APPENDIX I

ROCKWORKS TECHNICAL MEMORANDUM

02 April 2021

MEMORANDUM

To: Tom Rooze (Zone 7 Water Agency [Zone 7])
Colleen Winey (Zone 7)

From: Anona Dutton, PG, CHg (EKI Environment & Water, Inc. [EKI])
Aaron Lewis (EKI)
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Subject: **Progress Update on Extending Existing Hydrogeologic Framework**
(EKI C00065.00)

EKI Environment & Water, Inc. (EKI) is pleased to present to Zone 7 Water Agency (Zone 7) a summary of specific technical efforts related to extending the existing Hydrogeologic Conceptual Model (HCM) framework to encompass the entirety of the Livermore Valley Groundwater Basin (Basin). Pursuant to our approved scope of work, EKI's work efforts include application of 3D geologic modeling software to support development of three cross-sections for the Basin. This memorandum is anticipated to be included as an attachment to the 2022 Alternative Groundwater Sustainability Plan (Alt GSP).

GEOLOGIC MODELING SOFTWARE

The 3D geologic modeling software platform RockWorks[1] was selected by Zone 7 to support data integration, HCM representation, and cross-section development.

DATA SOURCES

The primary data sources that have been integrated into the RockWorks platform and are otherwise supporting development of the updated HCM framework include the following:

- Well information, including locations and well construction details as provided by Zone 7;
- Geologic and lithology data and resources as provided by Zone 7, including borehole geophysical (e-log) data, lithology intervals, aquifer layer (stratigraphy) depth intervals, prior hydrogeologic reports and studies, geologic maps, existing cross-sections, faults information, and other supporting resources;
- California Department of Water Resources (DWR) reports and information (e.g., from the SGMA data portal);

[1] RockWorks 2020 Standard Level License from RockWare is downloaded and installed on 15 October 2020: https://www.rockware.com/product/rockworks/

- Lawrence Livermore National Laboratory (LLNL) wells e-logs and lithology data;
- United States Geological Survey (USGS) ground surface elevation data;
- Groundwater elevation data provided by Zone 7; and
- Groundwater dependent ecosystem (GDE) resources, including GDE geospatial data and Sycamore alluvial woodland data.

MAJOR ASSUMPTIONS

Based on EKI's approved scope of work and further direction provided by Zone 7, the following key assumptions have informed the approach presented herein:

- ***On-going refinement of the Basin HCM is anticipated to be an evolving and iterative process that extends beyond the scope of this effort.*** As part of this scope of work, all currently available data have been processed and imported into the RockWorks framework to create a general 3D representation of the Basin. Additionally, detailed analysis and interpretations of the HCM framework are being made along the three proposed cross-section traces. It is anticipated that additional data can be added to RockWorks as available and that refined interpretations can be developed for additional areas of interest and/or to refine the Basin HCM as part of future work efforts by Zone 7 staff or consultants.
- ***For purposes of the 2022 Alt GSP, simplified Basin-scale Interpretations of the hydro-stratigraphic framework are appropriate.*** Multiple cross-sections have been developed by and for Zone 7 over time for different purposes. Previous interpretations of aquifer layer intervals contained as many as 10 stratigraphic units (i.e., overburden, perched aquifer, perched clay, cyan, gray clay, gray, purple clay, purple, red clay, and red) based on previous geological investigations within the Main Basin Management Area (MBMA) (Norfleet Consultant, 2004). However, given the considerable uncertainty involved in extending these stratigraphic units into the Fringe and Uplands management areas of the Basin, simplified stratigraphic units depicting only the overburden, upper aquifer, aquitard, lower aquifer, and the Lower Livermore Formation are used in the 3D modeling performed for the Basin for purposes of the 2022 Alt GSP. The original dataset of contact points between these more detailed stratigraphic units (cyan, gray, etc.) have been imported and are preserved as "I-Data" (interval data) in RockWorks to provide for future use and/or refinement, as applicable.

  Within the MBMA, the "upper aquifer" corresponds to the cyan unit (generally consisting of younger, unconsolidated Holocene to Quaternary alluvial deposits), the "aquitard" represents the gray clay unit, and the "lower aquifer" represents the combined gray-purple-red complex (generally consisting of older, semi-consolidated Quaternary alluvial deposits and the productive upper zone of the Plio-Pleistocene Livermore Formation [defined herein as the "Upper Livermore Formation"]). Where it exists outside the MBMA, the upper aquifer represents younger Quaternary alluvial deposits, while the lower aquifer represents older Quaternary terrace and alluvial deposits and the Upper Livermore Formation. The Basin bottom is defined at the top of the Lower Livermore Formation, i.e. the depth at which deposits become increasingly consolidated (transitioning from gravel beds lain with silts and clay to predominantly blue silts and clays) and well yields diminish considerably. In the Uplands area, it is assumed the Lower Livermore Formation is the dominant outcropping stratigraphic unit and therefore the upper and lower aquifers are not assumed to be present.

- ***Limited structural data can be directly incorporated into RockWorks.*** Given the RockWorks 2020 Standard Level license limitation, only three faults can be mapped and directly incorporated in the model. As such, three major faults[2] within the Basin were selected for modeling purposes, including the Livermore Thrust Fault, Las Positas Fault, and Verona Thrust Fault.

DATA INTEGRATION / APPLICATION OF ROCKWORKS

The following list summarizes the step-wise development process that was used to build the HCM framework in RockWorks. Graphical representations of the work effort to date are also included below:

1) ***Process and import borehole data provided by Zone 7 for 1,053 unique boreholes into the RockWorks Borehole Manager framework.*** As shown in Figure 1, these data included the location, borehole depth, borehole elevation, lithology, stratigraphy, and e-log data (gamma, short normal, long normal, spontaneous potential, single point resistivity, and lateral resistivity)[3].

    a. The lithology data were further refined to group the 19 Unified Soil Classification System (USCS) classifications included in the lithology dataset into six simplified types (i.e., clay, silt, gravel, sand, fill, and top soil).

    b. The stratigraphy data were further refined to group the 10 stratigraphic units included in the original Zone 7 stratigraphy dataset into five generalized units (overburden, upper aquifer, aquitard, lower aquifer, and Lower Livermore Foundation), as described below in more detail.

    c. To examine whether there were similar grain-size distribution patterns between wells in each aquifer layer, the lithological data were reclassified as either coarse or fine-grained sediments[4], and their coarse grain percentages within each aquifer layer were summarized by well. This classification was loaded into RockWorks as a separate attribute of the lithology dataset, but was ultimately not used for model development.

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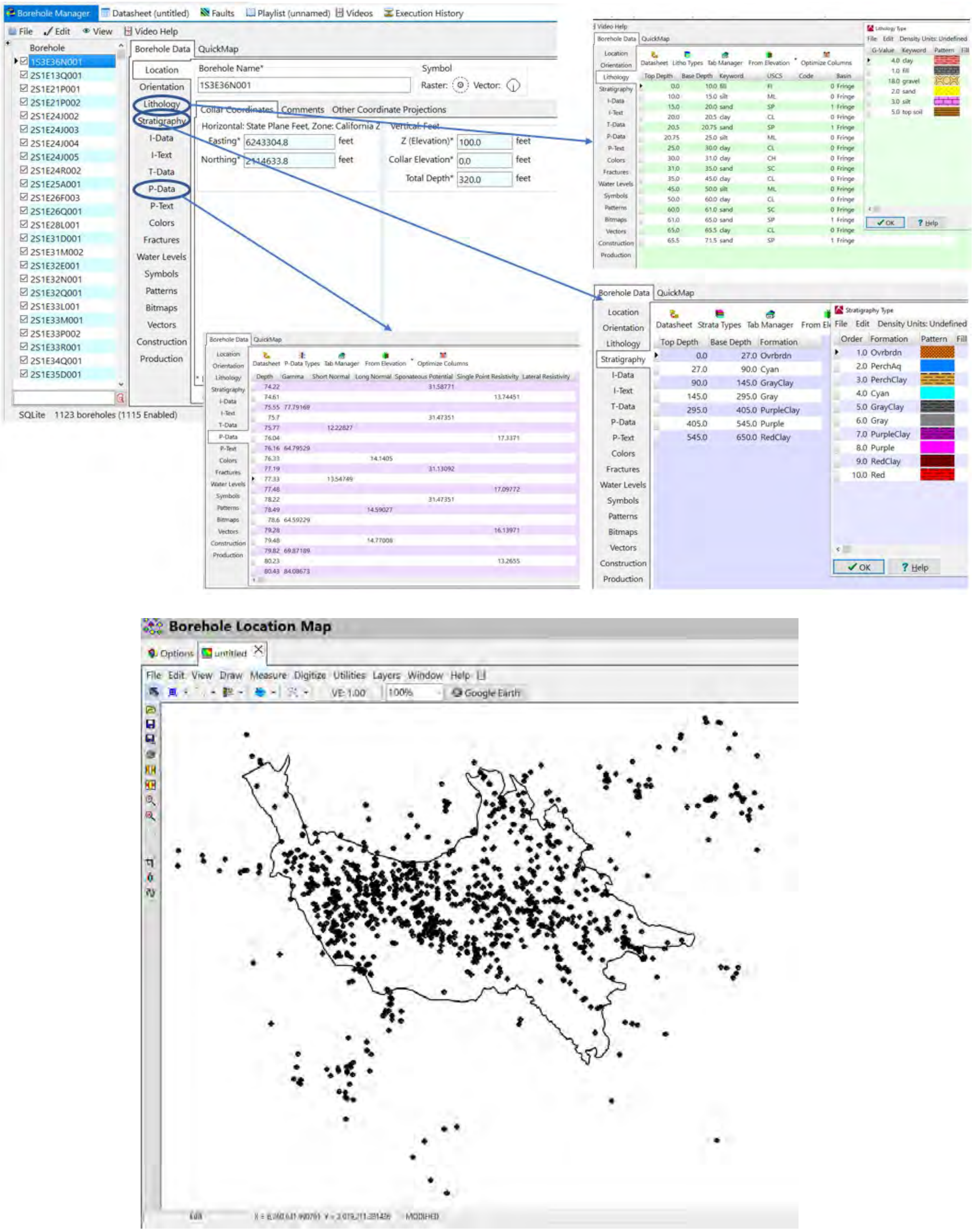
[2] Three faults are mapped in Figure 3-3 Preliminary Stratigraphy Evaluation, Main Basin, Norfleet Consultants, dated 15 January 2004.

[3] Data availability varies by borehole.

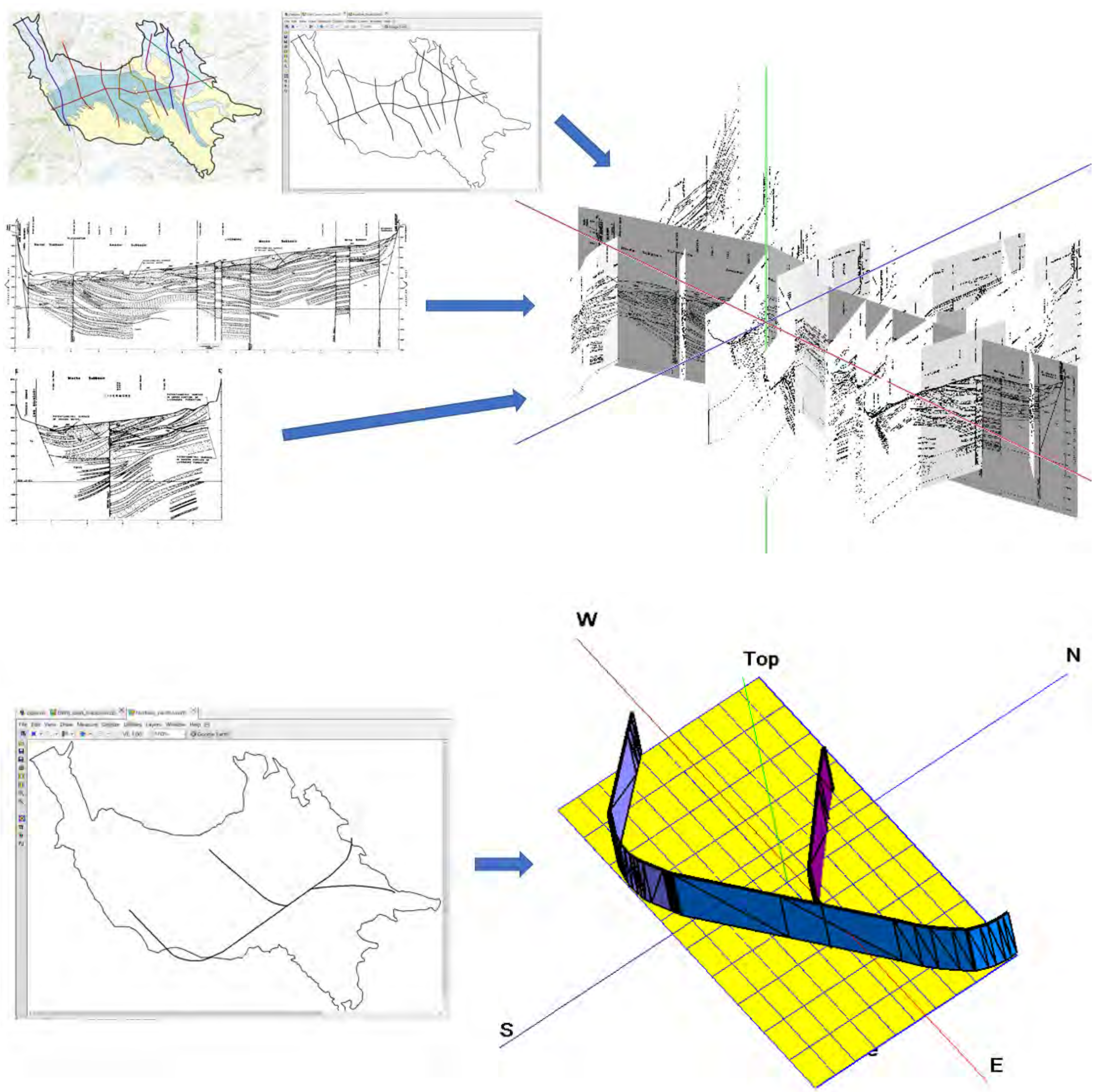
[4] Coarse/fine classification is based on Standard Practice for Classification of Soils for Engineering Purposes (USCS), American Society for Testing and Materials (ASTM) D2487-06.

Figure 1 - Processing of Well and Borehole Data



2) ***Process and import selected 2D shapefiles and imagery into the RockWorks framework.*** As shown in Figure 2, these files included the Basin boundary, the DWR (1974) cross-section traces[5] that were digitized by EKI, and three major faults within the Basin (Livermore Thrust, Las Positas Fault, and Verona Thrust) that were also digitized by EKI. EKI created georeferenced 3D RockWorks files for the 1974 DWR cross-section traces and three major faults.

