SCHOOL	Public/Quasi-Public	17.2	16.9	85.9	162.1	282.1
UF	Agricultural Urban Reserve	28.7	17.7	70.3	18.7	135.4
VHDR	High Density Residential (RD-40)	0.0	29.0	28.5	28.5	86.0
VLDR	Low Density Residential (RD-2)	0.0	0.0	245.5	346.8	592.2
Total		**851.8**	**669.7**	**1,789.3**	**939.0**	**4,249.8**

(1) *To account for rights-of-way and streets, City demands add 15% onto the other land use zones*

The annual water demands by phase translate to the Average Day Demand, Maximum Day Demand, and Peak Hour Demand shown in **Table 12**, by unit conversion and the use of peaking factors from **Table 7**.

Table 12 Average Day Demand, Maximum Day Demand, and Peak Hour Demand by Phase

Land Use Designation	Project Land Use (Zoning)	Phase 1			Phase 2			Phase 3			Phase 4		
		Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)
RW	Roads	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]	0[(1)]
CC	Commercial & Office	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.1	4.1	0.0	0.0	0.0
CMU	Mixed Use	0.0	0.0	0.0	20.2	36.4	72.8	55.2	99.3	198.5	117.8	212.0	424.0
E/HC	Commercial & Office	0.0	0.0	0.0	0.0	0.0	0.0	10.4	18.6	37.3	38.9	69.9	139.9
HDR	High Density Residential (RD-25)	16.2	29.2	58.4	34.7	62.5	125.0	0.0	0.0	0.0	34.8	62.6	125.2
LC	Landscape Corridor	22.8	41.1	82.1	9.3	16.8	33.6	14.8	26.7	53.4	24.1	43.4	86.8
LDR	Low Density Residential (RD-5)	286.5	515.6	1031.3	184.9	332.7	665.5	486.7	876.0	1752.0	0.0	0.0	0.0
LMDR	Low Density Residential (RD-7)	99.4	178.9	357.8	73.0	131.4	262.9	124.4	223.9	447.7	0.0	0.0	0.0
MDR	Medium Density Residential (RD-10)	33.6	60.4	120.8	20.5	36.9	73.8	74.1	133.3	266.6	19.2	34.6	69.1
P	Recreation	41.1	74.1	148.1	33.2	59.7	119.4	76.0	136.9	273.7	2.7	4.8	9.5
SCHOOL	Public/Quasi-Public	10.7	19.2	38.4	10.5	18.9	37.8	53.2	95.8	191.6	100.5	180.9	361.9
UF	Agricultural Urban Reserve	17.8	32.1	64.1	10.9	19.7	39.4	43.6	78.4	156.9	11.6	20.9	41.8
VHDR	High Density Residential (RD-40)	0.0	0.0	0.0	18.0	32.3	64.6	17.7	31.8	63.6	17.7	31.8	63.6
VLDR	Low Density Residential (RD-2)	0.0	0.0	0.0	0.0	0.0	0.0	152.2	273.9	547.9	215.0	387.0	773.9
Total		**528**	**951**	**1,901**	**415**	**747**	**1,495**	**1,109**	**1,997**	**3,993**	**582**	**1,048**	**2,096**

(1) To account for rights-of-way and streets, City demands add 15% onto the other land use zones

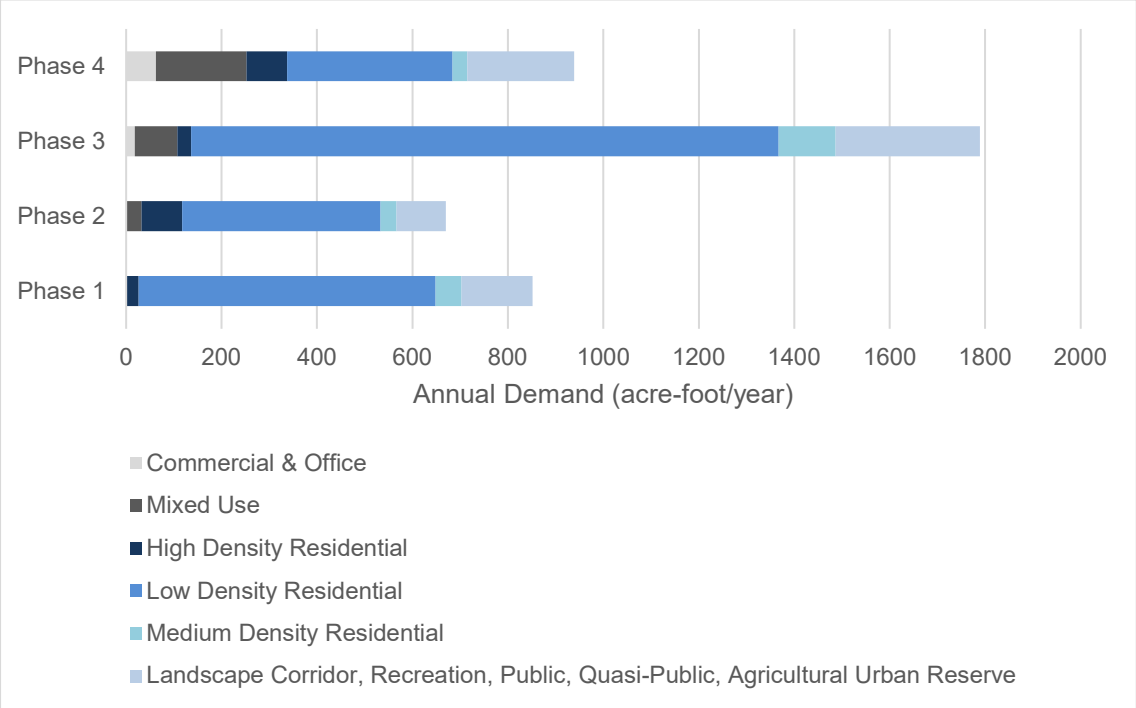


Figure 2. Annual Demands by Project Phase

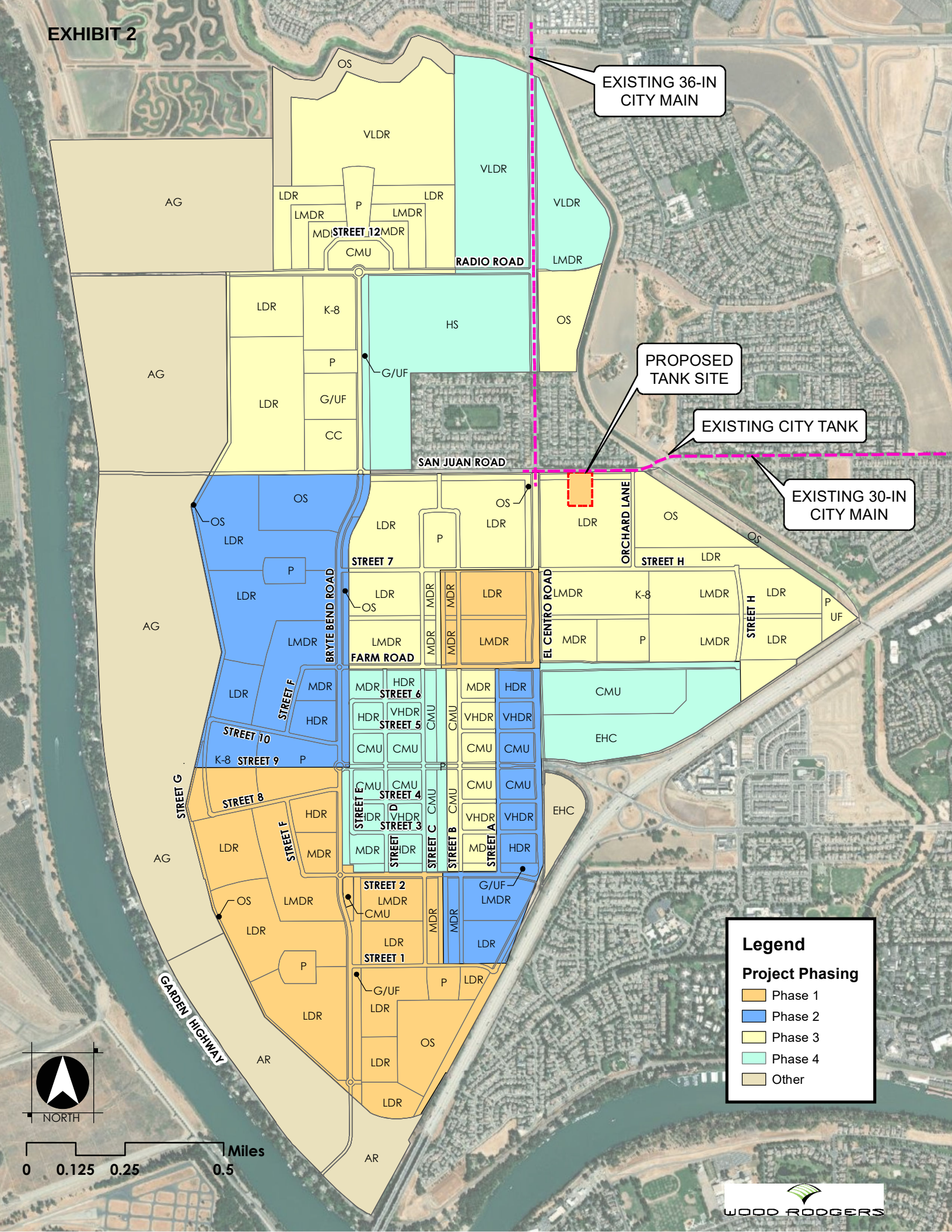
3.6 Canal Make-up Water

It is anticipated that a make-up well will be required to maintain the water surface elevation within the Upper Westside canal stretching from Street 1 to Street 7 through the proposed town center. It is anticipated that a 1,500 gallon per minute well will provide make-up water in the canal. Further geotechnical investigation with design will be required to determine loss rates and sizing of the proposed well.

3.7 Conclusion

This section summarizes the proposed land use for UWS and compares the demand factors and peaking factors of SCWA and the City. At this time, it is not known which entity will be the water purveyor for the Plan Area. The City is anticipated to provide treated water to UWS, and SCWA will likely retail the water to customers. SCWA and the City have different guidelines and criteria that yield different estimates of

domestic water demand. For the most conservative approach, UWS will utilize the City's demand estimates, which provides the higher total demand.


EXHIBIT 2
EXISTING 36-IN CITY MAIN
PROPOSED TANK SITE
EXISTING CITY TANK
EXISTING 30-IN CITY MAIN
RADIO ROAD
SAN JUAN ROAD
FARM ROAD
BRYTE BEND ROAD
EL CENTRO ROAD
ORCHARD LANE
GARDEN HIGHWAY
STREET 1
STREET 2
STREET 3
STREET 4
STREET 5
STREET 6
STREET 7
STREET 8
STREET 9
STREET 10
STREET 12
STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
AG
AR
VLDR
LDR
LMDR
MDR
HDR
VHDR
CMU
EHC
HS
K-8
P
G/UF
CC
OS
UF
Legend
Project Phasing
Phase 1
Phase 2
Phase 3
Phase 4
Other
NORTH
0
0.125
0.25
0.5
Miles
WOOD RODGERS

4.0 WATER SYSTEM IMPROVEMENT ANALYSIS

This section discusses the hydraulic modeling and analysis performed to support the proposed Upper Westside development.

The analysis used the following methodology:

- The existing City water system adjacent to the project was reviewed, as the backbone infrastructure pipes for UWS are proposed to make connections to existing transmission mains.
- Performance criteria for the proposed pipe system were set based on both City and SCWA standards, as discussed in **Section 2.02.0 System Criteria**.
- A hydraulic pipe network model was developed based on the proposed backbone infrastructure layout.
- The model was used to simulate the City system supplying the proposed system with the domestic and fire demands calculated in **Section 3.03.0 Water Demand Estimate**. The modeled system was evaluated against sizing and operating criteria set in **Section 2.0**.

4.1 Existing System

The City currently retails and delivers water to the vicinity of the proposed project. This includes retailing to areas outside the City Limits and the West Drainage Canal. Existing City water infrastructure in the vicinity of UWS includes 36-inch and 30-inch transmission mains in El Centro Road and San Juan Road, north and east of their intersection, as shown in **Exhibit 2** and in **Exhibit 4**. El Centro Road also has an existing 12-inch distribution main, from Arena Boulevard (Natomas Central Drive) south to Interstate 80, and San Juan Road has roughly 1,600 LF of 12-inch distribution main west of El Centro Road.

There is an existing tank, San Juan Reservoir, on San Juan Road east of El Centro Road (see **Exhibit 4**). The partially underground tank has a capacity of 3 MG and includes a pump station. It is one of twelve storage reservoirs that the City operates (see **Section 5.0** for a discussion of City water supply facilities). The pump at San Juan Reservoir is operated to supplement pressure during Peak Hour Demand and

during fire flow, as well as in emergencies (see email correspondence with the City consultant West Yost, November 15, 2021).

4.2 Proposed Backbone Infrastructure

As shown on **Exhibit 3**, the proposed backbone water infrastructure for UWS will differ based on whether the County or the City manages the public water mains in UWS. The way in which UWS makes connections to the existing City water system will also depend on the retail water purveyor, as described below.

Scenario I (SCWA retail)

If the water system is operated by SCWA, El Centro Road and Street 2 are proposed to have a 16-inch transmission main. Mains proposed everywhere else will be 8- and 12-inch. See **Exhibit 3**. Where County mains are proposed parallel to existing City mains in the same street, adequate horizontal separation should be maintained to protect existing pipes. There will be two proposed metered connections to the existing City transmission main: one at the intersection of San Juan Road and El Centro Road, and one at Radio Road and El Centro Road. The City will use the meters to track wholesale water deliveries to SCWA. The City requires a reduced pressure backflow or an air gap at each tie-in that SCWA makes to the City system. The point of connection (POC) at San Juan Road and El Centro Road is intended to initially be a metered connection with a backflow and booster pump[2], later converted to a water storage tank (i.e. air gap) and booster pump facility to serve UWS at buildout. The point of connection at Radio Road and El Centro Road will consist of a meter and backflow, and it is intended to be a backup to the San Juan Road POC.

Scenario II (City retail)

If the City were to expand its water distribution system to serve UWS, the proposed system would consist of 8- and 12-inch distribution mains, which connect to existing City mains in San Juan Road and El Centro Road. Along San Juan Road, an 18-inch transmission main will be extended from the existing 30-

[2] Scenario I (SCWA retail) Phase 1 booster pump: approximately 15 HP or less pump on a variable frequency drive, with a bladder tank to handle low flows. A more formal design report is anticipated prior to these facilities being constructed.

inch main, as well as a 12-inch distribution main extended from the existing 12-inch. Along El Centro Road, multiple tie-ins will be made to the existing 12-inch main, which crosses Interstate 80 near Barandas Drive into the existing City main network southeast of the project. The project also proposes a connection with 12-inch pipe, between the southern end of UWS to the City system on the other side of Interstate 80. The connection may be accomplished via a bore-and-jack under the freeway. As required by the City, this connection provides for a better looped system to serve phase one.

In either scenario, backbone distribution mains of 8- and 12-inch pipes will be located in major backbone streets: El Centro Road, Bryte Bend Road, Radio Road, San Juan Road, Farm Road, West El Camino, and Street 2. See **Exhibit 3** for the proposed distribution main layout. The hydraulic model of the Plan Area at this stage includes pipes in the backbone streets, listed above, as well as some additional 8-inch and 12-inch pipes along in-tract roads (based on a preliminary lotting layout) to demonstrate how the distribution mains will be looped. The proposed pipe network was modeled to ensure pipes are adequately sized to support this development. As detailed lot layouts develop in the future, additional distribution mains will be added to serve adjacent customers, and these will further improve available pressures in the system.

4.3 Demands

Land use and the resulting expected water demand from UWS are discussed in Section 3.0 Water Demand Estimate. See Table 11 of the previous section for a summary of water demand expected from each phase.

4.4 Hydraulic Model

The proposed backbone water infrastructure for UWS is evaluated using the hydraulic modeling program H2ONET (version 16.0) developed by Innovyze. The model consists of the proposed backbone transmission and distribution pipes, connected to a fictitious reservoir and pump that represents the system pressure of the existing City water system (see **Section E. Existing Boundary Conditions** for more information).

In H2ONet, pipes are represented by link elements with an assigned roughness coefficient, size, and length. Per **Section 2.0 System Criteria**, a roughness coefficient of 125 is used for all pipes.

Links are joined by nodes, to which the surface elevation and water demand are assigned. For simplicity, ground surface elevations are used for all nodes, valves, and the pump. Elevations for proposed nodes are taken from the master grading exhibit for UWS prepared in September 2021 by Wood Rodgers. Any future changes to the proposed grading maybe incorporated into the model and the system re-evaluated at that time. Elevations in the model use the North American Vertical Datum of 1988.

Two sets of hydraulic models were developed to reflect the facilities proposed in two different scenarios: *Scenario I*, where the public water mains in UWS are part of the SCWA system; and *Scenario II*, where they belong to the City system. In the former scenario, at the two proposed metered connections to existing City transmission mains, general valve elements are modeled with head loss curves to represent head loss through the meters. A typical meter head loss curve is used and should be replaced if a specific model is specified by the water retailer. Downstream of each meter, another general valve element is modeled to represent a reduced pressure backflow device, as required by the City.

The project proposes a domestic water tank site with a booster pump station at southeast of the intersection of San Juan Road and El Centro Road. The storage tank would be constructed in *Scenario I*, for SCWA to store water that supports UWS in times of peak usage during the day, and in fire flow events. It may also provide domestic water during emergencies that affect the water supply from the City. The storage tank and booster pump station are not anticipated to be required for the first phase of residential development in *Scenario I*. However, it may be required prior to construction of the school site located in phase two. Modeling was performed as worst case scenario with no on-site tank during phase one. Ultimate timing of the tank and booster pump will be subject to Agency requirements.

The tank facility for *Scenario I (SCWA retail)* is modeled as a ground-level reservoir at this time, with a generic pump curve representing the additional head the booster pump system supplies. The tank size is assumed to be adequate to meet peak hour demand, fire flow demand, and emergency storage, although the exact size required will be confirmed at a later date with consideration given to the overall City system

capacity. The existing San Juan Reservoir just east of the Plan Area is not explicitly modeled since its operations are accounted for in the model boundary curve the City provided (see following **Section E. Model Boundary Conditions**.)

As previously discussed in **Section 2.02.0 System Criteria**, the system must meet certain operating goals and performance criteria of the water purveyor. These criteria include acceptable ranges for pressure, velocity, and head loss during domestic and fire flow scenarios, as well as storage requirements. To ensure proper sizing and layout of the backbone water distribution system to meet all operating criteria in all development phases, the hydraulic model developed simulates various demand scenarios.

4.5 Model Boundary Conditions

The City provided a water pressure curve from the City's water system model to be used as the boundary condition for the UWS model[3]. Per West Yost on November 29, 2021, the curve represents the City system response for all scenarios (ADD, MDD, PHD, and fire flow concurrent with MDD) at the intersection of San Juan Road and El Centro Road. The curve (head versus flow) is based on a ground elevation of 14 feet at this intersection, and it is assumed all City pipes are functioning (see email from City DOU, May 21, 2021, and from the City's consultant West Yost, November 19, 2021, **Appendix 2**). During peak events including Peak Hour Demand and fire flow, the San Juan Reservoir and other existing storage tanks throughout the City supplement the system in order to meet the required flow rate and duration. This is reflected in the boundary condition curve provided by the City and as shown in **Figure 3**.

[3] Received November 19, 2021

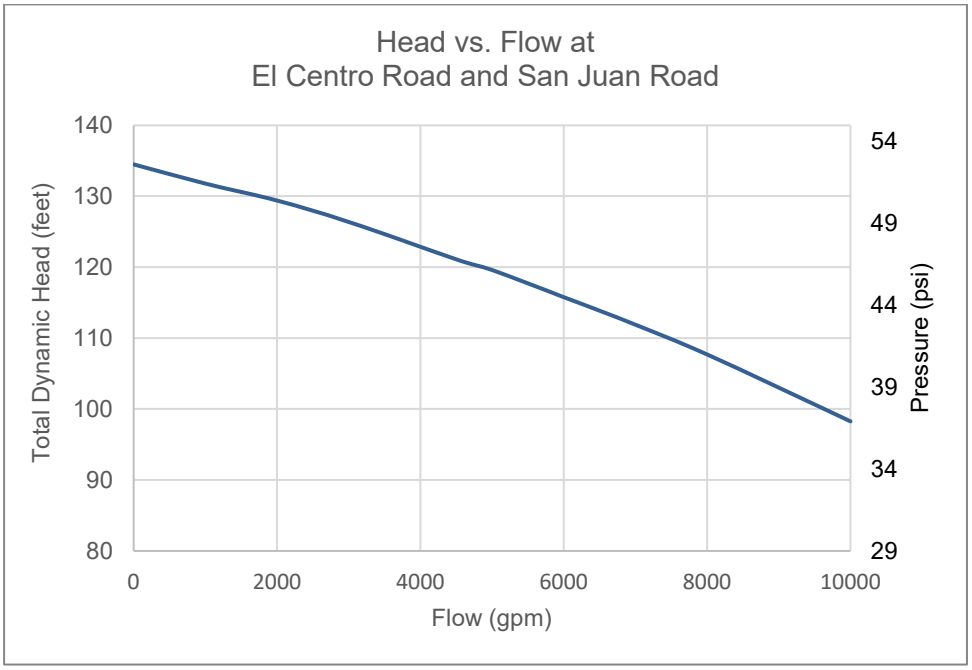


Figure 3. Model Boundary Curve (El Centro Road at San Juan Road)

The curve above gives the available pressure at the San Juan/El Centro point of connection for the various flow rates demanded by UWS. The curve is derived from a multi-day simulation in the City model and is representative of the City system's performance during maximum day, peak hour, and fire events (per conversation with West Yost on June 21, 2022). Refer to **Table 12** of **Section 3.03.0 Water Demand Estimate** for the Water System Scenario Demands.

Following additional discussion between the City and Wood Rodgers, on October 18, 2022, the City provided a second curve derived from their system model at the 12-inch water main connecting Barandas Drive and El Centro Road. See **Figure 4** below. If the City becomes the water retailer for UWS (*Scenario II*), this existing segment of pipe crossing Interstate 80 will serve as one of three proposed points of connection for the project. This curve is also assumed to be at a ground elevation of 14 feet.

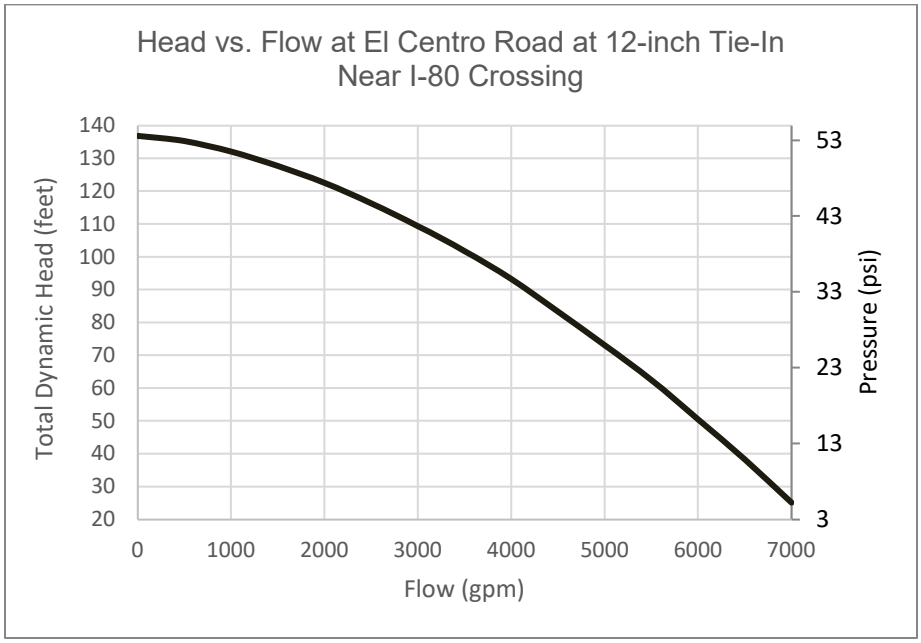


Figure 4. Model Boundary Curve (El Centro Road, South)

In the hydraulic model, the existing City water system adjacent to UWS is modeled with a fictitious reservoir and pump. The fictitious reservoir and pump feed the existing 30-inch and 36-inch City transmission mains in San Juan Road and El Centro Road, respectively, via nodes T010 and T040 (see **Figure 3**) using zero-loss pipes. A fixed hydraulic grade line (HGL) is assumed over T10 and T04. The fixed HGL is based on the City-provided curve at the intersection of San Juan and El Centro. The two *physical* tie-ins to the existing City system are located upstream of the two proposed meters, one near T020 and one near T030, as shown in **Figure 3**. However, in the rest of **Section 4.0**, "model points of connection" refers to nodes T010 and T040.

The locations, elevations, starting pressure, and HGLs at the project connection points are presented for *Scenario I* and *Scenario II*, in **Table 13** and **Table 14**. The HGLs are based on the City-provided curves at an elevation of 14 feet per the City model. Assuming a fixed HGL on the City side, the pressure available at each modeled points of connection are as shown below.

Table 13. Boundary Conditions – *Scenario I (SCWA retail)*

Model Point of Connection	Main Size (inch)	Elev. (ft)	ADD		MDD		PHD		MDD+FF	
			Pressure (psi)	HGL[(1)] (ft)	Pressure (psi)	HGL[(1)] (ft)	Pressure (psi)	HGL[(1)] (ft)	Pressure (psi)	HGL[(1)] (ft)
El Centro Road at T010	36	17.6	47.6	127.5	44.6	120.4	36.1	100.8	36.5	101.9
San Juan Road at T040	30	14.4	49.0		46.0		37.5		37.9	

(1) HGL is calculated based on elevation head of 14 feet at the intersection of El Centro and San Juan Road, per City DOU

Table 14. Boundary Conditions – *Scenario II (DOU retail)*

Model Point of Connection	Main Size (inch)	Elev. (ft)	ADD		MDD		PHD		MDD+FF	
			Pressure (psi)	HGL[(1)] (ft)	Pressure (psi)	HGL[(1)] (ft)	Pressure (psi)	HGL[(1)] (ft)	Pressure (psi)	HGL[(1)] (ft)
El Centro Road at T010	36	17.6	48.8	130.1	46.6	125.1	40.7	111.4	40.6	111.3
San Juan Road at T040	30	14.4	50.2		48.0		42.1		42.0	
El Centro Road Crossing to Barandas Drive at J_BRD	12	14.0	51.3	132.5	49.7	128.8	45.0	117.9	46.5	121.3
Southern Crossing to West River Drive at J_WRD	12	13.0	51.8		50.2		45.5		46.9	

(2) For T010 and T040, HGL is calculated based on elevation head of 14 feet at the intersection of El Centro and San Juan Road, per City DOU

4.6 Modeling Scenarios

The proposed system was modeled for two possible layouts based on purveyor (*Scenario I* and *Scenario II*) as described above, with six demand cases: average day, maximum day, peak hour, and maximum day plus fire flow at three different locations.

For *Scenario I (SCWA retail)*, Phase 1 relies on the existing City water system and a proposed booster pump to meet pressure criteria. The existing City water system includes the San Juan reservoir. The proposed onsite tank and a booster pump station is hydraulically required in Phase 2, but the timing will ultimately be subject to Agency requirements.

For *Scenario II (DOU retail)*, the City water supply has adequate pressure for UWS to meet the criteria set in Section II with three tie-ins to existing pipes. This is the case for all phases of development and for all domestic and fire flow scenarios modeled.

The fire flow scenarios assume a fire event occurs under the maximum day demand condition. As the largest required fire flow would occur at the proposed K-8 school site off of Bryte Bend Road or at the proposed high school site on Radio Road, a fire event is modeled at node J072 and at J023, each for a flow rate of 4,500 gpm (per **Section 2.0 System Criteria, Table 3**). An additional fire scenario is created for 2,000 gpm (single family residential) at node J040, farthest south from the fictitious reservoir. Following the proposed project phasing presented in **Exhibit 2**, the school fire flow of 4,500 gpm first becomes necessary with completion of the K-8 site in Phase 2. Phase 1 infrastructure only needs to support a 2,000 gpm residential fire flow, which is possible without the tank and booster pump station.

4.7 Modeling Results

Table 15 and **Table 16** summarize results for ADD, MDD, PHD, and MDD plus Fire Flow Scenarios. Detailed results for the demand scenarios are in **Appendix 3.**

Table 15. Modeling Results – *Scenario I (SCWA retail)*

Demand Scenario	Minimum Pressure Onsite, Transmission Main (psi)	Criteria	Minimum Pressure Onsite, Distribution Main (psi)	Criteria	Maximum Velocity (fps)	Criteria
Average Day Demand (3)	50.7	40 (1)	51.7	35 (1)	1.9	5 (2)
Maximum Day Demand (3)	50.7		50.2		3.4	5 (1)
Peak Hour Demand (3)	46.6		44.6		6.7	7 (1)
Maximum Day Demand plus 4,500 gpm Fire Flow at J023 (4)	48.5	25 (1)	29.2	20 (1) (2)	7.9	10 (1)
Maximum Day Demand plus 4,500 gpm Fire Flow at J072 (3)	42.3		33.7		6.6	
Maximum Day Demand plus 2,000 gpm Fire Flow at J040 (3)	48.3		44.7		4.8	

(1) Per SCWA
(2) Per City DOU
(3) Booster pump station is modeled to provide a pressure increase of 54 psi
(4) Booster pump station is modeled to provide a pressure increase of 63 psi

Table 16. Modeling Results – *Scenario II (DOU retail)*

Demand Scenario	Minimum Pressure Onsite, Transmission Main (psi)	Criteria	Minimum Pressure Onsite, Distribution Main (psi)	Criteria	Maximum Velocity (fps)	Criteria
Average Day Demand	48.3	30 (2)	48.9	30 (2)	2.0	5 (2)
Maximum Day Demand	46.8		45.7		3.0	5 (1)
Peak Hour Demand	41.1		37.2		5.2	7 (1)
Maximum Day Demand plus 4,500 gpm Fire Flow at J023	41.0	25 (1)	28.0	20 (1) (2)	7.8	10 (1)
Maximum Day Demand plus 4,500 gpm Fire Flow at J072	42.0		28.1		6.2	
Maximum Day Demand plus 2,000 gpm Fire Flow at J040	44.8		40.8		4.0	

(1) Per SCWA
(2) Per City DOU

During both purveyor scenarios and for all modeled demands, system pressures meet all criteria considered in **Section 2.0**. Pipe flow velocities onsite also stay within the City's and SCWA's operating criteria.

4.8 Conclusion

This water model has been prepared in accordance with the County of Sacramento Zone 40's WSIP and the City of Sacramento Water Distribution System Criteria. Based on the proposed land use, boundary conditions, and generally accepted water modeling practices, the system as proposed will meet the operating requirements set in **Section 2.0**. As more detailed layouts are designed in the future, and distribution mains added, further analysis may be needed to verify the layout and sizing of additional mains.

EXHIBIT 3

UPPER WESTSIDE WATER MASTER PLAN - MODEL LAYOUT

MAJOR WATER INFRASTRUCTURE SCENARIOS I & II

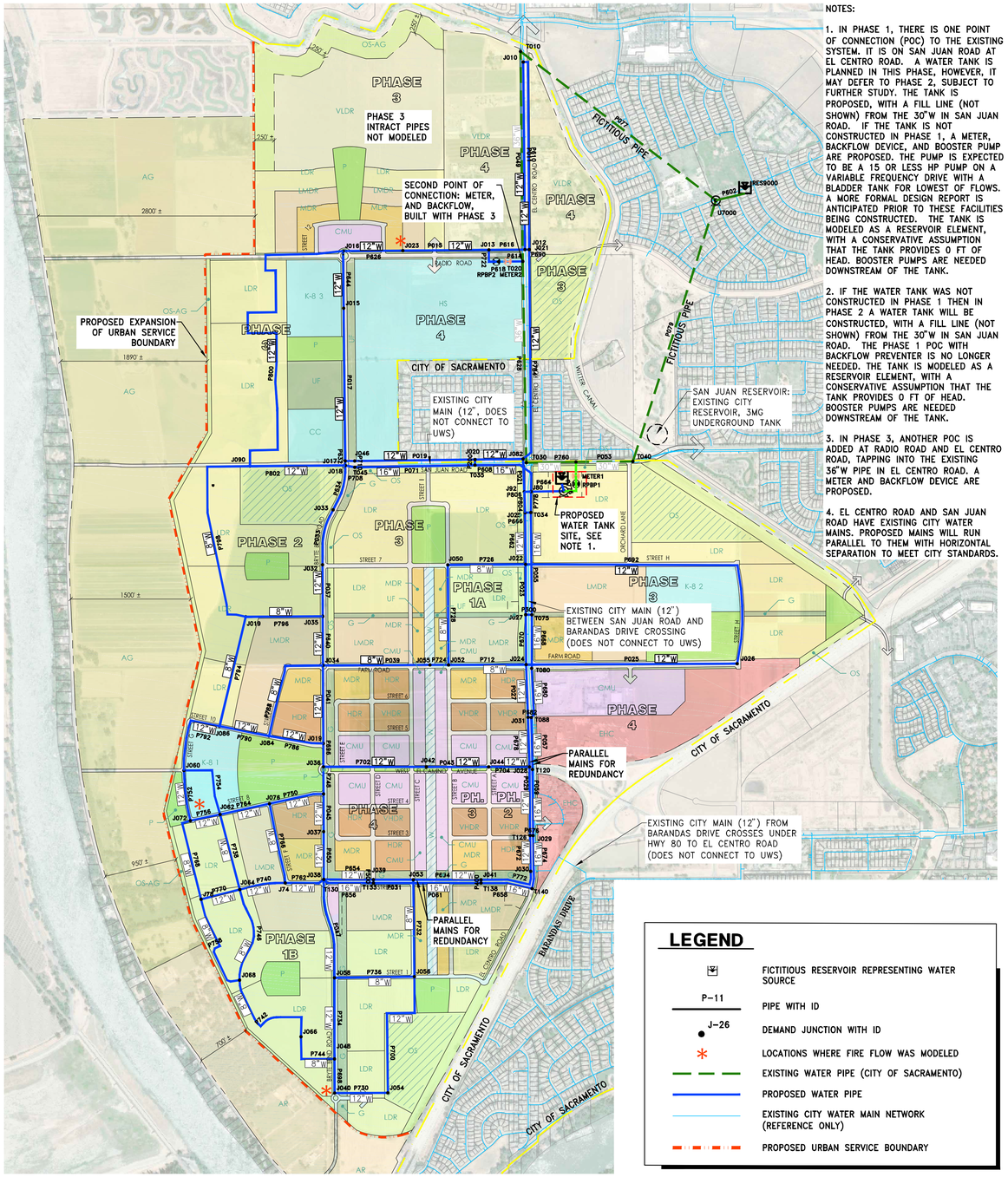
SACRAMENTO COUNTY, CALIFORNIA

AUGUST 4, 2023

800' 400' 0 800'

SCALE: 1" = 800'

SCENARIO I: SCWA AS WATER PURVEYOR, CITY PROVIDES WHOLESALE WATER



NOTES:

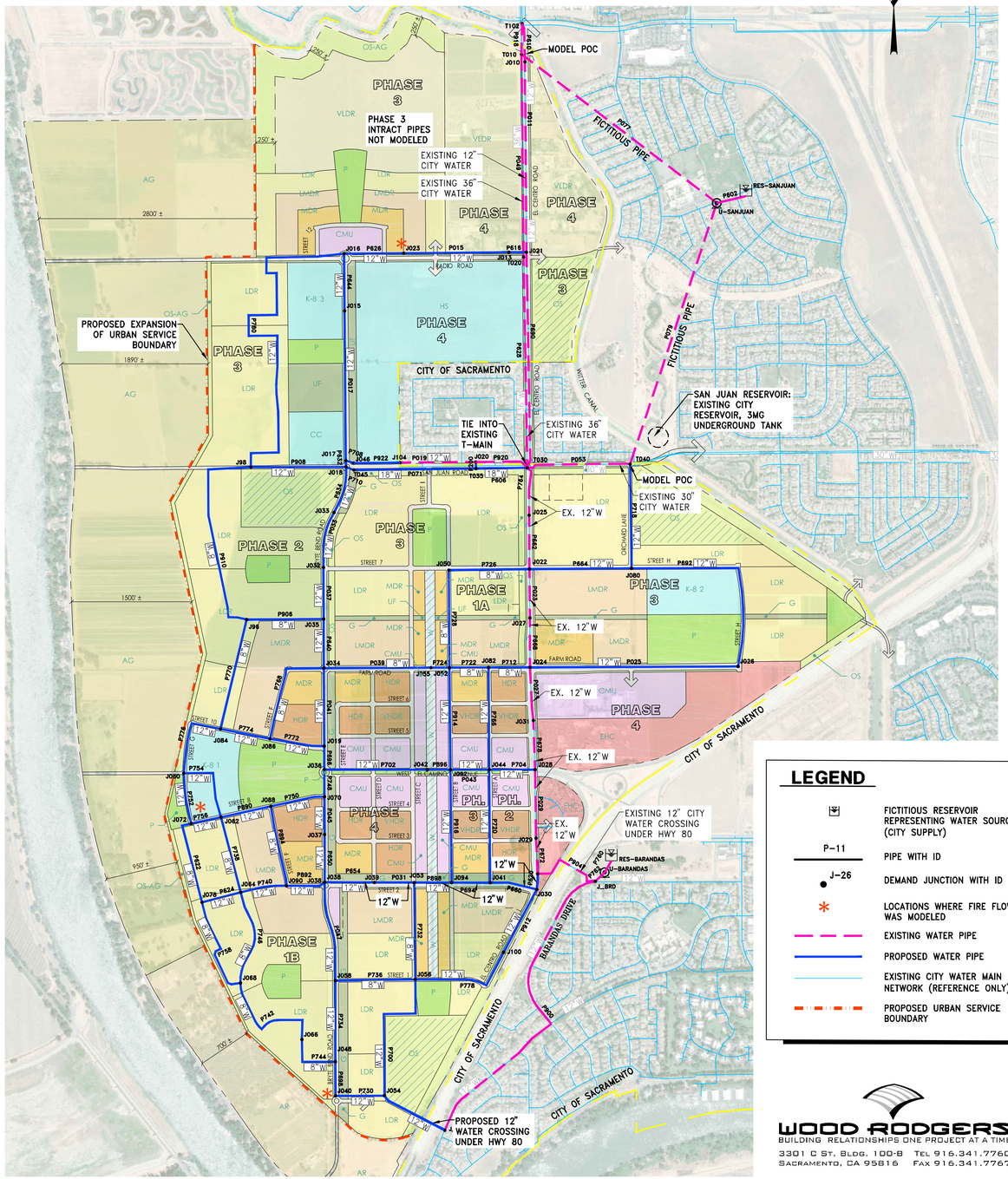
1. IN PHASE 1, THERE IS ONE POINT OF CONNECTION (POC) TO THE EXISTING SYSTEM. IT IS ON SAN JUAN ROAD AT EL CENTRO ROAD. A WATER TANK IS PLANNED IN THIS PHASE, HOWEVER, IT MAY DEFER TO PHASE 2, SUBJECT TO FURTHER STUDY. THE TANK IS PROPOSED, WITH A FILL LINE (NOT SHOWN) FROM THE 30"W IN SAN JUAN ROAD. IF THE TANK IS NOT CONSTRUCTED IN PHASE 1, A METER, BACKFLOW DEVICE, AND BOOSTER PUMP ARE PROPOSED. THE PUMP IS EXPECTED TO BE A 15 OR LESS HP PUMP ON A VARIABLE FREQUENCY DRIVE WITH A BLADDER TANK FOR LOWEST OF FLOWS. A MORE FORMAL DESIGN REPORT IS ANTICIPATED PRIOR TO THESE FACILITIES BEING CONSTRUCTED. THE TANK IS MODELED AS A RESERVOIR ELEMENT, WITH A CONSERVATIVE ASSUMPTION THAT THE TANK PROVIDES 0 FT OF HEAD. BOOSTER PUMPS ARE NEEDED DOWNSTREAM OF THE TANK.

2. IF THE WATER TANK WAS NOT CONSTRUCTED IN PHASE 1 THEN IN PHASE 2 A WATER TANK WILL BE CONSTRUCTED, WITH A FILL LINE (NOT SHOWN) FROM THE 30"W IN SAN JUAN ROAD. THE PHASE 1 POC WITH BACKFLOW PREVENTER IS NO LONGER NEEDED. THE TANK IS MODELED AS A RESERVOIR ELEMENT, WITH A CONSERVATIVE ASSUMPTION THAT THE TANK PROVIDES 0 FT OF HEAD. BOOSTER PUMPS ARE NEEDED DOWNSTREAM OF THE TANK.

3. IN PHASE 3, ANOTHER POC IS ADDED AT RADIO ROAD AND EL CENTRO ROAD, TAPPING INTO THE EXISTING 36"W PIPE IN EL CENTRO ROAD. A METER AND BACKFLOW DEVICE ARE PROPOSED.