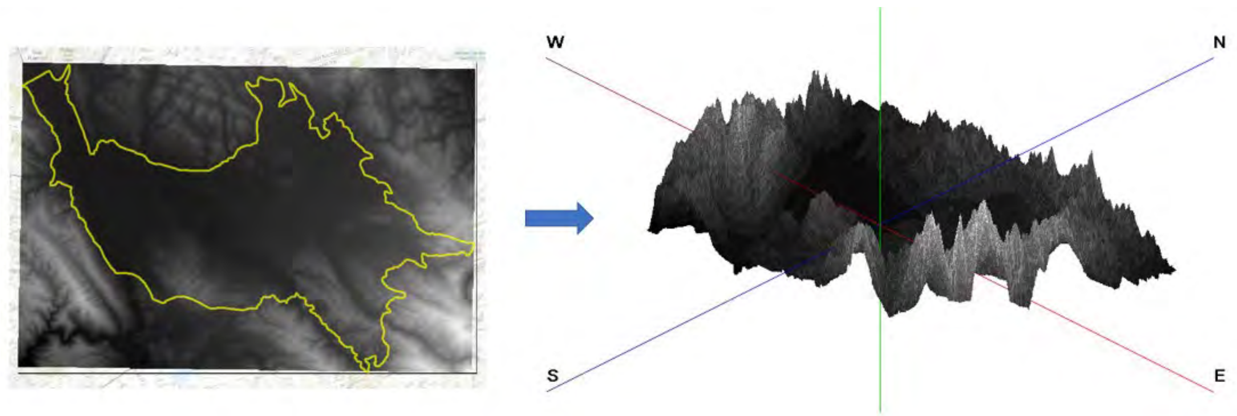
Figure 2 - Processing of Additional Basin Data and Structural Features



[5] California Department of Water Resources Bulletin 118-2, Evaluation of Ground Water Resources: Livermore and Sunol Valleys, dated June 1974.

3) ***Process and import USGS topography raster data and create 3D RockWorks file.*** As shown in Figure 3, the USGS dataset serves as an upper boundary (i.e., ground surface) to clip other RockWorks 3D models to. This dataset was resized and clipped to match the Basin dimensions as specified in RockWorks.

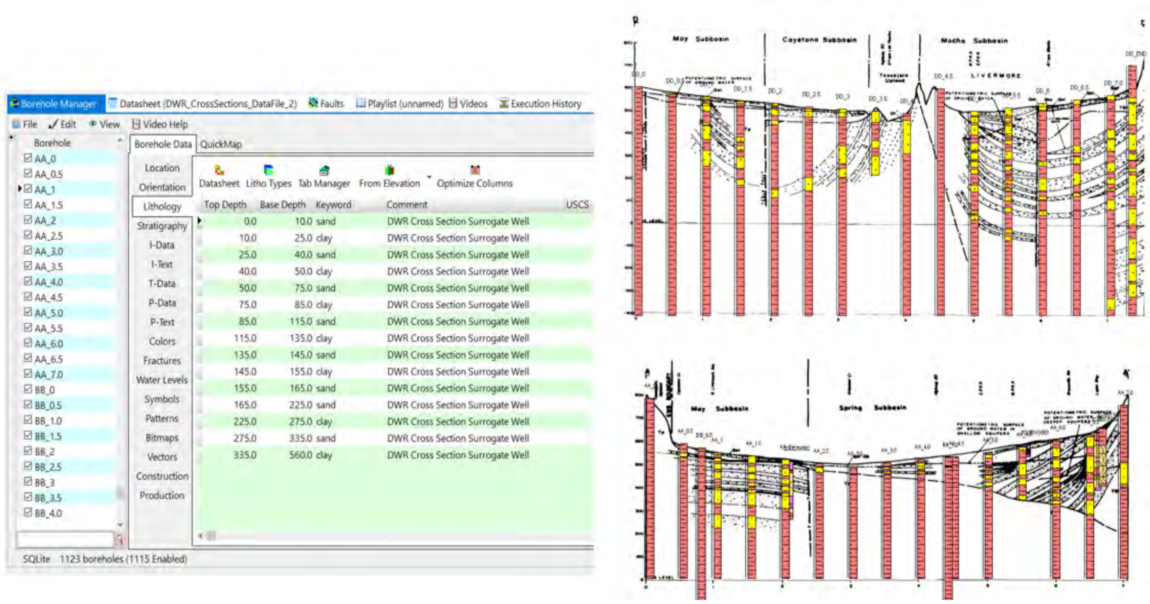
Figure 3 - Processing of Digital Elevation Model



4) ***Digitize and import lithology from select DWR (1974) cross-sections to fill data gaps***. Limited borehole data exist in certain portions of the Basin. To fill in data gaps, a total of 83 "surrogate" boreholes were developed and their generalized lithology profiles were characterized along the DWR (1974) cross-section traces A-A', B-B', C-C', D-D', E-E', and I-I'[6] to densify lithology information in the Fringe and Uplands management areas of the Basin. The DWR (1974) cross-sections approximate water bearing and non-water bearing units by elevation, which were then classified by EKI as either sand or clay in the surrogate boreholes. As shown in Figure 4, these surrogate boreholes were imported into RockWorks for subsequent use in developing the 3D lithology and stratigraphy models.

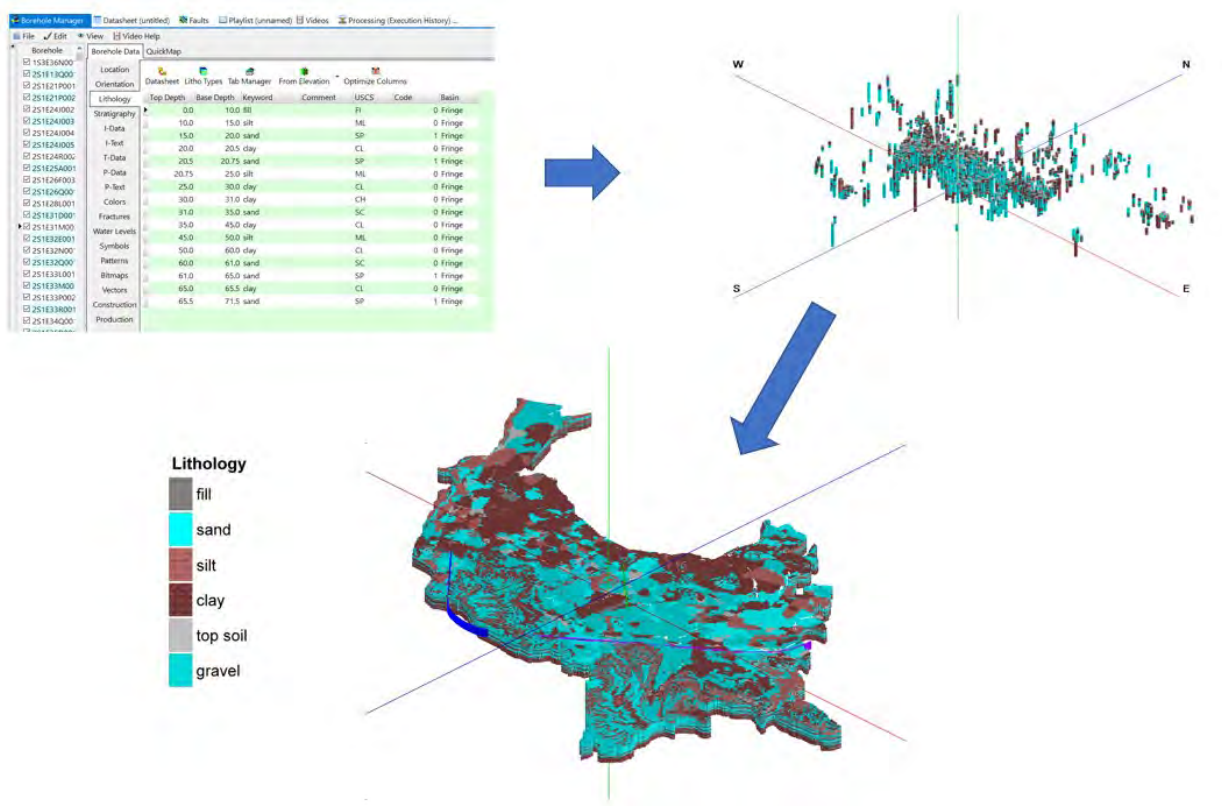
[6] *Ibid* [5].

Figure 4 – Development of Surrogate Boreholes to Fill Data Gaps



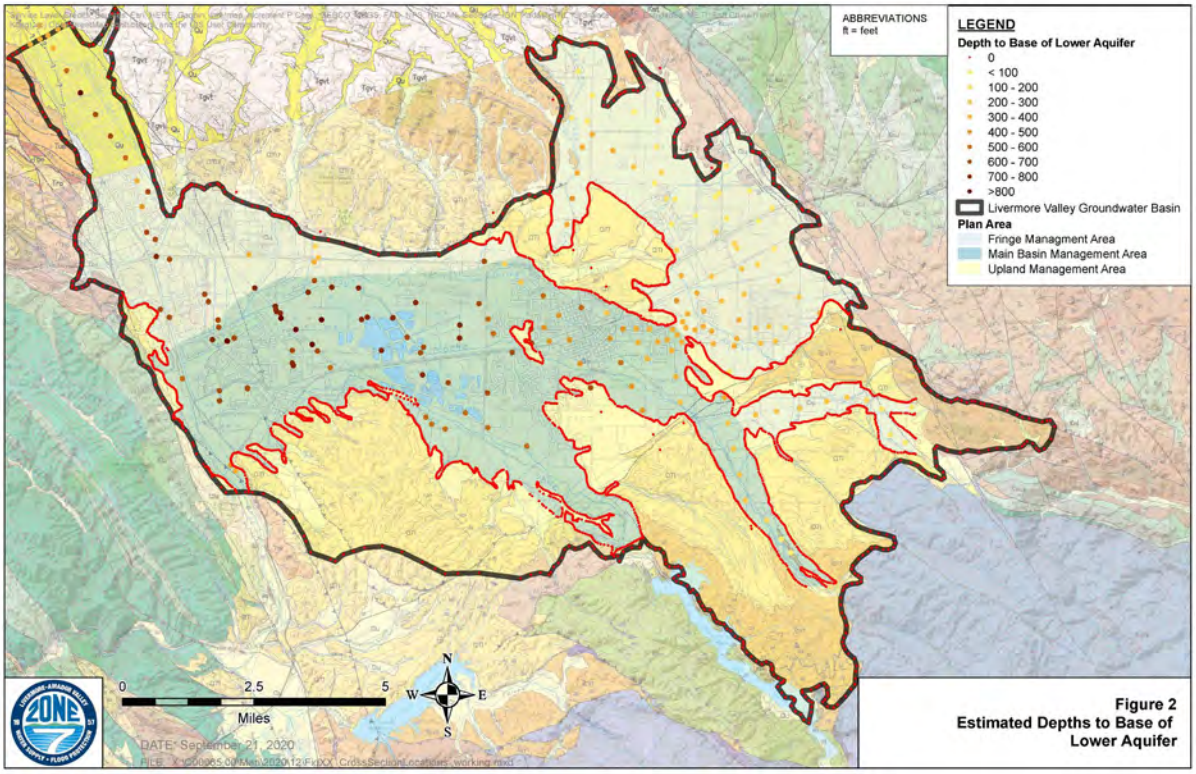
5) ***Create 3D RockWorks lithology model using the six simplified lithological classifications.*** As shown in Figure 5, a 3D gridded lithology model (200 x 200 x 20 ft resolution) was developed in RockWorks using the five simplified lithological classifications described in Step 1 to visualize the spatial distribution of lithology throughout the Basin. Discrete borehole lithology data from 991 wells were interpolated across the Basin to create a 3D gridded lithology model that extends from the ground surface down to the bottom of the Basin (i.e., the top of the Lower Livermore Formation).

Figure 5 – Development of a Basin Lithology Model



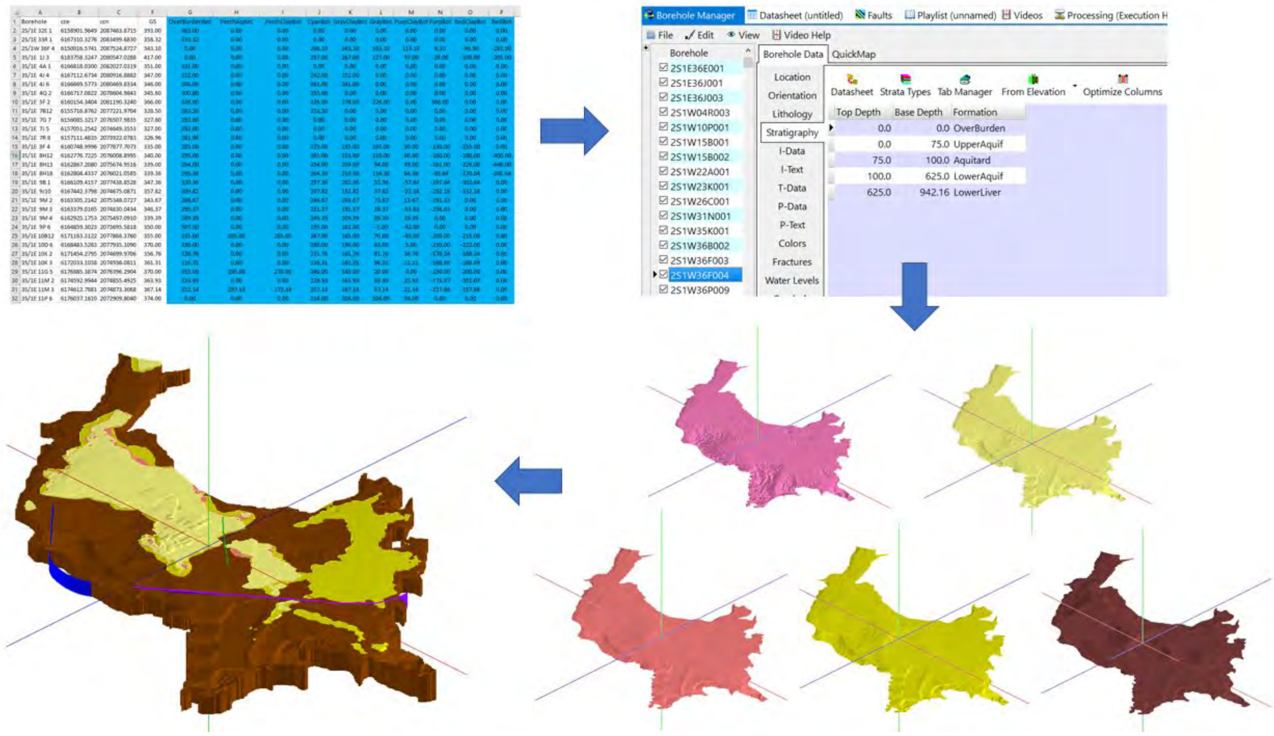
6) ***Refine stratigraphic contacts to inform 3D RockWorks stratigraphy model.*** The original "aquifer layers" dataset provided by Zone 7 only contained stratigraphy interval data for 72 boreholes, all of which were located in the MBMA and many of which only contained information for a few of the (10) stratigraphic units. To provide for a reasonable representation of Basin-wide geometry, these data were augmented with the "surrogate" boreholes used to densify the dataset of stratigraphic contact points within the Fringe and Upland areas and along the Basin boundaries (see Step 4). These "surrogate" boreholes included the 83 digitized DWR records mentioned above, the >6,000 vertices of Zone 7's Basin subareas shapefile used to delineate the Uplands and Fringe areas and the Basin boundaries, and several other locations within the MBMA, Fringe, and Upland management areas where aquifer depths were estimated based on nearby borehole (lithology, elog) information and other available geologic information (see Figure 6).

Figure 6 – Refine Stratigraphic Contacts Based on Additional Data



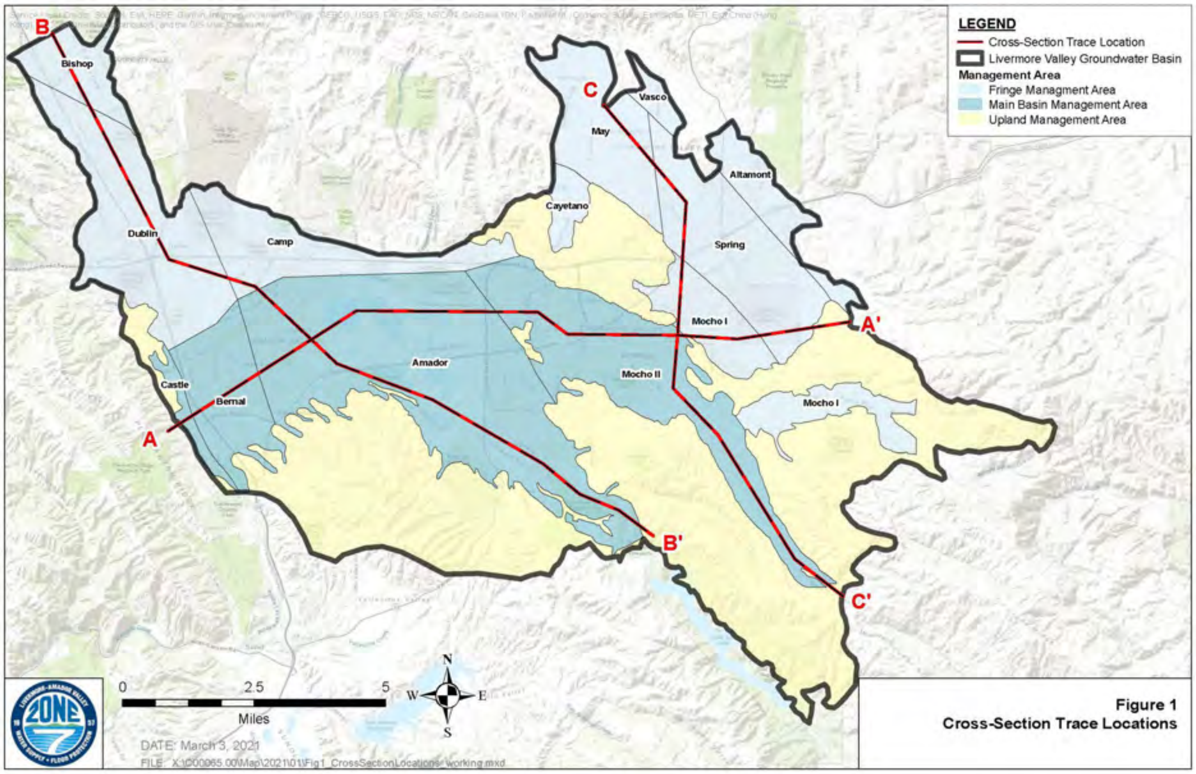
7) ***Create 3D RockWorks stratigraphy model.*** A 3D model of Basin stratigraphy was subsequently developed in RockWorks using the refined dataset of stratigraphic contacts described above (Step 6) along with other available lithology and e-log information (Step 1). As shown in Figure 7, the 3D stratigraphy model is a system of interpolated surfaces representing the top and base of the major aquifer units that have been "filled in" to produce a volumetric representations of each major aquifer unit across the Basin, and includes modeled hydrogeologic discontinuities resulting from the three major faults imported into RockWorks (Step 2).

Figure 7 – Development of a Basin Stratigraphic Model



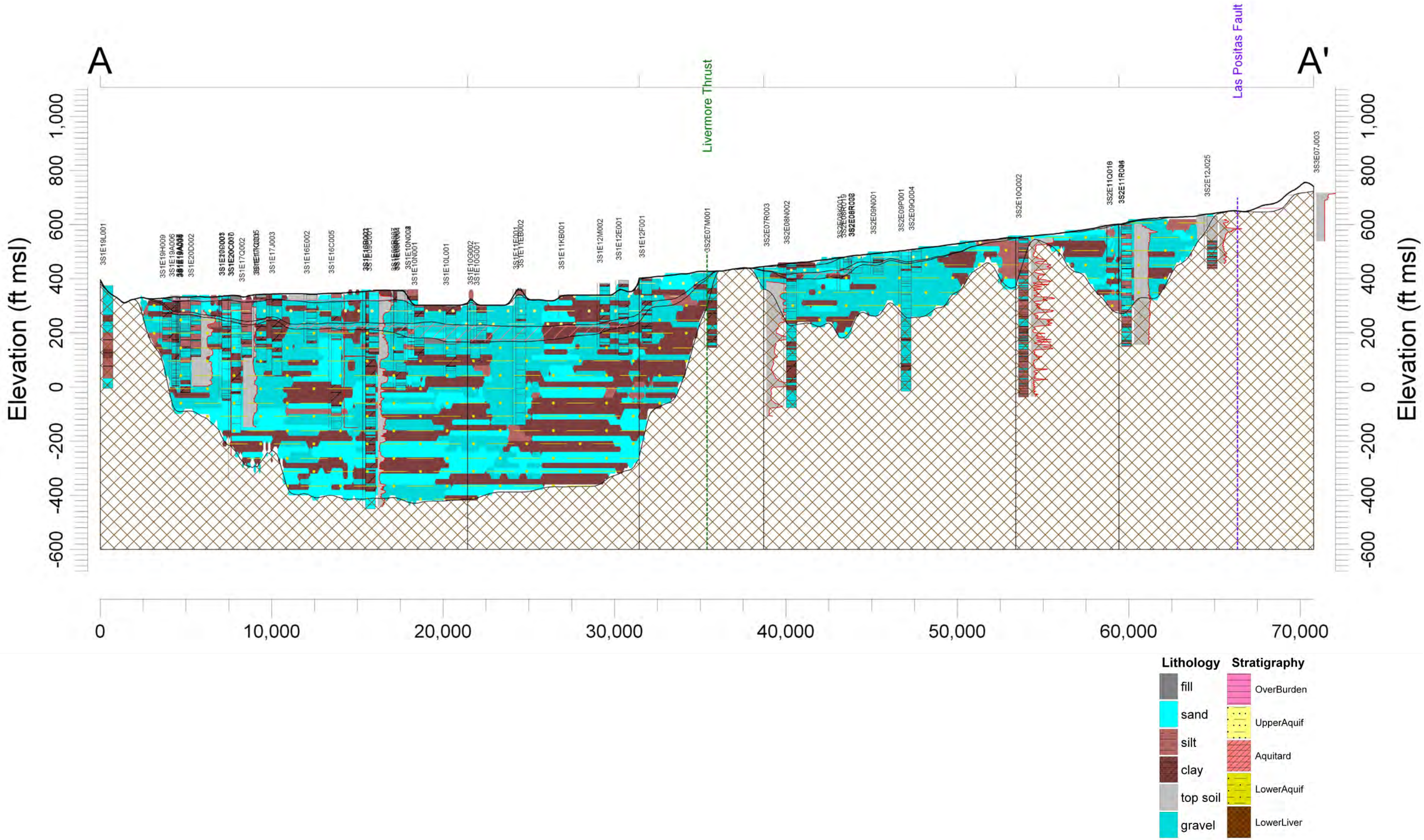
8) ***Develop cross-section traces*.** Various sources of available information, including well, lithology, and e-log dataset locations, surficial geology and fault maps, critical infrastructure facilities (e.g., Chain of Lakes recharge basins), potential GDE areas, and previous cross-section locations were assessed to develop proposed locations of three cross-section traces, A-A', B-B', and C-C', to be built in RockWorks for inclusion in the 2022 Alt GSP. These draft cross-section trace locations were reviewed and edited by Zone 7 technical staff to produce the final cross-section traces shown in Figure 8.

Figure 8 – Cross-Section Traces for the 2022 Alt GSP



9) ***Develop preliminary cross-sections.*** The 3D stratigraphy model (Step 7) was subsequently "sliced" by the cross-section traces (Step 8) to produce cross-section profiles of the Basin. These cross-sections depict the major aquifer units represented in the stratigraphy model and also show projected lithology and e-log information from nearby wells along the traces. Depending on preference, the cross-sections can also be underlain by the interpolated lithology model produced from the bulk lithology dataset (Step 5). Figure 9 shows a "first-cut" example of cross-section A-A' as output from RockWorks.

Figure 9 – Draft Cross-Section A-A’



10) ***Export to AutoCAD and refine cross-sections.*** After receiving feedback from Zone 7 on the preliminary cross-section outputs from RockWorks, each cross-section was exported from Rockworks in .DXF format and imported into AutoCAD software. AutoCAD was ultimately employed for subsequent cross-section refinement as it allowed EKI to more efficiently modify stratigraphic contacts at individual borehole locations based on available lithology and e-log data, and to more accurately portray complex geological features such as the Livermore Thrust plate and Calaveras Fault deformation zone along the section traces. AutoCAD also provides for greater control of symbology, annotations, and formatting edits compared to RockWorks' Plot2D tool. Figure 10 presents the refined Cross-Section A-A' after subsequent editing in AutoCAD.

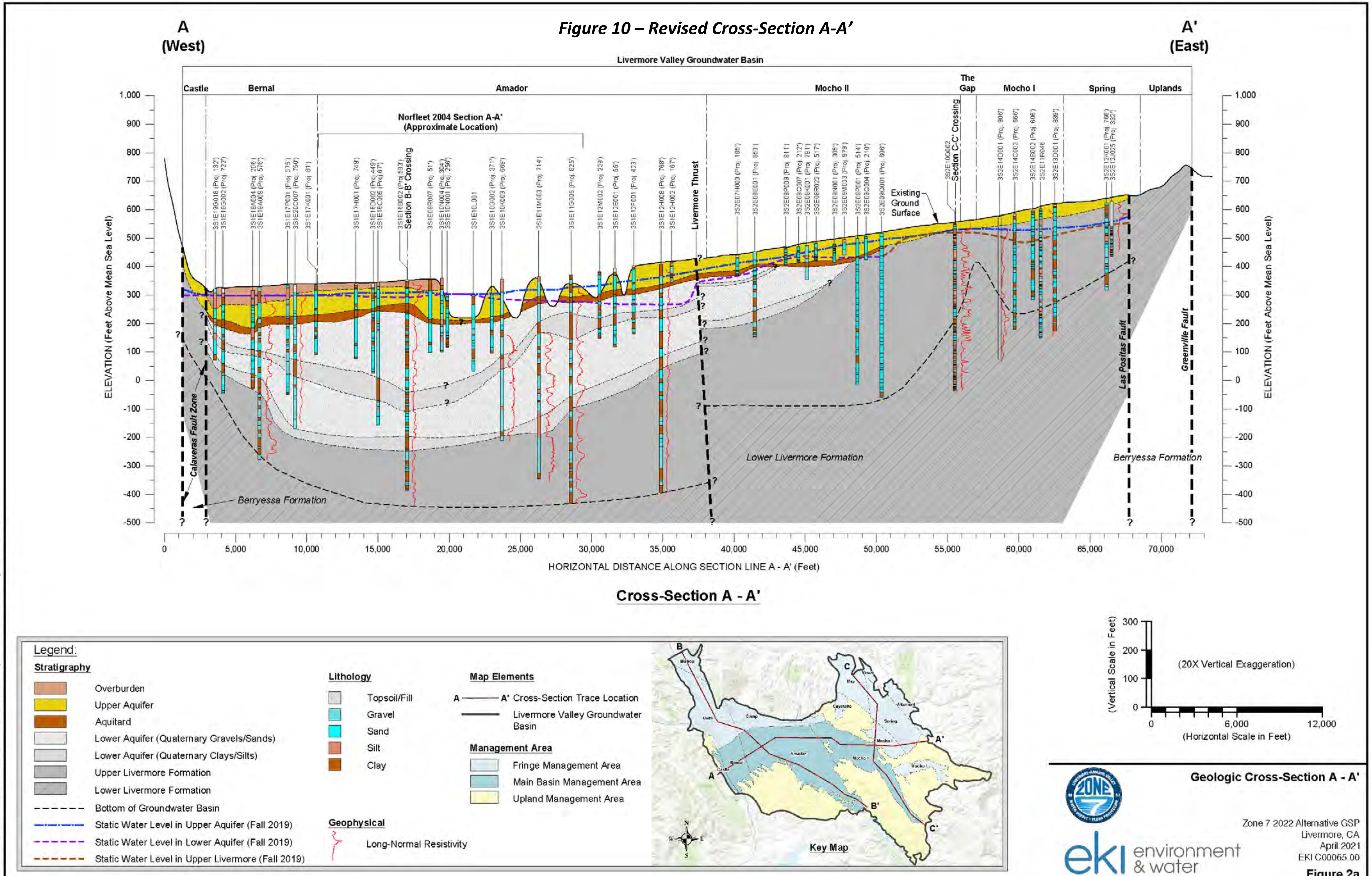


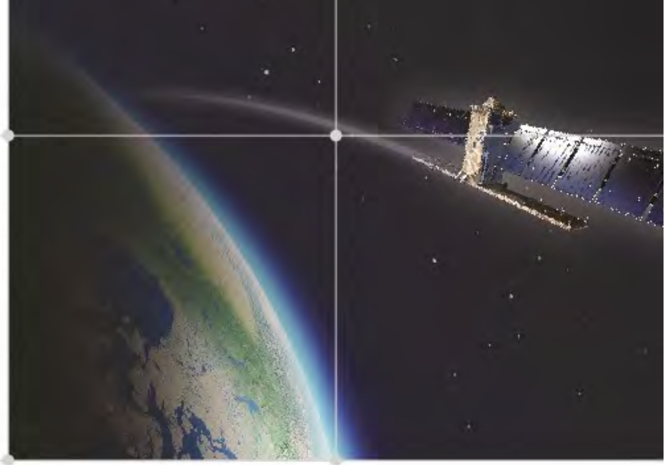
Figure 10 – Revised Cross-Section A-A'
A (West)
A' (East)
Livermore Valley Groundwater Basin
Castle
Bernal
Amador
Mocho II
The Gap
Mocho I
Spring
Uplands
Norfleet 2004 Section A-A' (Approximate Location)
Livermore Thrust
Existing Ground Surface
Calaveras Fault Zone
Berryessa Formation
Lower Livermore Formation
Las Positas Fault
Greenville Fault
ELEVATION (Feet Above Mean Sea Level)
HORIZONTAL DISTANCE ALONG SECTION LINE A - A' (Feet)
Cross-Section A - A'
Legend:
Stratigraphy
Overburden
Upper Aquifer
Aquitard
Lower Aquifer (Quaternary Gravels/Sands)
Lower Aquifer (Quaternary Clays/Silts)
Upper Livermore Formation
Lower Livermore Formation
Bottom of Groundwater Basin
Static Water Level in Upper Aquifer (Fall 2019)
Static Water Level in Lower Aquifer (Fall 2019)
Static Water Level in Upper Livermore (Fall 2019)
Lithology
Topsoil/Fill
Gravel
Sand
Silt
Clay
Geophysical
Long-Normal Resistivity
Map Elements
Cross-Section Trace Location
Livermore Valley Groundwater Basin
Management Area
Fringe Management Area
Main Basin Management Area
Upland Management Area
Key Map
(Vertical Scale in Feet)
(20X Vertical Exaggeration)
(Horizontal Scale in Feet)
Geologic Cross-Section A - A'
Zone 7 2022 Alternative GSP
Livermore, CA
April 2021
EKI C00065.00
Figure 2a

NEXT STEPS

As discussed previously, refining the Basin-wide stratigraphy model in RockWorks is an evolving and iterative process and can be routinely revisited as new information and/or borehole data becomes available. Under the current scope, EKI will reimport revisions to stratigraphic contacts made in AutoCAD into RockWorks in order to update the Basin-wide stratigraphy model. This updated stratigraphy model will subsequently be used to develop estimates of total available groundwater storage in each principal aquifer unit of the Basin for use in designing groundwater storage sustainability criteria for the 2022 Alt GSP. If desired, this updated Basin-wide stratigraphy model can also be used to inform future refinements to the layering and structure of Zone 7's MODFLOW groundwater flow model.