4. EL CENTRO ROAD AND SAN JUAN ROAD HAVE EXISTING CITY WATER MAINS. PROPOSED MAINS WILL RUN PARALLEL TO THEM WITH HORIZONTAL SEPARATION TO MEET CITY STANDARDS.

SCENARIO II: CITY AS WATER PURVEYOR



LEGEND

- FICTITIOUS RESERVOIR REPRESENTING WATER SOURCE
- P-11 — PIPE WITH ID
- J-26 — DEMAND JUNCTION WITH ID
- LOCATIONS WHERE FIRE FLOW WAS MODELED
- EXISTING WATER PIPE (CITY OF SACRAMENTO)
- PROPOSED WATER PIPE
- EXISTING CITY WATER MAIN NETWORK (REFERENCE ONLY)
- PROPOSED URBAN SERVICE BOUNDARY

LEGEND

- FICTITIOUS RESERVOIR REPRESENTING WATER SOURCE (CITY SUPPLY)
- P-11 — PIPE WITH ID
- J-26 — DEMAND JUNCTION WITH ID
- LOCATIONS WHERE FIRE FLOW WAS MODELED
- EXISTING WATER PIPE
- PROPOSED WATER PIPE
- EXISTING CITY WATER MAIN NETWORK (REFERENCE ONLY)
- PROPOSED URBAN SERVICE BOUNDARY

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

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5.0 WATER SUPPLY SOURCES AND AVAILABILITY

The purpose of this section is to provide an overview of water supply sources and existing City water facilities available to the Plan Area. The information is taken from the City's 2020 Urban Water Management Plan (UWMP), dated May 2021.

5.1 Water Distribution Facilities

As described in the UWMP, the City produces, treats, stores, and delivers potable water to residential, commercial, and irrigation customers over a retail service area of about 101 square miles. It also wholesales water to customers including SCWA. The City's distribution system consists of two surface water treatment facilities, two pressure zones, groundwater wells, storage tanks, pumping facilities, and distribution/transmission pipelines (refer to **3.3 Water System Description** of the 2020 UWMP). Each of these facilities are summarized below, and the locations of the major facilities are shown on **Exhibit 4**.

Surface Water Supply and Treatment Facilities

The City treats surface water diverted from the Sacramento and American Rivers with two water treatment facilities: the Sacramento River Water Treatment Plant (SRWTP) and the E.A. Fairbairn Water Treatment Plant (EAFWTP). The locations of the water treatment plants are shown on **Exhibit 4**.

Sacramento River Water Treatment Plant (SRWTP)

The SRWTP, located just east of Interstate 5 and south of Richards Boulevard, treats water that is pumped from the Sacramento River about one-half mile downstream of the American River confluence (**Exhibit 4**). The City is permitted to operate the plant at 160 million gallons per day (MGD) in the summer months and 120 MGD for the rest of the year. The City is currently evaluating further expansion of the SRWTP to increase the diversion and treatment capacity to 310 MGD.

E. A. Fairbairn Water Treatment Plant (EAFWTP)

The EAFWTP is located on the south bank of the lower American River near Sacramento State University, approximately seven miles upstream from its confluence with the Sacramento River (**Exhibit 4**). The EAFWTP is currently rated at a diversion capacity of 200 MGD, with a permitted treatment capacity of 160 MGD (80 MGD for Basins 1 and 2, and 80 MGD for Basins 3 and 4). However, the

EAFWTP operates at reduced capacities as required by environmental and water rights agreements discussed below, as well as due to poor condition of some of its plant facilities (see UWMP **3.3.1**).

As a participant in the Sacramento area's regional Water Forum, the City's American River diversions at the EAFWTP is limited by environmental factors as specified by its Purveyor Specific Agreement (PSA). The City's PSA limits the diversion at the EAFWTP to 50,000 AF during extremely dry years, known as Conference Years (years with projected unimpaired inflow into Folsom Reservoir of 400,000 AF or less during March through November, or 550,000 AF or less for the whole year). During all other years (non-Conference Years), Hodge Flow conditions (flows determined by Judge Richard Hodge in 1987 litigation) limit the diversions from the American River during certain periods of the year based on the observed flow rate of the river, as shown in **Table 17**.

Table 17. Hodge Decision Flow Criteria

Period	American River Hodge Flow Criteria (cfs)(1)	Maximum Diversion Allowed (MGD)
January through February	2,000	77.6
March through May	3,000	77.6
June	3,000	100.2
July through August	1,750	100.2
September	1,750	77.6
October 1st through 14th	1,750	64.6
October 15th through December	2,000	64.6

Source: City UWMP Table 6-10 and Table 6-11

(1) During this table's time period, when the American River flow passing by the EAFWTP intake is less than the Hodge Flow, diversions to the EAFWTP are limited to this table's assigned Maximum Diversion Allowed. When observed flows exceed the Hodge Flow Criteria, the City may divert up to 200 MGD at the EAFWTP.

When the American River flow passing by the EAFWTP is greater than the Hodge Flow Criteria, the City may divert up to 200 MGD at the EAFWTP, the equivalent of approximately 224,000 AF in a year. In comparison, in a hypothetical Hodge Flow Year, where the Hodge Flow condition applies throughout the year, the diversion to EAFWTP is limited to approximately 89,600 AFY.

Groundwater Wells

The City currently has 26 permitted ground water wells in the North American Subbasin and 2 permitted ground water wells in the South American Subbasin, 23 of which are operated on a regular basis to supply municipal water. Three more wells have recently been constructed and will be brought on-line in the future (City UWMP **6.2.2.4**). The total pumping capacity of the wells is about 23 MGD, but the actual pumping capacity is 14 to 20 MGD accounting for some of the wells being off-line at times. As of 2020, the average age of the City's active potable water wells is about 60 years old with the oldest being 76 years old. The City's Groundwater Water Plan (2017) includes recommendations to replace one or two wells every year through 2040 to keep groundwater a reliable part of the City water supply (City UWMP **6.2.2.5**). Well locations are shown on **Exhibit 4**.

Storage Tanks

The City currently has seventeen (17) storage facilities: twelve (12) storage reservoirs are located throughout the City, and five (5) finished water clearwells located at the water treatment plants (two at EAFWTP and three at SRWTP). The cumulative distribution storage reservoir capacity is 49 million gallons (MG). The clearwell reservoirs located at EAFWTP and SRWTP have a combined capacity of approximately 45 MG.

The locations of the twelve storage tanks located throughout the City are shown on **Exhibit 4**.

Pumping Facilities

The City currently operates eighteen (18) high lift service pumps at the SRWTP and EAFWTP and has capacity to add an additional six (6) high lift service pumps at the EAFWTP. The locations of the booster pump facilities are shown on **Exhibit 4**. All of the storage reservoirs have pump stations to deliver water to residents and businesses as water demands vary. The City maintains one additional booster pump station to serve water in a small separated pressure zone in the northeast part of the City.

Distribution and Transmission Pipelines

The City maintains approximately 1,800 miles of transmission and distribution system mains ranging in size from 2 to 72 inches in diameter; with 415 miles of pipeline sizes 12 inches in diameter and larger.

Approximately 70 percent of the City's system consists of 6-inch and 8-inch diameter pipelines. There also exists a recycled water pipeline within the City, with a limited service area. This line is owned by the Sacramento Regional County Sanitation District (Regional San) and delivers recycled water from the Sacramento Regional Wastewater Treatment Plant to the Sacramento Power Authority Cogeneration Facility, as shown on **Exhibit 4** and further discussed in the 2020 UWMP.

Pressure Zones

Two pressure zones exist in the City. High service pumps at each of the treatment plants pump water directly into the distribution system, creating a pressure zone that encompasses the majority of the City. The second pressure zone is a small area in the northeast portion of the City. On average the City maintains approximately 45 pounds per square inch (psi) throughout its system with a minimum service pressure goal of 30 psi.

5.2 Water Supply

The City sources its water from the American River, the Sacramento River, and groundwater wells in its service area. As shown on **Exhibit 5**, the UWS Plan Area is not currently within City Limits but is located within the American River Place of Use. As such, UWS is included in the City's UWMP as part of its 30-year planning horizon (projected retail water use for the year 2050). This is discussed in **4.2.3 Projected Retail Water Use** and **4.3.3 Projected Wholesale Water Use** of the 2020 UWMP.

Surface Water Entitlements

The City has multiple surface water entitlements for water from the American and Sacramento Rivers. The Places of Use for water diverted under the American River permit includes not only the City limits, but also areas adjacent to the City. The City's current authorized Places of Use for water diverted under the Sacramento River permit includes all the land within the City limits, and the UWS Plan Area, which may change over time with annexations. These areas include portions of service areas of several other water purveyors. **Exhibit 5** illustrates the City's current American River Places of Use for these water supply sources.

The amount of water the City may divert from the Sacramento and American Rivers is established based on several factors. This includes provisions contained within State-issued water rights permits, a 1957 legal agreement between the City and the United States Bureau of Reclamation (USBR) known as the Settlement Contract, and a voluntary agreement made through the regional Water Forum in 2000.

A summary of allowed diversions in 5-year increments are shown in **Table 18**.

Table 18. Maximum Annual and Combined Annual Diversion Allowed to the Year 2040

Year	Maximum Diversion[(1)] from Sacramento River, AFY	Maximum Diversion[(1)] from American River, AFY	Maximum Combined Diversion[(1)], AFY
2015	81,800	189,000	252,000
2020	81,800	208,500	278,000
2025	81,800	228,000	304,000
2030	81,800	245,000	326,800
2035	81,800	245,000	326,800
2040	81,800	245,000	326,800

Source: City UWMP Table 6-9

(1) Per Schedule A of the 1957 Water Rights Settlement Contract between USBR and the City, a maximum amount is allowed from the Sacramento River, the American River, and both rivers concurrently.

In addition to the above maximum diversions per the Settlement Contract, the American River Water diversion at the EAFWTP is limited by the Water Forum PSA and by the Hodge Flow Criteria as previously discussed. However, the Maximum Combined Diversion the City is permitted remains the same. The City may divert its remaining American River water right through its existing Sacramento River diversion point, located downstream of the confluence of the American and Sacramento Rivers (see **6.2.3.2**, **7.1.1.3** UWMP).

Groundwater Supply

The City's UWMP includes data on its historical retail groundwater pumping from 2016 through 2020, shown below in **Table 19.**

Table 19. Retail Groundwater Volume Pumped (Acre-Feet)

Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	North American Subbasin	16,723	23,301	22,842	19,443	19,022
Alluvial Basin	South American Subbasin	863	2,619	2,467	1,524	1,407
	Total	17,586	25,920	25,309	20,967	20,429

Source: City UWMP Table 6-3

Currently, the City's wholesale agreements rely primarily on surface water (City UWMP **6.2.2.4**) with the exception of SCWA's Airport and Metro Air Park. The volume of groundwater historically supplied to SCWA is summarized in **Table 20**.

Table 20. Wholesale Groundwater Volume Supplied to SCWA (Acre-Feet)

Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	North American Subbasin	428	427	655	903	712

Source: City UWMP Table 6-4

Table 21 below summarizes the projected groundwater supply for the City based on the planned future groundwater pumping from the North American and South American Subbasins. Pumping from the North American Subbasin will follow a sustainable target pumping rate of 20,591 AF per year, as dedicated to the City by the Sacramento Groundwater Authority (SGA), who manages Sacramento County's portion of the North American Subbasin. From the South American Subbasin, which is managed by the Sacramento Central Groundwater Authority (SCGA), the City plans to gradually increase its annual extractions from a baseline of 4,077 AF to 19,000 AF. Both projections of pumping are subject to the Groundwater Sustainability Plan (GSP) developed for each subbasin as required by the Sustainable Groundwater Management Act (SGMA). A summary of the SGMA and how it relates to UWS is provided in **Section 7.0**.

Table 21. Groundwater Supplies – Projected

Water Purveyor	Projected Water Supply Volume (AFY)[1]				
	2025	2030	2035	2040	2045
City of Sacramento	27,083	31,107	35,131	39,155	39,155

Source: City UWMP Table 6-5

(1) Based on sustainable target pumping of 20,591 AFY from the North American Subbasin and up to approximately 19,000 AFY from the South American Subbasin.

As previously discussed, it is anticipated that a make-up well will be required to maintain the desired water surface elevation within the Upper Westside canal stretching from Street 1 to Street 7 through the proposed town center. It is anticipated that a 1,500 gallon per minute well will provide make-up water in the canal. Further geotechnical investigation with design will be required to determine loss rates and sizing of the proposed well.

Water Supply vs. Demand

For the Year 2050, assuming a typical rain year, projected retail demands and projected wholesale demands were summed to find the total projected demands. Subtracting the total project demand from the sum of the maximum combined surface water diversion and groundwater supply gives a net unused water, or surplus, for the City. This is shown in **Table 22**.

Table 22. Projected Unused Water for the Year 2050

Retail Demands[1] (AF)	Wholesale Demands[2] (AF)	Total Demands (AF)	Maximum Combined Diversion[3] (AF)	Groundwater Supply[4] (AF)	Net Unused Water (AF) (Surplus)
155,219	97,060	252,279	326,800	22,400	96,921

(1) Source: City UWMP Table 4-4

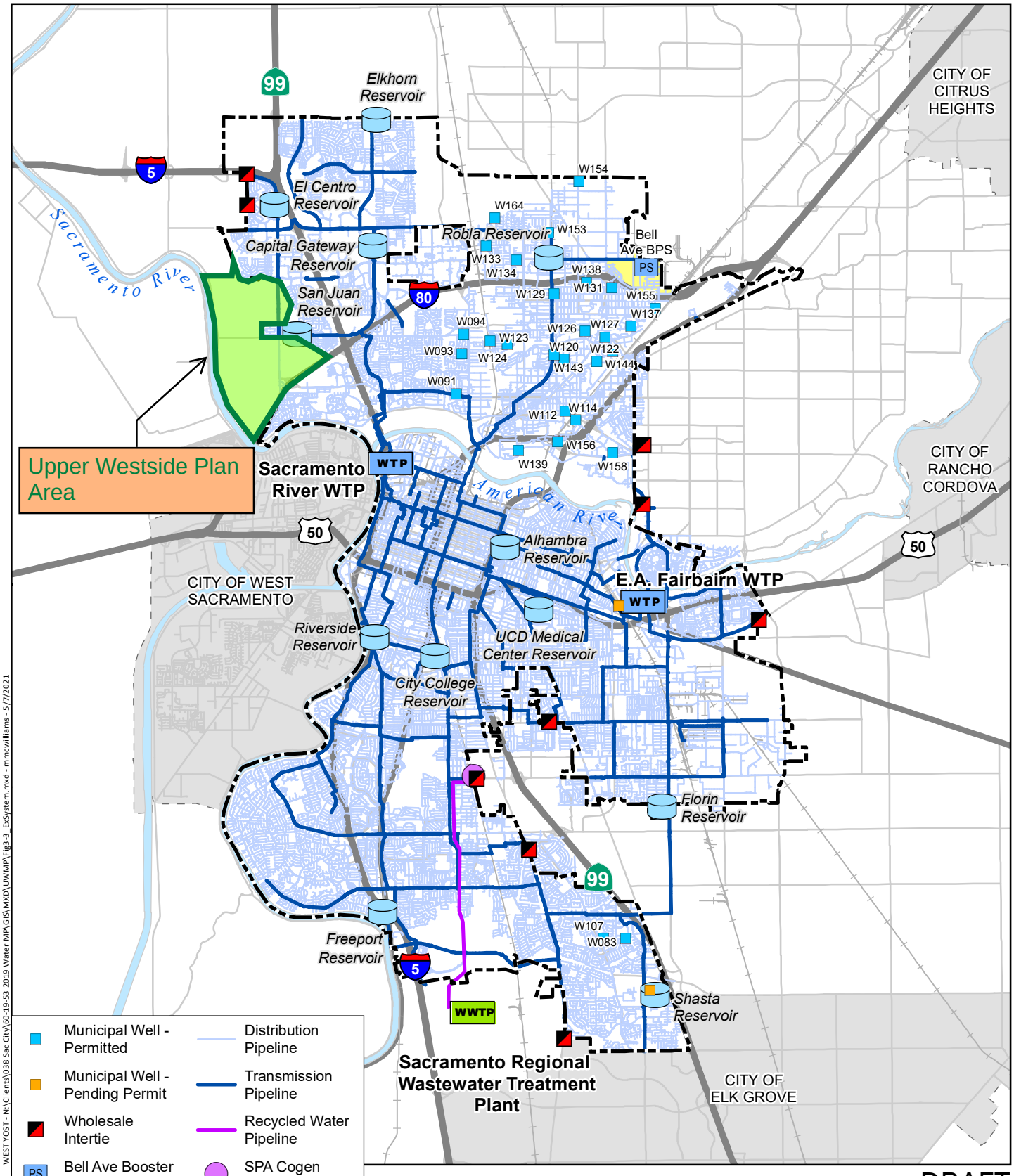
(2) Source: City UWMP Table 4-8, assume wholesale projected water use is equal to the maximum estimate in 2040, 2045, and 2050.

(3) Source: City UWMP Table 6-9

(4) Source: City UWMP Table 7-7, assume same as 2040-2045. Table 6-5 shows a projected groundwater supply of 39,155 AF. However, the UWMP's water service reliability analysis (Chapter 7) uses 22,400 AF.

Note that during Conference Years and during Hodge Flow conditions, American River water diversions at EAFWTP are limited. However, the remaining American River entitlements may be diverted at the

SRWTP downstream of the confluence. The City expects its Single Dry Year and Multiple Dry Year supplies to be adequate to meet projected demands (see UWMP, **7.1.3.2** and **7.1.3.3**). The UWMP also states that, "*As articulated in Section 7.1.3.2, the City has elected in the past, and may in the future, to engage in more aggressive demand management measures or reoperation of the water system to benefit broader statewide conditions during drier periods irrespective of legal entitlements to supply*."



Municipal Well - Permitted
Municipal Well - Pending Permit
Wholesale Intertie
Bell Ave Booster Pump Station
Storage Facility
Water Treatment Plant
Wastewater Treatment Plant
Distribution Pipeline
Transmission Pipeline
Recycled Water Pipeline
SPA Cogen Facility
Main Avenue Pressure Zone
City of Sacramento Limits

N

0 1.25 2.5
Miles

Notes:
1. Municipal wells with pending permit includes one well at the EAFWTP and two wells at the Shasta Storage facility.

WEST YOST - N:\Clients\038 Sac City\60-19-53 2019 Water MP\GIS\MXD\UWMP\Fig3-3_ExSystem.mxd - mmcwilliams - 5/7/2021

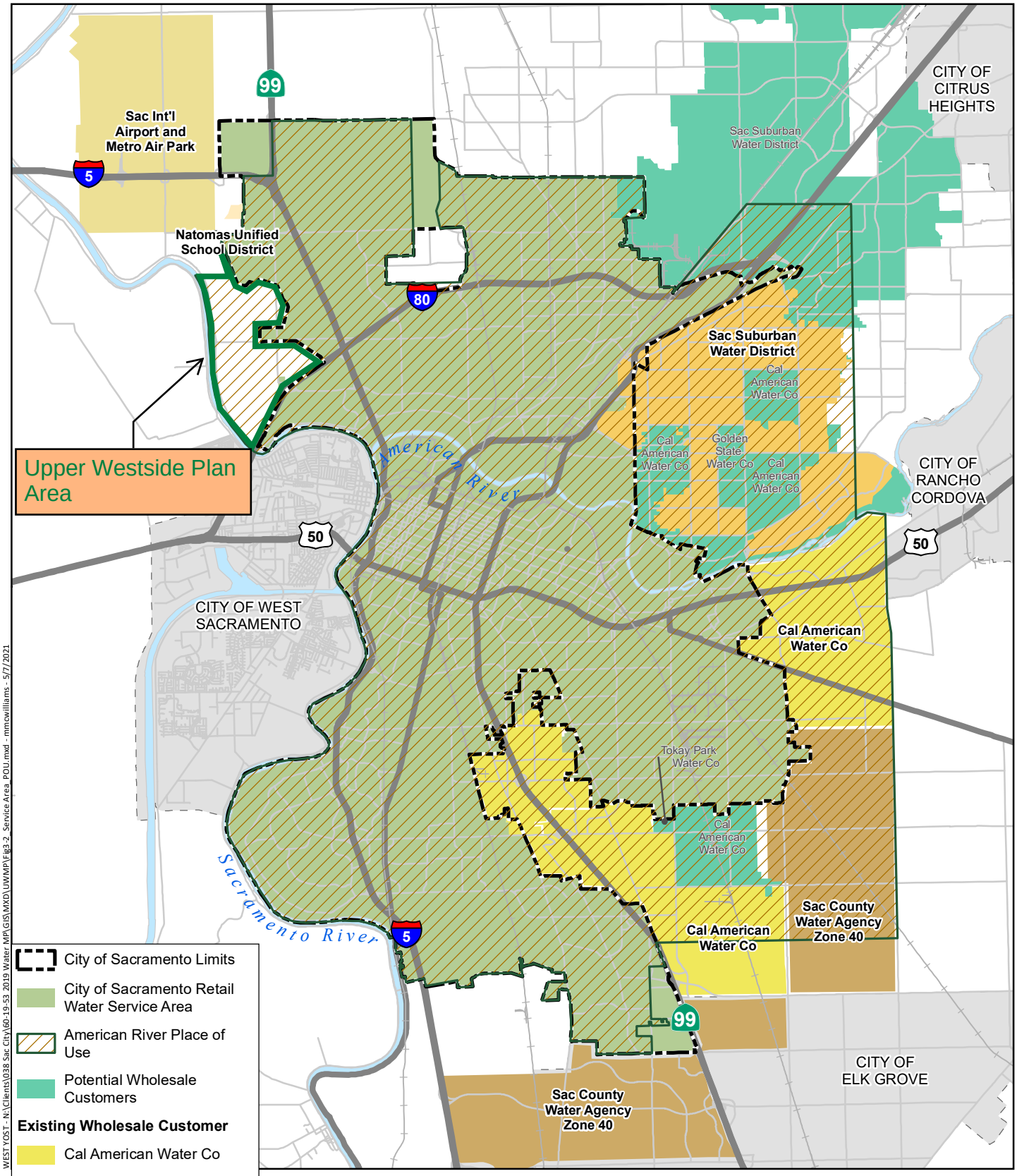
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Exhibit 4

Water Treatment and Distribution System

City of Sacramento
2020 UWMP

WEST YOST



WEST YOST - N:\Clients\038 Sac City\60-19-53 2019 Water MP\GIS\MXD\UWMP\Fig3-2_Service Area_POU.mxd - mmcwilliams - 5/7/2021

DRAFT

Exhibit 5

Service Area, Limits, and Places of Use

City of Sacramento
2020 UWMP

WEST YOST

6.0 WATER SUPPLY SUFFICIENCY ANALYSIS

The following is an excerpt from Chapter 8 of the 2020 Urban Water Management Plan (May 2021 Draft), discussing the City's Water Shortage Contingency Plan:

> *Chapters 6 and 7 of the City's 2020 UWMP discuss the City's water supply sources and reliability, respectively. Findings show that the City will have enough supply with its current water supply sources to meet increased retail and wholesale demands for both a near-term (within the next 5 years) and long-term (within the next 20 years) timeframe.*
>
> *Statewide water supply conditions, changes in groundwater levels, subsidence, and actions by surrounding agencies may impact the City's available water supply. For the City, a water shortage condition occurs when the supply of potable water available cannot meet ordinary water demands for human consumption, sanitation, fire protection, and other beneficial uses. The City may be able to foresee its water shortage condition in some cases; however, in other cases, the water shortage may be caused by an unforeseen sudden or emergency event. In general, the City's water supply conditions may be affected by the following issues:*
>
> - *Intake structure issues on the Sacramento or American Rivers*
> - *Diversion limitations from Sacramento or American Rivers*
> - *Operational and/or water quality issues at the City's SRWTP or EAFWTP*
> - *Well production reduction and/or water quality issues*
>
> *Annually, the City determines the expected purchased water and surface water supplies availability for foreseeable water shortages. In other cases, the City may experience unforeseen water shortage when catastrophic interruption of water supplies occurs due to regional power outage, an earthquake, or other potential emergency events.*

> *In future years, the City will conduct an annual water supply and demand assessment in accordance with its Water Shortage Contingency Plan (WSCP). The analysis associated with this WSCP was developed in the context of the City's water supply sources and reliability.*

Per above, in June 2022, the City of Sacramento prepared its first Annual Water Supply and Demand Assessment and submitted an Annual Water Shortage Assessment Report (Annual Shortage Report) to the California Department of Water Resources (DWR). Per the Annual Assessment, for the period of July 1, 2022, to June 30, 2023, the City projects an annual surplus of 173%.

7.0 SUSTAINABLE GROUNDWATER MANAGEMENT ACT

The City of Sacramento relies on surface water and groundwater. If groundwater is pursued for UWS, the Project will need to comply with the Sustainable Groundwater Management Act (SGMA).

7.1 Sustainable Groundwater Management Act

The following excerpt from the City's UWMP (Chapter 6, Section 6.2.2.2.1) describes the SGMA and its role.

> *The SGMA was passed in September 2014 as a three-bill legislative package composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley). The legislation provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention when necessary to protect the resource. The legislation lays out a process and a timeline for local authorities to achieve sustainable management of groundwater basins. It also provides tools, authorities, and deadlines to take the necessary steps to achieve the goal.*
>
> *SGMA applies to basins or subbasins designated by DWR as high- or medium-priority basins, based on a statewide ranking that uses criteria including population and extent of irrigated agriculture dependent on groundwater… 94 of California's 515 groundwater basins and subbasins have been identified as high-priority basins.*

In 2019, the state DWR released initial findings identifying 94 of its 515 groundwater basins as high- or medium-priority. Additional basins have since been identified as high-priority, including the North American Subbasin, where UWS is located (see **Table 21** below). Newly identified basins are required to form a GSA within two years of the basin's priority being finalized and must submit a GSP within five years of the same date. Once the GSP is in place, local agencies must fully implement the plan within 20 years.

Table 23. Groundwater Basin Prioritization for SGMA

Rank	Basin Number	Basin Name	Overall Basin Ranking Score	Overall Basin Priority
24	5-21.64	Sacramento Valley / North American Subbasin	23	High
29	5-21.65	Sacramento Valley / South American Subbasin	22	High

7.2 Management of the North American Subbasin

The North American Subbasin is on track to complying with SGMA requirements. The following excerpt from the City's UWMP (Chapter 6, Section **6.2.2.2.2**) describes how it has satisfied the first steps of SGMA implementation.

> *Local agencies have invested substantial time and resources to participate in the following regional planning activities affecting the management of groundwater resources in the North American Subbasin:*
>
> - *Sacramento Groundwater Authority (SGA)*
> - *Sacramento Water Forum*
> - *American River Basin Cooperating Agencies Regional Water Master Plan*
> - *Sacramento Metropolitan Water Authority (SMWA)*
> - *Regional Water Authority (RWA) (successor to the SMWA)*
>
> *The SGA was formed as a joint powers authority in 1998 to collectively manage Sacramento County's portion of the North American Subbasin. SGA is governed by a joint powers agreement between the City, the County, City of Folsom, and the City of Citrus Heights, who each have police power to manage and protect the underlying groundwater basin. Appointed representatives of fourteen local water purveyors [and] a representative from both the agricultural and private pumpers serve as the Board of Directors to the SGA. As of 2020, the members of the SGA collectively provide high quality, reliable water supply to over 500,000 people, in addition to irrigation supply.*

On December 11, 2014, the SGA adopted the SGA Groundwater Management Plan (GMP) to help establish a framework for maintaining a sustainable groundwater resource for the various purveyors overlying the groundwater basin within Sacramento County, north of the American River. A copy of the SGA GMP (December 2014) can be found on the SGA website (GMP SGA 2014 Final).

On October 20, 2015, the SGA notified DWR that it would be the GSA for the North American Subbasin and will undertake the development of the GSP for the subbasin. Since that time, SGA has been working with the other GSAs that have formed over the remaining portions of the North American Subbasin in the development of a single GSP for the subbasin.

Ultimately, five GSAs collaborated on the GSP for the North American subbasin: SGA GSA, Reclamation District 1001 GSA, South Sutter Water District GSA, Sutter County GSA, and West Placer County GSA. The North American Subbasin Groundwater Sustainability Plan was finalized in December 2021 and adopted by each GSA. The GSP will be assessed every five years by the GSAs as it is implemented over 20 years.

7.3 Overdraft Conditions

The State of California characterizes its groundwater basins in its publication, DWR Bulletin 118. In its descriptions, neither the North American Subbasin nor the South American Subbasin are in, or projected to be, in overdraft from current management practices.

8.0 CAPITAL IMPROVEMENT PROGRAM AND FEE DEVELOPMENT

This section provides the basis for a Capital Improvement Program to support the proposed water infrastructure for UWS. Economic Planning Systems is developing a fee program for the Plan Area. Project cost analysis was performed for the two major water infrastructures studied. In *Scenario I*, SCWA is assumed to own the proposed public water system for UWS. *Scenario II* includes the infrastructure needed if the project were to be incorporated into the City of Sacramento's water system.

8.1 Water System Projects and Costs

Presented below are planning-level cost estimates for each phase of the development, as well as a sum for buildout. The summary costs contain contingencies, soft costs, and land acquisition costs. A placeholder of $26,060,000 is given for the Tank Site, including a booster pump station and land acquisition. Further modeling is needed with the City system to determine the required storage for UWS, and timing. Costs for the booster pump station will also vary based on final design, and a more formal design report is anticipated prior to these facilities being constructed.

Phase 1 costs are presented with water transmission and water distribution separated out for fee development. Other phases are shown with the combined cost of transmission and distribution facilities.

Segments correspond to roads as follows:

- Segment A: Bryte Bend Road
- Segment B: El Centro Road
- Segment C: Radio Road
- Segment D: San Juan Road
- Segment E: Farm Road
- Segment F: West El Camino
- Segment G: Street 2

Exhibits 6 through **15** correspond to the estimates presented below. Note that while all modeled pipes are shown in the Exhibits, only those within backbone roads (as labeled with Segment names) included in the cost estimate.

Scenario I (SCWA retail) - Phase 1 Projects

Estimated Cost of Water Transmission: $28,580,000

For detailed cost estimates, see **Appendix 4**. For segment locations, see **Exhibit 6**.

- Segment B-1-T: El Centro Road - Approximately 5,700 LF between San Juan Road and Street 2.
- Segment G-1-T: Street 2 - Approximately 2,700 LF between Bryte Bend Road and El Centro Road.
- Include a connection to existing main in San Juan Road with water storage tank and booster pump station. The tank has been included in the initial phase even though hydraulically it is not required for Phase 1. Timing will be subject to Agency requirements and therefore to be conservative is included as a Phase 1 cost.

Estimated Cost of Water Distribution: $3,220,000

For detailed cost estimates, see **Appendix 5**. For segment locations, see **Exhibit 6**.

- Segment A-1-D: Bryte Bend Road – Approximately 4,250 LF south of West El Camino.
- Segment B-1-D: El Centro Road - Approximately 5,200 LF between San Juan Road and Street 2.
- Segment E-1-D: Farm Road - Approximately 1,300 LF between Street C and El Centro Road.
- Segment G-1-D: Street 2 - Approximately 2,700 LF between Bryte Bend Road and El Centro Road.

Scenario I (SCWA retail) – Phase 2 Projects

Estimated Total Cost: $3,620,000

For detailed cost estimates, see **Appendix 6 & 7**. For segment locations, see **Exhibit 7**.

- Segment A-2: Bryte Bend Road – Approximately 3,950 LF between San Juan Road and West El Camino.
- Segment D-2: San Juan Road – Approximately 4,000 LF west of El Centro Road, including 300 LF south down El Centro Road to connect to Phase 1.
- Segment F-2: West El Camino – Approximately 550 LF west of El Centro Road.

Scenario I (SCWA retail) - Phase 3 Projects

Estimated Total Cost: $3,810,000

For detailed cost estimates, see **Appendix 8 & 9**. For segment locations, see **Exhibit 8**.

- Segment A-3: Bryte Bend Road - Approximately 2,730 LF between Radio Road and San Juan Road.
- Segment B-3: El Centro Road - Approximately 3,200 LF between Radio Road and 300 LF past San Juan Road.
- Segment C-3: Radio Road - Approximately 2,350 LF between Bryte Bend Road and El Centro Road.
- Segment D-3: San Juan Road - Approximately 2,350 LF between Bryte Bend Road and El Centro Road.
- Segment E-3: Farm Road - Approximately 2,700 LF between El Centro Road and Street H.
- Segment F-3: West El Camino - Approximately 790 LF

Scenario I (SCWA retail) - Phase 4 Projects

Estimated Total Cost: $1,280,000

For detailed cost estimates, see **Appendix 9 & 10**. For segment locations, see **Exhibit 9**.

- Segment B-4: El Centro Road - Approximately 2,600 LF north of Radio Road.
- Segment E-4: Farm Road - Approximately 1,370 LF between Bryte Bend Road and Street C.
- Segment F-4: West El Camino - Approximately 1,370 LF between Bryte Bend Road and Street C.

Scenario I (SCWA retail) - All Phases

Estimated Total Cost: $40,510,000

For full buildout, see **Exhibit 10.**

Scenario II (DOU retail) - Phase 1 Projects

Estimated Total Cost: $2,250,000

For detailed cost estimates, see **Appendix 11**. For segment locations, see **Exhibit 11**.

- Segment A-1-D: Bryte Bend Road – Approximately 4,250 LF south of West El Camino.
- Segment B-1-D: El Centro Road - Approximately 200 LF between existing water main and Street 2.
- Segment E-1-D: Farm Road - Approximately 1,300 LF between Street C and El Centro Road.
- Segment G-1-D: Street 2 - Approximately 2,700 LF between Bryte Bend Road and El Centro Road.
- Includes offsite work – Approximately 350 across Interstate 80, near south end of Plan Area.

Scenario II (DOU retail) - Phase 2 Projects

Estimated Total Cost: $3,760,000

For detailed cost estimates, see **Appendix 12 & 13**. For segment locations, see **Exhibit 12**.

- Segment A-2: Bryte Bend Road - Approximately 3,950 LF between San Juan Road and West El Camino.

- Segment D-2: San Juan Road - Approximately 4,150 LF between the Tank Site and the western plan boundary

- Segment F-2: West El Camino - Approximately 550 LF west of El Centro Road.

Scenario II (DOU retail) - Phase 3 Projects

Estimated Total Cost: $2,300,000

For detailed cost estimates, see **Appendix 14**. For segment locations, see **Exhibit 13**.

- Segment A-3: Bryte Bend Road - Approximately 2,730 LF between Radio Road and San Juan Road.

- Segment B-3: El Centro Road - Approximately 1,360 LF between Radio Road and Alcantar Circle.

- Segment C-3: Radio Road - Approximately 2,350 LF between Bryte Bend Road and El Centro Road.

- Segment D-3: San Juan Road - Approximately 700 LF between Bryte Bend Road and El Centro Road.

- Segment E-3: Farm Road - Approximately 2,715 LF between El Centro Road and Street H.

Scenario II (DOU retail) – Phase 4 Projects

Estimated Total Cost: $640,000

For detailed cost estimates, see **Appendix 15**. For segment locations, see **Exhibit 14**.

- Segment E-4: Farm Road – Approximately 1,330 LF between Bryte Bend Road and Street C.

- Segment F-4: West El Camino – Approximately 1,365 LF between Bryte Bend Road and Street C.