APPENDIX J

TRE ALTAMIRA 2020 REPORT



InSAR Analysis of Ground Displacement over Livermore for the period 2014 - 2020

Technical Report

February 2021

Report Specifications

Client:	**Zone 7 Water Agency**
Attention:	Tom Rooze
Address:	100 N. Canyons Parkway Livermore, CA 94551-9486

Reference:	
Title:	InSAR Analysis of Ground Displacement over Livermore
TRE ALTAMIRA Delivery Reference:	JO20-1257-CA REP 1.0
Client Reference (PO):	

Prepared by:	**TRE ALTAMIRA Inc.**
Author(s):	Vicky Hsiao
Verified by:	Giacomo Falorni
Approved by:	Giacomo Falorni
Date:	19 Feb 2021
Version:	1.3

Executive Summary

This report describes the results of the InSAR ground displacement analysis over Livermore covering the period 13 March 2015 to 30 September 2020. TRE Altamira used its SqueeSAR® algorithm to process Sentinel satellite imagery and produce 2-D ground displacement measurements that were then calibrated using GNSS stations in the area. This report provides an update to the displacement measurements provided in 2019.

The following points summarize the key findings:

- Localized subsidence is detected in 2020
    - An interpolated map of annual (September to September) ground displacement shows over -0.25 inches of subsidence from 2019 to 2020 in the Main Basin.
- There appears to be a weak correlation between variations in groundwater levels at Key_AMW_U, Key_Bern_U and well 3S1E08H009, and ground displacement.
- Generalized westward movement is present throughout the AOI.

Confidentiality disclaimer

Table of Contents

Acronyms and Abbreviations

AOI	Area of Interest
ATS	Average Time Series
CS	Cross-Section
cRTS	Common Time Series of Residuals
DEM	Digital Elevation Model
DInSAR	Differential Interferometric SAR
DS	Distributed Scatterer(s)
ENVISAT	ENVISAT Satellite
ERS	European Remote Sensing Satellite
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
InSAR	Interferometric Synthetic Aperture Radar
LOS	Line of Sight
LTS	LOS Time Series
MP	Measurement Point
PS	Permanent Scatterer(s)
SAR	Synthetic Aperture Radar
SNT	Sentinel Satellite
SqueeSAR®	The most recent InSAR algorithm patented by TRE
TS	Time Series
UNAVCO	UNAVCO Data Center

1. Introduction

TRE ALTAMIRA Inc. (TRE) has been contracted by the Zone 7 Water Agency (Zone 7) to provide a 2-D SqueeSAR ground displacement update over the Livermore and Pleasanton areas. The InSAR study includes:

- A historical study using LOS ERS, Envisat and Sentinel satellite imagery covering the periods 1992 – 2000, 2003 – 2010, and 2015 – 2016, respectively [Completed in 2016].
- 2019 Annual InSAR monitoring using 2D Sentinel satellite imagery covering the periods 2015 – 2019 [Completed in 2019].
- 2020 Annual InSAR monitoring using 2D Sentinel satellite imagery covering the periods 2015 – 2020 [Current report].

1.1. Area of Interest

The AOI for Livermore comprises urban as well as very dry, sparsely vegetated areas and covers approximately 121 square miles (Figure 1). The terrain is flat with moderate hills and presents conditions suitable for the application of InSAR.

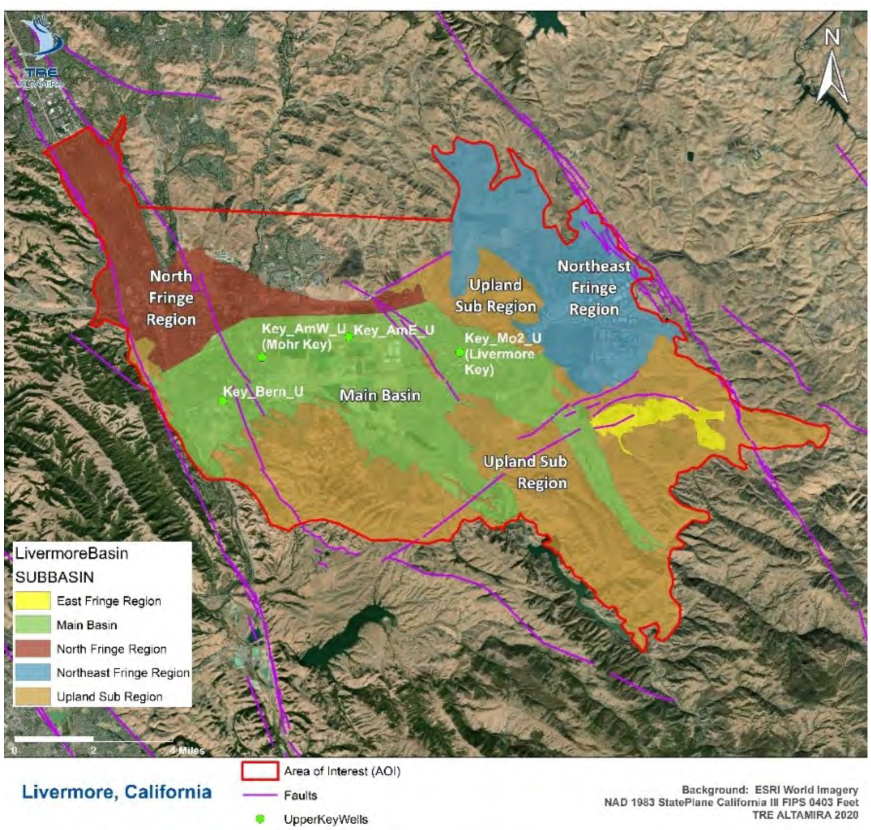


Figure 1: Livermore Area of Interest (AOI).

2. Radar Data

Radar images were acquired over Livermore by the Sentinel (SNT) satellite from both descending (satellite travelling from north to south and imaging to the west) and ascending orbits (satellite travelling from south to north and imaging to the east), with a 12-day revisit frequency. A total of 190 images from the descending orbit, covering the period 31 December 2014 - 30 September 2020, and 171 from the ascending orbit, spanning 13 March 2015 - 30 September 2020, were processed (Table 1). The temporal distribution of the radar imagery is shown in Figure 2. Appendix 2 provides additional information on the satellite acquisition data details.

Table 1: Satellite acquisition parameters and image acquisition information.

Satellite	Pixel Resolution	Orbit	LOS Angle (Θ)	Revisit Frequency	# of Images	Date Range
Sentinel	65 ft x 15 ft	Descending	42.3°	12 days (6-day since Aug 2019)	190	31 Dec 2014 – 30 Sep 2020
		Ascending	41.9°	12 days (6-day since Jan 2019)	171	13 Mar 2015 – 30 Sep 2020

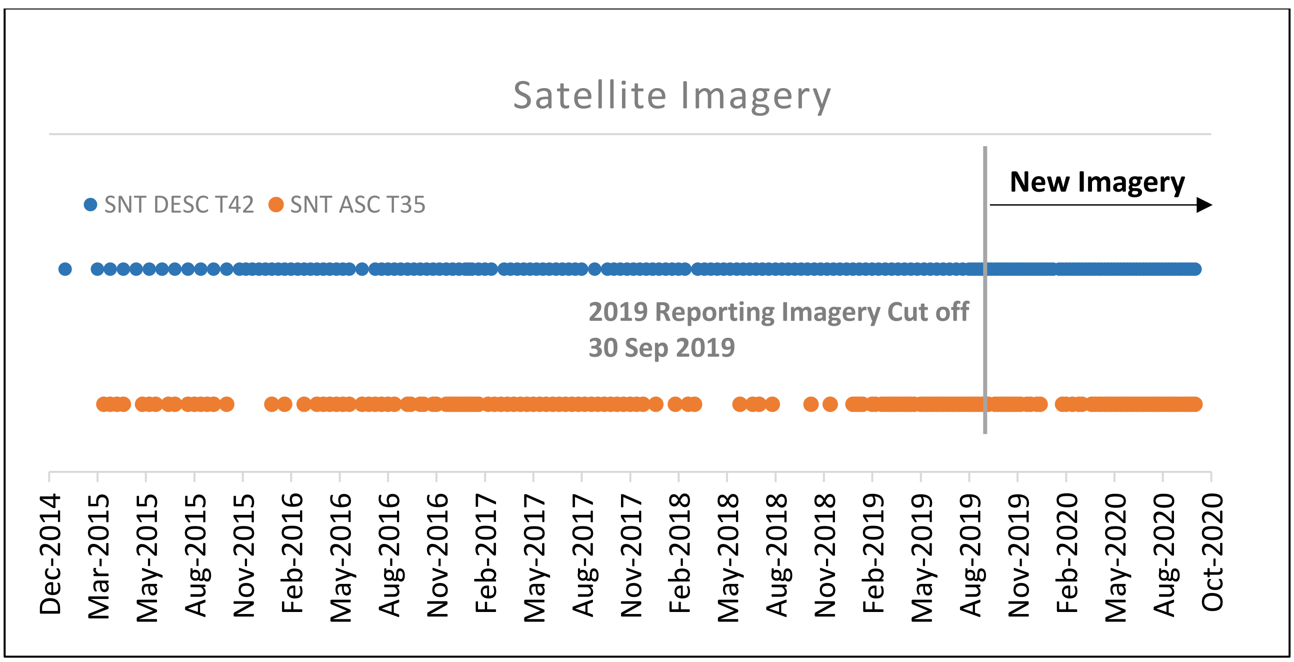


Figure 2: Temporal distribution of Sentinel ascending and descending radar images processed over Livermore.

3. Overview of Results

This section provides a summary of the techniques used and a general overview of the results, while Section 4 further describes areas of displacement in more detail. Refer to the Handbook for further details the technology and techniques used.

3.1. SqueeSAR Analysis

SqueeSAR identifies measurement points (MPs) from objects on the ground that display a stable return to the satellite in every image of an image archive. The MPs belong to two different families (Figure 3):

- Permanent Scatterers (PS): point-wise radar targets characterized by highly stable radar signal return (e.g. buildings, rocky outcrops, linear infrastructures, etc.)
- Distributed Scatterers (DS): patches of ground exhibiting a lower but homogenous radar signal return (e.g. rangeland, debris fields, arid areas, etc.). DS therefore refer to small areas covering several pixels rather than to a single target or object on the ground. For clarity of presentation and ease of interpretation, DS are represented as individual points.

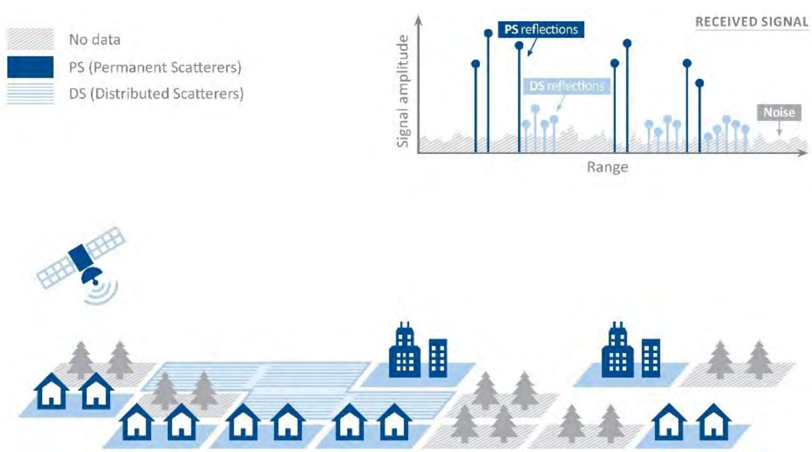


Figure 3: Schematic of PS and DS radar targets.

In InSAR analyses, all measurements are 1-D readings along the sensor's line-of-sight (LOS) as the true vector of displacement is projected onto the LOS. The same displacement will produce different readings when viewed from different angles (Figure 4). Negative values (red) indicate surface displacement away from the satellite, while positive values (blue) indicate surface displacement towards the satellite. The LOS displacement rates are calculated from a linear regression of the ground movement measured over the entire period covered by the satellite images. Each measurement point corresponds to a Permanent Scatterer (PS) or a distributed scatterer (DS), and is color-coded according to its annual rate of movement and direction:

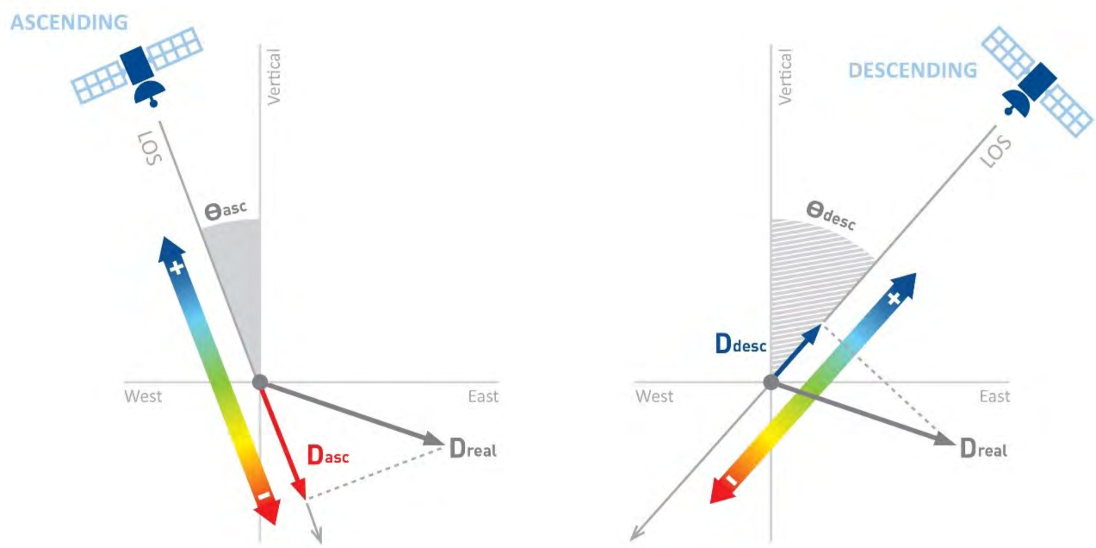


Figure 4: SqueeSAR measures the projection of real movement (D_{real}) onto the LOS. The same real movement (D_{real}) will produce a different value from a different LOS (different inclination or different acquisition geometry).