Scenario II (DOU retail) - All Phases

Estimated Total Cost: $8,950,000

For full buildout, see **Exhibit 15.**

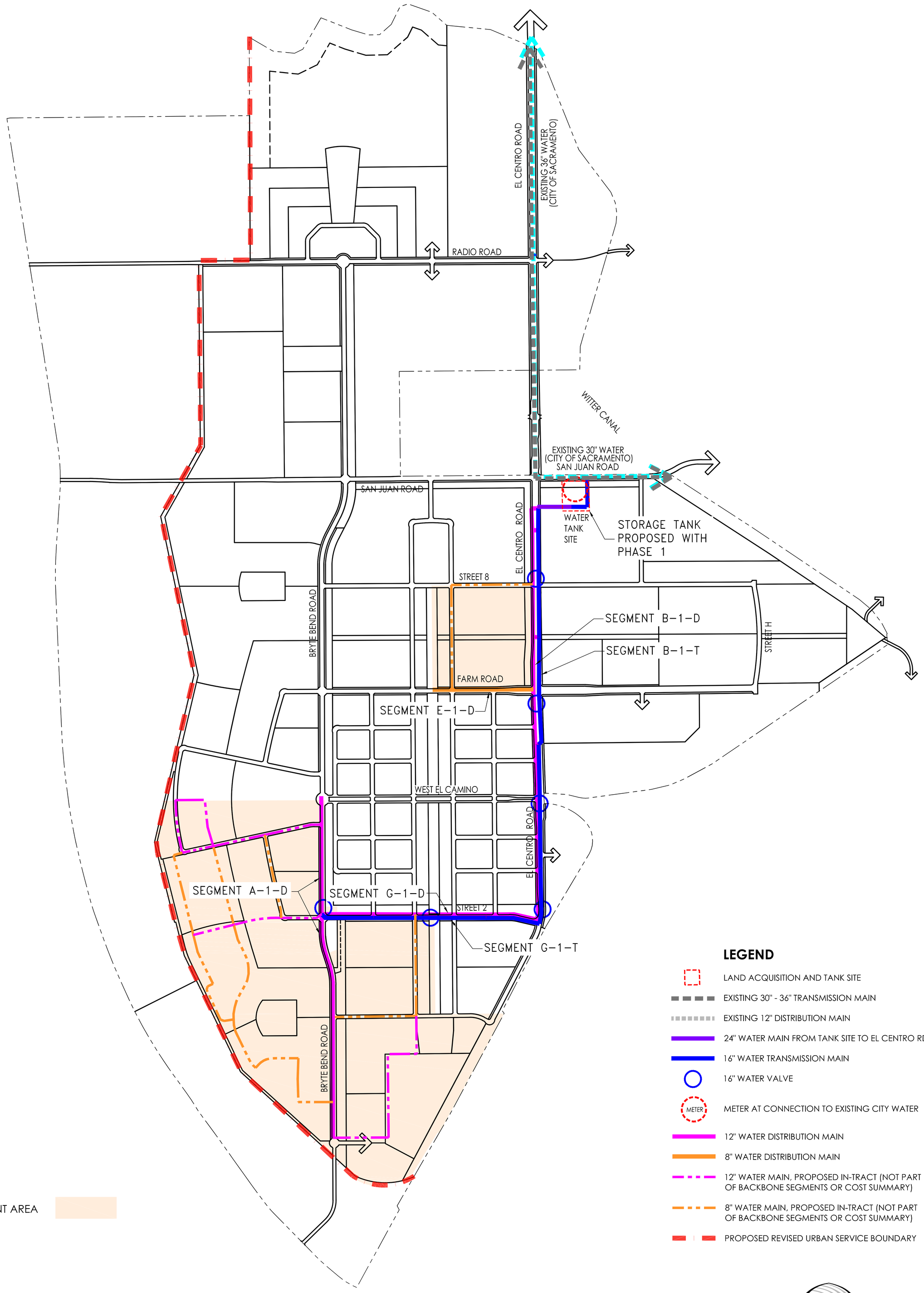
EXHIBIT 6

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 1

UPPER WESTSIDE - SCENARIO I

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



CONCEPTUAL PHASES

PHASE 1 DEVELOPMENT AREA

NORTH

0 800 400 1600

LEGEND

- LAND ACQUISITION AND TANK SITE
- EXISTING 30" - 36" TRANSMISSION MAIN
- EXISTING 12" DISTRIBUTION MAIN
- 24" WATER MAIN FROM TANK SITE TO EL CENTRO RD
- 16" WATER TRANSMISSION MAIN
- 16" WATER VALVE
- METER — METER AT CONNECTION TO EXISTING CITY WATER
- 12" WATER DISTRIBUTION MAIN
- 8" WATER DISTRIBUTION MAIN
- 12" WATER MAIN, PROPOSED IN-TRACT (NOT PART OF BACKBONE SEGMENTS OR COST SUMMARY)
- 8" WATER MAIN, PROPOSED IN-TRACT (NOT PART OF BACKBONE SEGMENTS OR COST SUMMARY)
- PROPOSED REVISED URBAN SERVICE BOUNDARY

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3741 Douglas Blvd., Ste. 150 Tel 916.341.7760
Roseville, CA 95661 Fax 916.341.7767

CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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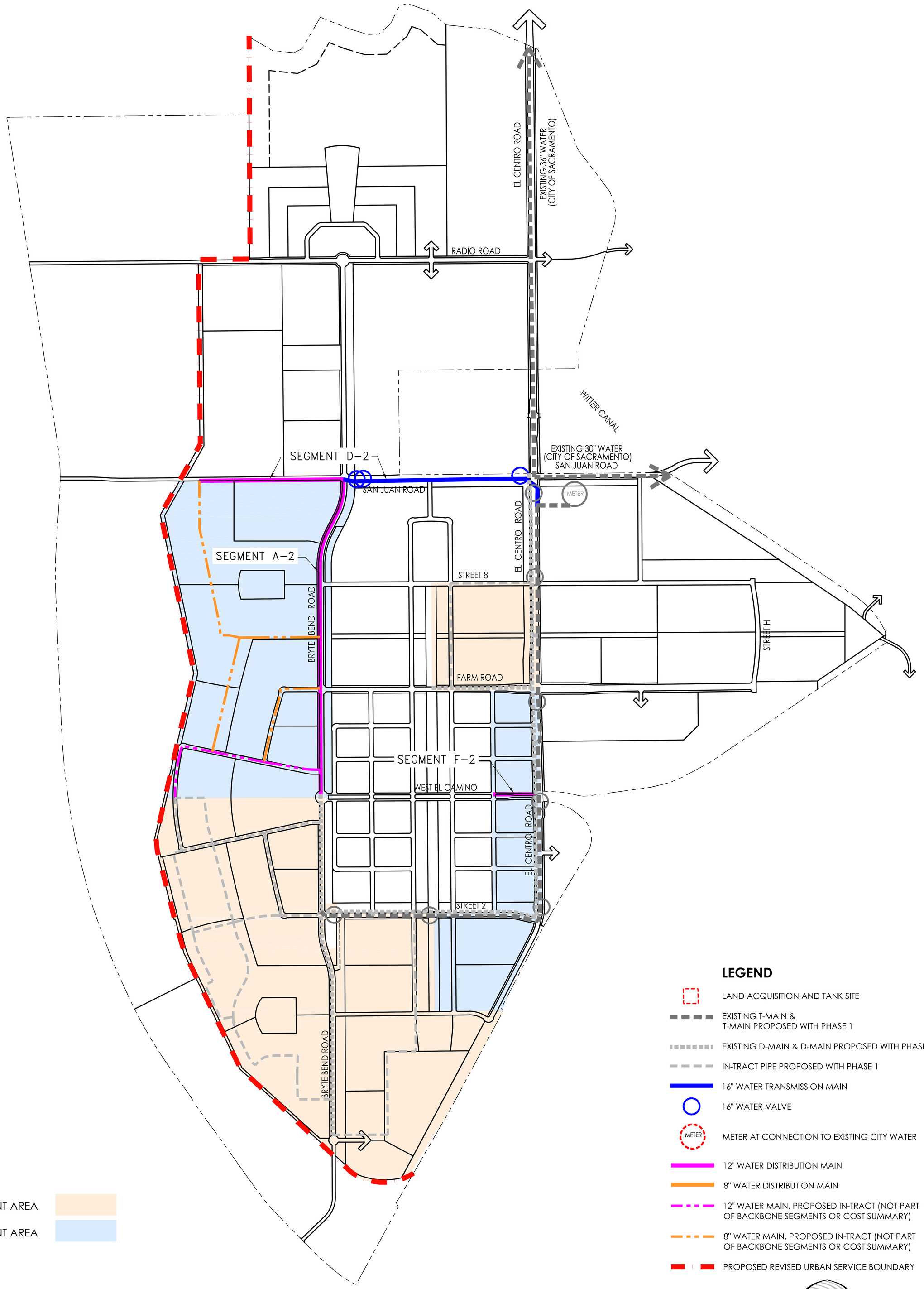
EXHIBIT 7

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 2

UPPER WESTSIDE - SCENARIO I

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



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CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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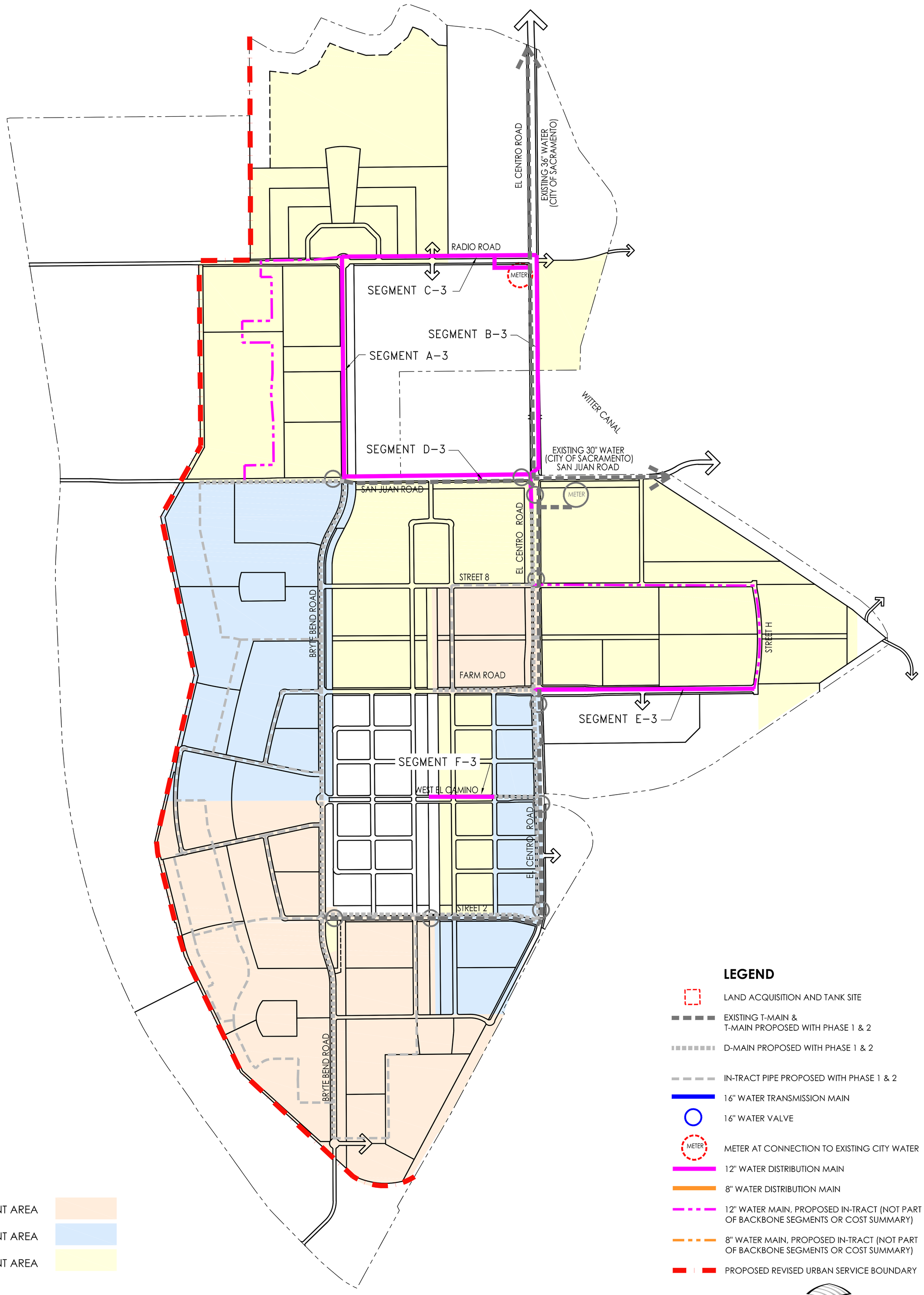
EXHIBIT 8

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 3

UPPER WESTSIDE - SCENARIO I

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



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CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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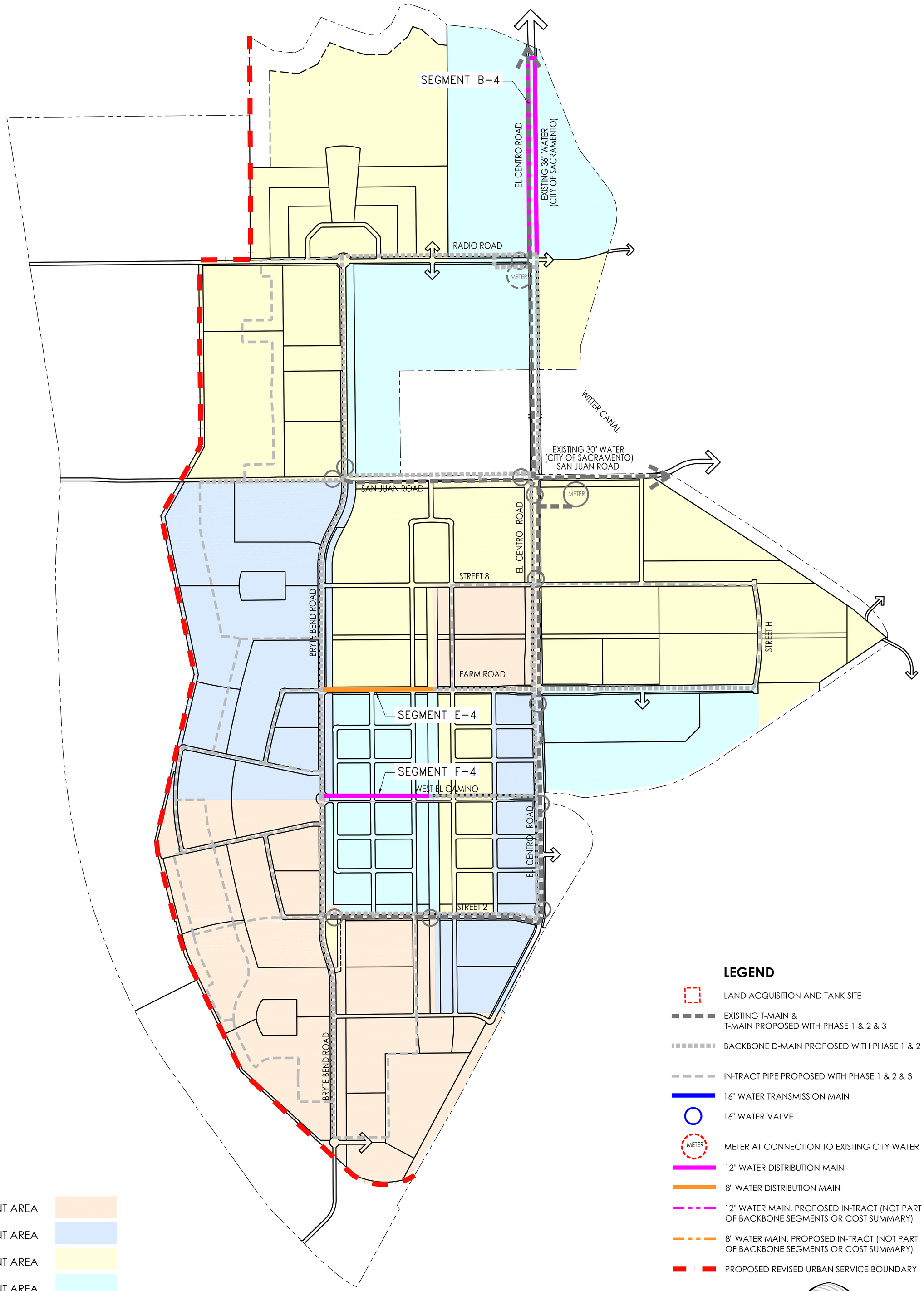
EXHIBIT 9

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 4

UPPER WESTSIDE - SCENARIO I

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



LEGEND

- LAND ACQUISITION AND TANK SITE
- EXISTING T-MAIN & T-MAIN PROPOSED WITH PHASE 1 & 2 & 3
- BACKBONE D-MAIN PROPOSED WITH PHASE 1 & 2 & 3
- IN-TRACT PIPE PROPOSED WITH PHASE 1 & 2 & 3
- 16" WATER TRANSMISSION MAIN
- 16" WATER VALVE
- METER AT CONNECTION TO EXISTING CITY WATER
- 12" WATER DISTRIBUTION MAIN
- 8" WATER DISTRIBUTION MAIN
- 12" WATER MAIN, PROPOSED IN-TRACT (NOT PART OF BACKBONE SEGMENTS OR COST SUMMARY)
- 8" WATER MAIN, PROPOSED IN-TRACT (NOT PART OF BACKBONE SEGMENTS OR COST SUMMARY)
- PROPOSED REVISED URBAN SERVICE BOUNDARY

CONCEPTUAL PHASES

- PHASE 1 DEVELOPMENT AREA
- PHASE 2 DEVELOPMENT AREA
- PHASE 3 DEVELOPMENT AREA
- PHASE 4 DEVELOPMENT AREA

NORTH

0 400 800 1600

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Fax 916.341.7767

CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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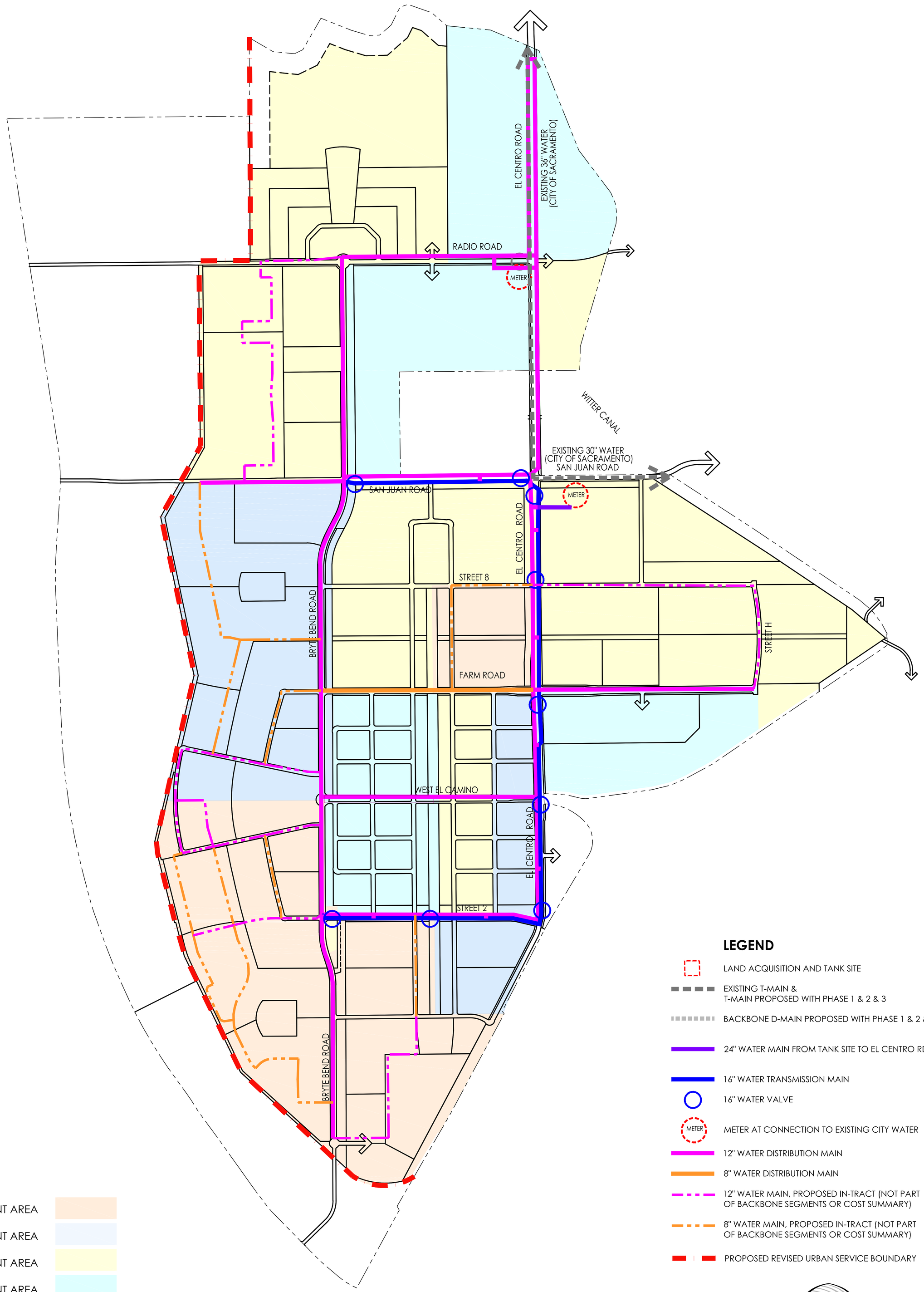
EXHIBIT 10

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - BUILDOUT

UPPER WESTSIDE - SCENARIO I

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



CONCEPTUAL PHASES

- PHASE 1 DEVELOPMENT AREA
- PHASE 2 DEVELOPMENT AREA
- PHASE 3 DEVELOPMENT AREA
- PHASE 4 DEVELOPMENT AREA

NORTH

0 400 800 1600

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CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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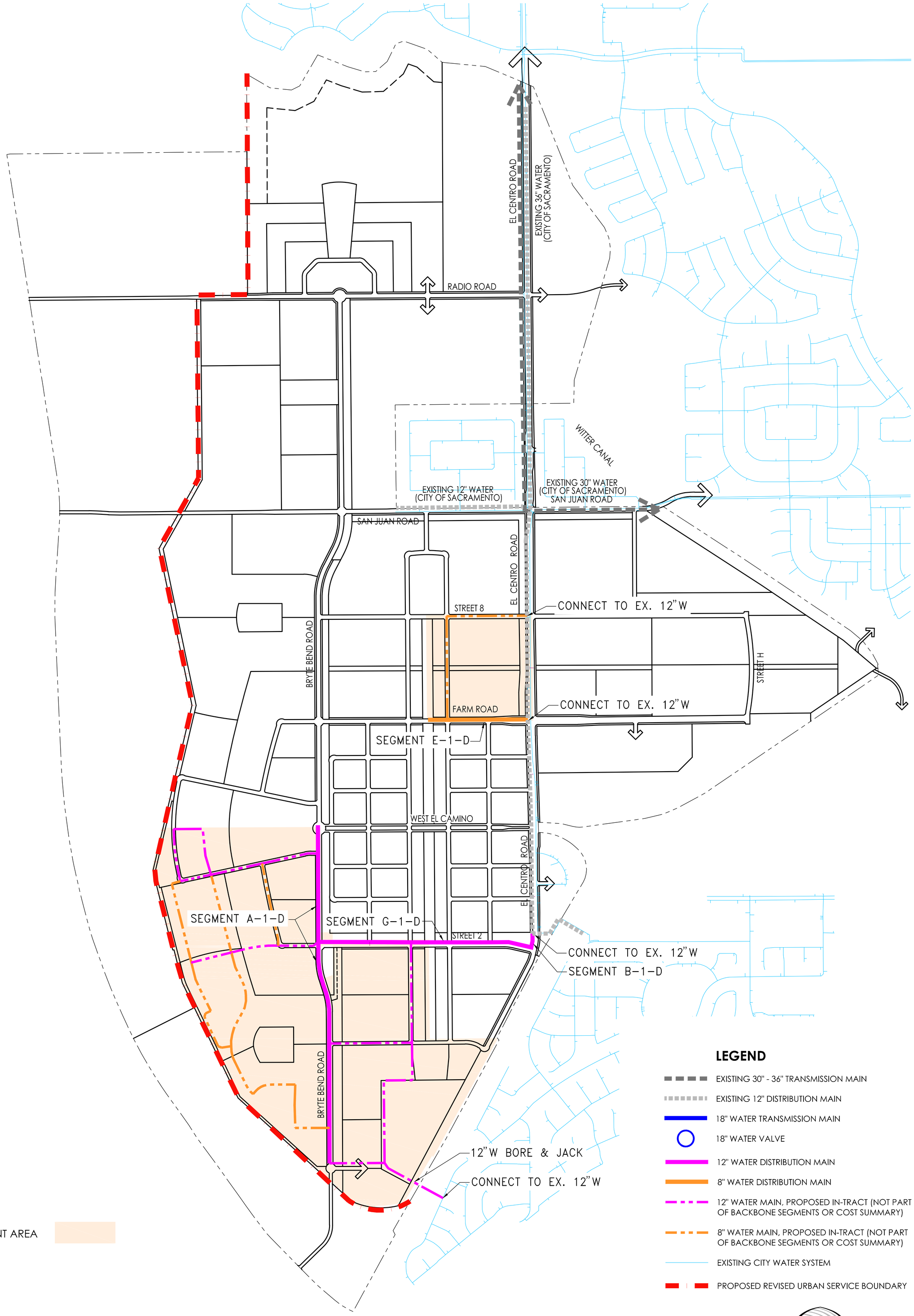
EXHIBIT 11

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 1

UPPER WESTSIDE - SCENARIO II

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



CONCEPTUAL PHASES

PHASE 1 DEVELOPMENT AREA

NORTH

0 400 800 1600

LEGEND

- EXISTING 30" - 36" TRANSMISSION MAIN
- EXISTING 12" DISTRIBUTION MAIN
- 18" WATER TRANSMISSION MAIN
- 18" WATER VALVE
- 12" WATER DISTRIBUTION MAIN
- 8" WATER DISTRIBUTION MAIN
- 12" WATER MAIN, PROPOSED IN-TRACT (NOT PART OF BACKBONE SEGMENTS OR COST SUMMARY)
- 8" WATER MAIN, PROPOSED IN-TRACT (NOT PART OF BACKBONE SEGMENTS OR COST SUMMARY)
- EXISTING CITY WATER SYSTEM
- PROPOSED REVISED URBAN SERVICE BOUNDARY

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Roseville, CA 95661 Fax 916.341.7767

CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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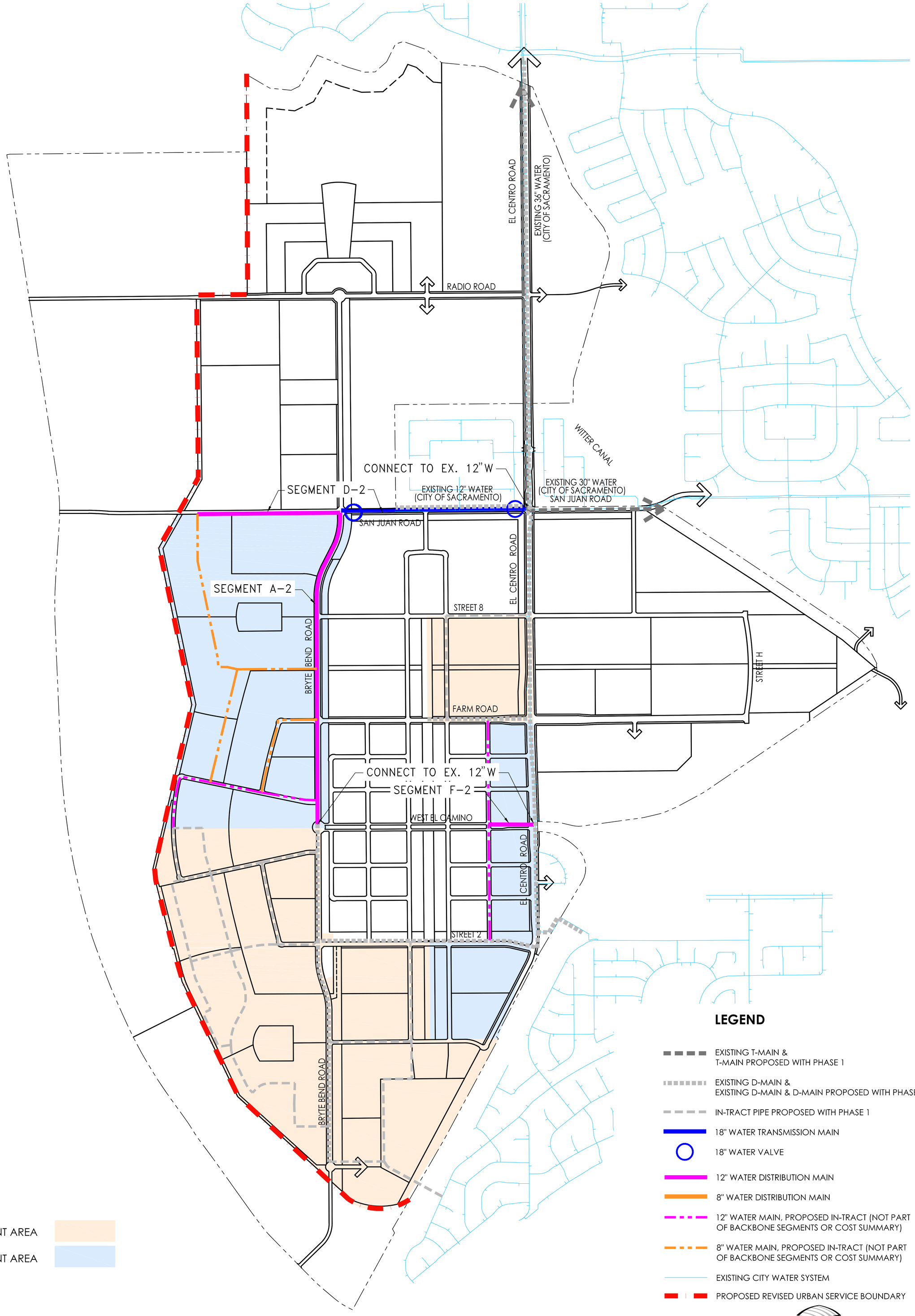
EXHIBIT 12

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 2

UPPER WESTSIDE - SCENARIO II

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



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CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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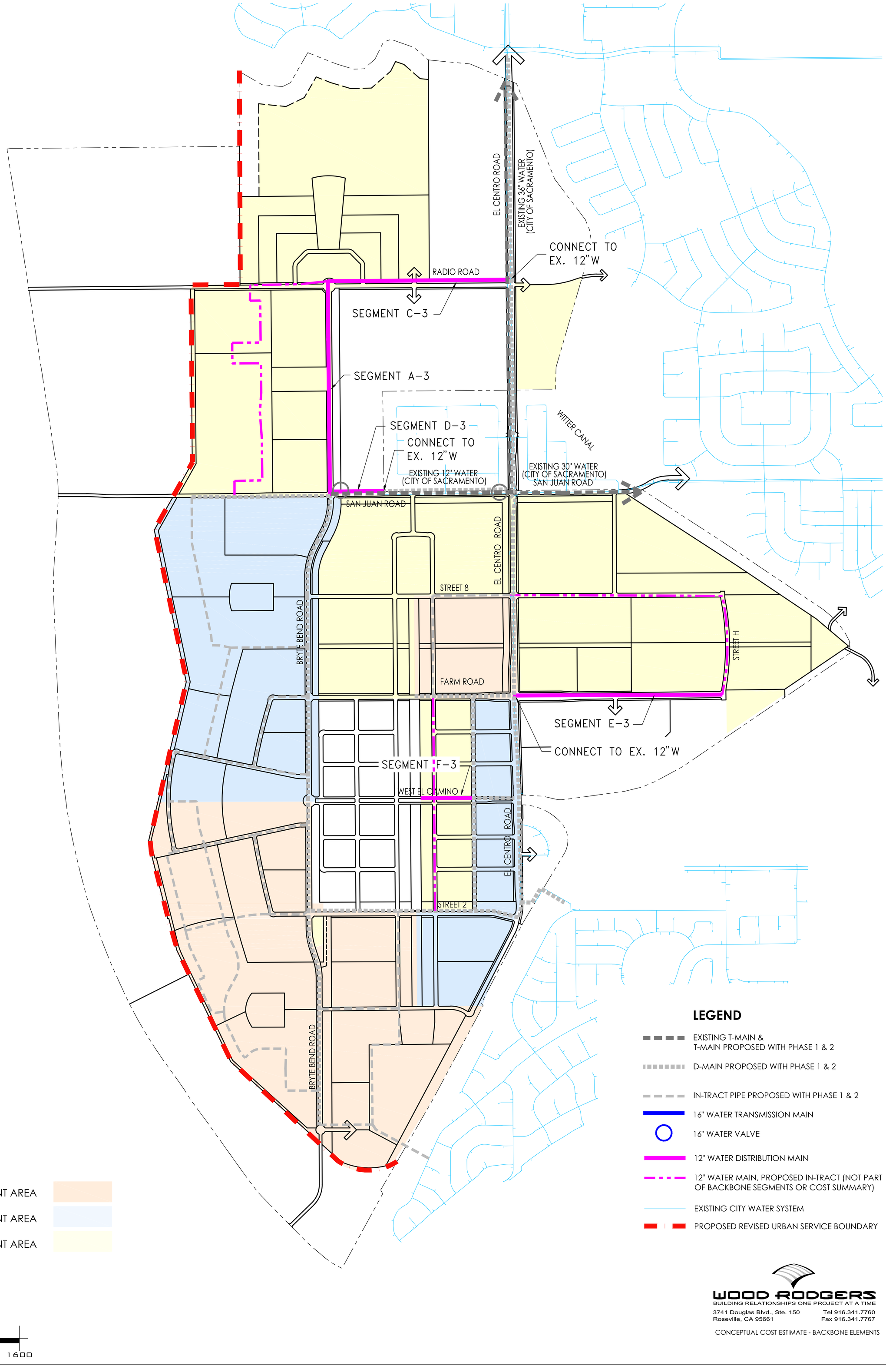
EXHIBIT 13

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 3

UPPER WESTSIDE - SCENARIO II

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



CONCEPTUAL PHASES

PHASE 1 DEVELOPMENT AREA

PHASE 2 DEVELOPMENT AREA

PHASE 3 DEVELOPMENT AREA

LEGEND

- EXISTING T-MAIN & T-MAIN PROPOSED WITH PHASE 1 & 2
- D-MAIN PROPOSED WITH PHASE 1 & 2
- IN-TRACT PIPE PROPOSED WITH PHASE 1 & 2
- 16" WATER TRANSMISSION MAIN
- 16" WATER VALVE
- 12" WATER DISTRIBUTION MAIN
- 12" WATER MAIN, PROPOSED IN-TRACT (NOT PART OF BACKBONE SEGMENTS OR COST SUMMARY)
- EXISTING CITY WATER SYSTEM
- PROPOSED REVISED URBAN SERVICE BOUNDARY

NORTH

0 400 800 1600

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CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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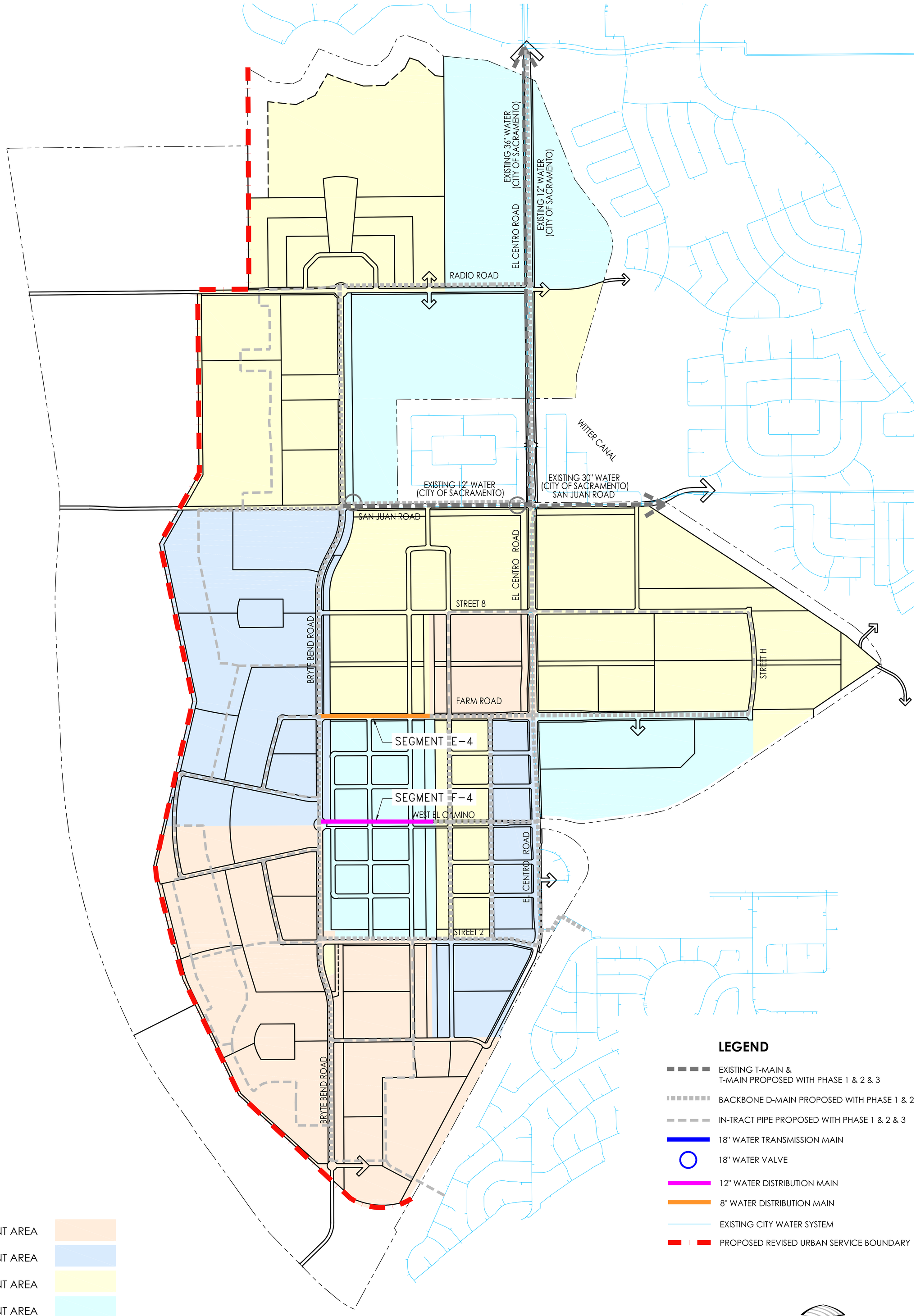
EXHIBIT 14

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - PHASE 4

UPPER WESTSIDE - SCENARIO II

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



CONCEPTUAL PHASES

- PHASE 1 DEVELOPMENT AREA
- PHASE 2 DEVELOPMENT AREA
- PHASE 3 DEVELOPMENT AREA
- PHASE 4 DEVELOPMENT AREA

NORTH

0 800 400 1600

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CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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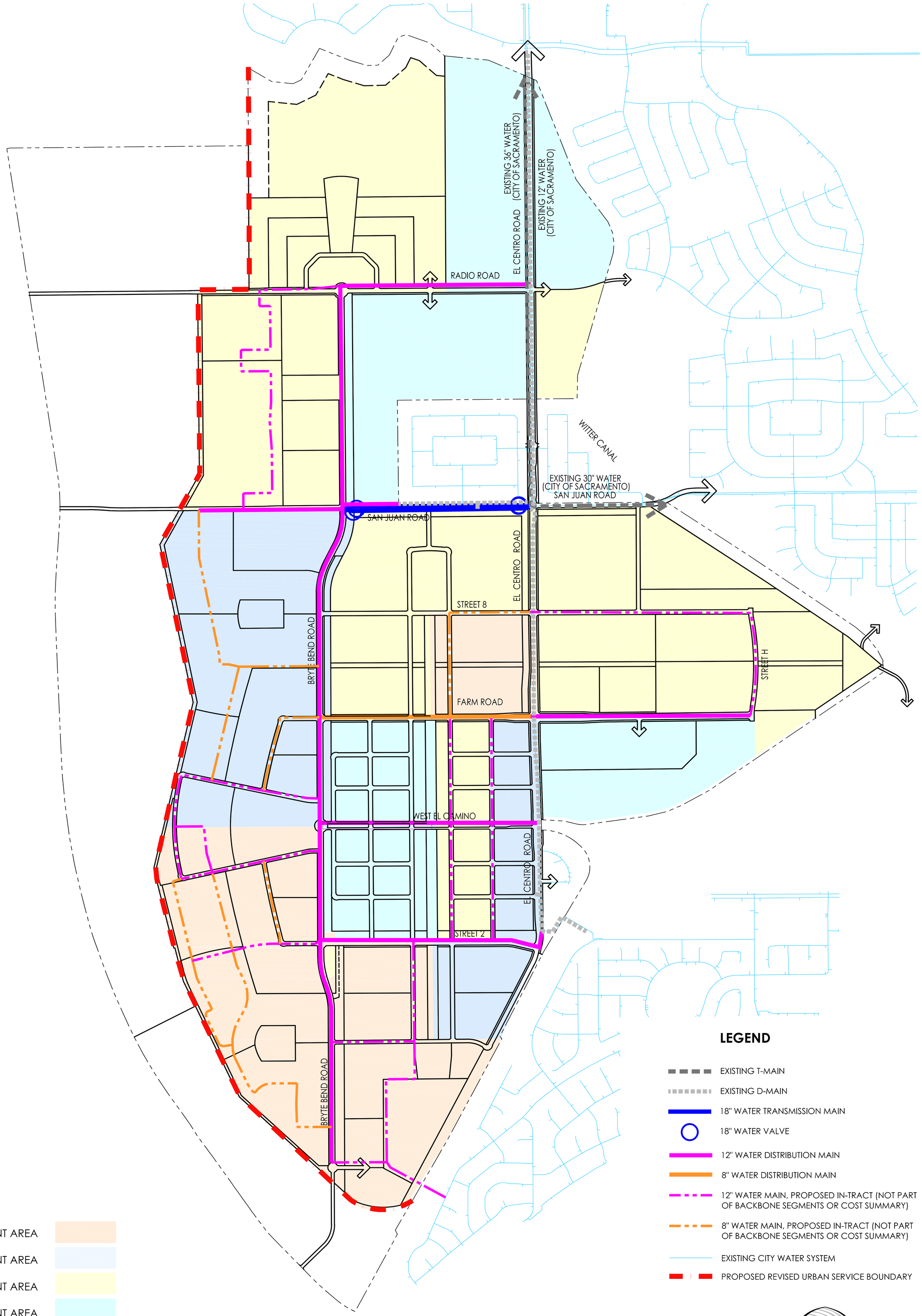
EXHIBIT 15

BACKBONE COST ESTIMATE EXHIBIT - WATER - DISTRIBUTION & TRANSMISSION - BUILDOUT

UPPER WESTSIDE - SCENARIO II

COUNTY OF SACRAMENTO, CALIFORNIA

AUGUST 4, 2023



CONCEPTUAL PHASES

PHASE 1 DEVELOPMENT AREA

PHASE 2 DEVELOPMENT AREA

PHASE 3 DEVELOPMENT AREA

PHASE 4 DEVELOPMENT AREA

NORTH

0 800 400 1600

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CONCEPTUAL COST ESTIMATE - BACKBONE ELEMENTS

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8.2 Buy-In Costs and Supply Fees

The recommended action for Buy in Costs and Supply Fees is to have the City provide wholesale potable water for retail in UWS. With the City treating and delivering wholesale American River POU Water, the need for on-site water treatment is eliminated.

One-time fees for this option include: City of Sacramento Connection Fee, and Natomas Central Mutual Water Company (NCMWC) cancellation fee. The anticipated initial costs to support Phase 1 connection to the City water system is approximately $12.3 million; for buildout, it is approximately $61.2 million. Refer to the costs presented in **Table 24** below.

Table 24. Preliminary City Water Treatment / Supply Costs

Description	Phase 1	Phase 2	Phase 3	Phase 4
City Connection Fee[4]	$11,200,000	$8,800,000	$23,530,000	$12,350,000
NCMWC Cancellation	$1,080,000	$860,000	$2,180,000	$1,230,000
Sub-Total	$12,280,000	$9,660,000	$25,710,000	$13,580,000
Cumulative Total	$12,280,000	$21,940,000	$47,650,000	$61,230,000

The City Connection Fee is subject to negotiations between the applicant, SCWA, and City. While the fee shown above is based upon MGD for maximum day demands it may be higher to account for peak hour demand and fire flow if connections to the City system are made in advance of UWS water tank construction. If a higher fee is charged by the City to account for higher instantaneous flows to UWS, those paid fees will offset subsequent phases that would develop after tank construction. The fees above do not account for a potentially higher City Connection Fee since the project cost estimates include the water tank in Phase 1 as a worst-case scenario cost. The estimated cost for the water tank would be sufficient to cover a connection fee for an additional 2000 gpm of fire flow in addition to maximum day demands in the event the tank is not provided in Phase I. The proposed land use for Phase I is not expected to exceed 2000 gpm of fire flow demand.

[4] Based upon maximum day demand MGD; Assumes Zone 50 fees but subject to negotiation with applicant, SCWA, and City.

Recurring costs with this option include wholesale water cost and monthly City charges for: metered connection to City transmission main; standby fire service per connection to transmission main; and capital improvement project (CIP) fees. These recurring costs, along with the Operations and Maintenance (O&M) costs of water treatment, get passed to the rate payers by way of monthly utility fees.

9.0 REFERENCES

Sacramento County Water Agency Water Study Approval Guidelines, v9.18

City of Sacramento Water Distribution System Criteria, January 2018

Upper Westside Water Supply Master Plan – Technical Memorandum #2 – Estimated Water Demands by Wood Rodgers, October 19, 2021.