Displacement measurements obtained by the SqueeSAR algorithm are differential in space and time. Measurements are spatially related to the reference point, and temporally to the date of the first available satellite image. The reference point is assumed to be motionless and selected for its radar properties and motion behavior. Any seasonal trends present in the displacement data will be highlighted by the [SEASOM_AMP] field, which estimates amplitude of the average annual displacement.

The trigonometric combination of SqueeSAR results obtained from different orbits (i.e. ascending and descending), over the same area and overlapping period, produces 2-D (vertical and east-west) measurements of ground movement (Figure 5) in a gridded format, as different measurement points are identified from the two orbits. MPs contained within a same cell are averaged and a new unique, derived time series of displacement is obtained for each grid cell.

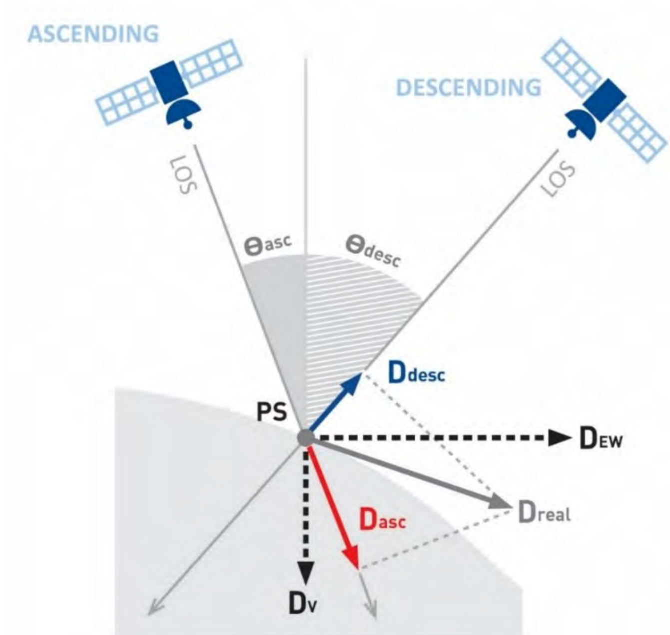


Figure 5: Example of motion decomposition combining ascending and descending acquisitions geometry.

As in the LOS analysis, average annual displacement rates in a 2-D analysis are calculated from a linear regression of the ground movement measured over the entire time interval covered by the analysis and all measurements are relative to a chosen reference point. Each point is color-coded according to the magnitude of movement:

- In a vertical data set, negative values (red) indicate downward surface displacement (i.e. subsidence), while positive values (blue) indicate upward surface displacement (i.e. uplift).
- In an east-west data set, negative values (red) indicate westward motion, while positive values (blue) indicate eastward motion.

The SqueeSAR data are calibrated using GNSS (Global Navigation Satellite System) stations P228 and P229 from UNAVCO. Appendix 3 provides additional information on the details for the calibration methodology.

3.2. 2-D and Line-of-Sight Results

The LOS displacement rates, measured in inches per year, were computed from the ascending archive (13 March 2015 to 30 September 2020) and the descending archive (31 December 2014 to 30 September 2020). These LOS results were calibrated using GPS stations located within the area of interest to account for regional ground displacement trends (Figure 6, uncalibrated results in Figure 7). The calibrated LOS (Ascending and Descending) results were then used to produce calibrated 2-D (East-West and Vertical) measurements (Figure 8, uncalibrated results in Figure 9). The calibrated 2-D output highlights an area of uplift in the western portion of the AOI and generalized westward movement throughout the AOI. Further observations are described in Section 4.

Various parameters of the analysis, including measurement point density and precision, are indicated in Table 2. Note that more heavily vegetated areas may produce a lower density of measurement points. Furthermore, as the radar signal in these areas is weaker the displacement readings may be noisier.

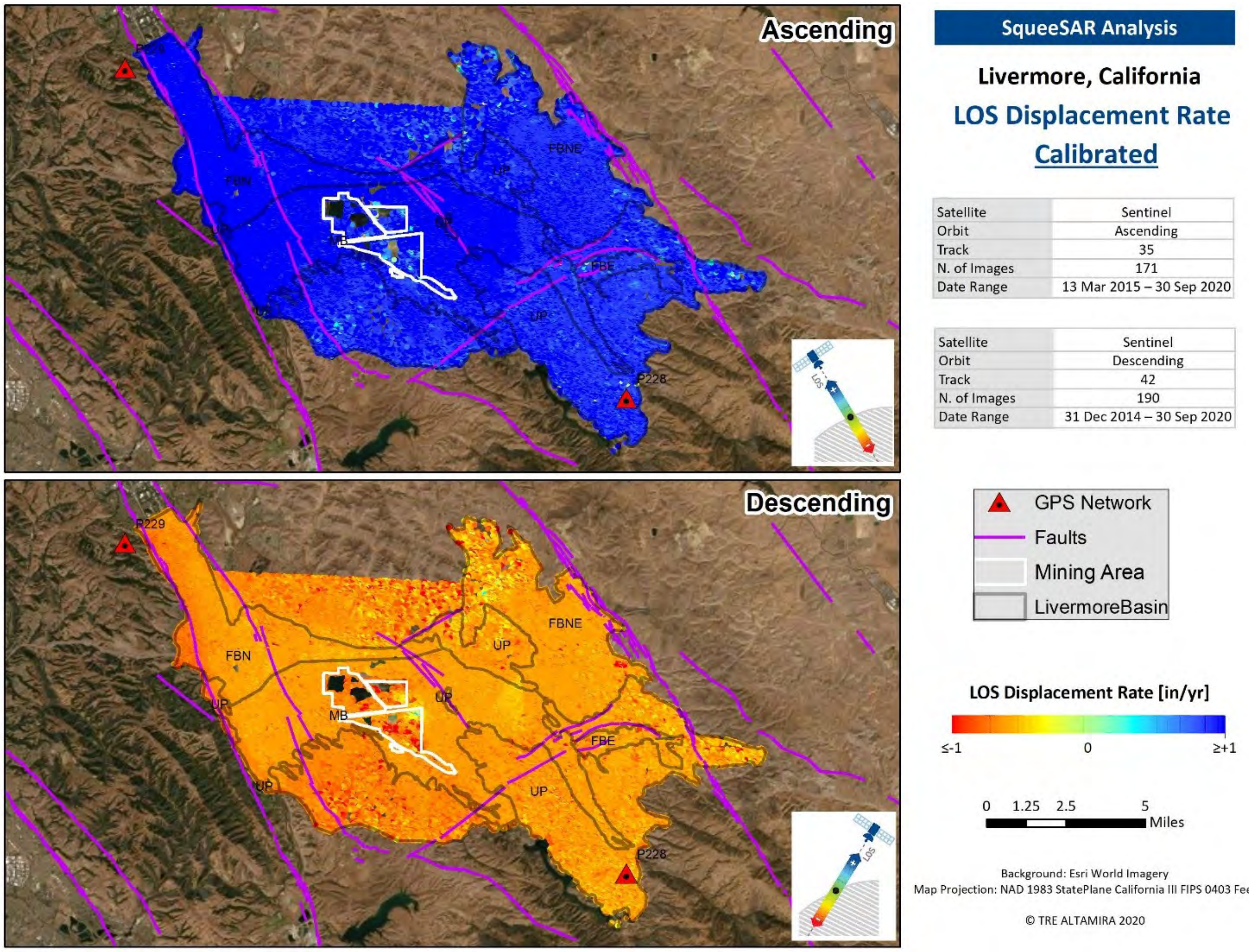


Figure 6: Ascending and Descending calibrated displacement rates over the AOI for the entire study period.

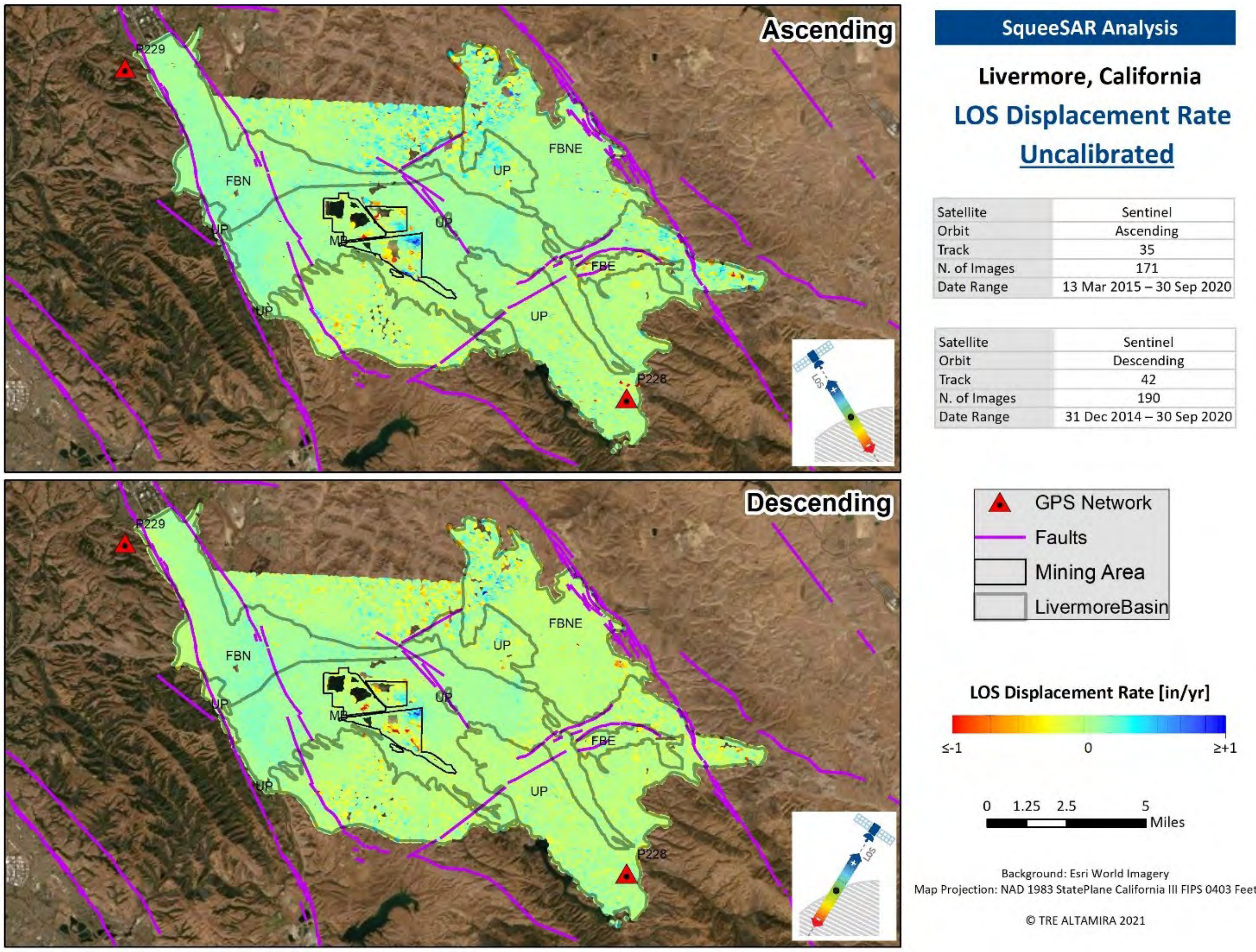


Figure 7: Ascending and Descending uncalibrated displacement rates over the AOI for the entire study period.

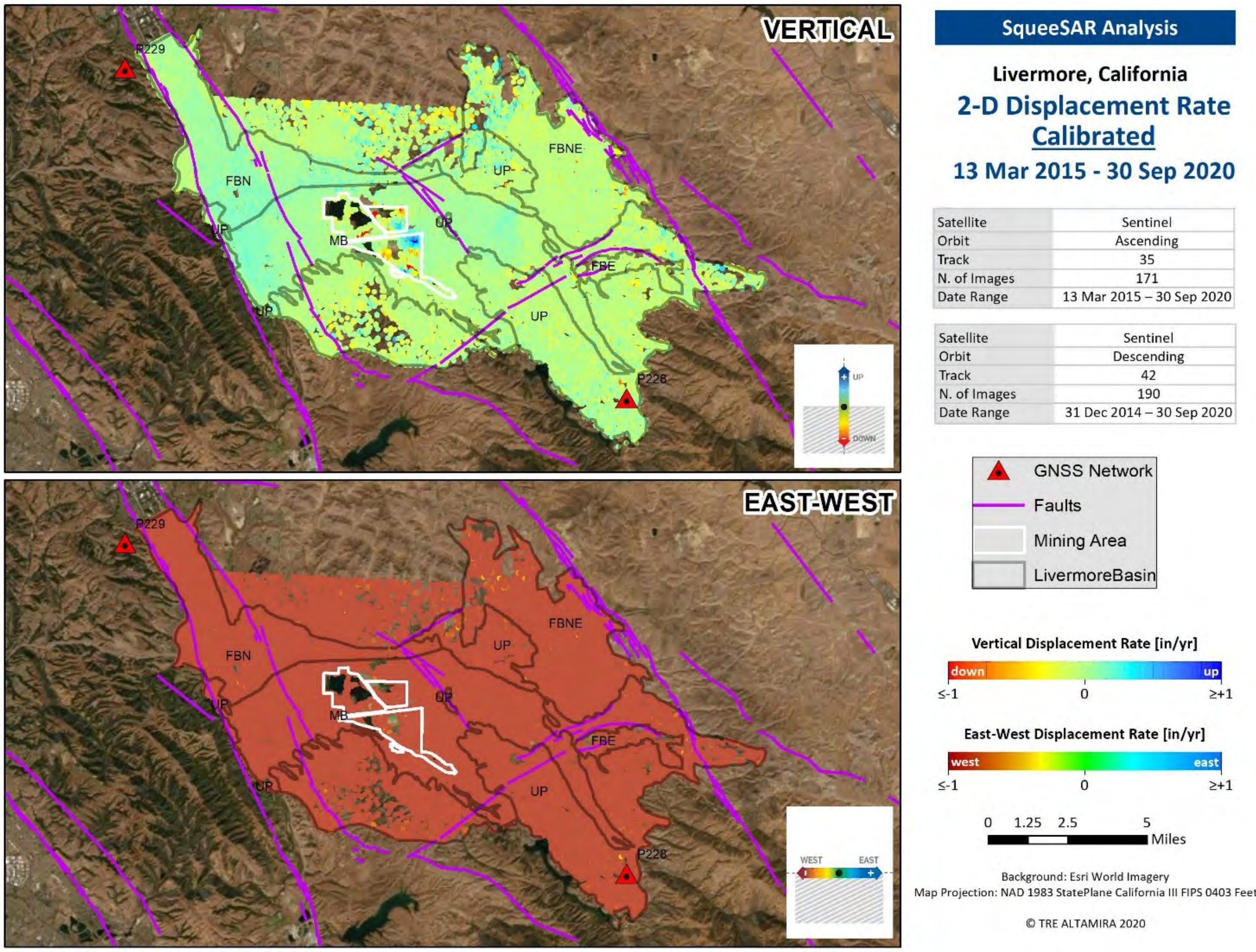


Figure 8: East-West and Vertical calibrated displacement rates over the AOI for the entire study period.