Sacramento County Water Agency Zone 40 Water System Infrastructure Plan Update, 2016

City of Sacramento 2020 Urban Water Management Plan, Draft Report, May 2021

California Department of Water Resources 2022 Annual Water Supply and Demand Assessment Summary Report, November 2022

City of Sacramento 2022 Annual Water Shortage Assessment Report, June 17, 2022

APPENDIX A

PROJECT WATER DEMANDS

APPENDIX A

UPPER WESTSIDE

Preliminary Project Water Demands by Purveyor

Updated: February 3, 2023

Proposed Project Land Use				SCWA (WSIP Update 2016) Demands						City of Sacramento Demands					
Land Use Designation	Project Land Use (Zoning)	Sum of AcreNet	SCWA Land Use Category	Demand Factor	Factor with 7.5% System Losses	Annual Demand (AFY)	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)	City Land Use Category	Demand Factor (*)	Annual Demand (AFY)	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)
RW	**Roads**	**122.0**	Right-Of-Way	0.18	0.19	23.6	15	29	59	--(*)	--	0.0	0	0	0
AG	**Agricultural Reserve**	**410.2**	Agricultural	0	0.00	0.0	0	0	0	--	--	0.0	0	0	0
AG/RES	**General Agriculture**	**86.1**	Agricultural	0	0.00	0.0	0	0	0	--	--	0.0	0	0	0
CC	**Commercial & Office**	**1.2**	Commercial	2.02	2.17	2.7	2	3	7	Commercial/Office	1.5	1.8	1	2	4
CMU	**Mixed Use**	**82.0**	Mixed Land Use	5.35	5.75	471.5	292	585	1169	Mixed Use	3.8	311.6	193	348	695
E/HC	**Commercial & Office**	**52.9**	Commercial	2.02	2.17	114.9	71	143	285	Commercial/Office	1.5	79.4	49	89	177
HDR	**High Density Residential (RD-25)**	**36.4**	Multi-Family-High-Density	3.33	3.58	130.2	81	161	323	Residential Medium	3.8	138.3	86	154	309
LC	**Landscape Corridor**	**38.2**	Public Recreation	2.8	3.01	115.1	71	143	285	Park	3.0	114.7	71	128	256
LDR	**Low Density Residential (RD-5)**	**429.2**	Single Family	2.13	2.29	982.8	609	1219	2437	Residential Low	3.6	1545.2	958	1724	3449
LMDR	**Low Density Residential (RD-7)**	**133.0**	Single Family	2.13	2.29	304.5	189	378	755	Residential Low	3.6	478.7	297	534	1068
MDR	**Medium Density Residential (RD-10)**	**62.5**	Multi-Family-Low-Density	2.44	2.62	164.0	102	203	407	Residential Medium	3.8	237.6	147	265	530
P	**Recreation**	**82.3**	Public Recreation	2.8	3.01	247.6	153	307	614	Park	3.0	246.8	153	275	551
SCHOOL	**Public/Quasi-Public**	**141.1**	Public	0.81	0.87	122.8	76	152	305	Mixed Use	2.0	282.1	175	315	630
UF	**Agricultural Urban Reserve**	**45.1**	Public Recreation	2.8	3.01	135.8	84	168	337	Park	3.0	135.4	84	151	302
VHDR	**High Density Residential (RD-40)**	**22.6**	Multi-Family-High-Density	3.33	3.58	81.0	50	100	201	Residential Medium	3.8	86.0	53	96	192
VLDR	**Low Density Residential (RD-2)**	**164.5**	Rural Estate	1.37	1.47	242.3	150	300	601	Residential Low	3.6	592.2	367	661	1322
W	**Public/Quasi-Public**	**15.0**	Non-irrigated	0	0.00	0.0	0	0	0	--	--	0.0	0	0	0
WTLND	**Natural Reserve**	**141.9**	Non-irrigated	0	0.00	0.0	0	0	0	--	--	0.0	0	0	0
Grand Total		**2066.3**				**3138.9**	**1946**	**3892**	**7784**			**4249.8**	**2635**	**4742**	**9485**

(*)City's use factor includes 10% for unaccounted-for water and 15% to account for rights-of-way and streets.

Notes:
City has no category for agricultural parcels. SCWA sees them as not supplied by SCWA water.
City category of Mixed Use was assumed for the school parcel.
All parks were assumed to be irrigated with domestic water at this time.

APPENDIX B

MODEL ASSUMPTIONS AT BOUNDARY

APPENDIX B

Sayo Chaoka

From: Megan Thomas <MeThomas@cityofsacramento.org>
Sent: Tuesday, October 18, 2022 1:49 PM
To: Sayo Chaoka
Cc: Mike Motroni; Jason Reed
Subject: RE: UWS Response
Attachments: Elcentro_12in.pdf

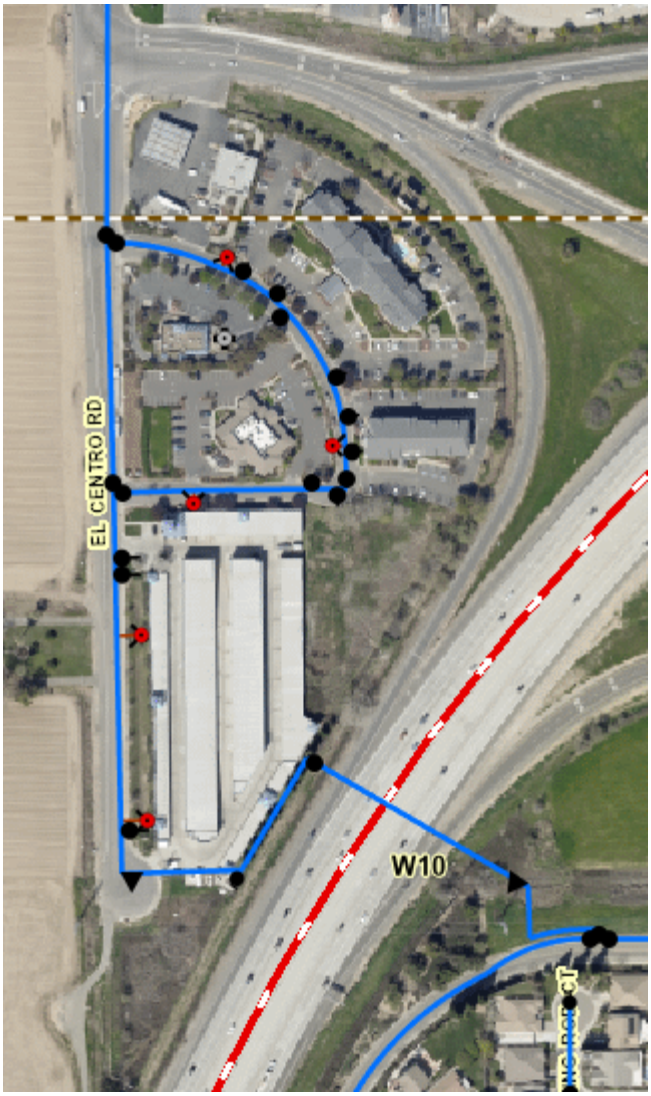
CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hi Sayo,

I just received the information on the 12" tie-in to the south of your project. Please note that this is assuming the water system is City owned. Also, please note that your project plans didn't reflect the City's existing 12" that runs through El Centro today (from Barandas Dr., across I-80, through to San Juan Rd.), see snapshot below. This should help improve your cost situation for the looping end of things for meeting the City's standards for water main installations.

Let me know if you have any questions.

Megan



From: Sayo Chaoka <schaoka@WoodRodgers.com>
Sent: Monday, October 17, 2022 4:36 PM
To: Megan Thomas <MeThomas@cityofsacramento.org>
Cc: Mike Motroni <mmotroni@WoodRodgers.com>; Jason Reed <jreed@WoodRodgers.com>
Subject: RE: UWS Response

Hi Megan,

I hope you had a good weekend.

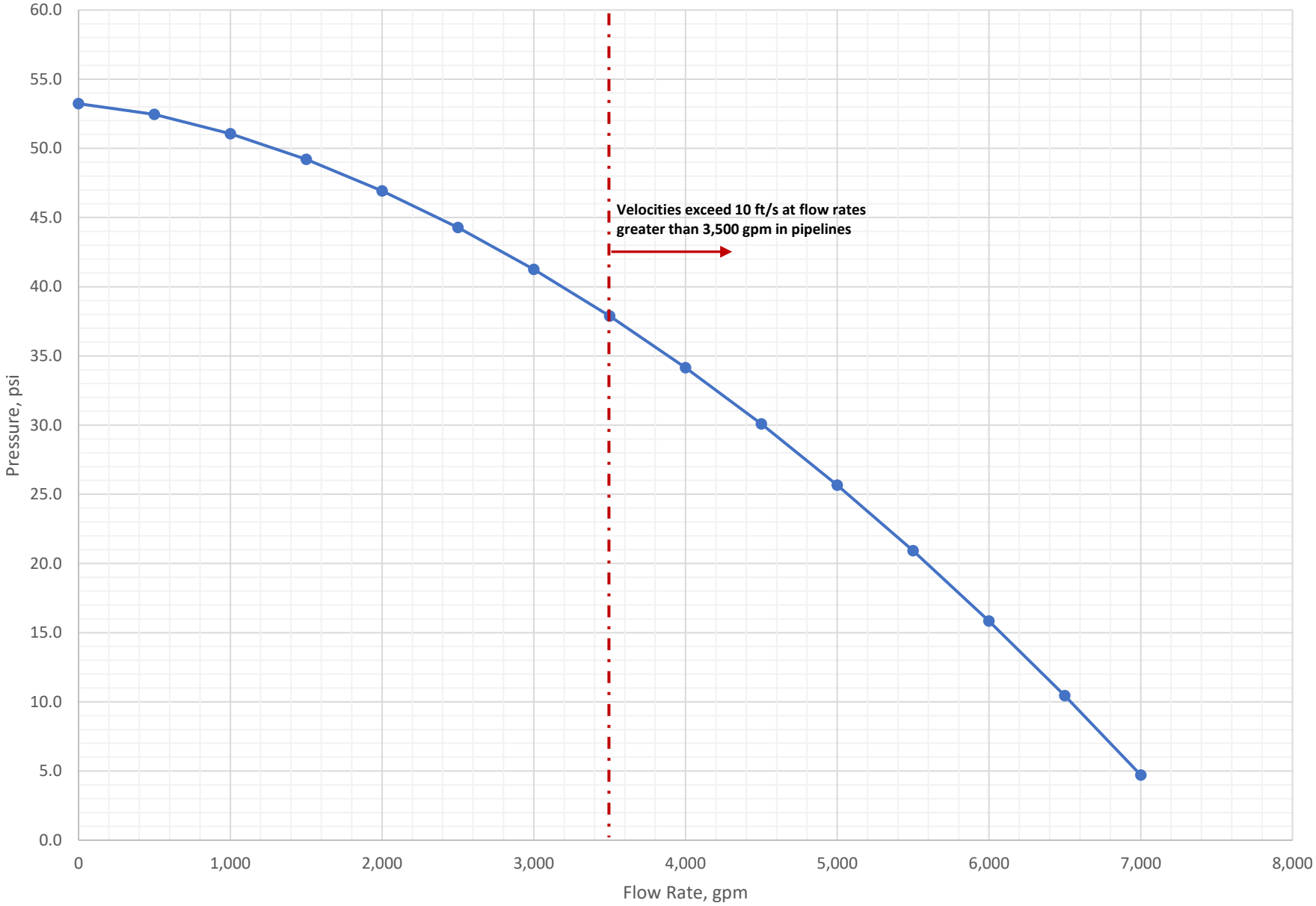
Do you have a new system curve or curves for us to apply to the Upper Westside water model at El Centro and San Juan Road, based on your meeting with West Yost last week?

Thank you,

Sayo

Sayo Chaoka, PE | Project Engineer

Pressure Rating Curve at 12-inch diameter along El Centro



Luke Philbert

From: Bobby Vera <bvera@westyost.com>
Sent: Monday, December 13, 2021 1:22 PM
To: Sayo Chaoka; Brenda Estrada
Cc: Brett Ewart; Mike Motroni; Luke Philbert
Subject: RE: UWS Response

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Hi Sayo –

The curve sent on 11/19 is appropriate to use for your planning level analysis. Thanks!

Bobby Vera, PE
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From: Sayo Chaoka <schaoka@WoodRodgers.com>
Sent: Wednesday, December 8, 2021 9:54 AM
To: Bobby Vera <bvera@westyost.com>; Brenda Estrada <bestrada@westyost.com>
Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>
Subject: RE: UWS Response

[This message has originated from outside of West Yost]

Hi Bobby,

Following up on my question below. Could you confirm the curve you sent on 11/19 is good for use as the model boundary for all scenarios – ADD, MDD, PHD, and MDD + Fire Flow?

Thank you,

Sayo Chaoka | Civil Engineer

Wood Rodgers, Inc. | www.woodrodgers.com |
916.341.7760 Tel
916.341.7769 Direct

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From: Sayo Chaoka
Sent: Friday, December 3, 2021 9:25 AM
To: Bobby Vera <bvera@westyost.com>; Brenda Estrada <bestrada@westyost.com>

Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>
Subject: RE: UWS Response

Hi Bobby,

In our conversation last Tuesday, you explained that we would be provided one curve from the City's model. This is to be used during all scenarios (ADD, MDD, PHD, MDD plus fire flow) as the model boundary condition for our hydraulic model. Does it mean that due to the existing storage tanks and pumps kicking in during peak periods, the City system's ability to provide flow/pressure to Upper Westside is unaltered by a peak event?

Please confirm and we will proceed with the curve you provided on November 19th.

Thank you,

Sayo Chaoka | Civil Engineer

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916.341.7769 Direct

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From: Bobby Vera [mailto:bvera@westyost.com]
Sent: Monday, November 29, 2021 4:22 PM
To: Sayo Chaoka <schaoka@WoodRodgers.com>; Brenda Estrada <bestrada@westyost.com>
Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>
Subject: RE: UWS Response

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Hi Sayo –

I would simply just interpolate to get pressure/head for 7,762 gpm. Below is the table with that interpolation. A conservative approach would be just to assume the head/pressure conditions at 8,000 gpm since that is close to your 7,762 gpm and buys you some buffer capacity.

Flow, gpm	Pressure, psi	Head, ft
0	52.2	134.5
1,000	51	131.8
2,000	50	129.4
3,000	48.7	126.4
4,505	46.4	121.1
5,000	45.7	119.6
6,000	44.1	115.8
7,000	42.4	111.9
7,762	41.0	108.6

8,000	40.6	107.7
10,000	36.5	98.3

Let me know if you need anything else. Thanks.

Bobby Vera, PE
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From: Sayo Chaoka <schaoka@WoodRodgers.com>
Sent: Monday, November 29, 2021 3:15 PM
To: Bobby Vera <bvera@westyost.com>; Brenda Estrada <bestrada@westyost.com>
Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>
Subject: RE: UWS Response

[This message has originated from outside of West Yost]

Hi Bobby,

I hope you had a good holiday weekend.

Would you be able to also provide a curve (table), similar to you did below, for the peak hour scenario? Buildout peak hour demand for Upper Westside is estimated to be 7,762 gpm.

Thank you,

Sayo Chaoka | Civil Engineer

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From: Sayo Chaoka
Sent: Friday, November 19, 2021 2:24 PM
To: Bobby Vera <bvera@westyost.com>; Brenda Estrada <bestrada@westyost.com>
Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>
Subject: RE: UWS Response

Thank you very much, Bobby. Have a great weekend.

Sayo Chaoka | Civil Engineer

Wood Rodgers, Inc. | www.woodrodgers.com |
916.341.7760 Tel
916.341.7769 Direct

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From: Bobby Vera [mailto:bvera@westyost.com]
Sent: Friday, November 19, 2021 2:23 PM
To: Sayo Chaoka <schaoka@WoodRodgers.com>; Brenda Estrada <bestrada@westyost.com>
Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>
Subject: RE: UWS Response

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Hi Sayo –

As discussed, below is the rating curve that is taken out to 10,000 gpm. If you use the values in the table below, they would be appropriate for your modeling efforts. Let us know if you have any questions. Thanks!

Flow, gpm	Pressure, psi	Head, ft
0	52.2	134.5
1,000	51.0	131.8
2,000	50.0	129.4
3,000	48.7	126.4
4,505	46.4	121.1
5,000	45.7	119.6
6,000	44.1	115.8
7,000	42.4	111.9
8,000	40.6	107.7
10,000	36.5	98.3

Bobby Vera, PE
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From: Sayo Chaoka <schaoka@WoodRodgers.com>
Sent: Friday, November 19, 2021 2:09 PM
To: Brenda Estrada <bestrada@westyost.com>
Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>; Bobby Vera <bvera@westyost.com>
Subject: RE: UWS Response

[This message has originated from outside of West Yost]

Thank you, Brenda and Bobby,

This is helpful. Yes, there are new transmission and distribution mains proposed with the new development. Please see attached and let me know if you need this in a different format.

I see that for MDD plus fire flow, we will be at 38 psi – or possibly better with the addition of the proposed UWS pipes. Could you please update our MDD estimate to 5,259 gpm, (FF is still at 4,500 gpm), incorporate the attached pipes, and let me know what the pressure curve will be?

Thanks again,

Sayo Chaoka | Civil Engineer

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916.341.7769 Direct

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From: Brenda Estrada [mailto:bestrada@westyost.com]
Sent: Friday, November 19, 2021 12:44 PM
To: Sayo Chaoka <schaoka@WoodRodgers.com>
Cc: Brett Ewart <bewart@cityofsacramento.org>; Mike Motroni <mmotroni@WoodRodgers.com>; Luke Philbert <lphilbert@WoodRodgers.com>; Bobby Vera <bvera@westyost.com>
Subject: FW: UWS Response

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Hi Sayo,
I apologize for not forwarding this information earlier this week. Please see answers below to your questions as well as possible clarification needed for the pressure curve.

Please let us know if you have any additional questions.
Thanks,
Brenda

From: Bobby Vera <bvera@westyost.com>
Sent: Monday, November 15, 2021 3:19 PM
To: Brenda Estrada <bestrada@westyost.com>
Subject: UWS Response

Brenda – See below.

Question	Response
Pressure curve at El Centro & San Juan during 4,500 gpm fire flow. (Conservative estimate for MDD at UWS is 5,300 gpm.)	*Attached is the Pressure Rating Curve for the intersection of El Centro and San Juan Roads. At 4,500 gpm we predicted a pressure of 46 psi. This was,*

	however, not including the MDD of a nearby development. *Does the proposed development include infrastructure that would loop existing infrastructure? If so we would need to incorporate that into the model to see if this would improve residual pressure.* *Assuming the demand associated with the development is taken out at the intersection (total flow of 9,800 gpm; 4,500 gpm ff + your conservative estimate of 5,300 gpm) the residual pressure would be 38 psi.*
Size of the San Juan reservoir. Is this used during fires only, or peak hour, too?	*San Juan is 3.0 MG tank. This tank is used for both fire flow and operational uses (peaking) as well as emergency.*
Size/type of meters required along El Centro and San Juan for UWS to connect to City system.	*This would be City preference and would be dependent on the layout of the site. If all supply coming from that intersection, then a combination of meters with double check valve assemblies would be needed per City's design criteria. Note that there would be additional head losses through these appurtenances that would need to be accounted for to ensure that 20 psi is maintained throughout the UWS development area.* *https://www.cityofsacramento.org/-/media/Corporate/Files/DOU/Specs-Drawings/Water.pdf?la=en*

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APPENDIX C

H2ONET MODEL RESULTS

Wood Rodgers, Inc.
S. Chaoka
2/3/2023

UPPER WESTSIDE WATER STUDY (Scenario II)
DOMESTIC WATER DEMAND

Updated: 2/2/2023

Node	Land Use	Area (acres)	Annual Demand ac-ft/yr	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hour Demand (gpm)
J010	Multiple LU's - see Table 1	96.3	346.77	214.98	386.97	773.94
J012	Multiple LU's - see Table 1	25.5	16.35	10.14	18.25	36.50
J013	Multiple LU's - see Table 1	81.1	162.15	100.53	180.95	361.89
J016	Multiple LU's - see Table 1	177.1	594.35	368.48	663.26	1,326.51
J018	Multiple LU's - see Table 1	115.6	310.20	192.31	346.16	692.31
J019	Multiple LU's - see Table 1	28.1	81.14	50.30	90.55	181.09
J020	Multiple LU's - see Table 1	1.1	3.40	2.11	3.79	7.58
J022	Multiple LU's - see Table 1	23.6	75.84	47.02	84.63	169.27
J024	Multiple LU's - see Table 1	61.2	226.85	140.64	253.15	506.30
J025	Multiple LU's - see Table 1	87.6	213.96	132.65	238.77	477.54
J026	Multiple LU's - see Table 1	76.3	235.59	146.06	262.90	525.80
J028	Multiple LU's - see Table 1	84.4	219.71	136.21	245.18	490.36
J030	Multiple LU's - see Table 1	56.1	172.73	107.09	192.76	385.51
J032	Multiple LU's - see Table 1	60.5	200.33	124.20	223.56	447.12
J034	Multiple LU's - see Table 1	64.3	219.78	136.26	245.26	490.52
J035	Multiple LU's - see Table 1	31.2	112.20	69.56	125.21	250.42
J036	Multiple LU's - see Table 1	34.6	117.28	72.71	130.88	261.76
J037	Multiple LU's - see Table 1	0.0	0.00	0.00	0.00	0.00
J038	Multiple LU's - see Table 1	16.7	54.41	33.73	60.72	121.44
J039	Multiple LU's - see Table 1	14.9	54.36	33.70	60.66	121.33
J040	Multiple LU's - see Table 1	4.4	2.14	1.33	2.39	4.78
J042	Multiple LU's - see Table 1	17.2	64.58	40.04	72.07	144.14
J048	Multiple LU's - see Table 1	4.1	12.40	7.69	13.84	27.68
J050	Multiple LU's - see Table 1	22.6	76.62	47.50	85.50	170.99
J052	Multiple LU's - see Table 1	47.7	100.11	62.07	111.72	223.44
J053	Multiple LU's - see Table 1	14.5	53.14	32.95	59.30	118.60
J056	Multiple LU's - see Table 1	33.1	116.44	72.19	129.94	259.88
J058	Multiple LU's - see Table 1	6.1	18.24	11.31	20.36	40.71
J060	Multiple LU's - see Table 1	8.6	17.22	10.67	19.21	38.43
J064	Multiple LU's - see Table 1	22.2	79.89	49.53	89.15	178.31
J066	Multiple LU's - see Table 1	26.8	96.40	59.77	107.58	215.15
J068	Multiple LU's - see Table 1	29.9	107.80	66.83	120.30	240.59
J070	Multiple LU's - see Table 1	6.9	26.16	16.22	29.19	58.39
J072	Multiple LU's - see Table 1	17.0	61.23	37.96	68.33	136.67
---	Right of Way	116.8				
---	Water	15.0				
Total Area (acres)		**1529.1**				
Total Water Demand including unaccounted system losses (gpm)				**2635**	**4742**	**9485**

categories. City demand factors include losses a 10 % and right-of-way water demands at 15%. For SCWA-based estimates, 7.5% losses were added to

Upper Westside (Scenario I)
1. AVERAGE DAY DEMAND

Updated: 2/2/2023

JUNCTION REPORT

ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	214.98	17.6	137.54	52.0
J012	10.14	13.8	137.64	53.7
J013	100.53	13.8	137.62	53.7
J015	0.00	14.7	137.75	53.3
J016	368.48	15.0	137.62	53.1
J017	0.00	14.3	138.11	53.6
J018	192.31	14.0	138.10	53.8
J019	50.30	14.6	137.64	53.3
J020	2.11	15.5	138.56	53.3
J021	0.00	13.8	137.65	53.7
J022	47.02	13.6	138.41	54.1
J023	0.00	14.5	137.62	53.4
J024	140.64	14.3	138.07	53.6
J025	132.65	13.3	138.87	54.4
J026	146.06	13.0	138.07	54.2
J027	0.00	13.9	138.35	53.9
J028	136.21	14.9	137.80	53.2
J029	0.00	14.5	137.80	53.4
J030	107.09	14.2	137.74	53.5
J031	0.00	14.6	138.01	53.5
J032	124.20	13.6	137.74	53.8
J033	0.00	13.8	137.94	53.8
J034	136.26	14.2	137.64	53.5
J035	69.56	14.1	137.68	53.6
J036	72.71	14.9	137.64	53.2
J037	0.00	14.5	137.64	53.4
J038	33.73	10.0	137.65	55.3
J039	33.70	14.2	137.66	53.5
J040	1.33	13.4	137.62	53.8
J041	0.00	14.2	137.72	53.5
J042	40.04	14.9	137.70	53.2
J044	0.00	14.9	137.76	53.2
J046	0.00	13.0	138.14	54.2
J048	7.69	13.0	137.62	54.0
J050	47.50	14.2	138.07	53.7
J052	62.07	14.8	137.91	53.4
J053	32.95	14.2	137.66	53.5
J054	0.00	13.4	137.62	53.8
J055	0.00	14.8	137.87	53.3
J056	72.19	13.5	137.63	53.8
J058	11.31	13.5	137.63	53.8
J060	10.67	14.9	137.62	53.2
J062	0.00	18.4	137.62	51.7
J064	49.53	17.0	137.58	52.3
J066	59.77	17.0	137.54	52.2
J068	66.83	16.0	137.54	52.7
J070	16.22	14.8	137.64	53.2
J072	37.96	14.5	137.61	53.4
J076	0.00	14.0	137.63	53.6
J082	0.00	0.0	138.60	60.1
J084	0.00	14.1	137.64	53.6
J086	0.00	14.1	137.63	53.6
J088	0.00	14.1	137.69	53.6
J090	0.00	14.0	137.95	53.7
J74	0.00	14.0	137.62	53.6
J78	0.00	17.0	137.58	52.3
J80	0.00	13.2	138.97	54.5
J92	0.00	13.2	138.88	54.5
T010	0.00	17.6	134.50	50.7
T020	0.00	13.8	134.50	52.3
T030	0.00	13.0	134.50	52.7
T034	0.00	13.3	138.93	54.4
T035	0.00	13.0	138.56	54.4
T040	0.00	14.4	134.50	52.1
T045	0.00	13.0	138.14	54.2
T075	0.00	13.9	138.36	53.9
T080	0.00	14.3	138.18	53.7
T088	0.00	14.6	138.02	53.5
T120	0.00	14.9	137.92	53.3
T126	0.00	14.5	137.80	53.4
T133	0.00	14.2	137.66	53.5
T138	0.00	14.2	137.72	53.5
T140	0.00	14.2	137.76	53.6
T74	0.00	0.0	134.50	58.3

RESERVOIR / POC REPORT

ID	Flow (gpm)	Head (feet)
RES9000	0.00	0
RESTANK	-2,634.71	14

PUMP REPORT

ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U7000	14	-6.07	52.21	0.00	134.50
UBOOSTER	13	0.41	54.69	2,634.71	125.26

VALVE REPORT

ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
METER-RADIORD	10	13.8	52.3	52.2	0.00	0	0.23
RP-RADIORD	10	13.8	42.14	53.65	0.00	0	26.57

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario I)
1. AVERAGE DAY DEMAND

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2417	12	125	-106	0.30	0.10	0.04
P015	J013	J023	1109	12	125	3	0.01	0.00	0.00
P017	J015	J017	1969	12	125	-230	0.65	0.35	0.18
P019	J046	J020	1551	12	125	-287	0.81	0.42	0.27
P021	J082	J92	423	12	125	-469	1.33	0.28	0.67
P023	J022	J027	649	12	125	167	0.47	0.06	0.10
P025	J024	J026	2719	12	125	-6	0.02	0.00	0.00
P027	J024	J031	681	12	125	157	0.45	0.06	0.09
P029	J028	J029	883	12	125	33	0.09	0.00	0.00
P031	J039	J053	514	12	125	-14	0.04	0.00	0.00
P033	J033	J032	733	12	125	289	0.82	0.20	0.27
P037	J032	J035	665	12	125	165	0.47	0.06	0.10
P039	J034	J055	1379	8	125	-76	0.49	0.23	0.17
P041	J034	J019	1005	12	125	43	0.12	0.01	0.01
P043	J044	J042	804	12	125	150	0.42	0.06	0.08
P045	J070	J037	486	12	125	-59	0.17	0.01	0.01
P047	J038	J058	1285	12	125	67	0.19	0.02	0.02
P049	T010	T020	2706	36	120	3	0.00	0.00	0.00
P053	T74	T040	734	30	120	3	0.00	0.00	0.00
P055	T034	T075	1318	16	125	791	1.26	0.57	0.43
P057	T088	T120	671	16	125	430	0.69	0.09	0.14
P059	T120	T126	853	16	125	430	0.69	0.12	0.14
P061	T138	T133	1387	16	125	222	0.35	0.06	0.04
P071	T045	T035	1549	16	125	-616	0.98	0.42	0.27
P077	U7000	T010	3165	999	125	3	0.00	0.00	0.00
P079	U7000	T040	3531	999	125	-3	0.00	0.00	0.00
P200	J020	T035	73	12	125	-149	0.42	0.01	0.08
P300	T075	J027	78	12	125	199	0.56	0.01	0.14
P400	T138	J041	43	12	125	52	0.15	0.00	0.01
P500	T133	J039	45	12	125	83	0.23	0.00	0.03
P602	RES9000	U7000	385	999	125	0	0.00	0.00	0.00
P608	J80	T035	998	16	125	765	1.22	0.41	0.41
P610	J010	J021	2480	12	125	-109	0.31	0.11	0.05
P614	T020	ETER-RADIO	192	16	125	0	0.00	0.00	0.00
P616	J012	J013	465	12	125	104	0.29	0.02	0.04
P626	J023	J016	770	12	125	3	0.01	0.00	0.00
P628	T020	T030	2594	36	120	3	0.00	0.00	0.00
P632	J017	J018	57	12	125	56	0.16	0.00	0.01
P634	J018	J033	603	12	125	289	0.82	0.16	0.27
P640	J035	J034	633	12	125	116	0.33	0.03	0.05
P644	J016	J015	738	12	125	-230	0.65	0.13	0.18
P650	J037	J038	616	12	125	-59	0.17	0.01	0.01
P654	J038	J039	640	12	125	-63	0.18	0.01	0.02
P656	T133	J038	659	16	125	140	0.22	0.01	0.02
P658	T140	T138	666	16	125	274	0.44	0.04	0.06
P662	J025	J022	665	12	125	478	1.36	0.46	0.69
P664	UBOOSTER	J80	423	24	125	2635	1.87	0.24	0.56
P666	J025	T034	75	12	125	-502	1.42	0.06	0.76
P668	J027	J024	643	12	125	366	1.04	0.27	0.42
P670	T075	T080	691	16	125	592	0.94	0.18	0.25
P672	J029	J030	463	12	125	189	0.54	0.06	0.13
P674	T126	T140	685	16	125	274	0.44	0.04	0.06
P676	T126	J029	39	12	125	156	0.44	0.00	0.09
P678	J031	J028	640	12	125	319	0.90	0.21	0.33
P680	T080	T088	646	16	125	592	0.94	0.16	0.25
P682	T088	J031	43	12	125	161	0.46	0.00	0.09
P690	J021	J012	54	12	125	220	0.62	0.01	0.16
P692	J022	J026	4009	12	125	153	0.43	0.34	0.08
P694	J053	J041	873	12	125	-134	0.38	0.06	0.07
P696	J019	J036	301	12	125	-19	0.05	0.00	0.00
P698	J048	J040	440	12	125	-22	0.06	0.00	0.00
P700	J056	J054	1851	12	125	23	0.07	0.00	0.00
P702	J042	J036	1326	12	125	110	0.31	0.06	0.05
P704	J028	J044	526	12	125	150	0.42	0.04	0.08
P708	T045	J018	125	16	125	616	0.98	0.03	0.27
P710	J046	J017	123	12	125	287	0.81	0.03	0.27
P712	J052	J024	1000	8	125	-74	0.47	0.16	0.16
P722	RP-RADIORE	J013	250	16	125	0	0.00	0.00	0.00
P724	J055	J052	239	8	125	-76	0.49	0.04	0.17
P726	J022	J050	1003	8	125	112	0.71	0.34	0.34
P728	J050	J052	1289	8	125	64	0.41	0.16	0.12
P730	J054	J040	686	12	125	23	0.07	0.00	0.00
P732	J053	J056	1249	12	125	87	0.25	0.04	0.03
P734	J058	J048	1047	12	125	48	0.14	0.01	0.01
P736	J056	J058	1030	8	125	-8	0.05	0.00	0.00
P738	J062	J064	1000	8	125	34	0.22	0.04	0.04
P740	J064	J74	595	8	125	-49	0.31	0.04	0.07
P742	J068	J066	1483	8	125	-2	0.02	0.00	0.00

Upper Westside (Scenario I)
1. AVERAGE DAY DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P744	J066	J048	712	8	125	-62	0.40	0.08	0.11
P746	J064	J068	1239	8	125	33	0.21	0.04	0.04
P748	J036	J070	350	12	125	18	0.05	0.00	0.00
P750	J070	J076	710	12	125	61	0.17	0.01	0.02
P752	J072	J060	655	12	125	-34	0.10	0.00	0.01
P754	J060	J062	944	12	125	15	0.04	0.00	0.00
P756	J062	J072	391	12	125	35	0.10	0.00	0.01
P758	J78	J068	1341	8	125	32	0.20	0.04	0.03
P760	T030	T74	640	30	120	3	0.00	0.00	0.00
P762	J74	J038	514	8	125	-42	0.27	0.03	0.06
P764	J076	J062	651	12	125	54	0.15	0.01	0.01
P766	J74	J076	1043	8	125	-7	0.04	0.00	0.00
P768	J78	J072	1122	8	125	-31	0.20	0.04	0.03
P770	J064	J78	513	12	125	1	0.00	0.00	0.00
P772	J030	J041	805	12	125	82	0.23	0.02	0.03
P776	RESTANK	UBOOSTER	97	24	125	2635	1.87	0.05	0.56
P778	J80	T034	270	24	125	1293	0.92	0.04	0.15
P782	J020	J082	619	12	125	-140	0.40	0.04	0.07
P784	J082	J021	2748	12	125	329	0.93	0.95	0.35
P786	J019	J084	706	12	125	12	0.03	0.00	0.00
P788	J034	J084	1417	8	125	13	0.08	0.01	0.01
P790	J084	J086	651	12	125	25	0.07	0.00	0.00
P792	J086	J060	1030	12	125	60	0.17	0.02	0.01
P794	J088	J086	1449	8	125	35	0.22	0.06	0.04
P796	J035	J088	992	8	125	-21	0.13	0.02	0.02
P798	J088	J090	2721	8	125	-56	0.36	0.26	0.09
P800	J090	J016	4945	12	125	135	0.38	0.33	0.07
P802	J018	J090	1227	12	125	191	0.54	0.16	0.13
P804	J92	J025	270	12	125	109	0.31	0.01	0.04
P806	J80	J92	86	12	125	578	1.64	0.09	0.99

Upper Westside (Scenario I)
2. MAXIMUM DAY DEMAND

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	134.10	50.5
J012	18.25	13.8	134.40	52.3
J013	180.95	13.8	134.35	52.2
J015	0.00	14.7	134.74	52.0
J016	663.26	15.0	134.34	51.7
J017	0.00	14.3	135.79	52.6
J018	346.16	14.0	135.79	52.8
J019	90.55	14.6	134.40	51.9
J020	3.79	15.5	137.13	52.7
J021	0.00	13.8	134.43	52.3
J022	84.63	13.6	136.70	53.3
J023	0.00	14.5	134.34	51.9
J024	253.15	14.3	135.70	52.6
J025	238.77	13.3	138.07	54.1
J026	262.90	13.0	135.70	53.2
J027	0.00	13.9	136.51	53.1
J028	245.18	14.9	134.89	52.0
J029	0.00	14.5	134.88	52.2
J030	192.76	14.2	134.71	52.2
J031	0.00	14.6	135.52	52.4
J032	223.56	13.6	134.70	52.5
J033	0.00	13.8	135.30	52.7
J034	245.26	14.2	134.42	52.1
J035	125.21	14.1	134.51	52.2
J036	130.88	14.9	134.40	51.8
J037	0.00	14.5	134.42	52.0
J038	60.72	10.0	134.44	53.9
J039	60.66	14.2	134.47	52.1
J040	2.39	13.4	134.34	52.4
J041	0.00	14.2	134.65	52.2
J042	72.07	14.9	134.58	51.9
J044	0.00	14.9	134.77	51.9
J046	0.00	13.0	135.89	53.3
J048	13.84	13.0	134.34	52.6
J050	85.50	14.2	135.69	52.6
J052	111.72	14.8	135.22	52.2
J053	59.30	14.2	134.47	52.1
J054	0.00	13.4	134.35	52.4
J055	0.00	14.8	135.11	52.1
J056	129.94	13.5	134.36	52.4
J058	20.36	13.5	134.37	52.4
J060	19.21	14.9	134.34	51.8
J062	0.00	18.4	134.34	50.2
J064	89.15	17.0	134.23	50.8
J066	107.58	17.0	134.10	50.7
J068	120.30	16.0	134.10	51.2
J070	29.19	14.8	134.40	51.8
J072	68.33	14.5	134.33	51.9
J076	0.00	14.0	134.36	52.2
J082	0.00	0.0	137.26	59.5
J084	0.00	14.1	134.39	52.2
J086	0.00	14.1	134.39	52.1
J088	0.00	14.1	134.56	52.2
J090	0.00	14.0	135.33	52.6
J74	0.00	14.0	134.36	52.2
J78	0.00	17.0	134.23	50.8
J80	0.00	13.2	138.36	54.2
J92	0.00	13.2	138.11	54.1
T010	0.00	17.6	134.50	50.7
T020	0.00	13.8	134.50	52.3
T030	0.00	13.0	134.50	52.7
T034	0.00	13.3	138.24	54.1
T035	0.00	13.0	137.15	53.8
T040	0.00	14.4	134.50	52.1
T045	0.00	13.0	135.89	53.3
T075	0.00	13.9	136.54	53.1
T080	0.00	14.3	136.02	52.8
T088	0.00	14.6	135.53	52.4
T120	0.00	14.9	135.25	52.1
T126	0.00	14.5	134.89	52.2
T133	0.00	14.2	134.48	52.1
T138	0.00	14.2	134.65	52.2
T140	0.00	14.2	134.77	52.3
T74	0.00	0.0	134.50	58.3

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES9000	0.00	0
RESTANK	-4,742.48	14

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U7000	14	-6.07	52.21	0.00	134.50
UBOOSTER	13	0.36	54.62	4,742.48	125.22

VALVE REPORT							
ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstrea... Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
METER-RADIORD	10	13.8	52.3	52.2	0.00	0	0.23
RP-RADIORD	10	13.8	40.55	52.07	0.00	0	26.57

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario I)
2. MAXIMUM DAY DEMAND

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2417	12	125	-190	0.54	0.31	0.13
P015	J013	J023	1109	12	125	6	0.02	0.00	0.00
P017	J015	J017	1969	12	125	-415	1.18	1.05	0.53
P019	J046	J020	1551	12	125	-516	1.46	1.24	0.80
P021	J082	J92	423	12	125	-844	2.39	0.84	1.99
P023	J022	J027	649	12	125	300	0.85	0.19	0.29
P025	J024	J026	2719	12	125	-12	0.03	0.00	0.00
P027	J024	J031	681	12	125	283	0.80	0.18	0.26
P029	J028	J029	883	12	125	59	0.17	0.01	0.01
P031	J039	J053	514	12	125	-25	0.07	0.00	0.00
P033	J033	J032	733	12	125	520	1.47	0.59	0.81
P037	J032	J035	665	12	125	296	0.84	0.19	0.29
P039	J034	J055	1379	8	125	-137	0.88	0.69	0.50
P041	J034	J019	1005	12	125	78	0.22	0.02	0.02
P043	J044	J042	804	12	125	269	0.76	0.19	0.24
P045	J070	J037	486	12	125	-106	0.30	0.02	0.04
P047	J038	J058	1285	12	125	121	0.34	0.07	0.05
P049	T010	T020	2706	36	120	6	0.00	0.00	0.00
P053	T74	T040	734	30	120	6	0.00	0.00	0.00
P055	T034	T075	1318	16	125	1423	2.27	1.70	1.29
P057	T088	T120	671	16	125	775	1.24	0.28	0.42
P059	T120	T126	853	16	125	775	1.24	0.36	0.42
P061	T138	T133	1387	16	125	400	0.64	0.17	0.12
P071	T045	T035	1549	16	125	-1108	1.77	1.26	0.81
P077	U7000	T010	3165	999	125	6	0.00	0.00	0.00
P079	U7000	T040	3531	999	125	-6	0.00	0.00	0.00
P200	J020	T035	73	12	125	-268	0.76	0.02	0.24
P300	T075	J027	78	12	125	358	1.02	0.03	0.41
P400	T138	J041	43	12	125	93	0.26	0.00	0.03
P500	T133	J039	45	12	125	149	0.42	0.00	0.08
P602	RES9000	U7000	385	999	125	0	0.00	0.00	0.00
P608	J80	T035	998	16	125	1376	2.20	1.21	1.21
P610	J010	J021	2480	12	125	-196	0.56	0.33	0.13
P614	T020	TER-RADIO	192	16	125	0	0.00	0.00	0.00
P616	J012	J013	465	12	125	187	0.53	0.06	0.12
P626	J023	J016	770	12	125	6	0.02	0.00	0.00
P628	T020	T030	2594	36	120	6	0.00	0.00	0.00
P632	J017	J018	57	12	125	101	0.29	0.00	0.04
P634	J018	J033	603	12	125	520	1.47	0.49	0.81
P640	J035	J034	633	12	125	209	0.59	0.09	0.15
P644	J016	J015	738	12	125	-415	1.18	0.39	0.53
P650	J037	J038	616	12	125	-106	0.30	0.03	0.04
P654	J038	J039	640	12	125	-113	0.32	0.03	0.05
P656	T133	J038	659	16	125	251	0.40	0.03	0.05
P658	T140	T138	666	16	125	493	0.79	0.12	0.18
P662	J025	J022	665	12	125	861	2.44	1.37	2.06
P664	UBOOSTER	J80	423	24	125	4742	3.36	0.70	1.66
P666	J025	T034	75	12	125	-904	2.56	0.17	2.26
P668	J027	J024	643	12	125	659	1.87	0.81	1.26
P670	T075	T080	691	16	125	1065	1.70	0.52	0.75
P672	J029	J030	463	12	125	341	0.97	0.17	0.37
P674	T126	T140	685	16	125	493	0.79	0.12	0.18
P676	T126	J029	39	12	125	282	0.80	0.01	0.26
P678	J031	J028	640	12	125	574	1.63	0.62	0.97
P680	T080	T088	646	16	125	1065	1.70	0.49	0.75
P682	T088	J031	43	12	125	290	0.82	0.01	0.28
P690	J021	J012	54	12	125	395	1.12	0.03	0.49
P692	J022	J026	4009	12	125	275	0.78	1.00	0.25
P694	J053	J041	873	12	125	-241	0.68	0.17	0.20
P696	J019	J036	301	12	125	-34	0.10	0.00	0.01
P698	J048	J040	440	12	125	-39	0.11	0.00	0.01
P700	J056	J054	1851	12	125	42	0.12	0.01	0.01
P702	J042	J036	1326	12	125	197	0.56	0.18	0.13
P704	J028	J044	526	12	125	269	0.76	0.13	0.24
P708	T045	J018	125	16	125	1108	1.77	0.10	0.81
P710	J046	J017	123	12	125	516	1.46	0.10	0.80
P712	J052	J024	1000	8	125	-134	0.85	0.47	0.47
P722	RP-RADIORD	J013	250	16	125	0	0.00	0.00	0.00
P724	J055	J052	239	8	125	-137	0.88	0.12	0.50
P726	J022	J050	1003	8	125	201	1.28	1.01	1.01
P728	J050	J052	1289	8	125	115	0.74	0.46	0.36
P730	J054	J040	686	12	125	42	0.12	0.01	0.01
P732	J053	J056	1249	12	125	157	0.45	0.11	0.09
P734	J058	J048	1047	12	125	86	0.24	0.03	0.03
P736	J056	J058	1030	8	125	-15	0.09	0.01	0.01
P738	J062	J064	1000	8	125	61	0.39	0.11	0.11
P740	J064	J74	595	8	125	-88	0.56	0.13	0.22
P742	J068	J066	1483	8	125	-4	0.03	0.00	0.00