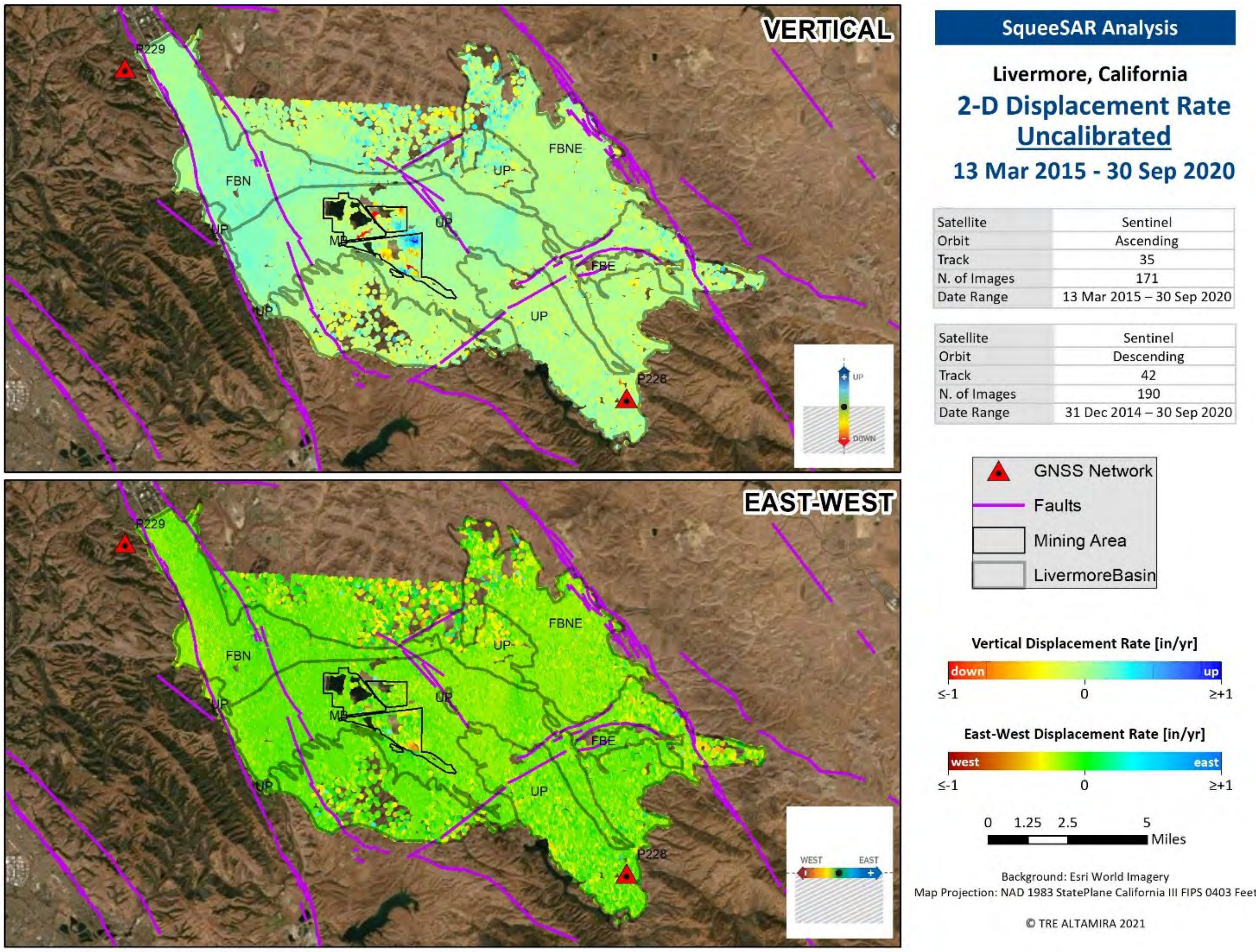


Figure 9: East-West and Vertical uncalibrated displacement rates over the AOI for the entire study period.

Table 2: Properties of the SqueeSAR analyses. *Based on uncalibrated LOS and 2D results.

Attribute	Ascending	Descending	Vertical	East-West
Date Range	13 Mar 2015 – 30 Sep 2020	31 Dec 2014 – 30 Sep 2020	13 Mar 2015– 30 Sep 2020	13 Mar 2015 – 30 Sep 2020
N. of Images	171	190	246	246
Total points (PS + DS) **Number of PS** **Number of DS**	120,467 82,924 37,543	124,723 86,639 38,084	41,665 / /	41,665 / /
Average Point Density (pts/mi^2)	996	1031	344	344
Average Displacement Rate Standard Deviation (in/yr)	±0.02	±0.01	±0.02	±0.02
Average Time Series Error Bar (in)	±0.15	±0.15	/	/

4. Observations

All data analyses in this section use uncalibrated vertical data, which is simply referred to as vertical data in the following.

4.1. Annual Ground Displacement

Figure 10 and Figure 11 outlines annual (September to September) cumulative displacement within the AOI. Within the North Fringe Region sub-basin (FBN) and the northwest Main Basin (MB), uplift is observed between 2016 to 2019, while up to -0.25 inches of subsidence is detected in the Main Basin (within the mining area) in 2020.

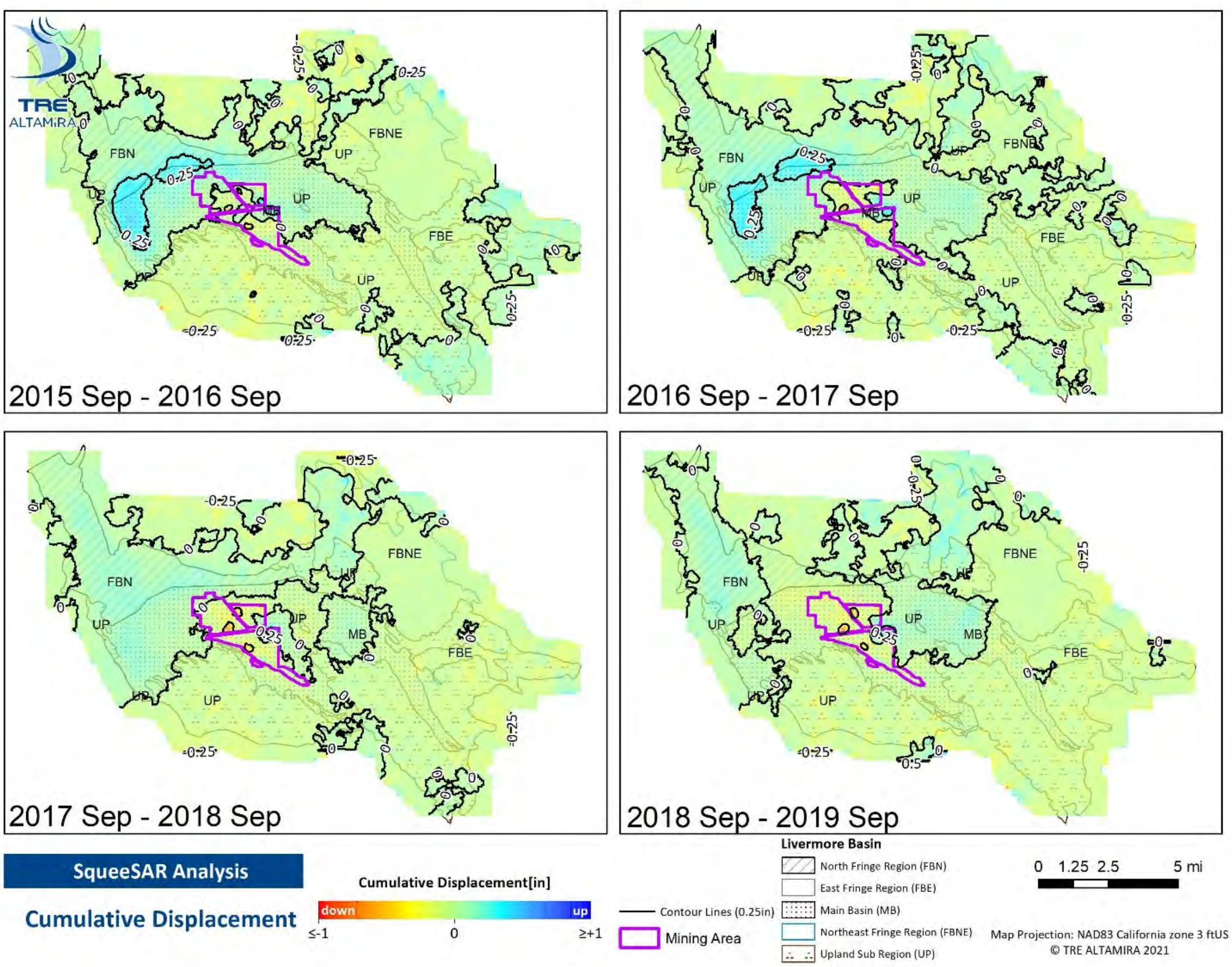


Figure 10: Interpolated map showing annual (September to September) ground displacement from 2015 to 2019. Contour lines have a 0.25-inch interval.

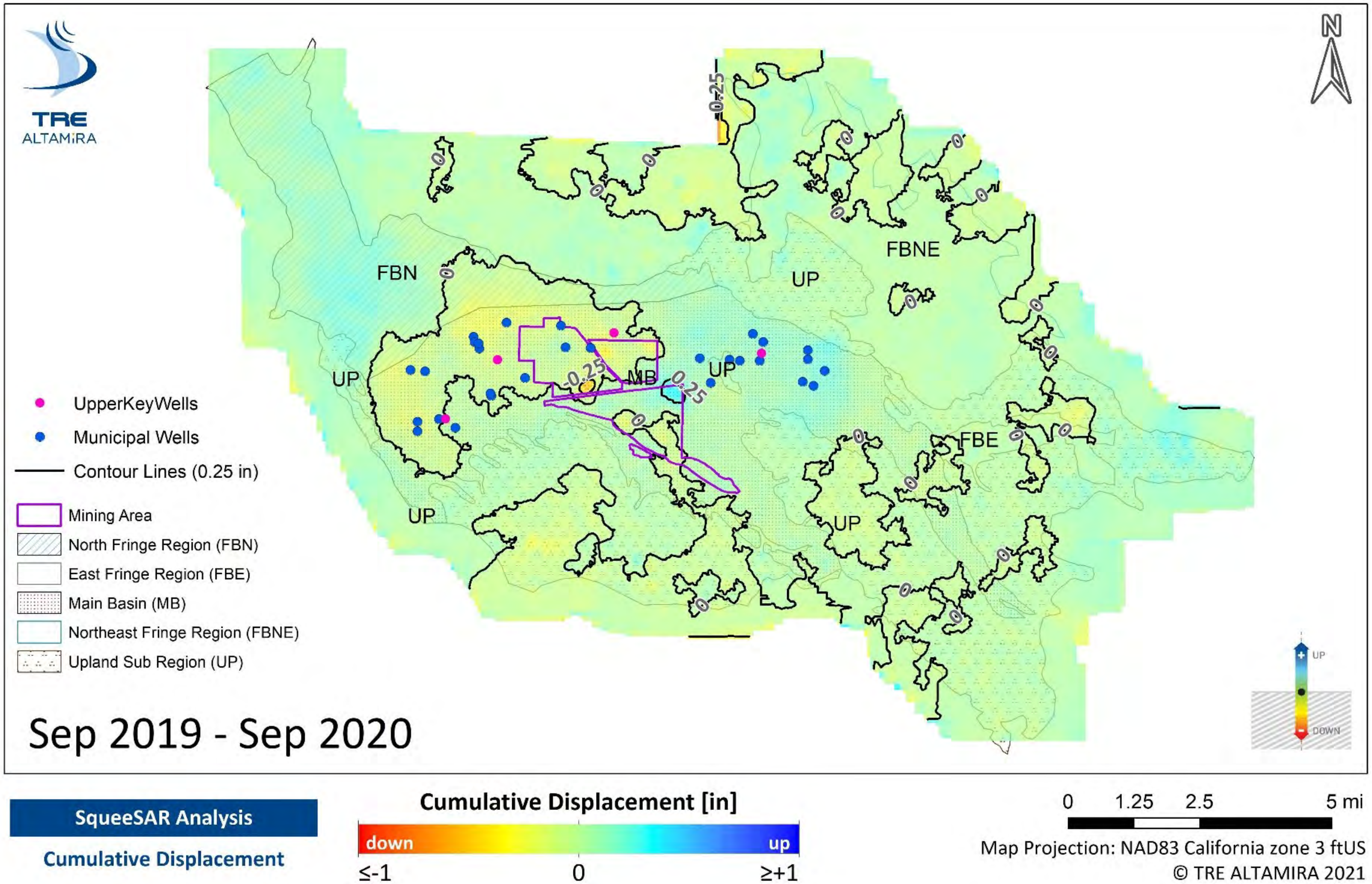


Figure 11: Interpolated map showing annual (September to September) ground displacement from 2019 to 2020. Contour lines have a 0.25-inch interval.

4.2. Comparison with Groundwater Levels

The relationship between groundwater levels and ground displacement was investigated by comparing vertical measurements (within a 500 foot buffer of four key wells and well 3S1E08H009) with groundwater levels (Figure 12). The results may be weakly correlated, including decreased groundwater levels matching minor ground subsidence (at Key_AMW_U, Key_Bern_U and well 3S1E08H009) in the last year (Figure 13 and Figure 14). The measurement points within 500 ft buffer to the wells are listed in Table 3.