Upper Westside (Scenario I)
2. MAXIMUM DAY DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P744	J066	J048	712	8	125	-112	0.71	0.24	0.34
P746	J064	J068	1239	8	125	59	0.38	0.13	0.10
P748	J036	J070	350	12	125	32	0.09	0.00	0.00
P750	J070	J076	710	12	125	109	0.31	0.03	0.05
P752	J072	J060	655	12	125	-61	0.17	0.01	0.02
P754	J060	J062	944	12	125	28	0.08	0.00	0.00
P756	J062	J072	391	12	125	64	0.18	0.01	0.02
P758	J78	J068	1341	8	125	57	0.36	0.13	0.10
P760	T030	T74	640	30	120	6	0.00	0.00	0.00
P762	J74	J038	514	8	125	-76	0.48	0.09	0.17
P764	J076	J062	651	12	125	97	0.28	0.02	0.04
P766	J74	J076	1043	8	125	-12	0.08	0.01	0.01
P768	J78	J072	1122	8	125	-56	0.36	0.11	0.09
P770	J064	J78	513	12	125	1	0.00	0.00	0.00
P772	J030	J041	805	12	125	148	0.42	0.06	0.08
P776	RESTANK	UBOOSTER	97	24	125	4742	3.36	0.16	1.66
P778	J80	T034	270	24	125	2327	1.65	0.12	0.44
P782	J020	J082	619	12	125	-252	0.72	0.13	0.21
P784	J082	J021	2748	12	125	592	1.68	2.83	1.03
P786	J019	J084	706	12	125	21	0.06	0.00	0.00
P788	J034	J084	1417	8	125	23	0.15	0.03	0.02
P790	J084	J086	651	12	125	44	0.13	0.01	0.01
P792	J086	J060	1030	12	125	108	0.31	0.05	0.04
P794	J088	J086	1449	8	125	63	0.40	0.17	0.12
P796	J035	J088	992	8	125	-38	0.24	0.05	0.05
P798	J088	J090	2721	8	125	-101	0.64	0.77	0.28
P800	J090	J016	4945	12	125	243	0.69	0.98	0.20
P802	J018	J090	1227	12	125	344	0.98	0.46	0.38
P804	J92	J025	270	12	125	196	0.56	0.04	0.13
P806	J80	J92	86	12	125	1040	2.95	0.25	2.93

Upper Westside (Scenario I)
3. PEAK HOUR DEMAND

Updated: 2/2/2023

JUNCTION REPORT

ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	773.94	17.6	120.44	44.6
J012	36.50	13.8	121.55	46.7
J013	361.89	13.8	121.34	46.6
J015	0.00	14.7	122.76	46.8
J016	1326.51	15.0	121.34	46.1
J017	0.00	14.3	126.56	48.6
J018	692.31	14.0	126.55	48.8
J019	181.09	14.6	121.52	46.3
J020	7.58	15.5	131.40	50.2
J021	0.00	13.8	121.64	46.7
J022	169.27	13.6	129.83	50.4
J023	0.00	14.5	121.34	46.3
J024	506.30	14.3	126.22	48.5
J025	477.54	13.3	134.79	52.6
J026	525.80	13.0	126.23	49.1
J027	0.00	13.9	129.14	49.9
J028	490.36	14.9	123.33	47.0
J029	0.00	14.5	123.28	47.1
J030	385.51	14.2	122.66	47.0
J031	0.00	14.6	125.58	48.1
J032	447.12	13.6	122.64	47.3
J033	0.00	13.8	124.79	48.1
J034	490.52	14.2	121.61	46.5
J035	250.42	14.1	121.95	46.7
J036	261.76	14.9	121.53	46.2
J037	0.00	14.5	121.60	46.4
J038	121.44	10.0	121.70	48.4
J039	121.33	14.2	121.81	46.6
J040	4.78	13.4	121.34	46.8
J041	0.00	14.2	122.43	46.9
J042	144.14	14.9	122.18	46.5
J044	0.00	14.9	122.87	46.8
J046	0.00	13.0	126.92	49.4
J048	27.68	13.0	121.33	46.9
J050	170.99	14.2	126.19	48.5
J052	223.44	14.8	124.52	47.5
J053	118.60	14.2	121.81	46.6
J054	0.00	13.4	121.36	46.8
J055	0.00	14.8	124.09	47.4
J056	259.88	13.5	121.41	46.8
J058	40.71	13.5	121.44	46.8
J060	38.43	14.9	121.34	46.1
J062	0.00	18.4	121.32	44.6
J064	178.31	17.0	120.92	45.0
J066	215.15	17.0	120.46	44.8
J068	240.59	16.0	120.45	45.3
J070	58.39	14.8	121.52	46.2
J072	136.67	14.5	121.30	46.3
J076	0.00	14.0	121.41	46.5
J082	0.00	0.0	131.88	57.1
J084	0.00	14.1	121.52	46.6
J086	0.00	14.1	121.50	46.6
J088	0.00	14.1	122.12	46.8
J090	0.00	14.0	124.88	48.0
J74	0.00	14.0	121.39	46.5
J78	0.00	17.0	120.92	45.0
J80	0.00	13.2	135.83	53.1
J92	0.00	13.2	134.92	52.7
T010	0.00	17.6	134.50	50.7
T020	0.00	13.8	134.50	52.3
T030	0.00	13.0	134.50	52.7
T034	0.00	13.3	135.40	52.9
T035	0.00	13.0	131.46	51.3
T040	0.00	14.4	134.50	52.1
T045	0.00	13.0	126.92	49.4
T075	0.00	13.9	129.26	50.0
T080	0.00	14.3	127.38	49.0
T088	0.00	14.6	125.62	48.1
T120	0.00	14.9	124.60	47.5
T126	0.00	14.5	123.32	47.2
T133	0.00	14.2	121.82	46.6
T138	0.00	14.2	122.43	46.9
T140	0.00	14.2	122.87	47.1
T74	0	0	134.5	58.28

RESERVOIR / POC REPORT

ID	Flow (gpm)	Head (feet)
RES9000	0.00	0
RESTANK	-9,484.96	14

PUMP REPORT

ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U7000	14	-6.07	52.21	0.00	134.50
UBOOSTER	13	0.18	54.32	9,484.96	124.95

VALVE REPORT

ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
METER-RADIORD	10	13.8	52.3	52.2	0.00	0	0.23
RP-RADIORD	10	13.8	35.09	46.6	0.00	0	26.57

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario I)
3. PEAK HOUR DEMAND

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2417	12	125	-381	1.08	1.10	0.46
P015	J013	J023	1109	12	125	11	0.03	0.00	0.00
P017	J015	J017	1969	12	125	-830	2.35	3.80	1.93
P019	J046	J020	1551	12	125	-1032	2.93	4.48	2.89
P021	J082	J92	423	12	125	-1688	4.79	3.04	7.19
P023	J022	J027	649	12	125	601	1.70	0.69	1.06
P025	J024	J026	2719	12	125	-23	0.07	0.01	0.00
P027	J024	J031	681	12	125	567	1.61	0.65	0.95
P029	J028	J029	883	12	125	119	0.34	0.05	0.05
P031	J039	J053	514	12	125	-50	0.14	0.01	0.01
P033	J033	J032	733	12	125	1039	2.95	2.15	2.93
P037	J032	J035	665	12	125	592	1.68	0.69	1.03
P039	J034	J055	1379	8	125	-275	1.75	2.47	1.80
P041	J034	J019	1005	12	125	156	0.44	0.09	0.09
P043	J044	J042	804	12	125	538	1.53	0.70	0.87
P045	J070	J037	486	12	125	-212	0.60	0.08	0.15
P047	J038	J058	1285	12	125	242	0.69	0.25	0.20
P049	T010	T020	2706	36	120	12	0.00	0.00	0.00
P053	T74	T040	734	30	120	12	0.01	0.00	0.00
P055	T034	T075	1318	16	125	2846	4.54	6.14	4.66
P057	T088	T120	671	16	125	1549	2.47	1.01	1.51
P059	T120	T126	853	16	125	1549	2.47	1.29	1.51
P061	T138	T133	1387	16	125	800	1.28	0.62	0.44
P071	T045	T035	1549	16	125	-2217	3.54	4.54	2.93
P077	U7000	T010	3165	999	125	12	0.00	0.00	0.00
P079	U7000	T040	3531	999	125	-12	0.00	0.00	0.00
P200	J020	T035	73	12	125	-536	1.52	0.06	0.86
P300	T075	J027	78	12	125	716	2.03	0.12	1.47
P400	T138	J041	43	12	125	186	0.53	0.01	0.12
P500	T133	J039	45	12	125	297	0.84	0.01	0.29
P602	RES9000	U7000	385	999	125	0	0.00	0.00	0.00
P608	J80	T035	998	16	125	2752	4.39	4.37	4.38
P610	J010	J021	2480	12	125	-393	1.11	1.20	0.48
P614	T020	:TER-RADIO	192	16	125	0	0.00	0.00	0.00
P616	J012	J013	465	12	125	373	1.06	0.20	0.44
P626	J023	J016	770	12	125	11	0.03	0.00	0.00
P628	T020	T030	2594	36	120	12	0.00	0.00	0.00
P632	J017	J018	57	12	125	203	0.58	0.01	0.14
P634	J018	J033	603	12	125	1039	2.95	1.76	2.93
P640	J035	J034	633	12	125	417	1.18	0.34	0.54
P644	J016	J015	738	12	125	-830	2.35	1.42	1.93
P650	J037	J038	616	12	125	-212	0.60	0.10	0.15
P654	J038	J039	640	12	125	-226	0.64	0.11	0.17
P656	T133	J038	659	16	125	502	0.80	0.12	0.19
P658	T140	T138	666	16	125	986	1.57	0.44	0.65
P662	J025	J022	665	12	125	1721	4.88	4.96	7.45
P664	UBOOSTER	J80	423	24	125	9485	6.73	2.54	6.01
P666	J025	T034	75	12	125	-1807	5.13	0.61	8.15
P668	J027	J024	643	12	125	1317	3.74	2.92	4.54
P670	T075	T080	691	16	125	2130	3.40	1.88	2.72
P672	J029	J030	463	12	125	682	1.93	0.62	1.34
P674	T126	T140	685	16	125	986	1.57	0.45	0.65
P676	T126	J029	39	12	125	563	1.60	0.04	0.94
P678	J031	J028	640	12	125	1147	3.25	2.25	3.52
P680	T080	T088	646	16	125	2130	3.40	1.76	2.72
P682	T088	J031	43	12	125	581	1.65	0.04	1.00
P690	J021	J012	54	12	125	791	2.24	0.10	1.76
P692	J022	J026	4009	12	125	549	1.56	3.60	0.90
P694	J053	J041	873	12	125	-483	1.37	0.62	0.71
P696	J019	J036	301	12	125	-68	0.19	0.01	0.02
P698	J048	J040	440	12	125	-79	0.22	0.01	0.02
P700	J056	J054	1851	12	125	84	0.24	0.05	0.03
P702	J042	J036	1326	12	125	394	1.12	0.64	0.49
P704	J028	J044	526	12	125	538	1.53	0.46	0.87
P708	T045	J018	125	16	125	2217	3.54	0.37	2.93
P710	J046	J017	123	12	125	1032	2.93	0.36	2.89
P712	J052	J024	1000	8	125	-267	1.71	1.71	1.71
P722	RP-RADIORD	J013	250	16	125	0	0.00	0.00	0.00
P724	J055	J052	239	8	125	-275	1.75	0.43	1.80
P726	J022	J050	1003	8	125	402	2.56	3.64	3.63
P728	J050	J052	1289	8	125	231	1.47	1.68	1.30
P730	J054	J040	686	12	125	84	0.24	0.02	0.03
P732	J053	J056	1249	12	125	314	0.89	0.40	0.32
P734	J058	J048	1047	12	125	173	0.49	0.11	0.11
P736	J056	J058	1030	8	125	-29	0.19	0.03	0.03
P738	J062	J064	1000	8	125	123	0.78	0.40	0.40
P740	J064	J74	595	8	125	-176	1.12	0.47	0.79
P742	J068	J066	1483	8	125	-9	0.06	0.00	0.00

Upper Westside (Scenario I)
3. PEAK HOUR DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P744	J066	J048	712	8	125	-224	1.43	0.87	1.23
P746	J064	J068	1239	8	125	118	0.76	0.47	0.38
P748	J036	J070	350	12	125	64	0.18	0.01	0.02
P750	J070	J076	710	12	125	218	0.62	0.12	0.16
P752	J072	J060	655	12	125	-121	0.34	0.04	0.05
P754	J060	J062	944	12	125	56	0.16	0.01	0.01
P756	J062	J072	391	12	125	127	0.36	0.02	0.06
P758	J78	J068	1341	8	125	114	0.72	0.47	0.35
P760	T030	T74	640	30	120	12	0.01	0.00	0.00
P762	J74	J038	514	8	125	-152	0.97	0.31	0.60
P764	J076	J062	651	12	125	194	0.55	0.09	0.13
P766	J74	J076	1043	8	125	-24	0.15	0.02	0.02
P768	J78	J072	1122	8	125	-112	0.71	0.38	0.34
P770	J064	J78	513	12	125	2	0.01	0.00	0.00
P772	J030	J041	805	12	125	296	0.84	0.23	0.29
P776	RESTANK	UBOOSTER	97	24	125	9485	6.73	0.58	6.01
P778	J80	T034	270	24	125	4653	3.30	0.43	1.61
P782	J020	J082	619	12	125	-504	1.43	0.47	0.77
P784	J082	J021	2748	12	125	1183	3.36	10.23	3.72
P786	J019	J084	706	12	125	43	0.12	0.01	0.01
P788	J034	J084	1417	8	125	46	0.29	0.09	0.07
P790	J084	J086	651	12	125	89	0.25	0.02	0.03
P792	J086	J060	1030	12	125	215	0.61	0.16	0.16
P794	J088	J086	1449	8	125	126	0.81	0.62	0.43
P796	J035	J088	992	8	125	-76	0.48	0.16	0.16
P798	J088	J090	2721	8	125	-202	1.29	2.76	1.02
P800	J090	J016	4945	12	125	486	1.38	3.54	0.72
P802	J018	J090	1227	12	125	688	1.95	1.67	1.36

Upper Westside (Scenario I)
4. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J023 (School on Radio Road)

Updated: 2/2/2023

JUNCTION REPORT

ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	93.95	33.1
J012	18.25	13.8	94.05	34.8
J013	180.95	13.8	89.93	33.0
J015	0.00	14.7	103.56	38.5
J016	663.26	15.0	95.80	35.0
J017	0.00	14.3	124.26	47.7
J018	346.16	14.0	124.42	47.8
J019	90.55	14.6	125.93	48.2
J020	3.79	15.5	129.51	49.4
J021	0.00	13.8	94.59	35.0
J022	84.63	13.6	132.56	51.5
J023	4500.00	14.5	81.77	29.2
J024	253.15	14.3	130.60	50.4
J025	238.77	13.3	135.15	52.8
J026	262.90	13.0	130.74	51.0
J027	0.00	13.9	132.14	51.2
J028	245.18	14.9	128.43	49.2
J029	0.00	14.5	128.38	49.3
J030	192.76	14.2	127.99	49.3
J031	0.00	14.6	129.96	50.0
J032	223.56	13.6	124.53	48.1
J033	0.00	13.8	124.47	48.0
J034	245.26	14.2	125.44	48.2
J035	125.21	14.1	124.82	48.0
J036	130.88	14.9	126.24	48.2
J037	0.00	14.5	126.60	48.6
J038	60.72	10.0	126.99	50.7
J039	60.66	14.2	127.14	48.9
J040	2.39	13.4	126.88	49.2
J041	0.00	14.2	127.70	49.2
J042	72.07	14.9	127.19	48.7
J044	0.00	14.9	127.94	49.0
J046	0.00	13.0	124.65	48.4
J048	13.84	13.0	126.87	49.3
J050	85.50	14.2	130.61	50.4
J052	111.72	14.8	129.31	49.6
J053	59.30	14.2	127.18	49.0
J054	0.00	13.4	126.90	49.2
J055	0.00	14.8	128.73	49.4
J056	129.94	13.5	126.95	49.2
J058	20.36	13.5	126.93	49.2
J060	19.21	14.9	126.02	48.2
J062	0.00	18.4	126.06	46.7
J064	89.15	17.0	126.06	47.3
J066	107.58	17.0	126.27	47.4
J068	120.30	16.0	126.03	47.7
J070	29.19	14.8	126.30	48.3
J072	68.33	14.5	126.04	48.3
J076	0.00	14.0	126.21	48.6
J082	0.00	0.0	129.51	56.1
J084	0.00	14.1	125.90	48.5
J086	0.00	14.1	125.90	48.5
J088	0.00	14.1	124.66	47.9
J090	0.00	14.0	120.29	46.1
J74	0.00	14.0	126.38	48.7
J78	0.00	17.0	126.06	47.3
J80	0.00	13.2	136.00	53.2
J92	0.00	13.2	135.09	52.8
T010	0.00	17.6	134.50	50.7
T020	0.00	13.8	134.50	52.3
T030	0.00	13.0	134.50	52.7
T034	0.00	13.3	135.70	53.0
T035	0.00	13.0	129.72	50.6
T040	0.00	14.4	134.50	52.1
T045	0.00	13.0	124.82	48.5
T075	0.00	13.9	132.20	51.3
T080	0.00	14.3	131.05	50.6
T088	0.00	14.6	129.98	50.0
T120	0.00	14.9	129.28	49.5
T126	0.00	14.5	128.40	49.4
T133	0.00	14.2	127.15	48.9
T138	0.00	14.2	127.70	49.2
T140	0.00	14.2	128.04	49.3
T74	0.00	0.0	134.50	58.3

RESERVOIR / POC REPORT

ID	Flow (gpm)	Head (feet)
RES9000	0.00	0
RESTANK	-9,242.48	14

PUMP REPORT

ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U7000	14	-6.07	52.21	0.00	134.50
UBOOSTER	13	0.19	54.35	9,242.48	124.98

VALVE REPORT

ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
METER-RADIORD	10	13.8	52.3	52.2	0.00	0	0.23
RP-RADIORD	10	13.8	21.47	32.99	0.00	0	26.57

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario I)
4. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J023 (School on Radio Road)

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2417	12	125	-106	0.30	0.10	0.04
P015	J013	J023	1109	12	125	1710	4.85	8.16	7.36
P017	J015	J017	1969	12	125	-2073	5.88	20.70	10.51
P019	J046	J020	1551	12	125	-1078	3.06	4.86	3.13
P021	J082	J92	423	12	125	-2341	6.64	5.57	13.17
P023	J022	J027	649	12	125	460	1.30	0.42	0.65
P025	J024	J026	2719	12	125	-117	0.33	0.14	0.05
P027	J024	J031	681	12	125	566	1.60	0.65	0.95
P029	J028	J029	883	12	125	127	0.36	0.05	0.06
P031	J039	J053	514	12	125	-146	0.41	0.04	0.08
P033	J033	J032	733	12	125	-151	0.43	0.06	0.08
P037	J032	J035	665	12	125	-375	1.06	0.29	0.44
P039	J034	J055	1379	8	125	-320	2.05	3.29	2.39
P041	J034	J019	1005	12	125	-392	1.11	0.48	0.48
P043	J044	J042	804	12	125	560	1.59	0.75	0.93
P045	J070	J037	486	12	125	-451	1.28	0.30	0.62
P047	J038	J058	1285	12	125	113	0.32	0.06	0.05
P049	T010	T020	2706	36	120	12	0.00	0.00	0.00
P053	T74	T040	734	30	120	12	0.01	0.00	0.00
P055	T034	T075	1318	16	125	2103	3.36	3.51	2.66
P057	T088	T120	671	16	125	1265	2.02	0.70	1.04
P059	T120	T126	853	16	125	1265	2.02	0.88	1.04
P061	T138	T133	1387	16	125	758	1.21	0.56	0.40
P071	T045	T035	1549	16	125	-2311	3.69	4.91	3.17
P077	U7000	T010	3165	999	125	12	0.00	0.00	0.00
P079	U7000	T040	3531	999	125	-12	0.00	0.00	0.00
P200	J020	T035	73	12	125	-1038	2.94	0.21	2.92
P300	T075	J027	78	12	125	472	1.34	0.05	0.68
P400	T138	J041	43	12	125	106	0.30	0.00	0.04
P500	T133	J039	45	12	125	184	0.52	0.01	0.12
P602	RES9000	U7000	385	999	125	0	0.00	0.00	0.00
P608	J80	T035	998	16	125	3348	5.34	6.28	6.29
P610	J010	J021	2480	12	125	-281	0.80	0.64	0.26
P614	T020	TER-RADIO	192	16	125	0	0.00	0.00	0.00
P616	J012	J013	465	12	125	1891	5.36	4.12	8.87
P626	J023	J016	770	12	125	-2790	7.91	14.04	18.23
P628	T020	T030	2594	36	120	12	0.00	0.00	0.00
P632	J017	J018	57	12	125	-995	2.82	0.16	2.70
P634	J018	J033	603	12	125	-151	0.43	0.05	0.08
P640	J035	J034	633	12	125	-575	1.63	0.62	0.98
P644	J016	J015	738	12	125	-2073	5.88	7.76	10.51
P650	J037	J038	616	12	125	-451	1.28	0.38	0.62
P654	J038	J039	640	12	125	-269	0.76	0.15	0.24
P656	T133	J038	659	16	125	575	0.92	0.16	0.24
P658	T140	T138	666	16	125	864	1.38	0.34	0.51
P662	J025	J022	665	12	125	1212	3.44	2.59	3.89
P664	UBOOSTER	J80	423	24	125	9242	6.55	2.42	5.72
P666	J025	T034	75	12	125	-1712	4.86	0.55	7.38
P668	J027	J024	643	12	125	932	2.64	1.54	2.39
P670	T075	T080	691	16	125	1631	2.60	1.15	1.66
P672	J029	J030	463	12	125	527	1.50	0.39	0.83
P674	T126	T140	685	16	125	864	1.38	0.35	0.51
P676	T126	J029	39	12	125	400	1.14	0.02	0.50
P678	J031	J028	640	12	125	932	2.64	1.53	2.39
P680	T080	T088	646	16	125	1631	2.60	1.07	1.66
P682	T088	J031	43	12	125	366	1.04	0.02	0.42
P690	J021	J012	54	12	125	2015	5.72	0.54	9.98
P692	J022	J026	4009	12	125	380	1.08	1.82	0.45
P694	J053	J041	873	12	125	-441	1.25	0.52	0.60
P696	J019	J036	301	12	125	-590	1.67	0.31	1.03
P698	J048	J040	440	12	125	-78	0.22	0.01	0.02
P700	J056	J054	1851	12	125	81	0.23	0.05	0.03
P702	J042	J036	1326	12	125	488	1.38	0.96	0.72
P704	J028	J044	526	12	125	560	1.59	0.49	0.93
P708	T045	J018	125	16	125	2311	3.69	0.40	3.17
P710	J046	J017	123	12	125	1078	3.06	0.39	3.13
P712	J052	J024	1000	8	125	-231	1.47	1.30	1.30
P722	RP-RADIORD	J013	250	16	125	0	0.00	0.00	0.00
P724	J055	J052	239	8	125	-320	2.05	0.57	2.39
P726	J022	J050	1003	8	125	287	1.83	1.95	1.95
P728	J050	J052	1289	8	125	202	1.29	1.30	1.01
P730	J054	J040	686	12	125	81	0.23	0.02	0.03
P732	J053	J056	1249	12	125	235	0.67	0.23	0.19
P734	J058	J048	1047	12	125	118	0.33	0.05	0.05
P736	J056	J058	1030	8	125	25	0.16	0.02	0.02
P738	J062	J064	1000	8	125	12	0.08	0.01	0.01
P740	J064	J74	595	8	125	-144	0.92	0.32	0.54
P742	J068	J066	1483	8	125	-75	0.48	0.24	0.16

Upper Westside (Scenario I)
4. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J023 (School on Radio Road)

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P744	J066	J048	712	8	125	-182	1.16	0.60	0.84
P746	J064	J068	1239	8	125	24	0.16	0.03	0.02
P748	J036	J070	350	12	125	-234	0.66	0.06	0.18
P750	J070	J076	710	12	125	188	0.53	0.09	0.12
P752	J072	J060	655	12	125	89	0.25	0.02	0.03
P754	J060	J062	944	12	125	-115	0.33	0.05	0.05
P756	J062	J072	391	12	125	136	0.39	0.03	0.07
P758	J78	J068	1341	8	125	21	0.14	0.02	0.02
P760	T030	T74	640	30	120	12	0.01	0.00	0.00
P762	J74	J038	514	8	125	-219	1.40	0.61	1.18
P764	J076	J062	651	12	125	262	0.74	0.15	0.23
P766	J74	J076	1043	8	125	75	0.48	0.17	0.16
P768	J78	J072	1122	8	125	21	0.13	0.02	0.02
P770	J064	J78	513	12	125	42	0.12	0.00	0.01
P772	J030	J041	805	12	125	335	0.95	0.29	0.36
P776	RESTANK	UBOOSTER	97	24	125	9242	6.55	0.55	5.72
P778	J80	T034	270	24	125	3815	2.71	0.30	1.11
P782	J020	J082	619	12	125	-44	0.13	0.01	0.01
P784	J082	J021	2748	12	125	2296	6.51	34.92	12.71
P786	J019	J084	706	12	125	108	0.31	0.03	0.04
P788	J034	J084	1417	8	125	-108	0.69	0.45	0.32
P790	J084	J086	651	12	125	0	0.00	0.00	0.00
P792	J086	J060	1030	12	125	-184	0.52	0.12	0.12
P794	J088	J086	1449	8	125	-184	1.17	1.23	0.85
P796	J035	J088	992	8	125	75	0.48	0.16	0.16
P798	J088	J090	2721	8	125	259	1.65	4.38	1.61
P800	J090	J016	4945	12	125	1380	3.92	24.48	4.95
P802	J018	J090	1227	12	125	1121	3.18	4.13	3.37
P804	J92	J025	270	12	125	-262	0.74	0.06	0.23
P806	J80	J92	86	12	125	2079	5.90	0.91	10.57

Upper Westside (Scenario I)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	127.80	47.8
J012	18.25	13.8	128.09	49.5
J013	180.95	13.8	127.86	49.4
J015	0.00	14.7	127.86	49.0
J016	663.26	15.0	127.54	48.8
J017	0.00	14.3	128.71	49.6
J018	346.16	14.0	128.66	49.7
J019	90.55	14.6	109.82	41.3
J020	3.79	15.5	132.65	50.8
J021	0.00	13.8	128.15	49.6
J022	84.63	13.6	128.71	49.9
J023	0.00	14.5	127.67	49.0
J024	253.15	14.3	123.91	47.5
J025	238.77	13.3	134.99	52.7
J026	262.90	13.0	124.77	48.5
J027	0.00	13.9	127.28	49.1
J028	245.18	14.9	116.90	44.2
J029	0.00	14.5	116.48	44.2
J030	192.76	14.2	115.31	43.8
J031	0.00	14.6	121.34	46.3
J032	223.56	13.6	119.19	45.8
J033	0.00	13.8	124.39	47.9
J034	245.26	14.2	113.07	42.8
J035	125.21	14.1	115.57	44.0
J036	130.88	14.9	109.80	41.1
J037	0.00	14.5	109.84	41.3
J038	60.72	10.0	111.02	43.8
J039	60.66	14.2	111.73	42.3
J040	2.39	13.4	110.58	42.1
J041	0.00	14.2	113.97	43.2
J042	72.07	14.9	113.10	42.6
J044	0.00	14.9	115.40	43.6
J046	0.00	13.0	129.00	50.3
J048	13.84	13.0	110.49	42.2
J050	85.50	14.2	124.99	48.0
J052	111.72	14.8	121.90	46.4
J053	59.30	14.2	111.96	42.4
J054	0.00	13.4	110.72	42.2
J055	0.00	14.8	120.60	45.8
J056	129.94	13.5	111.10	42.3
J058	20.36	13.5	110.81	42.2
J060	19.21	14.9	97.30	35.7
J062	0.00	18.4	97.29	34.2
J064	89.15	17.0	99.45	35.7
J066	107.58	17.0	106.12	38.6
J068	120.30	16.0	100.12	36.5
J070	29.19	14.8	108.91	40.8
J072	4568.33	14.5	92.32	33.7
J076	0.00	14.0	103.38	38.7
J082	0.00	0.0	133.20	57.7
J084	0.00	14.1	108.35	40.9
J086	0.00	14.1	105.68	39.7
J088	0.00	14.1	115.28	43.8
J090	0.00	14.0	127.64	49.2
J74	0.00	14.0	104.27	39.1
J78	0.00	17.0	99.22	35.6
J80	0.00	13.2	136.00	53.2
J92	0.00	13.2	135.23	52.9
T010	0.00	17.6	134.50	50.7
T020	0.00	13.8	134.50	52.3
T030	0.00	13.0	134.50	52.7
T034	0.00	13.3	135.51	53.0
T035	0.00	13.0	132.68	51.9
T040	0.00	14.4	134.50	52.1
T045	0.00	13.0	128.96	50.3
T075	0.00	13.9	127.35	49.2
T080	0.00	14.3	124.26	47.7
T088	0.00	14.6	121.37	46.3
T120	0.00	14.9	119.23	45.2
T126	0.00	14.5	116.52	44.2
T133	0.00	14.2	111.75	42.3
T138	0.00	14.2	113.97	43.2
T140	0.00	14.2	115.23	43.8
T74	0.00	0.0	134.50	58.3

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES9000	0.00	0
RESTANK	-9,242.48	14

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U7000	14	-6.07	52.21	0.00	134.50
UBOOSTER	13	0.19	54.35	9,242.48	124.98

VALVE REPORT							
ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
METER-RADIORD	10	13.8	52.3	52.2	0.00	0	0.23
RP-RADIORD	10	13.8	60.93	49.42	0.00	0	26.57

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario I)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2417	12	125	-185	0.53	0.29	0.12
P015	J013	J023	1109	12	125	222	0.63	0.19	0.17
P017	J015	J017	1969	12	125	-370	1.05	0.85	0.43
P019	J046	J020	1551	12	125	-924	2.62	3.65	2.36
P021	J082	J92	423	12	125	-1356	3.85	2.03	4.79
P023	J022	J027	649	12	125	890	2.52	1.42	2.19
P025	J024	J026	2719	12	125	-313	0.89	0.86	0.32
P027	J024	J031	681	12	125	1192	3.38	2.57	3.77
P029	J028	J029	883	12	125	388	1.10	0.42	0.47
P031	J039	J053	514	12	125	-376	1.07	0.23	0.44
P033	J033	J032	733	12	125	1675	4.75	5.20	7.09
P037	J032	J035	665	12	125	1452	4.12	3.62	5.44
P039	J034	J055	1379	8	125	-501	3.20	7.53	5.46
P041	J034	J019	1005	12	125	1096	3.11	3.25	3.23
P043	J044	J042	804	12	125	1025	2.91	2.29	2.85
P045	J070	J037	486	12	125	-828	2.35	0.93	1.92
P047	J038	J058	1285	12	125	223	0.63	0.22	0.17
P049	T010	T020	2706	36	120	12	0.00	0.00	0.00
P053	T74	T040	734	30	120	12	0.01	0.00	0.00
P055	T034	T075	1318	16	125	3319	5.30	8.16	6.19
P057	T088	T120	671	16	125	2318	3.70	2.14	3.19
P059	T120	T126	853	16	125	2318	3.70	2.72	3.19
P061	T138	T133	1387	16	125	1601	2.56	2.23	1.61
P071	T045	T035	1549	16	125	-1992	3.18	3.73	2.40
P077	U7000	T010	3165	999	125	12	0.00	0.00	0.00
P079	U7000	T040	3531	999	125	-12	0.00	0.00	0.00
P200	J020	T035	73	12	125	-381	1.08	0.03	0.46
P300	T075	J027	78	12	125	534	1.52	0.07	0.85
P400	T138	J041	43	12	125	145	0.41	0.00	0.08
P500	T133	J039	45	12	125	300	0.85	0.01	0.29
P602	RES9000	U7000	385	999	125	0	0.00	0.00	0.00
P608	J80	T035	998	16	125	2373	3.79	3.32	3.32
P610	J010	J021	2480	12	125	-202	0.57	0.35	0.14
P614	T020	TER-RADIO	192	16	125	0	0.00	0.00	0.00
P616	J012	J013	465	12	125	403	1.14	0.24	0.51
P626	J023	J016	770	12	125	222	0.63	0.13	0.17
P628	T020	T030	2594	36	120	12	0.00	0.00	0.00
P632	J017	J018	57	12	125	555	1.57	0.05	0.91
P634	J018	J033	603	12	125	1675	4.75	4.27	7.09
P640	J035	J034	633	12	125	1224	3.47	2.51	3.96
P644	J016	J015	738	12	125	-370	1.05	0.32	0.43
P650	J037	J038	616	12	125	-828	2.35	1.18	1.92
P654	J038	J039	640	12	125	-615	1.74	0.71	1.11
P656	T133	J038	659	16	125	1302	2.08	0.72	1.09
P658	T140	T138	666	16	125	1746	2.79	1.26	1.88
P662	J025	J022	665	12	125	1957	5.55	6.29	9.45
P664	UBOOSTER	J80	423	24	125	9242	6.55	2.42	5.72
P666	J025	T034	75	12	125	-1654	4.69	0.52	6.92
P668	J027	J024	643	12	125	1424	4.04	3.37	5.24
P670	T075	T080	691	16	125	2785	4.44	3.09	4.47
P672	J029	J030	463	12	125	960	2.72	1.17	2.53
P674	T126	T140	685	16	125	1746	2.79	1.29	1.88
P676	T126	J029	39	12	125	572	1.62	0.04	0.97
P678	J031	J028	640	12	125	1658	4.70	4.45	6.95
P680	T080	T088	646	16	125	2785	4.44	2.89	4.47
P682	T088	J031	43	12	125	466	1.32	0.03	0.66
P690	J021	J012	54	12	125	607	1.72	0.06	1.08
P692	J022	J026	4009	12	125	576	1.63	3.93	0.98
P694	J053	J041	873	12	125	-912	2.59	2.01	2.30
P696	J019	J036	301	12	125	141	0.40	0.02	0.07
P698	J048	J040	440	12	125	-244	0.69	0.09	0.20
P700	J056	J054	1851	12	125	246	0.70	0.38	0.20
P702	J042	J036	1326	12	125	953	2.70	3.31	2.49
P704	J028	J044	526	12	125	1025	2.91	1.50	2.85
P708	T045	J018	125	16	125	1992	3.18	0.30	2.40
P710	J046	J017	123	12	125	924	2.62	0.29	2.36
P712	J052	J024	1000	8	125	-292	1.86	2.01	2.01
P722	RP-RADIORE	J013	250	16	125	0	0.00	0.00	0.00
P724	J055	J052	239	8	125	-501	3.20	1.31	5.46
P726	J022	J050	1003	8	125	406	2.59	3.72	3.71
P728	J050	J052	1289	8	125	321	2.05	3.09	2.39
P730	J054	J040	686	12	125	246	0.70	0.14	0.20
P732	J053	J056	1249	12	125	477	1.35	0.86	0.69
P734	J058	J048	1047	12	125	304	0.86	0.31	0.30
P736	J056	J058	1030	8	125	101	0.64	0.29	0.28
P738	J062	J064	1000	8	125	-303	1.93	2.15	2.15
P740	J064	J74	595	8	125	-621	3.96	4.83	8.12
P742	J068	J066	1483	8	125	-426	2.72	6.00	4.05

Upper Westside (Scenario I)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P744	J066	J048	712	8	125	-534	3.41	4.37	6.14
P746	J064	J068	1239	8	125	-144	0.92	0.67	0.54
P748	J036	J070	350	12	125	963	2.73	0.89	2.54
P750	J070	J076	710	12	125	1762	5.00	5.52	7.78
P752	J072	J060	655	12	125	-1740	4.93	4.98	7.60
P754	J060	J062	944	12	125	45	0.13	0.01	0.01
P756	J062	J072	391	12	125	2295	6.51	4.97	12.69
P758	J78	J068	1341	8	125	-162	1.03	0.90	0.67
P760	T030	T74	640	30	120	12	0.01	0.00	0.00
P762	J74	J038	514	8	125	-805	5.14	6.75	13.13
P764	J076	J062	651	12	125	1946	5.52	6.09	9.35
P766	J74	J076	1043	8	125	184	1.17	0.89	0.85
P768	J78	J072	1122	8	125	534	3.41	6.90	6.15
P770	J064	J78	513	12	125	373	1.06	0.22	0.44
P772	J030	J041	805	12	125	767	2.18	1.34	1.67
P776	RESTANK	UBOOSTER	97	24	125	9242	6.55	0.55	5.72
P778	J80	T034	270	24	125	4972	3.53	0.49	1.82
P782	J020	J082	619	12	125	-547	1.55	0.55	0.89
P784	J082	J021	2748	12	125	808	2.29	5.05	1.84
P786	J019	J084	706	12	125	864	2.45	1.47	2.08
P788	J034	J084	1417	8	125	384	2.45	4.72	3.33
P790	J084	J086	651	12	125	1248	3.54	2.67	4.11
P792	J086	J060	1030	12	125	1804	5.12	8.38	8.13
P794	J088	J086	1449	8	125	556	3.55	9.61	6.63
P796	J035	J088	992	8	125	103	0.66	0.29	0.29
P798	J088	J090	2721	8	125	-454	2.90	12.36	4.54
P800	J090	J016	4945	12	125	71	0.20	0.10	0.02
P802	J018	J090	1227	12	125	525	1.49	1.01	0.83