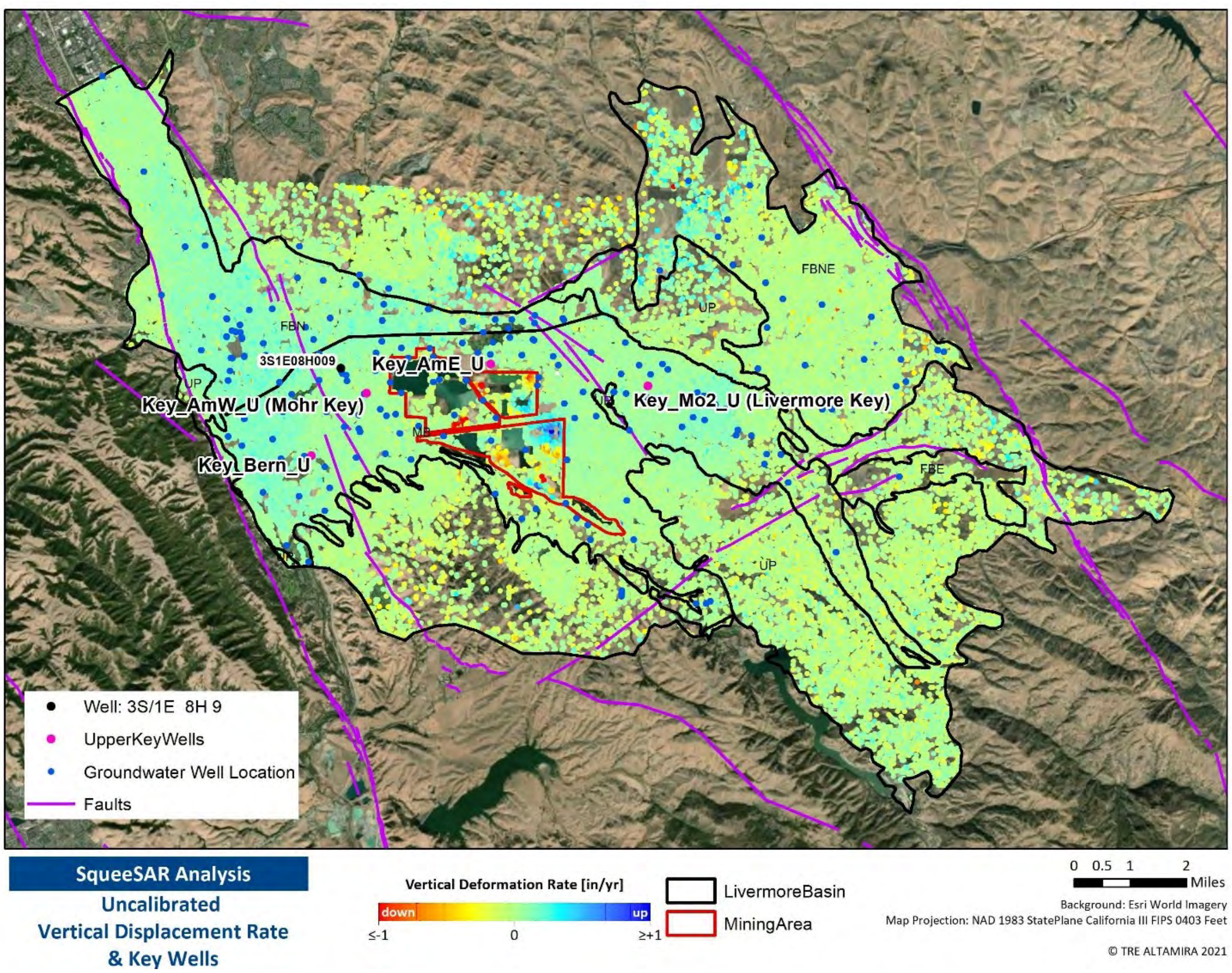
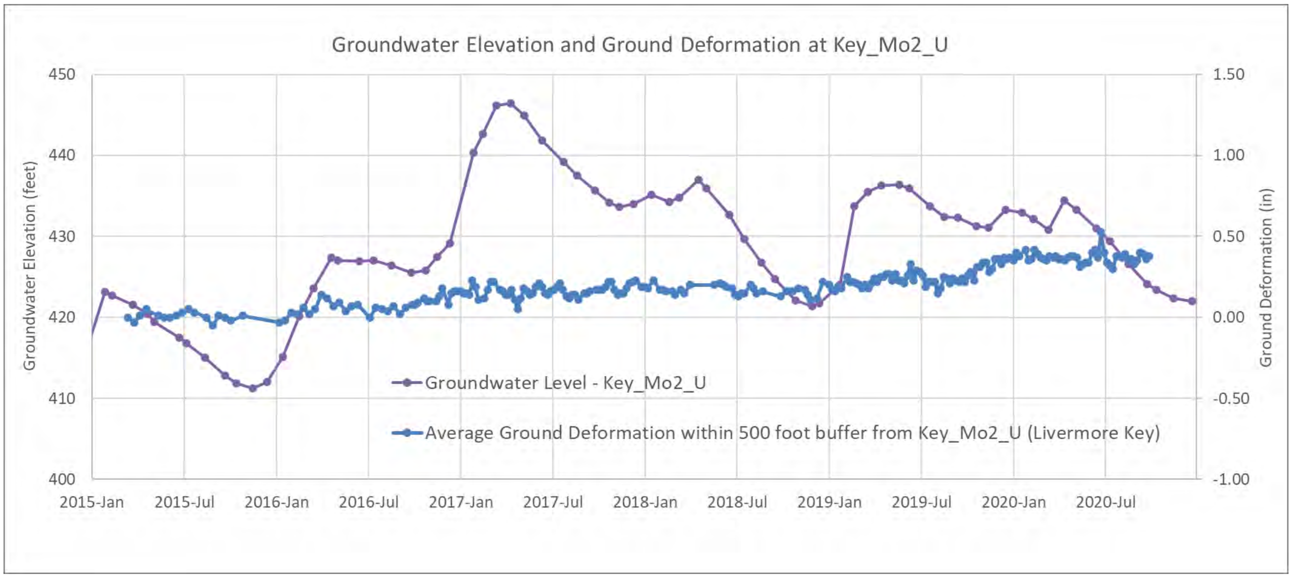


Figure 12: Key well locations, ground displacement and faults.



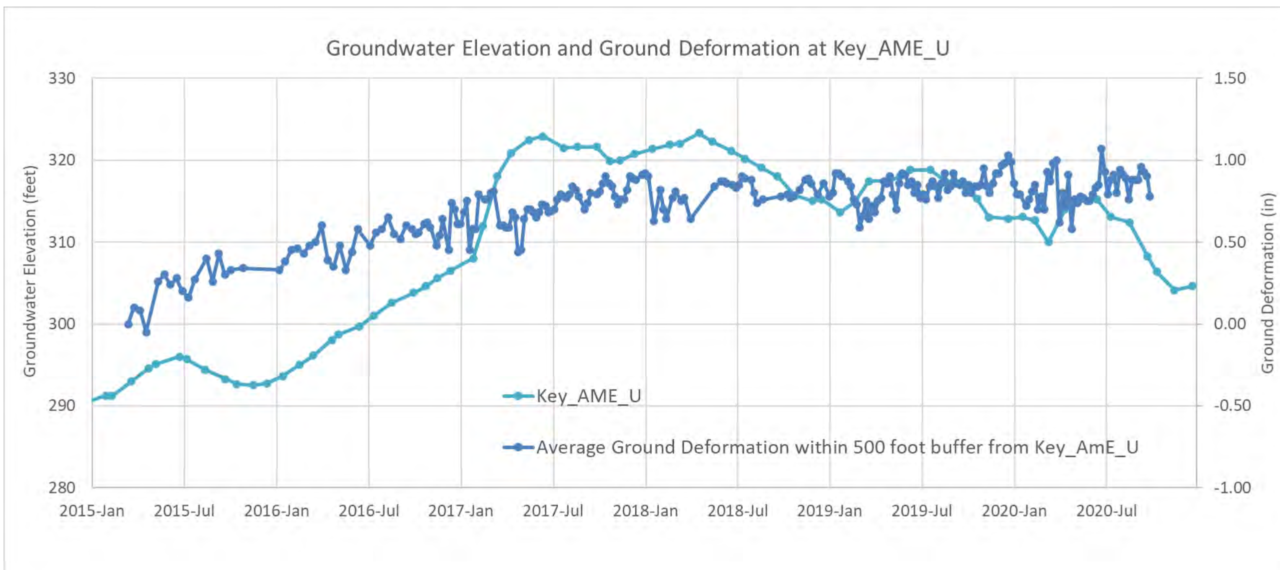
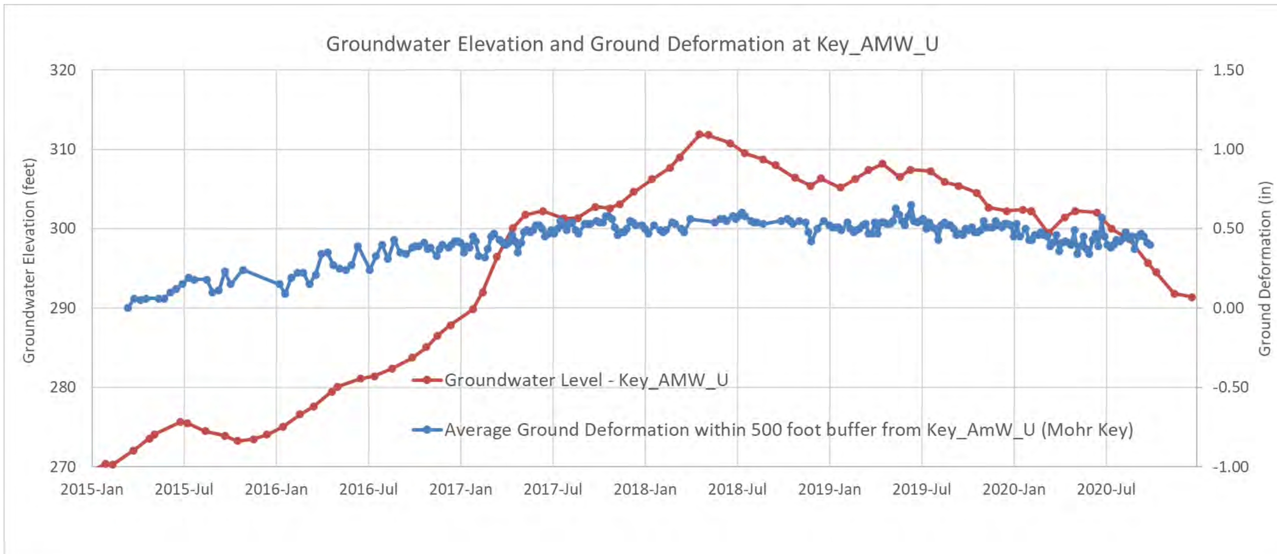


Figure 13: Groundwater elevation vs. ground displacement at Key_Mo2_U (top) and Key_AME_U (bottom).



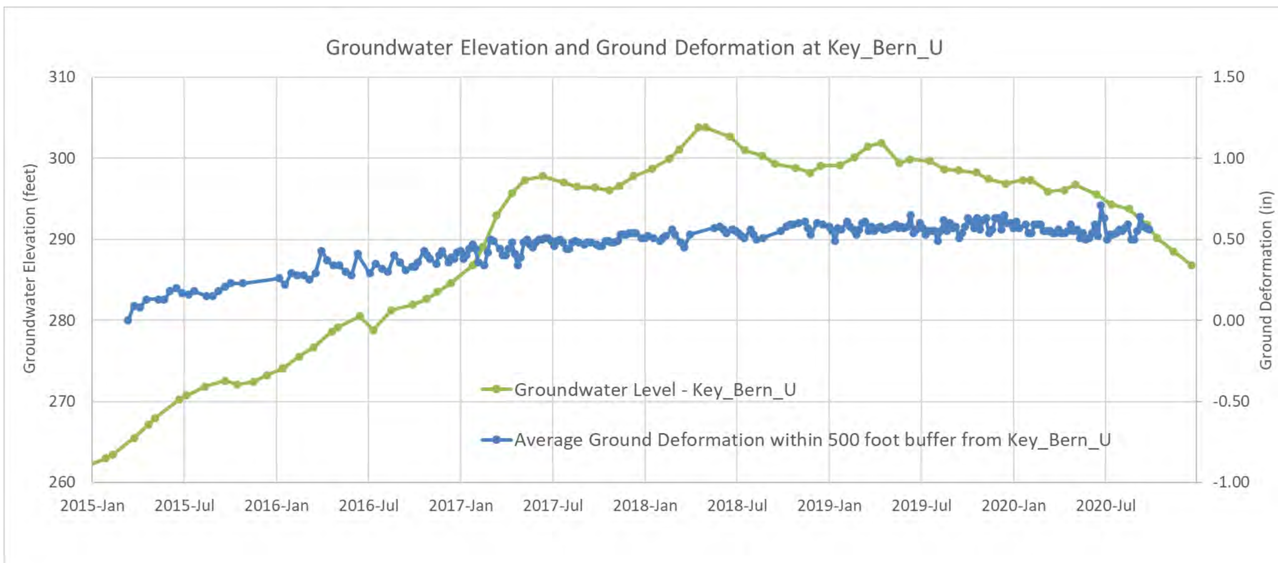


Figure 14: Groundwater elevation vs. ground displacement at Key_AMW_U (top) and Key_Bern_U (bottom).

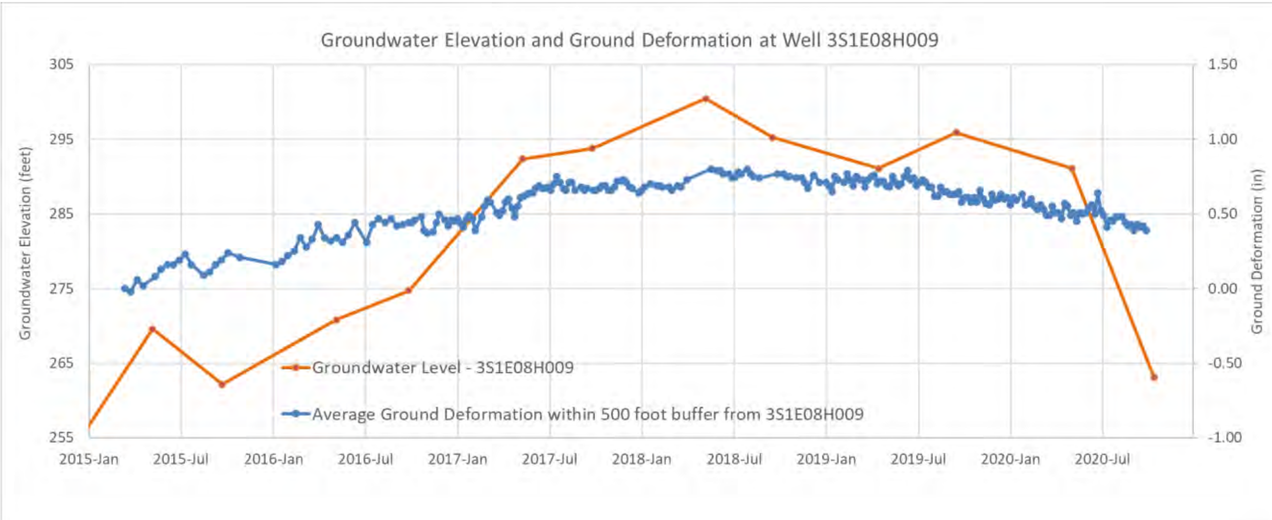


Figure 15: Groundwater elevation vs. ground displacement at well 3S1E08H009.

Table 3: Measurement points within 500-foot buffer to the wells.

Key Wells	Measurement point CODE
Key_Mo2_U	A3UQ07K, A3U4KLT, A3VBFTD, A3VWVF5, A3WIB0X, A3TJ502, A3UQ07M, A3VBFTE, A3VWVF6, A3WIB0Y, A3TJ503, A3U4KLV, A3VBFTF, A3VWVF7, A3WIB0Z, A3UQ07O, A3VBFTG, A3WIB10, A3U4KLX
Key_AME_U	A40OC6W, A43NI7S, A42GN0B, A4322M3
Key_AMW_U	A3RQU27, A3QJYUO, A3RQU28, A3SC9O0, A3SXP9T, A3PYJ8Y, A3RQU2A, A3SC9O2, A3SXP9U, A3QJYUR, A3R5EGJ, A3SXP9V, A3QJYUS, A3RQU2C
Key_Bern_U	A36B89C, A354D1T, A35PSNL, A36B89D, A36WNV5, A34IXG2, A35PSNM, A354D1V, A35PSNN, A36B89F, A36WNV7, A37I3GZ, A34IXG4, A35PSNO, A36WNV8, A35PSNP, A36B89H, A36WNV9
3S1E08H009	A402WIO, A3YALPD, A3YW1B5, A40OC4H, A3ZHGWY, A40OC4I, A419RQA, A3YW1B7, A3ZHGWZ, A3YALPG, A419RQC, A3YW1B9, A3ZHGX1, A402WIT, A40OC4L

5. Summary and Recommendations

TRE Altamira used its SqueeSAR® algorithm to process Sentinel images coupled with a GNSS calibration procedure to carry out a 2-D analysis of ground displacement over Livermore spanning 13 March 2015 to 30 September 2020. The current analysis provides an annual update for the period September 2019 to September 2020.