Upper Westside (Scenario I)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	147.80	56.4
J012	18.25	13.8	148.09	58.2
J013	180.95	13.8	147.86	58.1
J015	0.00	14.7	147.86	57.7
J016	663.26	15.0	147.54	57.4
J017	0.00	14.3	148.71	58.2
J018	346.16	14.0	148.66	58.4
J019	90.55	14.6	129.82	49.9
J020	3.79	15.5	152.65	59.4
J021	0.00	13.8	148.15	58.2
J022	84.63	13.6	148.71	58.5
J023	0.00	14.5	147.67	57.7
J024	253.15	14.3	143.91	56.2
J025	238.77	13.3	154.99	61.4
J026	262.90	13.0	144.77	57.1
J027	0.00	13.9	147.28	57.8
J028	245.18	14.9	136.90	52.8
J029	0.00	14.5	136.48	52.9
J030	192.76	14.2	135.31	52.5
J031	0.00	14.6	141.34	54.9
J032	223.56	13.6	139.19	54.4
J033	0.00	13.8	144.39	56.6
J034	245.26	14.2	133.07	51.5
J035	125.21	14.1	135.57	52.6
J036	130.88	14.9	129.80	49.8
J037	0.00	14.5	129.84	50.0
J038	60.72	10.0	131.02	52.4
J039	60.66	14.2	131.73	50.9
J040	2.39	13.4	130.58	50.8
J041	0.00	14.2	133.97	51.9
J042	72.07	14.9	133.10	51.2
J044	0.00	14.9	135.40	52.2
J046	0.00	13.0	149.00	58.9
J048	13.84	13.0	130.49	50.9
J050	85.50	14.2	144.99	56.7
J052	111.72	14.8	141.90	55.1
J053	59.30	14.2	131.96	51.0
J054	0.00	13.4	130.72	50.8
J055	0.00	14.8	140.60	54.5
J056	129.94	13.5	131.10	51.0
J058	20.36	13.5	130.81	50.8
J060	19.21	14.9	117.30	44.4
J062	0.00	18.4	117.29	42.9
J064	89.15	17.0	119.45	44.4
J066	107.58	17.0	126.12	47.3
J068	120.30	16.0	120.12	45.1
J070	29.19	14.8	128.91	49.4
J072	4568.33	14.5	112.32	42.4
J076	0.00	14.0	123.38	47.4
J082	0.00	0.0	153.20	66.4
J084	0.00	14.1	128.35	49.5
J086	0.00	14.1	125.68	48.4
J088	0.00	14.1	135.28	52.5
J090	0.00	14.0	147.64	57.9
J74	0.00	14.0	124.27	47.8
J78	0.00	17.0	119.22	44.3
J80	0.00	13.2	156.00	61.9
J92	0.00	13.2	155.23	61.5
T010	0.00	17.6	134.50	50.7
T020	0.00	13.8	134.50	52.3
T030	0.00	13.0	134.50	52.7
T034	0.00	13.3	155.51	61.6
T035	0.00	13.0	152.68	60.5
T040	0.00	14.4	134.50	52.1
T045	0.00	13.0	148.96	58.9
T075	0.00	13.9	147.35	57.8
T080	0.00	14.3	144.26	56.3
T088	0.00	14.6	141.37	54.9
T120	0.00	14.9	139.23	53.9
T126	0.00	14.5	136.52	52.9
T133	0.00	14.2	131.75	50.9
T138	0.00	14.2	133.97	51.9
T140	0.00	14.2	135.23	52.5
T74	0.00	0.0	134.50	58.3

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES9000	0.00	0
RESTANK	-9,242.48	14

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U7000	14	-6.07	52.21	0.00	134.50
UBOOSTER	13	0.19	63.01	9,242.48	144.98

VALVE REPORT							
ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
METER-RADIORD	10	13.8	52.3	52.2	0.00	0	0.23
RP-RADIORD	10	13.8	46.57	58.09	0.00	0	26.57

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario I)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2417	12	125	-185	0.53	0.29	0.12
P015	J013	J023	1109	12	125	222	0.63	0.19	0.17
P017	J015	J017	1969	12	125	-370	1.05	0.85	0.43
P019	J046	J020	1551	12	125	-924	2.62	3.65	2.36
P021	J082	J92	423	12	125	-1356	3.85	2.03	4.79
P023	J022	J027	649	12	125	890	2.52	1.42	2.19
P025	J024	J026	2719	12	125	-313	0.89	0.86	0.32
P027	J024	J031	681	12	125	1192	3.38	2.57	3.77
P029	J028	J029	883	12	125	388	1.10	0.42	0.47
P031	J039	J053	514	12	125	-376	1.07	0.23	0.44
P033	J033	J032	733	12	125	1675	4.75	5.20	7.09
P037	J032	J035	665	12	125	1452	4.12	3.62	5.44
P039	J034	J055	1379	8	125	-501	3.20	7.53	5.46
P041	J034	J019	1005	12	125	1096	3.11	3.25	3.23
P043	J044	J042	804	12	125	1025	2.91	2.29	2.85
P045	J070	J037	486	12	125	-828	2.35	0.93	1.92
P047	J038	J058	1285	12	125	223	0.63	0.22	0.17
P049	T010	T020	2706	36	120	12	0.00	0.00	0.00
P053	T74	T040	734	30	120	12	0.01	0.00	0.00
P055	T034	T075	1318	16	125	3319	5.30	8.16	6.19
P057	T088	T120	671	16	125	2318	3.70	2.14	3.19
P059	T120	T126	853	16	125	2318	3.70	2.72	3.19
P061	T138	T133	1387	16	125	1601	2.56	2.23	1.61
P071	T045	T035	1549	16	125	-1992	3.18	3.73	2.40
P077	U7000	T010	3165	999	125	12	0.00	0.00	0.00
P079	U7000	T040	3531	999	125	-12	0.00	0.00	0.00
P200	J020	T035	73	12	125	-381	1.08	0.03	0.46
P300	T075	J027	78	12	125	534	1.52	0.07	0.85
P400	T138	J041	43	12	125	145	0.41	0.00	0.08
P500	T133	J039	45	12	125	300	0.85	0.01	0.29
P602	RES9000	U7000	385	999	125	0	0.00	0.00	0.00
P608	J80	T035	998	16	125	2373	3.79	3.32	3.32
P610	J010	J021	2480	12	125	-202	0.57	0.35	0.14
P614	T020	:TER-RADIO	192	16	125	0	0.00	0.00	0.00
P616	J012	J013	465	12	125	403	1.14	0.24	0.51
P626	J023	J016	770	12	125	222	0.63	0.13	0.17
P628	T020	T030	2594	36	120	12	0.00	0.00	0.00
P632	J017	J018	57	12	125	555	1.57	0.05	0.91
P634	J018	J033	603	12	125	1675	4.75	4.27	7.09
P640	J035	J034	633	12	125	1224	3.47	2.51	3.96
P644	J016	J015	738	12	125	-370	1.05	0.32	0.43
P650	J037	J038	616	12	125	-828	2.35	1.18	1.92
P654	J038	J039	640	12	125	-615	1.74	0.71	1.11
P656	T133	J038	659	16	125	1302	2.08	0.72	1.09
P658	T140	T138	666	16	125	1746	2.79	1.26	1.88
P662	J025	J022	665	12	125	1957	5.55	6.29	9.45
P664	UBOOSTER	J80	423	24	125	9242	6.55	2.42	5.72
P666	J025	T034	75	12	125	-1654	4.69	0.52	6.92
P668	J027	J024	643	12	125	1424	4.04	3.37	5.24
P670	T075	T080	691	16	125	2785	4.44	3.09	4.47
P672	J029	J030	463	12	125	960	2.72	1.17	2.53
P674	T126	T140	685	16	125	1746	2.79	1.29	1.88
P676	T126	J029	39	12	125	572	1.62	0.04	0.97
P678	J031	J028	640	12	125	1658	4.70	4.45	6.95
P680	T080	T088	646	16	125	2785	4.44	2.89	4.47
P682	T088	J031	43	12	125	466	1.32	0.03	0.66
P690	J021	J012	54	12	125	607	1.72	0.06	1.08
P692	J022	J026	4009	12	125	576	1.63	3.93	0.98
P694	J053	J041	873	12	125	-912	2.59	2.01	2.30
P696	J019	J036	301	12	125	141	0.40	0.02	0.07
P698	J048	J040	440	12	125	-244	0.69	0.09	0.20
P700	J056	J054	1851	12	125	246	0.70	0.38	0.20
P702	J042	J036	1326	12	125	953	2.70	3.31	2.49
P704	J028	J044	526	12	125	1025	2.91	1.50	2.85
P708	T045	J018	125	16	125	1992	3.18	0.30	2.40
P710	J046	J017	123	12	125	924	2.62	0.29	2.36
P712	J052	J024	1000	8	125	-292	1.86	2.01	2.01
P722	RP-RADIORD	J013	250	16	125	0	0.00	0.00	0.00
P724	J055	J052	239	8	125	-501	3.20	1.31	5.46
P726	J022	J050	1003	8	125	406	2.59	3.72	3.71
P728	J050	J052	1289	8	125	321	2.05	3.09	2.39
P730	J054	J040	686	12	125	246	0.70	0.14	0.20
P732	J053	J056	1249	12	125	477	1.35	0.86	0.69
P734	J058	J048	1047	12	125	304	0.86	0.31	0.30
P736	J056	J058	1030	8	125	101	0.64	0.29	0.28
P738	J062	J064	1000	8	125	-303	1.93	2.15	2.15
P740	J064	J74	595	8	125	-621	3.96	4.83	8.12
P742	J068	J066	1483	8	125	-426	2.72	6.00	4.05

Upper Westside (Scenario I)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P744	J066	J048	712	8	125	-534	3.41	4.37	6.14
P746	J064	J068	1239	8	125	-144	0.92	0.67	0.54
P748	J036	J070	350	12	125	963	2.73	0.89	2.54
P750	J070	J076	710	12	125	1762	5.00	5.52	7.78
P752	J072	J060	655	12	125	-1740	4.93	4.98	7.60
P754	J060	J062	944	12	125	45	0.13	0.01	0.01
P756	J062	J072	391	12	125	2295	6.51	4.97	12.69
P758	J78	J068	1341	8	125	-162	1.03	0.90	0.67
P760	T030	T74	640	30	120	12	0.01	0.00	0.00
P762	J74	J038	514	8	125	-805	5.14	6.75	13.13
P764	J076	J062	651	12	125	1946	5.52	6.09	9.35
P766	J74	J076	1043	8	125	184	1.17	0.89	0.85
P768	J78	J072	1122	8	125	534	3.41	6.90	6.15
P770	J064	J78	513	12	125	373	1.06	0.22	0.44
P772	J030	J041	805	12	125	767	2.18	1.34	1.67
P776	RESTANK	UBOOSTER	97	24	125	9242	6.55	0.55	5.72
P778	J80	T034	270	24	125	4972	3.53	0.49	1.82
P782	J020	J082	619	12	125	-547	1.55	0.55	0.89
P784	J082	J021	2748	12	125	808	2.29	5.05	1.84
P786	J019	J084	706	12	125	864	2.45	1.47	2.08
P788	J034	J084	1417	8	125	384	2.45	4.72	3.33
P790	J084	J086	651	12	125	1248	3.54	2.67	4.11
P792	J086	J060	1030	12	125	1804	5.12	8.38	8.13
P794	J088	J086	1449	8	125	556	3.55	9.61	6.63
P796	J035	J088	992	8	125	103	0.66	0.29	0.29
P798	J088	J090	2721	8	125	-454	2.90	12.36	4.54
P800	J090	J016	4945	12	125	71	0.20	0.10	0.02
P802	J018	J090	1227	12	125	525	1.49	1.01	0.83
P804	J92	J025	270	12	125	542	1.54	0.24	0.88
P806	J80	J92	86	12	125	1897	5.38	0.77	8.93

Upper Westside (Scenario I)
6. MAXIMUM DAY DEMAND + FIRE FLOW OF 2,000 GPM AT J040

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	131.80	49.5
J012	18.25	13.8	132.10	51.3
J013	180.95	13.8	131.99	51.2
J015	0.00	14.7	132.28	51.0
J016	663.26	15.0	131.93	50.7
J017	0.00	14.3	133.22	51.5
J018	346.16	14.0	133.21	51.7
J019	90.55	14.6	126.87	48.7
J020	3.79	15.5	135.48	52.0
J021	0.00	13.8	132.14	51.3
J022	84.63	13.6	133.66	52.0
J023	0.00	14.5	131.95	50.9
J024	253.15	14.3	131.24	50.7
J025	238.77	13.3	136.90	53.6
J026	262.90	13.0	131.48	51.4
J027	0.00	13.9	133.02	51.6
J028	245.18	14.9	128.24	49.1
J029	0.00	14.5	127.90	49.1
J030	192.76	14.2	127.26	49.0
J031	0.00	14.6	130.19	50.1
J032	223.56	13.6	129.64	50.3
J033	0.00	13.8	131.60	51.0
J034	245.26	14.2	127.72	49.2
J035	125.21	14.1	128.53	49.6
J036	130.88	14.9	126.71	48.5
J037	0.00	14.5	125.96	48.3
J038	60.72	10.0	125.59	50.1
J039	60.66	14.2	125.65	48.3
J040	2002.39	13.4	117.65	45.2
J041	0.00	14.2	126.64	48.7
J042	72.07	14.9	127.36	48.7
J044	0.00	14.9	127.89	49.0
J046	0.00	13.0	133.39	52.2
J048	13.84	13.0	119.33	46.1
J050	85.50	14.2	131.73	50.9
J052	111.72	14.8	130.44	50.1
J053	59.30	14.2	125.46	48.2
J054	0.00	13.4	118.89	45.7
J055	0.00	14.8	130.04	49.9
J056	129.94	13.5	122.24	47.1
J058	20.36	13.5	122.19	47.1
J060	19.21	14.9	126.25	48.3
J062	0.00	18.4	126.15	46.7
J064	89.15	17.0	125.22	46.9
J066	107.58	17.0	120.13	44.7
J068	120.30	16.0	123.68	46.7
J070	29.19	14.8	126.26	48.3
J072	68.33	14.5	126.15	48.4
J076	0.00	14.0	126.16	48.6
J082	0.00	0.0	135.76	58.8
J084	0.00	14.1	126.87	48.9
J086	0.00	14.1	126.79	48.9
J088	0.00	14.1	128.55	49.6
J090	0.00	14.0	132.51	51.4
J74	0.00	14.0	125.59	48.4
J78	0.00	17.0	125.21	46.9
J80	0.00	13.2	137.47	53.8
J92	0.00	13.2	137.02	53.7
T010	0.00	17.6	134.50	50.7
T020	0.00	13.8	134.50	52.3
T030	0.00	13.0	134.50	52.7
T034	0.00	13.3	137.21	53.7
T035	0.00	13.0	135.51	53.1
T040	0.00	14.4	134.50	52.1
T045	0.00	13.0	133.38	52.2
T075	0.00	13.9	133.07	51.6
T080	0.00	14.3	131.59	50.8
T088	0.00	14.6	130.20	50.1
T120	0.00	14.9	129.20	49.5
T126	0.00	14.5	127.92	49.1
T133	0.00	14.2	125.69	48.3
T138	0.00	14.2	126.65	48.7
T140	0.00	14.2	127.27	49.0
T74	0.00	0.0	134.50	58.3

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES9000	0.00	0
RESTANK	-6,742.48	14

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U7000	14	-6.07	52.21	0.00	134.50
UBOOSTER	13	0.3	54.52	6,742.48	125.13

VALVE REPORT							
ID	Diameter (in)	Elevation (ft)	Upstream Pressure (psi)	Downstrea... Pressure (psi)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
METER-RADIORD	10	13.8	52.3	52.2	0.00	0	0.23
RP-RADIORD	10	13.8	39.7	51.21	0.00	0	26.57

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario I)
6. MAXIMUM DAY DEMAND + FIRE FLOW OF 2,000 GPM AT J040

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2417	12	125	-189	0.54	0.30	0.12
P015	J013	J023	1109	12	125	89	0.25	0.03	0.03
P017	J015	J017	1969	12	125	-391	1.11	0.94	0.48
P019	J046	J020	1551	12	125	-684	1.94	2.09	1.35
P021	J082	J92	423	12	125	-1049	2.98	1.26	2.98
P023	J022	J027	649	12	125	579	1.64	0.64	0.99
P025	J024	J026	2719	12	125	-156	0.44	0.24	0.09
P027	J024	J031	681	12	125	735	2.09	1.05	1.54
P029	J028	J029	883	12	125	349	0.99	0.34	0.39
P031	J039	J053	514	12	125	342	0.97	0.19	0.37
P033	J033	J032	733	12	125	990	2.81	1.96	2.67
P037	J032	J035	665	12	125	766	2.17	1.11	1.66
P039	J034	J055	1379	8	125	-265	1.69	2.32	1.68
P041	J034	J019	1005	12	125	532	1.51	0.85	0.85
P043	J044	J042	804	12	125	467	1.32	0.53	0.66
P045	J070	J037	486	12	125	444	1.26	0.29	0.61
P047	J038	J058	1285	12	125	984	2.79	3.40	2.64
P049	T010	T020	2706	36	120	6	0.00	0.00	0.00
P053	T74	T040	734	30	120	6	0.00	0.00	0.00
P055	T034	T075	1318	16	125	2301	3.67	4.14	3.14
P057	T088	T120	671	16	125	1545	2.46	1.01	1.50
P059	T120	T126	853	16	125	1545	2.46	1.28	1.50
P061	T138	T133	1387	16	125	1015	1.62	0.96	0.69
P071	T045	T035	1549	16	125	-1471	2.35	2.13	1.37
P077	U7000	T010	3165	999	125	6	0.00	0.00	0.00
P079	U7000	T040	3531	999	125	-6	0.00	0.00	0.00
P200	J020	T035	73	12	125	-314	0.89	0.02	0.32
P300	T075	J027	78	12	125	430	1.22	0.04	0.57
P400	T138	J041	43	12	125	184	0.52	0.01	0.12
P500	T133	J039	45	12	125	564	1.60	0.04	0.94
P602	RES9000	U7000	385	999	125	0	0.00	0.00	0.00
P608	J80	T035	998	16	125	1786	2.85	1.96	1.96
P610	J010	J021	2480	12	125	-198	0.56	0.34	0.14
P614	T020	ETER-RADIOI	192	16	125	0	0.00	0.00	0.00
P616	J012	J013	465	12	125	270	0.77	0.11	0.24
P626	J023	J016	770	12	125	89	0.25	0.02	0.03
P628	T020	T030	2594	36	120	6	0.00	0.00	0.00
P632	J017	J018	57	12	125	293	0.83	0.02	0.28
P634	J018	J033	603	12	125	990	2.81	1.61	2.67
P640	J035	J034	633	12	125	664	1.88	0.81	1.28
P644	J016	J015	738	12	125	-391	1.11	0.35	0.48
P650	J037	J038	616	12	125	444	1.26	0.37	0.61
P654	J038	J039	640	12	125	-161	0.46	0.06	0.09
P656	T133	J038	659	16	125	451	0.72	0.10	0.15
P658	T140	T138	666	16	125	1198	1.91	0.62	0.94
P662	J025	J022	665	12	125	1368	3.88	3.24	4.87
P664	UBOOSTER	J80	423	24	125	6742	4.78	1.35	3.19
P666	J025	T034	75	12	125	-1239	3.52	0.30	4.05
P668	J027	J024	643	12	125	1009	2.86	1.78	2.77
P670	T075	T080	691	16	125	1870	2.98	1.48	2.14
P672	J029	J030	463	12	125	696	1.97	0.64	1.39
P674	T126	T140	685	16	125	1198	1.91	0.64	0.94
P676	T126	J029	39	12	125	346	0.98	0.01	0.38
P678	J031	J028	640	12	125	1061	3.01	1.95	3.04
P680	T080	T088	646	16	125	1870	2.98	1.38	2.14
P682	T088	J031	43	12	125	326	0.92	0.01	0.34
P690	J021	J012	54	12	125	477	1.35	0.04	0.69
P692	J022	J026	4009	12	125	419	1.19	2.19	0.55
P694	J053	J041	873	12	125	-686	1.95	1.19	1.36
P696	J019	J036	301	12	125	408	1.16	0.16	0.52
P698	J048	J040	440	12	125	1201	3.41	1.68	3.83
P700	J056	J054	1851	12	125	802	2.27	3.35	1.81
P702	J042	J036	1326	12	125	395	1.12	0.65	0.49
P704	J028	J044	526	12	125	467	1.32	0.35	0.66
P708	T045	J018	125	16	125	1471	2.35	0.17	1.37
P710	J046	J017	123	12	125	684	1.94	0.17	1.35
P712	J052	J024	1000	8	125	-177	1.13	0.80	0.80
P722	RP-RADIORD	J013	250	16	125	0	0.00	0.00	0.00
P724	J055	J052	239	8	125	-265	1.69	0.40	1.68
P726	J022	J050	1003	8	125	286	1.82	1.93	1.93
P728	J050	J052	1289	8	125	200	1.28	1.29	1.00
P730	J054	J040	686	12	125	802	2.27	1.24	1.81
P732	J053	J056	1249	12	125	970	2.75	3.22	2.57
P734	J058	J048	1047	12	125	1002	2.84	2.86	2.73
P736	J056	J058	1030	8	125	38	0.24	0.05	0.05
P738	J062	J064	1000	8	125	193	1.23	0.94	0.93
P740	J064	J74	595	8	125	-155	0.99	0.37	0.62
P742	J068	J066	1483	8	125	321	2.05	3.54	2.39

Upper Westside (Scenario I)
6. MAXIMUM DAY DEMAND + FIRE FLOW OF 2,000 GPM AT J040

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P744	J066	J048	712	8	125	213	1.36	0.80	1.12
P746	J064	J068	1239	8	125	225	1.44	1.54	1.24
P748	J036	J070	350	12	125	672	1.91	0.46	1.30
P750	J070	J076	710	12	125	199	0.56	0.10	0.14
P752	J072	J060	655	12	125	-215	0.61	0.10	0.16
P754	J060	J062	944	12	125	174	0.49	0.10	0.11
P756	J062	J072	391	12	125	35	0.10	0.00	0.01
P758	J78	J068	1341	8	125	216	1.38	1.54	1.15
P760	T030	T74	640	30	120	6	0.00	0.00	0.00
P762	J74	J038	514	8	125	-11	0.07	0.00	0.00
P764	J076	J062	651	12	125	54	0.15	0.01	0.01
P766	J74	J076	1043	8	125	-145	0.92	0.57	0.55
P768	J78	J072	1122	8	125	-182	1.16	0.94	0.83
P770	J064	J78	513	12	125	34	0.10	0.00	0.01
P772	J030	J041	805	12	125	503	1.43	0.61	0.76
P776	RESTANK	UBOOSTER	97	24	125	6742	4.78	0.31	3.19
P778	J80	T034	270	24	125	3540	2.51	0.26	0.97
P782	J020	J082	619	12	125	-374	1.06	0.27	0.44
P784	J082	J021	2748	12	125	675	1.92	3.62	1.32
P786	J019	J084	706	12	125	33	0.09	0.00	0.01
P788	J034	J084	1417	8	125	152	0.97	0.85	0.60
P790	J084	J086	651	12	125	186	0.53	0.08	0.12
P792	J086	J060	1030	12	125	408	1.16	0.53	0.52
P794	J088	J086	1449	8	125	222	1.42	1.76	1.21
P796	J035	J088	992	8	125	-23	0.15	0.02	0.02
P798	J088	J090	2721	8	125	-246	1.57	3.97	1.46
P800	J090	J016	4945	12	125	183	0.52	0.58	0.12
P802	J018	J090	1227	12	125	429	1.22	0.70	0.57
P804	J92	J025	270	12	125	368	1.04	0.12	0.43
P806	J80	J92	86	12	125	1417	4.02	0.45	5.20

Upper Westside (Scenario II)
1. AVERAGE DAY DEMAND

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J_BRD	0.00	14.0	131.79	51.0
J_WRD	0.00	13.0	130.48	50.9
J010	214.98	17.6	130.19	48.8
J012	10.14	13.8	130.09	50.4
J013	100.53	13.8	130.05	50.4
J015	0.00	14.7	129.95	49.9
J016	368.48	15.0	129.89	49.8
J017	0.00	14.3	130.09	50.2
J018	192.31	14.0	130.09	50.3
J019	50.30	14.6	129.91	50.0
J020	2.11	15.5	130.26	49.7
J022	47.02	13.6	130.10	50.5
J023	0.00	14.5	129.95	50.0
J024	140.64	14.3	130.02	50.2
J025	132.65	13.3	130.15	50.6
J026	146.06	13.0	130.00	50.7
J027	0.00	13.9	130.06	50.3
J028	136.21	14.9	130.03	49.9
J029	0.00	14.5	130.23	50.1
J030	107.09	14.2	130.20	50.3
J031	0.00	14.6	130.02	50.0
J032	124.20	13.6	129.92	50.4
J033	0.00	13.8	130.01	50.4
J034	136.26	14.2	129.90	50.1
J035	69.56	14.1	129.90	50.2
J036	72.71	14.9	129.92	49.8
J037	0.00	14.5	129.94	50.0
J038	33.73	14.0	129.96	50.2
J039	33.70	14.2	129.99	50.2
J040	1.33	13.4	130.12	50.6
J041	0.00	14.2	130.07	50.2
J042	40.04	14.9	129.97	49.9
J044	0.00	14.9	130.02	49.9
J046	0.00	13.0	130.11	50.7
J048	7.69	13.0	130.07	50.7
J050	47.50	14.2	129.98	50.2
J052	62.07	14.8	129.97	49.9
J053	32.95	14.2	130.03	50.2
J054	0.00	13.4	130.20	50.6
J055	0.00	14.8	129.93	49.9
J056	72.19	13.5	130.09	50.5
J058	11.31	13.5	130.03	50.5
J060	10.67	14.9	129.91	49.8
J062	0.00	18.4	129.91	48.3
J064	49.53	17.0	129.91	48.9
J066	59.77	17.0	129.92	48.9
J068	66.83	16.0	129.89	49.4
J070	16.22	14.8	129.92	49.9
J072	37.96	14.5	129.91	50.0
J076	0.00	14.3	130.33	50.3
J078	0.00	17.0	129.91	48.9
J080	0.00	13.5	130.14	50.5
J082	0.00	14.5	130.01	50.1
J084	0.00	14.5	129.91	50.0
J086	0.00	14.5	129.91	50.0
J088	0.00	16.0	129.92	49.4
J090	0.00	14.0	129.93	50.2
J092	0.00	14.9	129.99	49.9
J094	0.00	14.2	130.03	50.2
J100	0.00	14.1	130.15	50.3
J104	0.00	13.0	130.16	50.8
J96	0.00	14.1	129.92	50.2
J98	0.00	14.0	130.03	50.3
T010	0.00	17.6	130.35	48.9
T020	0.00	13.8	130.34	50.5
T030	0.00	13.0	130.33	50.8
T035	0.00	13.0	130.26	50.8
T040	0.00	14.4	130.35	50.3
T045	0.00	13.0	130.11	50.8
T102	0.00	17.6	130.34	48.9

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES-BARANDAS	-1,028.72	0
RES-SANJUAN	-1,605.99	0

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U-BARANDAS	14	-6.07	51.04	1,028.72	131.79
U-SANJUAN	14	-6.07	50.41	1,605.99	130.35

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario II)
1. AVERAGE DAY DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2451	12	125	99	0.28	0.09	0.04
P015	J013	J023	1355	12	125	141	0.40	0.10	0.07
P017	J015	J017	1930	12	125	-144	0.41	0.14	0.08
P019	J104	J020	977	12	125	-166	0.47	0.10	0.10
P023	J022	J027	629	12	125	129	0.37	0.04	0.06
P025	J024	J026	2682	12	125	29	0.08	0.01	0.00
P027	J031	J024	687	12	120	53	0.15	0.01	0.01
P029	J028	J029	883	12	125	-258	0.73	0.20	0.22
P031	J039	J053	514	12	125	-147	0.42	0.04	0.08
P033	J033	J032	733	12	125	194	0.55	0.10	0.13
P037	J032	J035	665	12	125	70	0.20	0.01	0.02
P039	J034	J055	1379	12	125	-72	0.20	0.03	0.02
P041	J034	J019	1005	12	125	-33	0.09	0.00	0.00
P043	J044	J092	499	12	125	125	0.35	0.03	0.06
P045	J070	J037	486	12	125	-92	0.26	0.02	0.03
P047	J038	J058	1285	12	125	-125	0.36	0.07	0.06
P049	T010	T020	2615	36	120	470	0.15	0.01	0.00
P053	T040	T030	1345	30	120	612	0.28	0.02	0.01
P071	T045	T035	1574	18	125	-483	0.61	0.15	0.10
P077	U-SANJUAN	T010	3165	999	125	784	0.00	0.00	0.00
P079	U-SANJUAN	T040	3546	999	125	822	0.00	0.00	0.00
P200	J020	T035	85	12	125	-10	0.03	0.00	0.00
P602	RES-SANJUAN	U-SANJUAN	385	999	125	1606	0.00	0.00	0.00
P606	T030	T035	661	18	125	493	0.62	0.07	0.10
P610	J010	T102	498	12	125	-314	0.89	0.16	0.32
P616	J012	J013	226	12	125	242	0.69	0.04	0.20
P620	J076	J030	203	12	125	462	1.31	0.13	0.65
P622	J078	J072	1141	8	125	3	0.02	0.00	0.00
P624	J064	J078	513	12	125	23	0.07	0.00	0.00
P626	J023	J016	770	12	125	141	0.40	0.06	0.07
P628	T020	T030	2717	36	120	470	0.15	0.01	0.00
P632	J017	J018	82	12	125	22	0.06	0.00	0.00
P634	J018	J033	618	12	125	194	0.55	0.08	0.13
P640	J035	J034	633	12	125	21	0.06	0.00	0.00
P644	J016	J015	738	12	125	-144	0.41	0.06	0.08
P650	J037	J038	616	12	125	-92	0.26	0.02	0.03
P654	J038	J039	640	12	125	-113	0.32	0.03	0.05
P660	J030	J041	612	12	125	245	0.69	0.12	0.20
P662	J025	J022	693	12	120	145	0.41	0.06	0.08
P664	J022	J080	1315	12	125	-94	0.27	0.04	0.03
P668	J027	J024	637	12	120	129	0.37	0.04	0.07
P672	J029	J076	458	12	125	-258	0.73	0.10	0.22
P678	J031	J028	634	12	120	-53	0.15	0.01	0.01
P690	J012	T030	2788	12	125	-153	0.43	0.23	0.08
P692	J080	J026	2656	12	125	117	0.33	0.14	0.05
P694	J094	J041	498	12	125	-148	0.42	0.04	0.08
P696	J019	J036	301	12	125	-79	0.22	0.01	0.02
P698	J048	J040	440	12	125	-186	0.53	0.05	0.12
P700	J056	J054	1903	12	125	-122	0.35	0.11	0.06
P702	J042	J036	1326	12	125	103	0.29	0.05	0.04
P704	J028	J044	592	12	125	68	0.19	0.01	0.02
P708	J046	J017	109	12	125	166	0.47	0.01	0.10
P710	T045	J018	107	18	125	483	0.61	0.01	0.10
P712	J082	J024	535	8	125	-13	0.08	0.00	0.01
P718	T040	J080	1344	12	125	211	0.60	0.20	0.15
P720	J044	J041	1457	12	125	-97	0.27	0.05	0.04
P722	J052	J082	503	8	125	-53	0.34	0.04	0.09
P724	J055	J052	239	8	125	-72	0.46	0.04	0.15
P726	J022	J050	1038	8	125	62	0.40	0.12	0.11
P728	J050	J052	1256	8	125	14	0.09	0.01	0.01
P730	J054	J040	630	12	125	187	0.53	0.08	0.12
P732	J053	J056	1249	12	125	-117	0.33	0.06	0.05
P734	J058	J048	1047	12	125	-93	0.27	0.04	0.03
P736	J056	J058	1030	8	125	43	0.28	0.06	0.06
P738	J062	J064	1000	8	125	1	0.01	0.00	0.00
P740	J064	J090	600	12	125	-93	0.26	0.02	0.03
P742	J068	J066	1483	8	125	-25	0.16	0.03	0.02
P744	J066	J048	712	8	125	-85	0.54	0.14	0.20
P746	J064	J068	1239	8	125	22	0.14	0.02	0.02
P748	J036	J070	350	12	125	-48	0.14	0.00	0.01
P750	J070	J088	702	12	125	27	0.08	0.00	0.00
P752	J072	J060	657	12	125	-6	0.02	0.00	0.00
P754	J060	J062	958	12	125	-17	0.05	0.00	0.00

Upper Westside (Scenario II)
1. AVERAGE DAY DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P756	J062	J072	392	12	125	29	0.08	0.00	0.00
P758	J078	J068	1337	8	125	20	0.13	0.02	0.01
P760	ES-BARANDA	U-BARANDAS	171	999	120	1029	0.00	0.00	0.00
P762	U-BARANDAS	J_BRD	169	999	120	1029	0.00	0.00	0.00
P764	T030	J025	637	12	120	277	0.79	0.17	0.27
P766	J082	J044	1317	12	125	-40	0.11	0.01	0.01
P768	J034	J086	1417	8	125	-10	0.06	0.01	0.00
P770	J96	J084	1449	8	125	14	0.09	0.01	0.01
P772	J019	J086	707	12	125	-5	0.01	0.00	0.00
P774	J086	J084	651	12	125	-14	0.04	0.00	0.00
P776	J084	J060	1031	12	125	0	0.00	0.00	0.00
P778	J056	J100	1411	12	125	-110	0.31	0.06	0.05
P780	J016	J98	4922	12	125	-84	0.24	0.14	0.03
P890	J088	J062	658	12	125	47	0.13	0.01	0.01
P892	J090	J038	509	12	125	-113	0.32	0.02	0.05
P894	J090	J088	1044	8	125	20	0.12	0.01	0.01
P896	J092	J042	299	12	125	143	0.41	0.02	0.07
P898	J053	J094	481	12	125	-63	0.18	0.01	0.02
P900	J_BRD	J_WRD	4236	12	125	309	0.88	1.31	0.31
P902	J_WRD	J054	904	12	125	309	0.88	0.28	0.31
P904	J_BRD	J076	985	12	125	720	2.04	1.46	1.48
P906	J035	J96	992	8	125	-21	0.13	0.02	0.02
P908	J98	J018	1227	12	125	-119	0.34	0.06	0.05
P910	J98	J96	2720	8	125	35	0.23	0.11	0.04
P912	J100	J030	916	12	125	-110	0.31	0.04	0.05
P914	J052	J092	1314	12	125	-67	0.19	0.02	0.02
P916	J092	J094	1456	12	125	-85	0.24	0.04	0.03
P918	T010	T102	392	36	120	314	0.10	0.00	0.00
P920	T030	J020	696	12	120	158	0.45	0.07	0.10
P922	J046	J104	596	12	125	-166	0.47	0.06	0.10

Upper Westside (Scenario II)
2. MAXIMUM DAY DEMAND

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	125.10	46.6
J012	18.25	13.8	124.80	48.1
J013	180.95	13.8	124.66	48.0
J015	0.00	14.7	124.30	47.5
J016	663.26	15.0	124.14	47.3
J017	0.00	14.3	124.72	47.8
J018	346.16	14.0	124.71	48.0
J019	90.55	14.6	123.73	47.3
J020	3.79	15.5	125.29	47.6
J022	145.35	13.6	124.47	48.0
J023	0.00	14.5	124.33	47.6
J024	253.15	14.3	124.03	47.6
J025	263.55	13.3	124.76	48.3
J026	262.90	13.0	124.03	48.1
J027	0.00	13.9	124.26	47.8
J028	245.18	14.9	124.03	47.3
J029	0.00	14.5	124.38	47.6
J030	112.76	14.2	124.28	47.7
J031	0.00	14.6	124.03	47.4
J032	223.56	13.6	123.89	47.8
J033	0.00	13.8	124.34	47.9
J034	245.26	14.2	123.74	47.5
J035	125.21	14.1	123.78	47.5
J036	247.62	14.9	123.74	47.2
J037	0.00	14.5	123.76	47.3
J038	149.88	14.0	123.77	47.6
J039	60.66	14.2	123.82	47.5
J040	2.39	13.4	123.99	47.9
J041	0.00	14.2	124.05	47.6
J042	72.07	14.9	123.86	47.2
J044	0.00	14.9	123.99	47.3
J046	0.00	13.0	124.75	48.4
J048	121.42	13.0	123.86	48.0
J050	0.00	14.2	124.21	47.7
J052	111.72	14.8	123.90	47.3
J053	59.30	14.2	123.91	47.5
J054	0.00	13.4	124.17	48.0
J055	0.00	14.8	123.81	47.2
J056	129.94	13.5	123.98	47.9
J058	140.65	13.5	123.79	47.8
J060	0.00	14.9	123.75	47.2
J062	0.00	18.4	123.75	45.7
J064	0.00	17.0	123.77	46.3
J066	0.00	17.0	123.84	46.3
J068	0.00	16.0	123.78	46.7
J070	0.00	14.8	123.75	47.2
J072	0.00	14.5	123.75	47.3
J076	0.00	14.3	124.56	47.8
J078	0.00	17.0	123.77	46.3
J080	0.00	13.5	124.66	48.2
J082	0.00	14.5	123.99	47.4
J084	0.00	14.5	123.75	47.3
J086	0.00	14.5	123.74	47.3
J088	0.00	16.0	123.75	46.7
J090	0.00	14.0	123.77	47.6
J092	0.00	14.9	123.91	47.2
J094	0.00	14.2	123.95	47.6
J100	80.00	14.1	124.10	47.7
J104	0.00	13.0	124.96	48.5
J96	0.00	14.1	123.85	47.6
J98	0.00	14.0	124.49	47.9
J_BRD	0.00	14.0	127.51	49.2
J_WRD	0.00	13.0	124.75	48.4
T010	0.00	17.6	125.59	46.8
T020	0.00	13.8	125.56	48.4
T030	0.00	13.0	125.53	48.8
T035	0.00	13.0	125.29	48.7
T040	0.00	14.4	125.59	48.2
T045	0.00	13.0	124.75	48.4
T102	0.00	17.6	125.59	46.8

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES-BARANDAS	-1,513.57	0
RES-SANJUAN	-3,228.91	0

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U-BARANDAS	14	-6.07	49.19	1,513.57	127.51
U-SANJUAN	14	-6.07	48.35	3,228.91	125.59

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario II)
2. MAXIMUM DAY DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2451	12	125	188	0.53	0.30	0.12
P015	J013	J023	1355	12	125	271	0.77	0.33	0.24
P017	J015	J017	1930	12	125	-253	0.72	0.41	0.21
P019	J104	J020	977	12	125	-326	0.92	0.33	0.34
P023	J022	J027	629	12	125	321	0.91	0.21	0.33
P025	J024	J026	2682	12	125	-6	0.02	0.00	0.00
P027	J031	J024	687	12	120	-21	0.06	0.00	0.00
P029	J028	J029	883	12	125	-355	1.01	0.35	0.40
P031	J039	J053	514	12	125	-219	0.62	0.08	0.16
P033	J033	J032	733	12	125	444	1.26	0.45	0.61
P037	J032	J035	665	12	125	221	0.63	0.11	0.17
P039	J034	J055	1379	12	125	-117	0.33	0.07	0.05
P041	J034	J019	1005	12	125	24	0.07	0.00	0.00
P043	J044	J092	499	12	125	209	0.59	0.07	0.15
P045	J070	J037	486	12	125	-63	0.18	0.01	0.02
P047	J038	J058	1285	12	125	-73	0.21	0.03	0.02
P049	T010	T020	2615	36	120	945	0.30	0.03	0.01
P053	T040	T030	1345	30	120	1231	0.56	0.07	0.05
P071	T045	T035	1574	18	125	-949	1.20	0.54	0.34
P077	U-SANJUAN	T010	3165	999	125	1521	0.00	0.00	0.00
P079	U-SANJUAN	T040	3546	999	125	1708	0.00	0.00	0.00
P200	J020	T035	85	12	125	-19	0.05	0.00	0.00
P602	RES-SANJUAN	U-SANJUAN	385	999	125	3229	0.00	0.00	0.00
P606	T030	T035	661	18	125	968	1.22	0.24	0.36
P610	J010	T102	498	12	125	-575	1.63	0.49	0.98
P616	J012	J013	226	12	125	452	1.28	0.14	0.63
P620	J076	J030	203	12	125	697	1.98	0.28	1.40
P622	J078	J072	1141	8	125	17	0.11	0.01	0.01
P624	J064	J078	513	12	125	0	0.00	0.00	0.00
P626	J023	J016	770	12	125	271	0.77	0.19	0.24
P628	T020	T030	2717	36	120	945	0.30	0.03	0.01
P632	J017	J018	82	12	125	73	0.21	0.00	0.02
P634	J018	J033	618	12	125	444	1.26	0.37	0.61
P640	J035	J034	633	12	125	142	0.40	0.05	0.07
P644	J016	J015	738	12	125	-253	0.72	0.16	0.21
P650	J037	J038	616	12	125	-63	0.18	0.01	0.02
P654	J038	J039	640	12	125	-159	0.45	0.06	0.09
P660	J030	J041	612	12	125	344	0.98	0.23	0.38
P662	J025	J022	693	12	120	353	1.00	0.30	0.43
P664	J022	J080	1315	12	125	-208	0.59	0.20	0.15
P668	J027	J024	637	12	120	321	0.91	0.23	0.36
P672	J029	J076	458	12	125	-355	1.01	0.18	0.40
P678	J031	J028	634	12	120	21	0.06	0.00	0.00
P690	J012	T030	2788	12	125	-282	0.80	0.73	0.26
P692	J080	J026	2656	12	125	268	0.76	0.63	0.24
P694	J094	J041	498	12	125	-240	0.68	0.10	0.19
P696	J019	J036	301	12	125	-15	0.04	0.00	0.00
P698	J048	J040	440	12	125	-292	0.83	0.12	0.28
P700	J056	J054	1903	12	125	-168	0.48	0.19	0.10
P702	J042	J036	1326	12	125	162	0.46	0.12	0.09
P704	J028	J044	592	12	125	131	0.37	0.04	0.06
P708	J046	J017	109	12	125	326	0.92	0.04	0.34
P710	T045	J018	107	18	125	949	1.20	0.04	0.34
P712	J082	J024	535	8	125	-52	0.33	0.04	0.08
P718	T040	J080	1344	12	125	477	1.35	0.93	0.69
P720	J044	J041	1457	12	125	-104	0.29	0.06	0.04
P722	J052	J082	503	8	125	-78	0.50	0.09	0.18
P724	J055	J052	239	8	125	-117	0.75	0.09	0.37
P726	J022	J050	1038	8	125	95	0.60	0.26	0.25
P728	J050	J052	1256	8	125	95	0.60	0.31	0.25
P730	J054	J040	630	12	125	294	0.83	0.18	0.28
P732	J053	J056	1249	12	125	-119	0.34	0.07	0.05
P734	J058	J048	1047	12	125	-136	0.38	0.07	0.07
P736	J056	J058	1030	8	125	78	0.50	0.18	0.18
P738	J062	J064	1000	8	125	-18	0.12	0.01	0.01
P740	J064	J090	600	12	125	0	0.00	0.00	0.00
P742	J068	J066	1483	8	125	-35	0.22	0.06	0.04
P744	J066	J048	712	8	125	-35	0.22	0.03	0.04
P746	J064	J068	1239	8	125	-18	0.11	0.01	0.01
P748	J036	J070	350	12	125	-101	0.29	0.01	0.04
P750	J070	J088	702	12	125	-38	0.11	0.00	0.01
P752	J072	J060	657	12	125	9	0.03	0.00	0.00
P754	J060	J062	958	12	125	-6	0.02	0.00	0.00
P756	J062	J072	392	12	125	-7	0.02	0.00	0.00

Upper Westside (Scenario II)
2. MAXIMUM DAY DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P758	J078	J068	1337	8	125	-17	0.11	0.01	0.01
P760	ES-BARANDA	U-BARANDAS	171	999	120	1514	0.00	0.00	0.00
P762	U-BARANDAS	J_BRD	169	999	120	1514	0.00	0.00	0.00
P764	T030	J025	637	12	120	616	1.75	0.76	1.20
P766	J082	J044	1317	12	125	-26	0.07	0.00	0.00
P768	J034	J086	1417	8	125	-10	0.06	0.01	0.00
P770	J96	J084	1449	8	125	46	0.29	0.10	0.07
P772	J019	J086	707	12	125	-52	0.15	0.01	0.01
P774	J086	J084	651	12	125	-62	0.17	0.01	0.02
P776	J084	J060	1031	12	125	-16	0.04	0.00	0.00
P778	J056	J100	1411	12	125	-160	0.45	0.13	0.09
P780	J016	J98	4922	12	125	-139	0.39	0.35	0.07
P890	J088	J062	658	12	125	-19	0.05	0.00	0.00
P892	J090	J038	509	12	125	-19	0.05	0.00	0.00
P894	J090	J088	1044	8	125	19	0.12	0.01	0.01
P896	J092	J042	299	12	125	234	0.66	0.06	0.19
P898	J053	J094	481	12	125	-159	0.45	0.04	0.09
P900	J_BRD	J_WRD	4236	12	125	462	1.31	2.76	0.65
P902	J_WRD	J054	904	12	125	462	1.31	0.59	0.65
P904	J_BRD	J076	985	12	125	1052	2.98	2.95	2.99
P906	J035	J96	992	8	125	-46	0.29	0.06	0.07
P908	J98	J018	1227	12	125	-231	0.66	0.22	0.18
P910	J98	J96	2720	8	125	92	0.59	0.64	0.24
P912	J100	J030	916	12	125	-240	0.68	0.18	0.19
P914	J052	J092	1314	12	125	-56	0.16	0.02	0.01
P916	J092	J094	1456	12	125	-81	0.23	0.04	0.03
P918	T010	T102	392	36	120	575	0.18	0.00	0.01
P920	T030	J020	696	12	120	311	0.88	0.24	0.34
P922	J046	J104	596	12	125	-326	0.92	0.20	0.34

Upper Westside (Scenario II)
3. PEAK HOUR DEMAND

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	773.94	17.6	110.65	40.3
J012	36.50	13.8	109.48	41.5
J013	361.89	13.8	108.94	41.2
J015	0.00	14.7	107.49	40.2
J016	1326.51	15.0	106.94	39.9
J017	0.00	14.3	108.95	41.0
J018	692.31	14.0	108.94	41.1
J019	181.09	14.6	104.13	38.8
J020	7.58	15.5	111.24	41.5
J022	290.69	13.6	107.47	40.7
J023	0.00	14.5	107.67	40.4
J024	506.30	14.3	105.28	39.4
J025	527.11	13.3	108.91	41.4
J026	525.80	13.0	105.36	40.0
J027	0.00	13.9	106.43	40.1
J028	490.36	14.9	105.10	39.1
J029	0.00	14.5	105.95	39.6
J030	385.51	14.2	105.56	39.6
J031	0.00	14.6	105.18	39.3
J032	447.12	13.6	105.15	39.7
J033	0.00	13.8	107.21	40.5
J034	490.52	14.2	104.18	39.0
J035	250.42	14.1	104.52	39.2
J036	495.24	14.9	104.12	38.7
J037	0.00	14.5	104.16	38.9
J038	299.75	14.0	104.18	39.1
J039	121.33	14.2	104.34	39.1
J040	4.78	13.4	104.74	39.6
J041	0.00	14.2	105.02	39.4
J042	144.14	14.9	104.51	38.8
J044	0.00	14.9	104.95	39.0
J046	0.00	13.0	109.10	41.6
J048	242.83	13.0	104.39	39.6
J050	0.00	14.2	106.20	39.9
J052	223.44	14.8	104.67	38.9
J053	118.60	14.2	104.60	39.2
J054	0.00	13.4	105.26	39.8
J055	0.00	14.8	104.40	38.8
J056	259.88	13.5	104.77	39.6
J058	281.31	13.5	104.21	39.3
J060	0.00	14.9	104.18	38.7
J062	0.00	18.4	104.18	37.2
J064	0.00	17.0	104.18	37.8
J066	0.00	17.0	104.33	37.8
J068	0.00	16.0	104.21	38.2
J070	0.00	14.8	104.15	38.7
J072	0.00	14.5	104.18	38.9
J076	0.00	14.3	106.40	39.9
J078	0.00	17.0	104.18	37.8
J080	0.00	13.5	108.31	41.1
J082	0.00	14.5	104.95	39.2
J084	0.00	14.5	104.18	38.9
J086	0.00	14.5	104.16	38.9
J088	0.00	16.0	104.17	38.2
J090	0.00	14.0	104.18	39.1
J092	0.00	14.9	104.69	38.9
J094	0.00	14.2	104.75	39.2
J100	0.00	14.1	105.25	39.5
J104	0.00	13.0	109.91	42.0
J96	0.00	14.1	104.78	39.3
J98	0.00	14.0	108.07	40.8
J_BRD	0.00	14.0	114.58	43.6
J_WRD	0.00	13.0	106.90	40.7
T010	0.00	17.6	112.45	41.1
T020	0.00	13.8	112.32	42.7
T030	0.00	13.0	112.18	43.0
T035	0.00	13.0	111.24	42.6
T040	0.00	14.4	112.45	42.5
T045	0.00	13.0	109.09	41.6
T102	0.00	17.6	112.45	41.1

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES-BARANDAS	-2,626.66	0
RES-SANJUAN	-6,858.30	0

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U-BARANDAS	14	-6.07	43.58	2,626.66	114.58
U-SANJUAN	14	-6.07	42.66	6,858.30	112.45

Distribution Mains
City DOU: Minimum Required Pressure is 30 psi during a no-fire, domestic scenario
SCWA: Minimum Required Pressure is 35 psi during a no-fire, domestic scenario

Transmission Mains
SCWA requires min. 40 psi during domestic demand scenarios. City criteria is 30 psi.

Upper Westside (Scenario II)
3. PEAK HOUR DEMAND

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2451	12	125	390	1.11	1.17	0.48
P015	J013	J023	1355	12	125	564	1.60	1.28	0.94
P017	J015	J017	1930	12	125	-500	1.42	1.46	0.75
P019	J104	J020	977	12	125	-688	1.95	1.33	1.36
P023	J022	J027	629	12	125	767	2.17	1.05	1.67
P025	J024	J026	2682	12	125	-89	0.25	0.08	0.03
P027	J031	J024	687	12	120	-194	0.55	0.10	0.14
P029	J028	J029	883	12	125	-573	1.63	0.86	0.97
P031	J039	J053	514	12	125	-399	1.13	0.26	0.50
P033	J033	J032	733	12	125	1015	2.88	2.05	2.80
P037	J032	J035	665	12	125	568	1.61	0.64	0.96
P039	J034	J055	1379	12	125	-214	0.61	0.22	0.16
P041	J034	J019	1005	12	125	118	0.34	0.05	0.05
P043	J044	J092	499	12	125	406	1.15	0.26	0.51
P045	J070	J037	486	12	125	-75	0.21	0.01	0.02
P047	J038	J058	1285	12	125	-85	0.24	0.04	0.03
P049	T010	T020	2615	36	120	2009	0.63	0.13	0.05
P053	T040	T030	1345	30	120	2616	1.19	0.27	0.20
P071	T045	T035	1574	18	125	-2004	2.53	2.16	1.37
P077	U-SANJUAN	T010	3165	999	125	3173	0.00	0.00	0.00
P079	U-SANJUAN	T040	3546	999	125	3686	0.00	0.00	0.00
P200	J020	T035	85	12	125	-39	0.11	0.00	0.01
P602	RES-SANJUAN	U-SANJUAN	385	999	125	6858	0.00	0.00	0.00
P606	T030	T035	661	18	125	2042	2.58	0.94	1.42
P610	J010	T102	498	12	125	-1164	3.30	1.80	3.61
P616	J012	J013	226	12	125	926	2.63	0.53	2.36
P620	J076	J030	203	12	125	1251	3.55	0.84	4.13
P622	J078	J072	1141	8	125	10	0.06	0.00	0.00
P624	J064	J078	513	12	125	-15	0.04	0.00	0.00
P626	J023	J016	770	12	125	564	1.60	0.73	0.94
P628	T020	T030	2717	36	120	2009	0.63	0.14	0.05
P632	J017	J018	82	12	125	188	0.53	0.01	0.12
P634	J018	J033	618	12	125	1015	2.88	1.73	2.80
P640	J035	J034	633	12	125	415	1.18	0.34	0.53
P644	J016	J015	738	12	125	-500	1.42	0.56	0.75
P650	J037	J038	616	12	125	-75	0.21	0.01	0.02
P654	J038	J039	640	12	125	-278	0.79	0.16	0.25
P660	J030	J041	612	12	125	541	1.54	0.53	0.87
P662	J025	J022	693	12	120	826	2.34	1.43	2.06
P664	J022	J080	1315	12	125	-454	1.29	0.83	0.63
P668	J027	J024	637	12	120	767	2.17	1.15	1.80
P672	J029	J076	458	12	125	-573	1.63	0.45	0.97
P678	J031	J028	634	12	120	194	0.55	0.09	0.14
P690	J012	T030	2788	12	125	-572	1.62	2.70	0.97
P692	J080	J026	2656	12	125	615	1.74	2.94	1.11
P694	J094	J041	498	12	125	-421	1.19	0.27	0.55
P696	J019	J036	301	12	125	49	0.14	0.00	0.01
P698	J048	J040	440	12	125	-518	1.47	0.35	0.81
P700	J056	J054	1903	12	125	-280	0.79	0.49	0.26
P702	J042	J036	1326	12	125	299	0.85	0.39	0.29
P704	J028	J044	592	12	125	277	0.78	0.15	0.25
P708	J046	J017	109	12	125	688	1.95	0.15	1.36
P710	T045	J018	107	18	125	2004	2.53	0.15	1.37
P712	J082	J024	535	8	125	-156	0.99	0.33	0.63
P718	T040	J080	1344	12	125	1069	3.03	4.15	3.09
P720	J044	J041	1457	12	125	-120	0.34	0.08	0.05
P722	J052	J082	503	8	125	-146	0.93	0.28	0.56
P724	J055	J052	239	8	125	-214	1.36	0.27	1.13
P726	J022	J050	1038	8	125	223	1.43	1.27	1.22
P728	J050	J052	1256	8	125	223	1.43	1.54	1.22
P730	J054	J040	630	12	125	522	1.48	0.52	0.82
P732	J053	J056	1249	12	125	-201	0.57	0.17	0.14
P734	J058	J048	1047	12	125	-223	0.63	0.18	0.17
P736	J056	J058	1030	8	125	144	0.92	0.56	0.54
P738	J062	J064	1000	8	125	-13	0.08	0.00	0.00
P740	J064	J090	600	12	125	29	0.08	0.00	0.00
P742	J068	J066	1483	8	125	-52	0.33	0.12	0.08
P744	J066	J048	712	8	125	-52	0.33	0.06	0.08
P746	J064	J068	1239	8	125	-27	0.17	0.03	0.02
P748	J036	J070	350	12	125	-148	0.42	0.03	0.08
P750	J070	J088	702	12	125	-72	0.21	0.01	0.02
P752	J072	J060	657	12	125	-14	0.04	0.00	0.00
P754	J060	J062	958	12	125	19	0.05	0.00	0.00

Upper Westside (Scenario II)
3. PEAK HOUR DEMAND

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P756	J062	J072	392	12	125	-24	0.07	0.00	0.00
P758	J078	J068	1337	8	125	-25	0.16	0.03	0.02
P760	ES-BARANDA	U-BARANDAS	171	999	120	2627	0.00	0.00	0.00
P762	U-BARANDAS	J_BRD	169	999	120	2627	0.00	0.00	0.00
P764	T030	J025	637	12	120	1353	3.84	3.28	5.15
P766	J082	J044	1317	12	125	9	0.03	0.00	0.00
P768	J034	J086	1417	8	125	20	0.13	0.02	0.01
P770	J96	J084	1449	8	125	124	0.79	0.60	0.41
P772	J019	J086	707	12	125	-111	0.32	0.03	0.05
P774	J086	J084	651	12	125	-92	0.26	0.02	0.03
P776	J084	J060	1031	12	125	33	0.09	0.00	0.00
P778	J056	J100	1411	12	125	-325	0.92	0.48	0.34
P780	J016	J98	4922	12	125	-263	0.75	1.13	0.23
P890	J088	J062	658	12	125	-55	0.16	0.01	0.01
P892	J090	J038	509	12	125	12	0.04	0.00	0.00
P894	J090	J088	1044	8	125	17	0.11	0.01	0.01
P896	J092	J042	299	12	125	443	1.26	0.18	0.60
P898	J053	J094	481	12	125	-317	0.90	0.16	0.32
P900	J_BRD	J_WRD	4236	12	125	802	2.28	7.68	1.81
P902	J_WRD	J054	904	12	125	802	2.28	1.64	1.81
P904	J_BRD	J076	985	12	125	1824	5.18	8.18	8.30
P906	J035	J96	992	8	125	-98	0.62	0.26	0.26
P908	J98	J018	1227	12	125	-484	1.37	0.87	0.71
P910	J98	J96	2720	8	125	222	1.42	3.29	1.21
P912	J100	J030	916	12	125	-325	0.92	0.31	0.34
P914	J052	J092	1314	12	125	-68	0.19	0.02	0.02
P916	J092	J094	1456	12	125	-105	0.30	0.06	0.04
P918	T010	T102	392	36	120	1164	0.37	0.01	0.02
P920	T030	J020	696	12	120	657	1.86	0.94	1.35
P922	J046	J104	596	12	125	-688	1.95	0.81	1.36

Upper Westside (Scenario II)
4. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J023 (School on Radio Road)

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	109.04	39.6
J012	18.25	13.8	99.66	37.2
J013	180.95	13.8	96.35	35.8
J015	0.00	14.7	93.66	34.2
J016	663.26	15.0	88.16	31.7
J017	0.00	14.3	108.05	40.6
J018	346.16	14.0	108.26	40.8
J019	90.55	14.6	109.27	41.0
J020	3.79	15.5	110.87	41.3
J022	145.35	13.6	110.96	42.2
J023	4500.00	14.5	79.11	28.0
J024	253.15	14.3	110.57	41.7
J025	263.55	13.3	111.23	42.4
J026	262.90	13.0	110.57	42.3
J027	0.00	13.9	110.78	42.0
J028	245.18	14.9	110.58	41.4
J029	0.00	14.5	111.42	42.0
J030	112.76	14.2	111.25	42.1
J031	0.00	14.6	110.57	41.6
J032	223.56	13.6	108.29	41.0
J033	0.00	13.8	108.27	40.9
J034	245.26	14.2	108.95	41.0
J035	125.21	14.1	108.49	40.9
J036	247.62	14.9	109.43	41.0
J037	0.00	14.5	109.64	41.2
J038	149.88	14.0	109.79	41.5
J039	60.66	14.2	110.03	41.5
J040	2.39	13.4	110.55	42.1
J041	0.00	14.2	110.61	41.8
J042	72.07	14.9	110.00	41.2
J044	0.00	14.9	110.43	41.4
J046	0.00	13.0	108.23	41.3
J048	121.42	13.0	110.27	42.2
J050	0.00	14.2	110.55	41.8
J052	111.72	14.8	110.06	41.3
J053	59.30	14.2	110.29	41.6
J054	0.00	13.4	110.96	42.3
J055	0.00	14.8	109.44	41.0
J056	129.94	13.5	110.56	42.1
J058	140.65	13.5	110.05	41.8
J060	0.00	14.9	109.47	41.0
J062	0.00	18.4	109.51	39.5
J064	0.00	17.0	109.73	40.2
J066	0.00	17.0	110.12	40.4
J068	0.00	16.0	109.80	40.6
J070	0.00	14.8	109.52	41.0
J072	0.00	14.5	109.51	41.2
J076	0.00	14.3	111.86	42.3
J078	0.00	17.0	109.72	40.2
J080	0.00	13.5	111.21	42.3
J082	0.00	14.5	110.41	41.6
J084	0.00	14.5	109.28	41.1
J086	0.00	14.5	109.27	41.1
J088	0.00	16.0	109.53	40.5
J090	0.00	14.0	109.74	41.5
J092	0.00	14.9	110.17	41.3
J094	0.00	14.2	110.36	41.7
J100	80.00	14.1	110.89	41.9
J104	0.00	13.0	109.23	41.7
J96	0.00	14.1	108.39	40.9
J98	0.00	14.0	105.33	39.6
J_BRD	0.00	14.0	118.42	45.3
J_WRD	0.00	13.0	112.27	43.0
T010	0.00	17.6	112.25	41.0
T020	0.00	13.8	112.11	42.6
T030	0.00	13.0	111.96	42.9
T035	0.00	13.0	110.87	42.4
T040	0.00	14.4	112.25	42.4
T045	0.00	13.0	108.42	41.4
T102	0.00	17.6	112.24	41.0

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES-BARANDAS	-2,332.30	0
RES-SANJUAN	-6,910.19	0

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U-BARANDAS	14	-6.07	45.25	2,332.30	118.42
U-SANJUAN	14	-6.07	42.57	6,910.19	112.25

Distribution Mains
Minimum Required Pressure is 20 psi during fire flow.

Transmission Mains
SCWA Required 25 psi, and City requires 20 psi, in transmission mains during fire flow.

Upper Westside (Scenario II)
4. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J023 (School on Radio Road)

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2451	12	125	1201	3.41	9.38	3.83
P015	J013	J023	1355	12	125	2299	6.52	17.25	12.73
P017	J015	J017	1930	12	125	-1722	4.88	14.39	7.46
P019	J104	J020	977	12	125	-769	2.18	1.64	1.68
P023	J022	J027	629	12	125	305	0.86	0.19	0.30
P025	J024	J026	2682	12	125	-8	0.02	0.00	0.00
P027	J031	J024	687	12	120	45	0.13	0.01	0.01
P029	J028	J029	883	12	125	-567	1.61	0.84	0.95
P031	J039	J053	514	12	125	-403	1.14	0.26	0.51
P033	J033	J032	733	12	125	-81	0.23	0.02	0.03
P037	J032	J035	665	12	125	-305	0.86	0.20	0.30
P039	J034	J055	1379	12	125	-333	0.95	0.49	0.36
P041	J034	J019	1005	12	125	-312	0.88	0.32	0.31
P043	J044	J092	499	12	125	406	1.15	0.26	0.51
P045	J070	J037	486	12	125	-271	0.77	0.12	0.24
P047	J038	J058	1285	12	125	-245	0.70	0.26	0.20
P049	T010	T020	2615	36	120	2092	0.66	0.14	0.05
P053	T040	T030	1345	30	120	2724	1.24	0.29	0.22
P071	T045	T035	1574	18	125	-2147	2.71	2.45	1.56
P077	U-SANJUAN	T010	3165	999	125	3679	0.00	0.00	0.00
P079	U-SANJUAN	T040	3546	999	125	3231	0.00	0.00	0.00
P200	J020	T035	85	12	125	-62	0.18	0.00	0.02
P602	RES-SANJUAN	U-SANJUAN	385	999	125	6910	0.00	0.00	0.00
P606	T030	T035	661	18	125	2209	2.79	1.09	1.64
P610	J010	T102	498	12	125	-1588	4.50	3.20	6.42
P616	J012	J013	226	12	125	2480	7.03	3.31	14.65
P620	J076	J030	203	12	125	1054	2.99	0.61	3.00
P622	J078	J072	1141	8	125	81	0.52	0.21	0.19
P624	J064	J078	513	12	125	38	0.11	0.00	0.01
P626	J023	J016	770	12	125	-2201	6.24	9.05	11.75
P628	T020	T030	2717	36	120	2092	0.66	0.15	0.05
P632	J017	J018	82	12	125	-953	2.70	0.20	2.49
P634	J018	J033	618	12	125	-81	0.23	0.02	0.03
P640	J035	J034	633	12	125	-489	1.39	0.46	0.72
P644	J016	J015	738	12	125	-1722	4.88	5.50	7.46
P650	J037	J038	616	12	125	-271	0.77	0.15	0.24
P654	J038	J039	640	12	125	-342	0.97	0.24	0.37
P660	J030	J041	612	12	125	593	1.68	0.63	1.03
P662	J025	J022	693	12	120	336	0.95	0.27	0.39
P664	J022	J080	1315	12	125	-236	0.67	0.25	0.19
P668	J027	J024	637	12	120	305	0.86	0.21	0.33
P672	J029	J076	458	12	125	-567	1.61	0.44	0.95
P678	J031	J028	634	12	120	-45	0.13	0.01	0.01
P690	J012	T030	2788	12	125	-1297	3.68	12.30	4.41
P692	J080	J026	2656	12	125	271	0.77	0.64	0.24
P694	J094	J041	498	12	125	-402	1.14	0.25	0.50
P696	J019	J036	301	12	125	-413	1.17	0.16	0.53
P698	J048	J040	440	12	125	-458	1.30	0.28	0.64
P700	J056	J054	1903	12	125	-251	0.71	0.40	0.21
P702	J042	J036	1326	12	125	369	1.05	0.57	0.43
P704	J028	J044	592	12	125	277	0.79	0.15	0.25
P708	J046	J017	109	12	125	769	2.18	0.18	1.68
P710	T045	J018	107	18	125	2147	2.71	0.17	1.56
P712	J082	J024	535	8	125	-104	0.66	0.16	0.30
P718	T040	J080	1344	12	125	506	1.44	1.04	0.77
P720	J044	J041	1457	12	125	-191	0.54	0.18	0.13
P722	J052	J082	503	8	125	-165	1.06	0.35	0.70
P724	J055	J052	239	8	125	-333	2.13	0.61	2.57
P726	J022	J050	1038	8	125	121	0.78	0.41	0.40
P728	J050	J052	1256	8	125	121	0.78	0.50	0.40
P730	J054	J040	630	12	125	460	1.31	0.41	0.65
P732	J053	J056	1249	12	125	-253	0.72	0.27	0.21
P734	J058	J048	1047	12	125	-250	0.71	0.22	0.21
P736	J056	J058	1030	8	125	137	0.87	0.51	0.49
P738	J062	J064	1000	8	125	-87	0.55	0.21	0.21
P740	J064	J090	600	12	125	-81	0.23	0.02	0.03
P742	J068	J066	1483	8	125	-87	0.56	0.32	0.21
P744	J066	J048	712	8	125	-87	0.56	0.15	0.21
P746	J064	J068	1239	8	125	-44	0.28	0.07	0.06
P748	J036	J070	350	12	125	-292	0.83	0.10	0.28
P750	J070	J088	702	12	125	-20	0.06	0.00	0.00
P752	J072	J060	657	12	125	126	0.36	0.04	0.06
P754	J060	J062	958	12	125	-107	0.30	0.04	0.04

Upper Westside (Scenario II)
4. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J023 (School on Radio Road)

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P756	J062	J072	392	12	125	45	0.13	0.00	0.01
P758	J078	J068	1337	8	125	-43	0.28	0.08	0.06
P760	ES-BARANDA	U-BARANDAS	171	999	120	2332	0.00	0.00	0.00
P762	U-BARANDAS	J_BRD	169	999	120	2332	0.00	0.00	0.00
P764	T030	J025	637	12	120	599	1.70	0.72	1.14
P766	J082	J044	1317	12	125	-62	0.18	0.02	0.02
P768	J034	J086	1417	8	125	-89	0.57	0.32	0.22
P770	J96	J084	1449	8	125	-154	0.98	0.89	0.62
P772	J019	J086	707	12	125	10	0.03	0.00	0.00
P774	J086	J084	651	12	125	-79	0.22	0.02	0.02
P776	J084	J060	1031	12	125	-233	0.66	0.19	0.18
P778	J056	J100	1411	12	125	-268	0.76	0.34	0.24
P780	J016	J98	4922	12	125	-1143	3.24	17.18	3.49
P890	J088	J062	658	12	125	65	0.19	0.01	0.02
P892	J090	J038	509	12	125	-166	0.47	0.05	0.10
P894	J090	J088	1044	8	125	86	0.55	0.22	0.21
P896	J092	J042	299	12	125	441	1.25	0.18	0.60
P898	J053	J094	481	12	125	-209	0.59	0.07	0.15
P900	J_BRD	J_WRD	4236	12	125	712	2.02	6.15	1.45
P902	J_WRD	J054	904	12	125	712	2.02	1.31	1.45
P904	J_BRD	J076	985	12	125	1620	4.60	6.57	6.66
P906	J035	J96	992	8	125	59	0.38	0.10	0.10
P908	J98	J018	1227	12	125	-929	2.64	2.92	2.38
P910	J98	J96	2720	8	125	-213	1.36	3.05	1.12
P912	J100	J030	916	12	125	-348	0.99	0.35	0.39
P914	J052	J092	1314	12	125	-158	0.45	0.12	0.09
P916	J092	J094	1456	12	125	-193	0.55	0.19	0.13
P918	T010	T102	392	36	120	1588	0.50	0.01	0.03
P920	T030	J020	696	12	120	711	2.02	1.09	1.56
P922	J046	J104	596	12	125	-769	2.18	1.00	1.68

Upper Westside (Scenario II)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	113.75	41.7
J012	18.25	13.8	112.91	42.9
J013	180.95	13.8	112.59	42.8
J015	0.00	14.7	111.01	41.7
J016	663.26	15.0	110.89	41.6
J017	0.00	14.3	111.34	42.1
J018	346.16	14.0	111.29	42.2
J019	90.55	14.6	93.63	34.2
J020	3.79	15.5	113.39	42.4
J022	145.35	13.6	107.87	40.8
J023	0.00	14.5	111.51	42.0
J024	253.15	14.3	103.38	38.6
J025	263.55	13.3	110.59	42.2
J026	262.90	13.0	105.07	39.9
J027	0.00	13.9	105.72	39.8
J028	245.18	14.9	100.98	37.3
J029	0.00	14.5	101.40	37.7
J030	112.76	14.2	100.37	37.4
J031	0.00	14.6	102.13	37.9
J032	223.56	13.6	102.35	38.5
J033	0.00	13.8	107.21	40.5
J034	245.26	14.2	96.61	35.7
J035	125.21	14.1	99.01	36.8
J036	247.62	14.9	93.57	34.1
J037	0.00	14.5	92.84	33.9
J038	149.88	14.0	93.15	34.3
J039	60.66	14.2	95.26	35.1
J040	2.39	13.4	96.19	35.9
J041	0.00	14.2	99.45	36.9
J042	72.07	14.9	97.38	35.7
J044	0.00	14.9	99.61	36.7
J046	0.00	13.0	111.47	42.7
J048	121.42	13.0	95.28	35.7
J050	0.00	14.2	103.65	38.8
J052	111.72	14.8	98.54	36.3
J053	59.30	14.2	97.12	35.9
J054	0.00	13.4	97.50	36.5
J055	0.00	14.8	97.47	35.8
J056	129.94	13.5	97.41	36.4
J058	140.65	13.5	94.67	35.2
J060	0.00	14.9	83.94	29.9
J062	0.00	18.4	83.96	28.4
J064	0.00	17.0	89.96	31.6
J066	0.00	17.0	93.75	33.3
J068	0.00	16.0	90.56	32.3
J070	0.00	14.8	92.59	33.7
J072	4500.00	14.5	79.39	28.1
J076	0.00	14.3	101.61	37.8
J078	0.00	17.0	89.59	31.5
J080	0.00	13.5	108.97	41.4
J082	0.00	14.5	99.84	37.0
J084	0.00	14.5	90.56	33.0
J086	0.00	14.5	92.58	33.8
J088	0.00	16.0	88.92	31.6
J090	0.00	14.0	91.25	33.5
J092	0.00	14.9	98.36	36.2
J094	0.00	14.2	98.34	36.5
J100	80.00	14.1	99.05	36.8
J104	0.00	13.0	112.20	43.0
J96	0.00	14.1	98.87	36.7
J98	0.00	14.0	110.77	41.9
J_BRD	0.00	14.0	110.73	41.9
J_WRD	0.00	13.0	99.82	37.6
T010	0.00	17.6	114.48	42.0
T020	0.00	13.8	114.36	43.6
T030	0.00	13.0	114.24	43.9
T035	0.00	13.0	113.39	43.5
T040	0.00	14.4	114.48	43.4
T045	0.00	13.0	111.43	42.7
T102	0.00	17.6	114.48	42.0

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES-BARANDAS	-2,904.24	0
RES-SANJUAN	-6,338.24	0

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U-BARANDAS	14	-6.07	41.91	2,904.24	110.73
U-SANJUAN	14	-6.07	43.54	6,338.24	114.48

Distribution Mains
Minimum Required Pressure is 20 psi during fire flow.

Transmission Mains
SCWA Required 25 psi, and City requires 20 psi, in transmission mains during fire flow.

Upper Westside (Scenario II)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2451	12	125	327	0.93	0.84	0.34
P015	J013	J023	1355	12	125	517	1.47	1.09	0.80
P017	J015	J017	1930	12	125	-223	0.63	0.33	0.17
P019	J104	J020	977	12	125	-647	1.84	1.19	1.22
P023	J022	J027	629	12	125	1128	3.20	2.14	3.41
P025	J024	J026	2682	12	125	-453	1.29	1.69	0.63
P027	J031	J024	687	12	120	-772	2.19	1.25	1.82
P029	J028	J029	883	12	125	-388	1.10	0.42	0.47
P031	J039	J053	514	12	125	-1167	3.31	1.86	3.63
P033	J033	J032	733	12	125	1614	4.58	4.85	6.62
P037	J032	J035	665	12	125	1391	3.95	3.34	5.02
P039	J034	J055	1379	12	125	-450	1.28	0.85	0.62
P041	J034	J019	1005	12	125	1047	2.97	2.98	2.97
P043	J044	J092	499	12	125	959	2.72	1.26	2.52
P045	J070	J037	486	12	125	-405	1.15	0.25	0.51
P047	J038	J058	1285	12	125	-636	1.80	1.51	1.18
P049	T010	T020	2615	36	120	1902	0.60	0.12	0.05
P053	T040	T030	1345	30	120	2477	1.12	0.24	0.18
P071	T045	T035	1574	18	125	-1904	2.40	1.96	1.25
P077	U-SANJUAN	T010	3165	999	125	2615	0.00	0.00	0.00
P079	U-SANJUAN	T040	3546	999	125	3723	0.00	0.00	0.00
P200	J020	T035	85	12	125	-29	0.08	0.00	0.00
P602	RES-SANJUAN	U-SANJUAN	385	999	125	6338	0.00	0.00	0.00
P606	T030	T035	661	18	125	1933	2.44	0.85	1.28
P610	J010	T102	498	12	125	-714	2.02	0.73	1.46
P616	J012	J013	226	12	125	698	1.98	0.32	1.40
P620	J076	J030	203	12	125	1547	4.39	1.24	6.11
P622	J078	J072	1141	8	125	654	4.17	10.20	8.94
P624	J064	J078	513	12	125	486	1.38	0.37	0.72
P626	J023	J016	770	12	125	517	1.47	0.62	0.80
P628	T020	T030	2717	36	120	1902	0.60	0.12	0.05
P632	J017	J018	82	12	125	424	1.20	0.05	0.56
P634	J018	J033	618	12	125	1614	4.58	4.09	6.62
P640	J035	J034	633	12	125	1195	3.39	2.40	3.79
P644	J016	J015	738	12	125	-223	0.63	0.13	0.17
P650	J037	J038	616	12	125	-405	1.15	0.31	0.51
P654	J038	J039	640	12	125	-1106	3.14	2.10	3.29
P660	J030	J041	612	12	125	724	2.05	0.92	1.50
P662	J025	J022	693	12	120	1170	3.32	2.73	3.93
P664	J022	J080	1315	12	125	-530	1.50	1.11	0.84
P668	J027	J024	637	12	120	1128	3.20	2.34	3.67
P672	J029	J076	458	12	125	-388	1.10	0.22	0.47
P678	J031	J028	634	12	120	772	2.19	1.15	1.82
P690	J012	T030	2788	12	125	-390	1.11	1.33	0.48
P692	J080	J026	2656	12	125	716	2.03	3.90	1.47
P694	J094	J041	498	12	125	-901	2.56	1.12	2.25
P696	J019	J036	301	12	125	236	0.67	0.06	0.19
P698	J048	J040	440	12	125	-861	2.44	0.91	2.06
P700	J056	J054	1903	12	125	-107	0.30	0.08	0.04
P702	J042	J036	1326	12	125	1029	2.92	3.81	2.87
P704	J028	J044	592	12	125	914	2.59	1.37	2.31
P708	J046	J017	109	12	125	647	1.84	0.13	1.22
P710	T045	J018	107	18	125	1904	2.40	0.13	1.25
P712	J082	J024	535	8	125	-556	3.55	3.55	6.63
P718	T040	J080	1344	12	125	1246	3.54	5.51	4.10
P720	J044	J041	1457	12	125	177	0.50	0.16	0.11
P722	J052	J082	503	8	125	-334	2.13	1.30	2.58
P724	J055	J052	239	8	125	-450	2.87	1.07	4.47
P726	J022	J050	1038	8	125	427	2.73	4.22	4.07
P728	J050	J052	1256	8	125	427	2.73	5.11	4.07
P730	J054	J040	630	12	125	863	2.45	1.31	2.07
P732	J053	J056	1249	12	125	-266	0.76	0.29	0.24
P734	J058	J048	1047	12	125	-436	1.24	0.61	0.59
P736	J056	J058	1030	8	125	340	2.17	2.75	2.67
P738	J062	J064	1000	8	125	-527	3.37	6.00	6.00
P740	J064	J090	600	12	125	-878	2.49	1.29	2.14
P742	J068	J066	1483	8	125	-303	1.93	3.19	2.15
P744	J066	J048	712	8	125	-303	1.93	1.53	2.15
P746	J064	J068	1239	8	125	-135	0.86	0.60	0.48
P748	J036	J070	350	12	125	1017	2.88	0.98	2.81
P750	J070	J088	702	12	125	1422	4.03	3.67	5.23
P752	J072	J060	657	12	125	-1655	4.69	4.55	6.93
P754	J060	J062	958	12	125	-67	0.19	0.02	0.02
P756	J062	J072	392	12	125	2192	6.22	4.57	11.66

Upper Westside (Scenario II)
5. MAXIMUM DAY DEMAND + FIRE FLOW OF 4,500 GPM AT J072 (School)

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P758	J078	J068	1337	8	125	-168	1.07	0.96	0.72
P760	ES-BARANDA	U-BARANDAS	171	999	120	2904	0.00	0.00	0.00
P762	U-BARANDAS	J_BRD	169	999	120	2904	0.00	0.00	0.00
P764	T030	J025	637	12	120	1434	4.07	3.65	5.73
P766	J082	J044	1317	12	125	222	0.63	0.22	0.17
P768	J034	J086	1417	8	125	353	2.25	4.04	2.85
P770	J96	J084	1449	8	125	515	3.28	8.31	5.74
P772	J019	J086	707	12	125	721	2.04	1.05	1.49
P774	J086	J084	651	12	125	1073	3.04	2.02	3.11
P776	J084	J060	1031	12	125	1588	4.50	6.62	6.42
P778	J056	J100	1411	12	125	-630	1.79	1.63	1.16
P780	J016	J98	4922	12	125	77	0.22	0.12	0.02
P890	J088	J062	658	12	125	1731	4.91	4.96	7.53
P892	J090	J038	509	12	125	-1187	3.37	1.91	3.75
P894	J090	J088	1044	8	125	309	1.97	2.33	2.23
P896	J092	J042	299	12	125	1101	3.12	0.97	3.26
P898	J053	J094	481	12	125	-960	2.72	1.22	2.53
P900	J_BRD	J_WRD	4236	12	125	970	2.75	10.91	2.57
P902	J_WRD	J054	904	12	125	970	2.75	2.33	2.57
P904	J_BRD	J076	985	12	125	1934	5.49	9.12	9.25
P906	J035	J96	992	8	125	70	0.45	0.14	0.14
P908	J98	J018	1227	12	125	-367	1.04	0.52	0.43
P910	J98	J96	2720	8	125	444	2.84	11.90	4.37
P912	J100	J030	916	12	125	-710	2.01	1.32	1.44
P914	J052	J092	1314	12	125	200	0.57	0.18	0.14
P916	J092	J094	1456	12	125	59	0.17	0.02	0.01
P918	T010	T102	392	36	120	714	0.22	0.00	0.01
P920	T030	J020	696	12	120	622	1.76	0.85	1.22
P922	J046	J104	596	12	125	-647	1.84	0.73	1.22

Upper Westside (Scenario II)
6. MAXIMUM DAY DEMAND + FIRE FLOW OF 2,000 GPM AT J040

Updated: 2/2/2023

JUNCTION REPORT				
ID	Demand * (gpm)	Elevation (feet)	Head (feet)	Pressure (psi)
J010	386.97	17.6	120.28	44.5
J012	18.25	13.8	119.81	45.9
J013	180.95	13.8	119.61	45.9
J015	0.00	14.7	118.86	45.1
J016	663.26	15.0	118.72	45.0
J017	0.00	14.3	119.20	45.5
J018	346.16	14.0	119.19	45.6
J019	90.55	14.6	113.93	43.0
J020	3.79	15.5	120.28	45.4
J022	145.35	13.6	117.73	45.1
J023	0.00	14.5	119.04	45.3
J024	253.15	14.3	115.88	44.0
J025	263.55	13.3	118.87	45.7
J026	262.90	13.0	116.33	44.8
J027	0.00	13.9	116.84	44.6
J028	245.18	14.9	115.20	43.4
J029	0.00	14.5	115.49	43.8
J030	112.76	14.2	115.01	43.7
J031	0.00	14.6	115.53	43.7
J032	223.56	13.6	116.04	44.4
J033	0.00	13.8	117.75	45.0
J034	245.26	14.2	114.41	43.4
J035	125.21	14.1	115.12	43.8
J036	247.62	14.9	113.83	42.9
J037	0.00	14.5	113.45	42.9
J038	149.88	14.0	113.21	43.0
J039	60.66	14.2	113.38	43.0
J040	2002.39	13.4	109.57	41.7
J041	0.00	14.2	114.71	43.6
J042	72.07	14.9	114.33	43.1
J044	0.00	14.9	114.81	43.3
J046	0.00	13.0	119.27	46.1
J048	121.42	13.0	110.35	42.2
J050	0.00	14.2	116.31	44.2
J052	111.72	14.8	114.59	43.2
J053	59.30	14.2	113.57	43.1
J054	0.00	13.4	112.01	42.7
J055	0.00	14.8	114.49	43.2
J056	129.94	13.5	113.16	43.2
J058	140.65	13.5	111.82	42.6
J060	0.00	14.9	113.67	42.8
J062	0.00	18.4	113.62	41.3
J064	0.00	17.0	113.24	41.7
J066	0.00	17.0	111.15	40.8
J068	0.00	16.0	112.84	42.0
J070	0.00	14.8	113.63	42.8
J072	0.00	14.5	113.62	43.0
J076	0.00	14.3	115.64	43.9
J078	0.00	17.0	113.24	41.7
J080	0.00	13.5	118.24	45.4
J082	0.00	14.5	114.89	43.5
J084	0.00	14.5	113.92	43.1
J086	0.00	14.5	113.94	43.1
J088	0.00	16.0	113.62	42.3
J090	0.00	14.0	113.24	43.0
J092	0.00	14.9	114.49	43.2
J094	0.00	14.2	114.29	43.4
J100	80.00	14.1	114.15	43.4
J104	0.00	13.0	119.66	46.2
J96	0.00	14.1	115.19	43.8
J98	0.00	14.0	118.82	45.4
J_BRD	0.00	14.0	120.59	46.2
J_WRD	0.00	13.0	113.52	43.6
T010	0.00	17.6	120.86	44.8
T020	0.00	13.8	120.80	46.4
T030	0.00	13.0	120.73	46.7
T035	0.00	13.0	120.29	46.5
T040	0.00	14.4	120.86	46.1
T045	0.00	13.0	119.26	46.1
T102	0.00	17.6	120.86	44.8

RESERVOIR / POC REPORT		
ID	Flow (gpm)	Head (feet)
RES-BARANDAS	-2,158.54	0
RES-SANJUAN	-4,583.94	0

PUMP REPORT					
ID	Elevation (ft)	Upstream Pressure (psi)	Downstream Pressure (psi)	Flow (gpm)	Head Gain (ft)
U-BARANDAS	14	-6.07	46.19	2,158.54	120.59
U-SANJUAN	14	-6.07	46.3	4,583.94	120.86

Distribution Mains
Minimum Required Pressure is 20 psi during fire flow.

Transmission Mains
SCWA Required 25 psi, and City requires 20 psi, in transmission mains during fire flow.

Upper Westside (Scenario II)
6. MAXIMUM DAY DEMAND + FIRE FLOW OF 2,000 GPM AT J040

PIPE REPORT									
ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P011	J010	J012	2451	12	125	241	0.68	0.48	0.20
P015	J013	J023	1355	12	125	362	1.03	0.56	0.42
P017	J015	J017	1930	12	125	-231	0.65	0.35	0.18
P019	J104	J020	977	12	125	-458	1.30	0.63	0.64
P023	J022	J027	629	12	125	699	1.98	0.88	1.40
P025	J024	J026	2682	12	125	-223	0.63	0.46	0.17
P027	J031	J024	687	12	120	-390	1.11	0.35	0.51
P029	J028	J029	883	12	125	-320	0.91	0.29	0.33
P031	J039	J053	514	12	125	-343	0.97	0.19	0.38
P033	J033	J032	733	12	125	919	2.61	1.71	2.33
P037	J032	J035	665	12	125	695	1.97	0.93	1.39
P039	J034	J055	1379	12	125	-127	0.36	0.08	0.06
P041	J034	J019	1005	12	125	389	1.10	0.48	0.47
P043	J044	J092	499	12	125	460	1.30	0.32	0.65
P045	J070	J037	486	12	125	347	0.98	0.19	0.38
P047	J038	J058	1285	12	125	609	1.73	1.40	1.09
P049	T010	T020	2615	36	120	1355	0.43	0.06	0.02
P053	T040	T030	1345	30	120	1765	0.80	0.13	0.10
P071	T045	T035	1574	18	125	-1342	1.69	1.03	0.65
P077	U-SANJUAN	T010	3165	999	125	1983	0.00	0.00	0.00
P079	U-SANJUAN	T040	3546	999	125	2601	0.00	0.00	0.00
P200	J020	T035	85	12	125	-23	0.07	0.00	0.00
P602	RES-SANJUAN	U-SANJUAN	385	999	125	4584	0.00	0.00	0.00
P606	T030	T035	661	18	125	1365	1.72	0.45	0.67
P610	J010	T102	498	12	125	-628	1.78	0.57	1.15
P616	J012	J013	226	12	125	543	1.54	0.20	0.88
P620	J076	J030	203	12	125	1071	3.04	0.63	3.09
P622	J078	J072	1141	8	125	-111	0.71	0.38	0.33
P624	J064	J078	513	12	125	-5	0.02	0.00	0.00
P626	J023	J016	770	12	125	362	1.03	0.32	0.42
P628	T020	T030	2717	36	120	1355	0.43	0.07	0.02
P632	J017	J018	82	12	125	228	0.65	0.01	0.18
P634	J018	J033	618	12	125	919	2.61	1.44	2.33
P640	J035	J034	633	12	125	618	1.75	0.71	1.12
P644	J016	J015	738	12	125	-231	0.65	0.13	0.18
P650	J037	J038	616	12	125	347	0.98	0.24	0.38
P654	J038	J039	640	12	125	-283	0.80	0.17	0.26
P660	J030	J041	612	12	125	396	1.12	0.30	0.49
P662	J025	J022	693	12	120	733	2.08	1.15	1.65
P664	J022	J080	1315	12	125	-349	0.99	0.51	0.39
P668	J027	J024	637	12	120	699	1.98	0.97	1.51
P672	J029	J076	458	12	125	-320	0.91	0.15	0.33
P678	J031	J028	634	12	120	390	1.11	0.33	0.51
P690	J012	T030	2788	12	125	-321	0.91	0.92	0.33
P692	J080	J026	2656	12	125	486	1.38	1.90	0.72
P694	J094	J041	498	12	125	-530	1.50	0.42	0.84
P696	J019	J036	301	12	125	328	0.93	0.10	0.35
P698	J048	J040	440	12	125	792	2.25	0.78	1.77
P700	J056	J054	1903	12	125	443	1.26	1.15	0.60
P702	J042	J036	1326	12	125	343	0.97	0.50	0.38
P704	J028	J044	592	12	125	465	1.32	0.39	0.66
P708	J046	J017	109	12	125	458	1.30	0.07	0.64
P710	T045	J018	107	18	125	1342	1.69	0.07	0.65
P712	J082	J024	535	8	125	-279	1.78	0.99	1.85
P718	T040	J080	1344	12	125	835	2.37	2.62	1.95
P720	J044	J041	1457	12	125	134	0.38	0.10	0.07
P722	J052	J082	503	8	125	-151	0.96	0.30	0.59
P724	J055	J052	239	8	125	-127	0.81	0.10	0.43
P726	J022	J050	1038	8	125	237	1.51	1.42	1.37
P728	J050	J052	1256	8	125	237	1.51	1.72	1.37
P730	J054	J040	630	12	125	1210	3.43	2.44	3.88
P732	J053	J056	1249	12	125	321	0.91	0.42	0.33
P734	J058	J048	1047	12	125	699	1.98	1.47	1.40
P736	J056	J058	1030	8	125	231	1.47	1.34	1.30
P738	J062	J064	1000	8	125	118	0.76	0.38	0.38
P740	J064	J090	600	12	125	14	0.04	0.00	0.00
P742	J068	J066	1483	8	125	215	1.37	1.68	1.14
P744	J066	J048	712	8	125	215	1.37	0.81	1.14
P746	J064	J068	1239	8	125	110	0.70	0.40	0.33
P748	J036	J070	350	12	125	423	1.20	0.19	0.55
P750	J070	J088	702	12	125	77	0.22	0.02	0.02
P752	J072	J060	657	12	125	-146	0.41	0.05	0.08
P754	J060	J062	958	12	125	122	0.34	0.05	0.05
P756	J062	J072	392	12	125	-35	0.10	0.00	0.01

Upper Westside (Scenario II)
6. MAXIMUM DAY DEMAND + FIRE FLOW OF 2,000 GPM AT J040

PIPE REPORT

ID	From Node	To Node	Length (feet)	Diameter (inches)	Roughness (C-Value)	Flow (gpm)	Velocity (fps)	Headloss (feet)	HL/1000 (ft/kft)
P758	J078	J068	1337	8	125	105	0.67	0.41	0.30
P760	ES-BARANDA	U-BARANDAS	171	999	120	2159	0.00	0.00	0.00
P762	U-BARANDAS	J_BRD	169	999	120	2159	0.00	0.00	0.00
P764	T030	J025	637	12	120	996	2.83	1.86	2.92
P766	J082	J044	1317	12	125	129	0.36	0.08	0.06
P768	J034	J086	1417	8	125	111	0.71	0.47	0.33
P770	J96	J084	1449	8	125	186	1.19	1.27	0.87
P772	J019	J086	707	12	125	-30	0.09	0.00	0.00
P774	J086	J084	651	12	125	81	0.23	0.02	0.03
P776	J084	J060	1031	12	125	267	0.76	0.24	0.24
P778	J056	J100	1411	12	125	-482	1.37	1.00	0.71
P780	J016	J98	4922	12	125	-70	0.20	0.10	0.02
P890	J088	J062	658	12	125	-38	0.11	0.00	0.01
P892	J090	J038	509	12	125	129	0.37	0.03	0.06
P894	J090	J088	1044	8	125	-115	0.73	0.37	0.36
P896	J092	J042	299	12	125	415	1.18	0.16	0.53
P898	J053	J094	481	12	125	-724	2.05	0.72	1.50
P900	J_BRD	J_WRD	4236	12	125	767	2.18	7.07	1.67
P902	J_WRD	J054	904	12	125	767	2.18	1.51	1.67
P904	J_BRD	J076	985	12	125	1391	3.95	4.95	5.02
P906	J035	J96	992	8	125	-48	0.31	0.07	0.07
P908	J98	J018	1227	12	125	-304	0.86	0.37	0.30
P910	J98	J96	2720	8	125	234	1.50	3.63	1.34
P912	J100	J030	916	12	125	-562	1.59	0.86	0.94
P914	J052	J092	1314	12	125	150	0.42	0.11	0.08
P916	J092	J094	1456	12	125	194	0.55	0.19	0.13
P918	T010	T102	392	36	120	628	0.20	0.00	0.01
P920	T030	J020	696	12	120	439	1.25	0.45	0.64
P922	J046	J104	596	12	125	-458	1.30	0.38	0.64

APPENDIX D

ENGINEER'S OPINION OF COST TRANSMISSION PHASE 1 SCENARIO I

Prepared by: J Reed
Date: 8/3/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I

Upper Westside Backbone Water System - Transmission - Phase 1

Summary

	Segment				Amount
	Bryte Bend Road				$0
	El Centro Road				$1,270,000
	Street H				$0
	Radio Road				$0
	San Juan Road (Water Tank)				$17,560,000
	Street 8				$0
	Farm Road				$0
	West El Camino				$0
	Street 2				$540,000
	Segment Construction Sub-Total:				$19,370,000
	Contingency Based upon Construction Hard Costs (20%):				$3,870,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$3,870,000
	Water Tank Land Acquisition (3 Acres)				$1,340,000
	Contingency Based upon LAND Acquisition Costs (10%):				$130,000
	BACKBONE WATER TOTAL:				**$28,580,000**

Prepared by: J Reed
Date: 8/3/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I

Upper Westside Backbone Water System - Transmission - Phase 1

Segment: El Centro Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	0	$145	$0
2	16" PVC C-905 Water Line - w/ Fittings	LF	5,730	$190	$1,088,700
3	24" DI C151 Water Line - w/ Fittings	LF	420	$285	$119,700
4	16" Butterfly Valve	EA	4	$14,000	$56,000
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	0	$12,000	$0
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Meter and Backflow in Vault at Connection to Exis	EA	0	$300,000	$0
10	Cathodic Protection	LF	420	$18	$7,600
11	Phase 1 Backflow Preventer w/Vault	EA	0	$250,000	$0
12	Phase 1 Booster Pump w/Bladder Tank	EA	0	$3,000,000	$0
13	Buildout Booster Pump Station	EA	0	$12,000,000	$0
	Segment Construction Sub-Total:				$1,272,000
	Contingency Based upon Construction Hard Costs (20%):				$254,400
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$254,400
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$1,780,000**

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I

Upper Westside Backbone Water System - Transmission - Phase 1

Segment: San Juan Road (Water Tank)

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	0	$145	$0
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	0	$12,000	$0
7	Water Tank and Site Development	LS	1	$5,000,000	$5,000,000
8	Transmission Main Connection to Existing	EA	1	$10,000	$10,000
9	Meter and Backflow in Vault at Connection to Exis	EA	1	$300,000	$300,000
10	Cathodic Protection	LF	0	$18	$0
11	Phase 1 Backflow Preventer w/Vault	EA	1	$250,000	$250,000
12	Phase 1 Booster Pump w/Bladder Tank	EA	0	$3,000,000	$0
13	Buildout Booster Pump Station	EA	1	$12,000,000	$12,000,000
	Segment Construction Sub-Total:				$17,560,000
	Contingency Based upon Construction Hard Costs (20%):				$3,512,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$3,512,000
LAND	Water Tank Land Acquisition (3 Acres)	SF	129,560	$10.33	$1,338,400
	Contingency Based upon LAND Acquisition Costs (10%):				$133,800
	SEGMENT TOTAL WATER:				**$26,060,000**

Prepared by: J Reed
Date: 8/3/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I

Upper Westside - Backbone Water System - Transmission - Phase 1

Segment: Street 2

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	0	$145	$0
2	16" PVC C-905 Water Line - w/ Fittings	LF	2,700	$190	$513,000
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	2	$14,000	$28,000
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	0	$12,000	$0
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Meter and Backflow in Vault at Connection to Exis	EA	0	$300,000	$0
10	Cathodic Protection	LF	0	$18	$0
11	Phase 1 Backflow Preventer w/Vault	EA	0	$250,000	$0
12	Phase 1 Booster Pump w/Bladder Tank	EA	0	$3,000,000	$0
13	Buildout Booster Pump Station	EA	0	$12,000,000	$0
	Segment Construction Sub-Total:				$541,000
	Contingency Based upon Construction Hard Costs (20%):				$108,200
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$108,200
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$760,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Transmission - Phase 1

Unit Prices

Item	Description	Unit	Unit Price
1	12" PVC C-905 - w/ Fittings & Valves	LF	$145
2	16" PVC C-905 Water Line - w/ Fittings	LF	$190
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	16" Butterfly Valve	EA	$14,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Water Tank and Site Development	LS	$5,000,000
8	Transmission Main Connection to Existing	EA	$10,000
9	Meter and Backflow in Vault at Connection to Exis	EA	$300,000
10	Cathodic Protection	LF	$18
11	Phase 1 Backflow Preventer w/Vault	EA	$250,000
12	Phase 1 Booster Pump w/Bladder Tank	EA	$3,000,000
13	Buildout Booster Pump Station	EA	$12,000,000
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX E
ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 1 SCENARIO I

Prepared by: J Reed
Date: 3/30/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside Major Water Infrastructure Scenario I

Backbone Water System - Distribution - Phase 1

Summary

	Segment				Amount
	Bryte Bend Road				$720,000
	El Centro Road				$890,000
	Radio Road				$0
	San Juan Road				$0
	Farm Road				$220,000
	West El Camino				$0
	Street 2				$460,000
	Segment Construction Sub-Total:				$2,300,000
	Contingency Based upon Construction Hard Costs (20%):				$460,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$460,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE WATER TOTAL:				**$3,220,000**

Prepared by: J Reed
Date: 3/30/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside Major Water Infrastructure Scenario I					
Backbone Water System - Distribution - Phase 1					
Segment:					**Bryte Bend Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	4,250	$145	$616,300
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	9	$12,000	$108,000
	Segment Construction Sub-Total:				$724,300
	Contingency Based upon Construction Hard Costs (20%):				$144,900
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$144,900
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$1,010,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside Major Water Infrastructure Scenario I

Backbone Water System - Distribution - Phase 1

Segment: El Centro Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	5,200	$145	$754,000
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	11	$12,000	$132,000
	Segment Construction Sub-Total:				$886,000
	Contingency Based upon Construction Hard Costs (20%):				$177,200
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$177,200
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$1,240,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside Major Water Infrastructure Scenario I					
Backbone Water System - Distribution - Phase 1					
Segment:					**Farm Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	1,300	$145	$188,500
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	3	$12,000	$36,000
	Segment Construction Sub-Total:				$224,500
	Contingency Based upon Construction Hard Costs (20%):				$44,900
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$44,900
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$310,000**

Prepared by: J Reed
Date: 3/30/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside Major Water Infrastructure Scenario I

Backbone Water System - Distribution - Phase 1

Segment: Street 2

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	2,700	$145	$391,500
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	6	$12,000	$72,000
	Segment Construction Sub-Total:				$463,500
	Contingency Based upon Construction Hard Costs (20%):				$92,700
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$92,700
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$650,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Distribution - Phase 1

Unit Prices

Item	Description	Unit	Unit Price
1	12" PVC C-905 - w/ Fittings & Valves	LF	$145
2	16" PVC C-905 Water Line - w/ Fittings	LF	$190
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	16" Butterfly Valve	EA	$14,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX F
ENGINEER'S OPINION OF COST TRANSMISSION PHASE 2 SCENARIO I

Prepared by: J Reed
Date: 8/3/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Transmission - Phase 2

Summary

	Segment				Amount
	A: Bryte Bend Road				$0
	B: El Centro Road				$0
	C: Radio Road				$0
	D: San Juan Road				$500,000
	E: Farm Road				$0
	F: West El Camino				$0
	G: Street 2				$0
	Segment Construction Sub-Total:				$500,000
	Contingency Based upon Construction Hard Costs (20%):				$100,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$100,000
	Water Tank Land Acquisition (3 Acres)				$1,340,000
	Contingency Based upon LAND Acquisition Costs (10%):				$130,000
	BACKBONE TRANSMISSION WATER TOTAL:				**$2,170,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Transmission - Phase 2

Segment: D: San Juan Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	0	$145	$0
2	16" PVC C-905 Water Line - w/ Fittings	LF	2,500	$190	$475,000
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	2	$14,000	$28,000
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	0	$12,000	$0
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Meter and Backflow in Vault at Connection to Exis	EA	0	$300,000	$0
10	Cathodic Protection	LF	0	$18	$0
11	Phase 1 Backflow Preventer w/Vault	EA	0	$250,000	$0
12	Phase 1 Booster Pump w/Bladder Tank	EA	0	$3,000,000	$0
13	Buildout Booster Pump Station	EA	0	$12,000,000	$0
	Segment Construction Sub-Total:				$503,000
	Contingency Based upon Construction Hard Costs (20%):				$100,600
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$100,600
LAND	Water Tank Land Acquisition (3 Acres)	SF	129,560	$10.33	$1,338,400
	Contingency Based upon LAND Acquisition Costs (10%):				$133,800
	SEGMENT TOTAL WATER:				**$2,180,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Transmission - Phase 2

Unit Prices

Item	Description	Unit	Unit Price
1	12" PVC C-905 - w/ Fittings & Valves	LF	$145
2	16" PVC C-905 Water Line - w/ Fittings	LF	$190
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	16" Butterfly Valve	EA	$14,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Water Tank and Site Development	LS	$5,000,000
8	Transmission Main Connection to Existing	EA	$10,000
9	Meter and Backflow in Vault at Connection to Exis	EA	$300,000
10	Cathodic Protection	LF	$18
11	Phase 1 Backflow Preventer w/Vault	EA	$250,000
12	Phase 1 Booster Pump w/Bladder Tank	EA	$3,000,000
13	Buildout Booster Pump Station	EA	$12,000,000
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX G
ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 2 SCENARIO I

Prepared by: J Reed
Date: 3/30/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Distribution - Phase 2

Summary

	Segment				Amount
	A: Bryte Bend Road				$670,000
	B: El Centro Road				$0
	C: Radio Road				$0
	D: San Juan Road				$310,000
	E: Farm Road				$0
	F: West El Camino				$100,000
	G: Street 2				$0
	Segment Construction Sub-Total:				$1,080,000
	Contingency Based upon Construction Hard Costs (20%):				$220,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$150,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE DISTRIBUTION WATER TOTAL:				**$1,450,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Distribution - Phase 2

Segment: A: Bryte Bend Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	3,950	$145	$572,800
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	8	$12,000	$96,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
	Segment Construction Sub-Total:				$668,800
	Contingency Based upon Construction Hard Costs (20%):				$133,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$133,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$940,000**

Prepared by: J Reed
Date: 3/30/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)					
Backbone Water System - Distribution - Phase 2					
Segment:					**F: West El Camino**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	550	$145	$79,800
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	2	$12,000	$24,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
	Segment Construction Sub-Total:				$103,800
	Contingency Based upon Construction Hard Costs (20%):				$20,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$20,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
				SEGMENT TOTAL WATER:	**$150,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)					
Backbone Water System - Distribution - Phase 2					
Segment:					**D: San Juan Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	1,780	$145	$258,100
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	4	$12,000	$48,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10	$0
	Segment Construction Sub-Total:				$306,100
				Contingency Based upon Construction Hard Costs (20%):	$61,200
				Soft Costs Budget Based upon Construction Hard Costs (20%):	$61,200
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
				Contingency Based upon LAND Acquisition Costs (10%):	$0
				SEGMENT TOTAL WATER:	**$430,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Distribution - Phase 2

Unit Prices

Item	Description	Unit	Unit Price
1	12" PVC C-905 - w/ Fittings & Valves	LF	$145
2	16" PVC C-905 Water Line - w/ Fittings	LF	$190
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	16" Butterfly Valve	EA	$14,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Water Tank and Site Development	LS	$5,000,000
8	Transmission Main Connection to Existing	EA	$10,000
9	Water Supply Meter at Connection to Existing	EA	$25,000
10	Buildout Booster Pump Station	EA	$12,000,000
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX H
ENGINEER'S OPINION OF COST TRANSMISSION PHASE 3 SCENARIO I

Prepared by: J Reed
Date: 3/31/2023

WOOD RODGERS

Engineer's Opinion of Costs

Upper West Side - Backbone Water System - Transmission - Phase 3 (Scenario I)

Summary

	Segment				Amount
	A: Bryte Bend Road				$0
	B: El Centro Road				$0
	C: Radio Road				$310,000
	D: San Juan Road				$0
	E: Farm Road				$0
	F: West El Camino				$0
	G: Street 2				$0
	Segment Construction Sub-Total:				$310,000
	Contingency Based upon Construction Hard Costs (20%):				$60,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$60,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE TRANSMISSION WATER TOTAL:				**$430,000**

WOOD RODGERS

Engineer's Opinion of Costs

Upper West Side - Backbone Water System - Transmission - Phase 3 (Scenario I)

Segment: C: Radio Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	0	$145	$0
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	0	$12,000	$0
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	1	$10,000	$10,000
9	Meter and Backflow in Vault at Connection to Exis	EA	1	$300,000	$300,000
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$310,000
	Contingency Based upon Construction Hard Costs (20%):				$62,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$62,000
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$430,000**

Prepared by: J Reed
Date: 3/31/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper West Side

Backbone Water System - Transmission - Phase 3 (Scenario I)

Unit Prices

Item	Description	Unit	Unit Price
1	12" PVC C-905 - w/ Fittings & Valves	LF	$145
2	16" PVC C-905 Water Line - w/ Fittings	LF	$190
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	16" Butterfly Valve	EA	$14,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Water Tank and Site Development	LS	$5,000,000
8	Transmission Main Connection to Existing	EA	$10,000
9	Meter and Backflow in Vault at Connection to Exis	EA	$300,000
10	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX I

ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 3 SCENARIO I

Prepared by: J Reed
Date: 3/30/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Phase 3

Summary

	Segment				Amount
	A: Bryte Bend Road				$470,000
	B: El Centro Road				$550,000
	C: Radio Road				$400,000
	D: San Juan Road				$400,000
	E: Farm Road				$460,000
	F: West El Camino				$140,000
	G: Street 2				$0
	Segment Construction Sub-Total:				$2,420,000
	Contingency Based upon Construction Hard Costs (20%):				$480,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$480,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE DISTRIBUTION WATER TOTAL:				**$3,380,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Phase 3

Segment: A: Bryte Bend Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	2,730	$145	$395,900
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	6	$12,000	$72,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$467,900
	Contingency Based upon Construction Hard Costs (20%):				$93,600
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$93,600
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$660,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)					
Backbone Water System - Phase 3					
Segment:					**B: El Centro Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	3,200	$145	$464,000
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	7	$12,000	$84,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$548,000
	Contingency Based upon Construction Hard Costs (20%):				$109,600
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$109,600
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$770,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Phase 3

Segment: C: Radio Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	2,350	$145	$340,800
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	5	$12,000	$60,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$400,800
	Contingency Based upon Construction Hard Costs (20%):				$80,200
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$80,200
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$560,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)					
Backbone Water System - Phase 3					
Segment:					**D: San Juan Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	2,350	$145	$340,800
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	5	$12,000	$60,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$400,800
	Contingency Based upon Construction Hard Costs (20%):				$80,200
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$80,200
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$560,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)					
Backbone Water System - Phase 3					
Segment:					**E: Farm Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	2,700	$145	$391,500
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	6	$12,000	$72,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$463,500
				Contingency Based upon Construction Hard Costs (20%):	$92,700
				Soft Costs Budget Based upon Construction Hard Costs (20%):	$92,700
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
				Contingency Based upon LAND Acquisition Costs (10%):	$0
				SEGMENT TOTAL WATER:	**$650,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)					
Backbone Water System - Phase 3					
Segment:					**F: West El Camino**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	790	$145	$114,600
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	2	$12,000	$24,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$138,600
	Contingency Based upon Construction Hard Costs (20%):				$27,700
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$27,700
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$190,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Phase 3

Unit Prices

Item	Description	Unit	Unit Price
1	12" PVC C-905 - w/ Fittings & Valves	LF	$145
2	16" PVC C-905 Water Line - w/ Fittings	LF	$190
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	16" Butterfly Valve	EA	$14,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Water Tank and Site Development	LS	$5,000,000
8	Transmission Main Connection to Existing	EA	$10,000
9	Water Supply Meter at Connection to Existing	EA	$25,000
10	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX J
ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 4 SCENARIO I

Prepared by: J Reed
Date: 3/30/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I

Upper Westside - Backbone Water System - Distribution - Phase 4

Summary

	Segment				Amount
	A: Bryte Bend Road				$0
	B: El Centro Road				$450,000
	C: Radio Road				$0
	D: San Juan Road				$0
	E: Farm Road				$230,000
	F: West El Camino				$230,000
	G: Street 2				$0
	Segment Construction Sub-Total:				$920,000
	Contingency Based upon Construction Hard Costs (20%):				$180,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$180,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE DISTRIBUTION WATER TOTAL:				**$1,280,000**

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I

Upper Westside - Backbone Water System - Distribution - Phase 4

Segment: B: El Centro Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	2,600	$145	$377,000
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	6	$12,000	$72,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$449,000
	Contingency Based upon Construction Hard Costs (20%):				$89,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$89,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$630,000**

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I

Upper Westside - Backbone Water System - Distribution - Phase 4

Segment: E: Farm Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" PVC C-905 - w/ Fittings & Valves	LF	1,370	$145	$198,700
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	3	$12,000	$36,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$234,700
	Contingency Based upon Construction Hard Costs (20%):				$46,900
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$46,900
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$330,000**

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario I					
Upper Westside - Backbone Water System - Distribution - Phase 4					
Segment:					**F: West El Camino**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" PVC C-905 - w/ Fittings & Valves	LF	1,370	$145	$198,700
2	16" PVC C-905 Water Line - w/ Fittings	LF	0	$190	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	16" Butterfly Valve	EA	0	$14,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	3	$12,000	$36,000
7	Water Tank and Site Development	LS	0	$5,000,000	$0
8	Transmission Main Connection to Existing	EA	0	$10,000	$0
9	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
10	Cathodic Protection	LF	0	$18	$0
	Segment Construction Sub-Total:				$234,700
	Contingency Based upon Construction Hard Costs (20%):				$46,900
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$46,900
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$330,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario I)

Backbone Water System - Distribution - Phase 4

Unit Prices

Item	Description	Unit	Unit Price
1	12" PVC C-905 - w/ Fittings & Valves	LF	$145
2	16" PVC C-905 Water Line - w/ Fittings	LF	$190
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	16" Butterfly Valve	EA	$14,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Water Tank and Site Development	LS	$5,000,000
8	Transmission Main Connection to Existing	EA	$10,000
9	Water Supply Meter at Connection to Existing	EA	$25,000
10	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPDENIX K

ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 1 SCENARIO II

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure (Scenario II)

Upper Westside Backbone Water System - Distribution - Phase 1

Summary

	Segment				Amount
	Bryte Bend Road				$730,000
	El Centro Road				$190,000
	Radio Road				$0
	San Juan Road				$0
	Farm Road				$230,000
	West El Camino				$0
	Street 2				$460,000
	Segment Construction Sub-Total:				$1,610,000
	Contingency Based upon Construction Hard Costs (20%):				$320,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$320,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE WATER TOTAL:				**$2,250,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario II					
Upper Westside Backbone Water System - Distribution - Phase 1					
Segment:					**Bryte Bend Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	4,250	$145	$616,300
2	18" DIP Water w/Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	9	$12,000	$108,000
7	Connect to Existing	EA	1	$5,000	$5,000
8	Offsite 12" Bore and Jack	LF	350	$250	$87,500
9	Cathodic Protection	LF	4,250	$18	$76,500
	Segment Construction Sub-Total:				$729,300
	Contingency Based upon Construction Hard Costs (20%):				$145,900
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$145,900
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$1,020,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario II					
Upper Westside Backbone Water System - Distribution - Phase 1					
Segment:					**El Centro Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	200	$145	$29,000
2	18" DIP Water w/Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	12	$12,000	$144,000
7	Connect to Existing	EA	2	$5,000	$10,000
8	Offsite 12" Bore and Jack	LF	0	$250	$0
9	Cathodic Protection	LF	200	$18	$3,600
	Segment Construction Sub-Total:				$186,600
	Contingency Based upon Construction Hard Costs (20%):				$37,300
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$37,300
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$260,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario II					
Upper Westside Backbone Water System - Distribution - Phase 1					
Segment:					**Farm Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	1,300	$145	$188,500
2	18" DIP Water w/Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	3	$12,000	$36,000
7	Connect to Existing	EA	1	$5,000	$5,000
8	Offsite 12" Bore and Jack	LF	0	$250	$0
9	Cathodic Protection	LF	1,300	$18	$23,400
	Segment Construction Sub-Total:				$229,500
				Contingency Based upon Construction Hard Costs (20%):	$45,900
				Soft Costs Budget Based upon Construction Hard Costs (20%):	$45,900
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
				Contingency Based upon LAND Acquisition Costs (10%):	$0
				SEGMENT TOTAL WATER:	**$320,000**

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario II

Upper Westside Backbone Water System - Distribution - Phase 1

Segment: Street 2

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" DIP Water Line - w/ Fittings & Valves	LF	2,700	$145	$391,500
2	18" DIP Water w/Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	6	$12,000	$72,000
7	Connect to Existing	EA	0	$5,000	$0
8	Offsite 12" Bore and Jack	LF	0	$250	$0
9	Cathodic Protection	LF	2,700	$18	$48,600
	Segment Construction Sub-Total:				$463,500
	Contingency Based upon Construction Hard Costs (20%):				$92,700
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$92,700
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$650,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Distribution - Phase 1

Unit Prices

Item	Description	Unit	Unit Price
1	12" DIP Water Line - w/ Fittings & Valves	LF	$145
2	18" DIP Water w/Fittings	LF	$200
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	18" Butterfly Valve	EA	$16,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Connect to Existing	EA	$5,000
8	Offsite 12" Bore and Jack	LF	$250
9	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX L

ENGINEER'S OPINION OF COST TRANSMISSION PHASE 2 SCENARIO II

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Transmission - Phase 2

Summary

	Segment				Amount
	A: Bryte Bend Road				$0
	B: El Centro Road				$0
	C: Radio Road				$0
	D: San Juan Road				$550,000
	E: Farm Road				$0
	F: West El Camino				$0
	G: Street 2				$0
	Segment Construction Sub-Total:				$550,000
	Contingency Based upon Construction Hard Costs (20%):				$110,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$110,000
	Water Tank Land Acquisition (3 Acres)				$1,340,000
	Contingency Based upon LAND Acquisition Costs (10%):				$130,000
	BACKBONE TRANSMISSION WATER TOTAL:				**$2,240,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)					
Backbone Water System - Transmission - Phase 2					
Segment:					**D: San Juan Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	0	$145	$0
2	18" DIP Water Line - w/ Fittings	LF	2,350	$200	$470,000
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	2	$16,000	$32,000
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	0	$12,000	$0
7	Transmission Main Connection to Existing	EA	1	$10,000	$10,000
8	Water Supply Meter at Connection to Existing	EA	0	$25,000	$0
9	Cathodic Protection	LF	2,350	$18	$42,300
	Segment Construction Sub-Total:				$554,300
	Contingency Based upon Construction Hard Costs (20%):				$110,900
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$110,900
LAND	Water Tank Land Acquisition (3 Acres)	SF	129,560	$10.33	$1,338,400
	Contingency Based upon LAND Acquisition Costs (10%):				$133,800
	SEGMENT TOTAL WATER:				**$2,250,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Transmission - Phase 2

Unit Prices

Item	Description	Unit	Unit Price
1	12" DIP Water Line - w/ Fittings & Valves	LF	$145
2	18" DIP Water Line - w/ Fittings	LF	$200
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	18" Butterfly Valve	EA	$16,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Transmission Main Connection to Existing	EA	$10,000
8	Water Supply Meter at Connection to Existing	EA	$25,000
9	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX M

ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 2 SCENARIO II

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Distribution - Phase 2

Summary

	Segment				Amount
	A: Bryte Bend Road				$670,000
	B: El Centro Road				$0
	C: Radio Road				$0
	D: San Juan Road				$310,000
	E: Farm Road				$0
	F: West El Camino				$100,000
	G: Street 2				$0
	Segment Construction Sub-Total:				$1,080,000
	Contingency Based upon Construction Hard Costs (20%):				$220,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$220,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE DISTRIBUTION WATER TOTAL:				**$1,520,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)					
Backbone Water System - Distribution - Phase 2					
Segment:					**A: Bryte Bend Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	3,950	$145	$572,800
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	8	$12,000	$96,000
7	Transmission Main Connection to Existing	EA	0	$10,000	$0
8	Connect to Existing	EA	1	$5,000	$5,000
9	Cathodic Protection	LF	3,950	$18	$71,100
	Segment Construction Sub-Total:				$668,800
	Contingency Based upon Construction Hard Costs (20%):				$133,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$133,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
				SEGMENT TOTAL WATER:	**$940,000**

WOOD RODGERS

Engineer's Opinion of Costs

Upper West Side - Backbone Water System - Distribution - Phase 2

Segment: D: San Juan Road

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" DIP Water Line - w/ Fittings & Valves	LF	1,800	$145	$261,000
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	4	$12,000	$48,000
7	Transmission Main Connection to Existing	EA	0	$10,000	$0
8	Connect to Existing	EA	1	$5,000	$5,000
9	Cathodic Protection	LF	1,800	$18	$32,400
	Segment Construction Sub-Total:				$309,000
	Contingency Based upon Construction Hard Costs (20%):				$61,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$61,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$430,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)					
Backbone Water System - Distribution - Phase 2					
Segment:					**F: West El Camino**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	550	$145	$79,800
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	2	$12,000	$24,000
7	Transmission Main Connection to Existing	EA	0	$10,000	$0
8	Connect to Existing	EA	1	$5,000	$5,000
9	Cathodic Protection	LF	550	$18	$9,900
	Segment Construction Sub-Total:				$103,800
	Contingency Based upon Construction Hard Costs (20%):				$20,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$20,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$150,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Distribution - Phase 2

Unit Prices

Item	Description	Unit	Unit Price
1	12" DIP Water Line - w/ Fittings & Valves	LF	$145
2	18" DIP Water Line - w/ Fittings	LF	$200
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	18" Butterfly Valve	EA	$16,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Transmission Main Connection to Existing	EA	$10,000
8	Connect to Existing	EA	$5,000
9	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX N
ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 3 SCENARIO II

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Phase 3

Summary

	Segment				Amount
	A: Bryte Bend Road				$470,000
	B: El Centro Road				$0
	C: Radio Road				$410,000
	D: San Juan Road				$130,000
	E: Farm Road				$470,000
	F: West El Camino				$160,000
	G: Street 2				$0
	Segment Construction Sub-Total:				$1,640,000
	Contingency Based upon Construction Hard Costs (20%):				$330,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$330,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE DISTRIBUTION WATER TOTAL:				**$2,300,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)					
Backbone Water System - Phase 3					
Segment:					**A: Bryte Bend Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	2,730	$145	$395,900
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	6	$12,000	$72,000
7	Connect to Existing	EA	1	$5,000	$5,000
8	Cathodic Protection	LF	2,730	$18	$49,100
	Segment Construction Sub-Total:				$472,900
	Contingency Based upon Construction Hard Costs (20%):				$94,600
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$94,600
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$660,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)					
Backbone Water System - Phase 3					
Segment:					**C: Radio Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	2,350	$145	$340,800
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	5	$12,000	$60,000
7	Connect to Existing	EA	1	$5,000	$5,000
8	Cathodic Protection	LF	2,350	$18	$42,300
	Segment Construction Sub-Total:				$405,800
	Contingency Based upon Construction Hard Costs (20%):				$81,200
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$81,200
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$570,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)					
Backbone Water System - Phase 3					
Segment:					**D: San Juan Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	700	$145	$101,500
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	2	$12,000	$24,000
7	Connect to Existing	EA	1	$5,000	$5,000
8	Cathodic Protection	LF	700	$18	$12,600
	Segment Construction Sub-Total:				$130,500
	Contingency Based upon Construction Hard Costs (20%):				$26,100
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$26,100
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$180,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)					
Backbone Water System - Phase 3					
Segment:					**E: Farm Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP Water Line - w/ Fittings & Valves	LF	2,715	$145	$393,700
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	6	$12,000	$72,000
7	Connect to Existing	EA	1	$5,000	$5,000
8	Cathodic Protection	LF	2,715	$18	$48,900
	Segment Construction Sub-Total:				$470,700
	Contingency Based upon Construction Hard Costs (20%):				$94,100
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$94,100
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$660,000**

WOOD RODGERS

Engineer's Opinion of Costs

Upper West Side - Backbone Water System - Phase 3

Segment: F: West El Camino

Item	Description	Unit	Quantity	Unit Price	Amount
1	12" DIP Water Line - w/ Fittings & Valves	LF	820	$145	$118,900
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	2	$12,000	$24,000
7	Connect to Existing	EA	1	$5,000	$5,000
8	Cathodic Protection	LF	820	$18	$14,800
	Segment Construction Sub-Total:				$162,700
	Contingency Based upon Construction Hard Costs (20%):				$32,500
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$32,500
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	SEGMENT TOTAL WATER:				**$230,000**

WOOD RODGERS

Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Phase 3

Unit Prices

Item	Description	Unit	Unit Price
1	12" DIP Water Line - w/ Fittings & Valves	LF	$145
2	18" DIP Water Line - w/ Fittings	LF	$200
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	18" Butterfly Valve	EA	$16,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Connect to Existing	EA	$5,000
8	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33

APPENDIX O

ENGINEER'S OPINION OF COST DISTRIBUTION PHASE 4 SCENARIO II

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario II

Upper Westside - Backbone Water System - Distribution - Phase 4

Summary

	Segment				Amount
	A: Bryte Bend Road				$0
	B: El Centro Road				$0
	C: Radio Road				$0
	D: San Juan Road				$0
	E: Farm Road				$230,000
	F: West El Camino				$230,000
	G: Street 2				$0
	Segment Construction Sub-Total:				$460,000
	Contingency Based upon Construction Hard Costs (20%):				$90,000
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$90,000
	Water Tank Land Acquisition (3 Acres)				$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
	BACKBONE DISTRIBUTION WATER TOTAL:				**$640,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario II					
Upper Westside - Backbone Water System - Distribution - Phase 4					
Segment:					**E: Farm Road**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP - w/ Fittings & Valves	LF	1,330	$145	$192,900
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	3	$12,000	$36,000
7	Transmission Main Connection to Existing	EA	0	$10,000	$0
8	Connect to Existing	EA	2	$5,000	$10,000
9	Cathodic Protection	LF	1,330	$18	$23,900
	Segment Construction Sub-Total:				$228,900
	Contingency Based upon Construction Hard Costs (20%):				$45,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$45,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
				SEGMENT TOTAL WATER:	**$320,000**

Prepared by: J Reed
Date: 4/20/2023

WOOD RODGERS

Engineer's Opinion of Costs - Major Water Infrastructure Scenario II					
Upper Westside - Backbone Water System - Distribution - Phase 4					
Segment:					**F: West El Camino**
Item	**Description**	**Unit**	**Quantity**	**Unit Price**	**Amount**
1	12" DIP - w/ Fittings & Valves	LF	1,365	$145	$197,900
2	18" DIP Water Line - w/ Fittings	LF	0	$200	$0
3	24" DI C151 Water Line - w/ Fittings	LF	0	$285	$0
4	18" Butterfly Valve	EA	0	$16,000	$0
5	24" Butterfly Valve	EA	0	$20,000	$0
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	3	$12,000	$36,000
7	Transmission Main Connection to Existing	EA	0	$10,000	$0
8	Connect to Existing	EA	2	$5,000	$10,000
9	Cathodic Protection	LF	1,365	$18	$24,600
	Segment Construction Sub-Total:				$233,900
	Contingency Based upon Construction Hard Costs (20%):				$46,800
	Soft Costs Budget Based upon Construction Hard Costs (20%):				$46,800
LAND	Water Tank Land Acquisition (3 Acres)	SF	0	$10.33	$0
	Contingency Based upon LAND Acquisition Costs (10%):				$0
				SEGMENT TOTAL WATER:	**$330,000**

Prepared by: J Reed
Date: 4/20/2023

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Engineer's Opinion of Costs - Upper Westside (Scenario II)

Backbone Water System - Distribution - Phase 4

Unit Prices

Item	Description	Unit	Unit Price
1	12" DIP - w/ Fittings & Valves	LF	$145
2	18" DIP Water Line - w/ Fittings	LF	$200
3	24" DI C151 Water Line - w/ Fittings	LF	$285
4	18" Butterfly Valve	EA	$16,000
5	24" Butterfly Valve	EA	$20,000
6	Fire Hydrant w/Tee & Valves (FH / 500')	EA	$12,000
7	Transmission Main Connection to Existing	EA	$10,000
8	Connect to Existing	EA	$5,000
9	Cathodic Protection	LF	$18
LAND	Water Tank Land Acquisition (3 Acres)	SF	$10.33