Up to -0.25 inches observed over the Main Basin over Livermore in 2020. The precision of the InSAR results is maintained within a quarter of an inch (±0.15 inches).

Appendix 1: Delivered Files

List of Deliverables

Table 4 list the deliverables including the present report, the InSAR data files and an updated version of the TRE toolbar, a software tool for assisting with the loading, viewing and interrogation of the data in ESRI ArcGIS 10.x software (For set-up procedure and functionalities, see the attached manual *TREToolbarSetup_5.0.pdf*).

Table 4: List of deliverables.

Description	File name
SqueeSAR Data	**LOS Calibrated & Uncalibrated:** Ascending: LIVERMORE_SNT_T35_A_SEP2020_NAD83_IMPERIAL_CA3030A1S.shp Descending: LIVERMORE_SNT_T42_D_SEP2020_NAD83_IMPERIAL_CA3030A2S.shp **2-D Calibrated & Uncalibrated:** Vertical: LIVERMORE_SNT_VERT_SEP2020_NAD83_IMPERIAL_CA3030A3V.shp East-West: LIVERMORE_SNT_EAST_SEP2020_NAD83_IMPERIAL_CA3030A4E.shp
MXD project file containing all the data (ESRI ArcGIS version 10.0 and 10.8)	Livermore_InSAR_Analysis_2014-2020.mxd
Technical Report	Livermore_Annnual_SqueeSAR_Analysis_2020_Report.pdf
TRE Toolbar v5.8.5 (ESRI® ArcGIS 10.x)	TREToolbar_5.0 TREToolbarSetup_5.0.pdf

Database Structure

The SqueeSAR vector data are delivered in a shapefile format and projected to NAD_1983_StatePlane_California_III_FIPS_0403_Feet (EPSG:2227) coordinates. The shapefile of each elaboration contains details about the measurement points identified, including displacement rate, elevation, cumulative displacement and quality index. The information associated within the database files (dbf) are described in Table 5.

Table 5: Description of the fields contained in the database of the vector data. *Field is only present in LOS data sets.

Field	Description
CODE	Measurement Point (MP) identification code.
HEIGHT*	Topographic Elevation referred to WGS84 ellipsoid of the measurement point [ft].
H_STDEV*	Height standard deviation of the measurement point [ft].
VEL	MP displacement rate [in/yr]. • **Ascending LOS:** Positive values correspond to motion toward the satellite (i.e. uplift and/or westward movement); negative values correspond to motion away from the satellite (i.e. downward and/or eastward movement). • **Descending LOS:** Positive values correspond to motion toward the satellite (i.e. uplift and/or eastward movement); negative values correspond to motion away from the satellite (i.e. downward and/or westward movement). • **Vertical (VEL_V):** Positive values indicate uplift; negative values indicate downward movement. • **E-W Horizontal (VEL_E):** Positive values indicate eastward movement; negative values westward movement.
V_STDEV	Displacement rate standard deviation [in/yr].
ACC*	Acceleration rate [in/yr^2].
A_STDEV*	Standard deviation of the acceleration value [in/yr^2].
SEASPM_AMP*	Average seasonal amplitude [in]
S_AMP_STD*	Average seasonal amplitude standard deviation [in]
SEASON_PHS*	Average seasonal phase [day]
S_PHS_STD*	SEASON_PHS standard deviation [day]
COHERENCE*	Quality measure between 0 and 1.

STD_DEF*	Displacement time series error bar [in]
EFF_AREA*	This parameter represents the effective extension of the area [ft^2] covered by Distributed Scatterers (DS). For permanent scatterers (PS), its value is set to 0.
Dyyyymmdd	Series of columns that contain the displacement values of successive acquisitions relative to the first acquisition available [in].

TREmaps

TREmaps® is our proprietary online GIS platform to view and interrogate the InSAR datasets. TREmaps has been completely revamped to include features and functionality previously available only within the TRE ArcGIS toolbar. Little or no training is required and no specialized GIS software is necessary. With internet access, the platform allows data to be overlaid on an optical image and to perform various operations on the data.

Functionalities include:

- Time-Series tool to view the history of displacement for each measurement point
- Average Time-Series tool to view the average history of displacement for a group of selected points.
- Cross-section tool to view the evolution of the ground surface over time
- Data download and data export (of subsets of data) to common formats (SHP, KML, GeoDB, CSV)
- Dynamic filtering tool to filter a subset of the results by a specified time period
- Client data integration.

TREmaps is hosted by Microsoft Azure, with all the advantages of data security and the cloud-based environment, with minimal downtime and robust internet connectivity. TREmaps runs directly on most Internet browsers and is accessed through a secure client login.

To log in, please go to:

https://tremaps5.tre-altamira.com/treaviewer

For assistance on any of the functions, please click the Help icon on the viewer or go to:

https://site.tre-altamira.com/tremaps-getting-started/

Appendix 2: Additional Radar Data Details

InSAR-based approaches measure surface displacement on a one-dimensional plane, along the satellite line-of-sight (LOS). The LOS angle varies depending on the satellite and on the acquisition parameters while another important angle, between the orbit direction and the geographic North, is nearly constant.

An ascending orbit denotes a satellite travelling from south to north and imaging to the east, while a descending orbit indicates a satellite travelling from north to south and imaging to the west. Table 6 lists the values of the angles for this study, while Figure 16 and Figure 17 show the geometry of the image acquisitions over the site for the ascending and descending orbits, respectively. The symbol Θ (theta) represents the angle the LOS forms with the vertical and δ (delta) the angle formed with the geographic north.

Table 6: Satellite viewing angles for the study.

Satellite	Wavelength	Orbit	Beam Mode/ Track	Symbol	Angle
Sentinel	C-Band 2.19 in	Ascending	35	θ	41.92°
				δ	10.48°
		Descending	42	θ	42.34°
				δ	8.94°

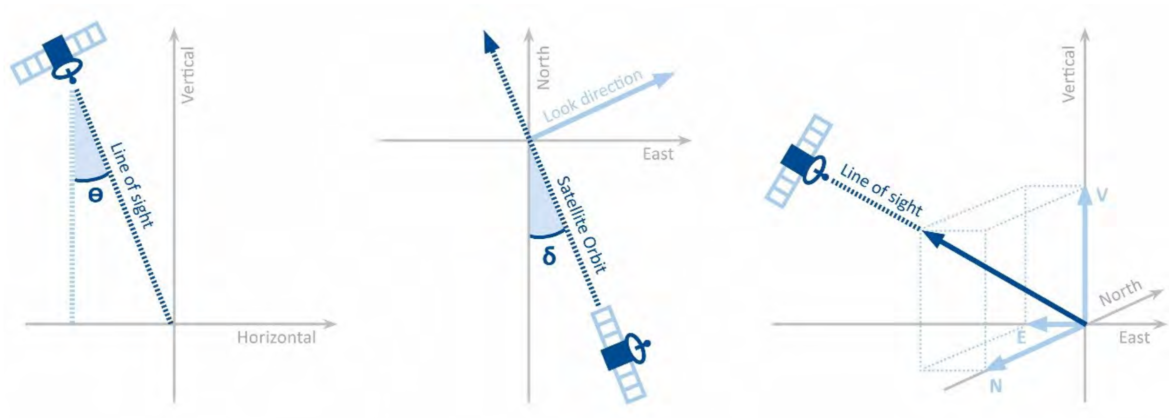


Figure 16: Geometry of the image acquisitions along the ascending orbit.

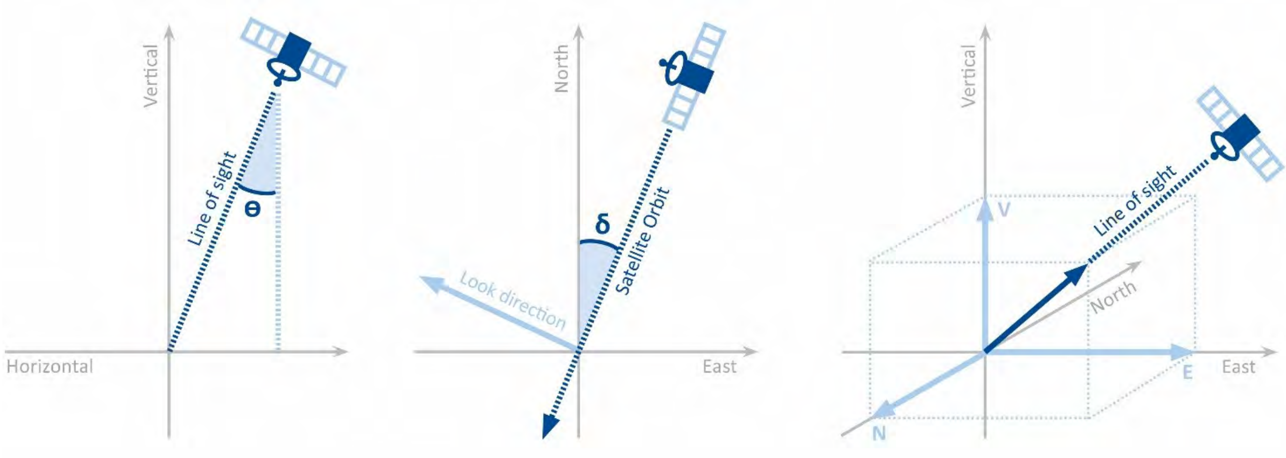


Figure 17: Geometry of the image acquisitions along the descending orbit.

Appendix 3: Calibration Methodology

The **calibration methodology** applied to Livermore consists of the following steps (Figure 18):

1. Data collection: InSAR LOS measurements and GNSS measurements are collected independently.
2. Time series filtering:
   a) To reduce the noise of GNSS measurements, the daily time series are filtered using a 30-day moving average (15 days prior and 15 days following any given date). The filtered GNSS 3-D measurements are then projected to the satellite 1-D LOS to create a GNSS LOS time series (LTS). This step allows a direct comparison of the two independent measurements (measurement direction correspondence).

   b) All InSAR measurement points (MP) within a 100 meter radius of each GNSS are selected and used to calculate an average time series (ATS) for the period of overlap with the GNSS time series (one ATS for each GNSS). This step allows the comparison of data collected at a same location over a corresponding period of time (spatial and temporal correspondence).
3. Plane removal: to remove possible linear errors related to potential satellite orbital inaccuracies, a difference in average velocity (linear trend) is calculated for each ATS and corresponding LTS. The differences calculated for each ATS and LTS pair are then used to estimate and remove a first order surface (plane) from the InSAR data. The time series of each InSAR MP are now corrected from any possible linear trend related to orbital inaccuracies.
4. Absolute calibration: to tie the two measurement techniques together and convert the relative InSAR measurements to the absolute reference of the GNSS network, it is necessary to calibrate the InSAR time series. The procedure involves the generation of a time series of residuals by comparing the ATS to the corresponding LTS for each GNSS location. All the time series of residuals are then averaged to define a common time series of residuals (cRTS). This cRTS represents the movement of the local InSAR reference points with respect to the absolute GNSS reference frame. The cRTS is then removed from every InSAR MP time series.

5. <u>Absolute Vertical InSAR</u>: The output of the absolute calibration is a LOS InSAR data set fixed to the same absolute reference system of the GNSS network. The calibration is performed separately for each orbit (ascending and descending) and the absolute LOS InSAR results will then be combined to produce the vertical and horizonal east/west displacement.

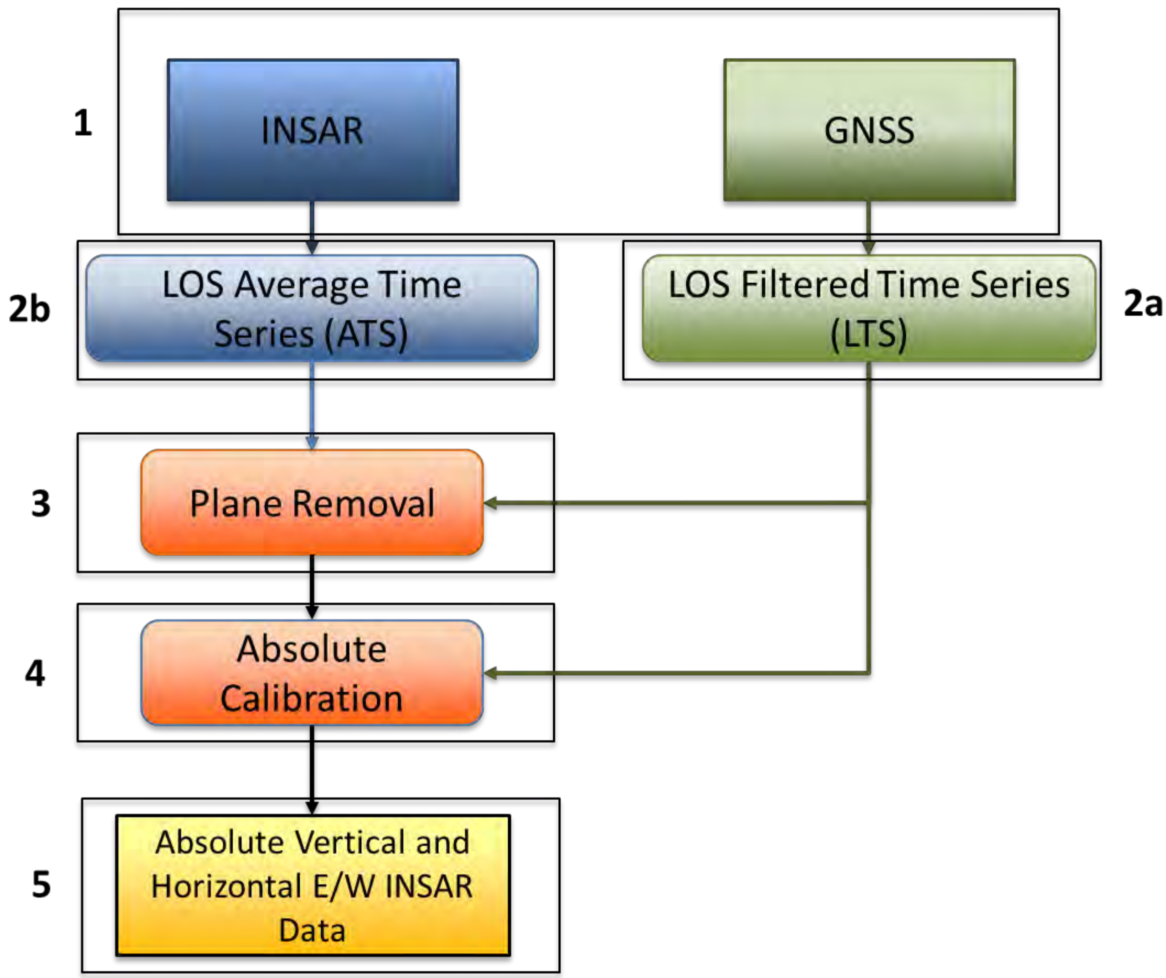
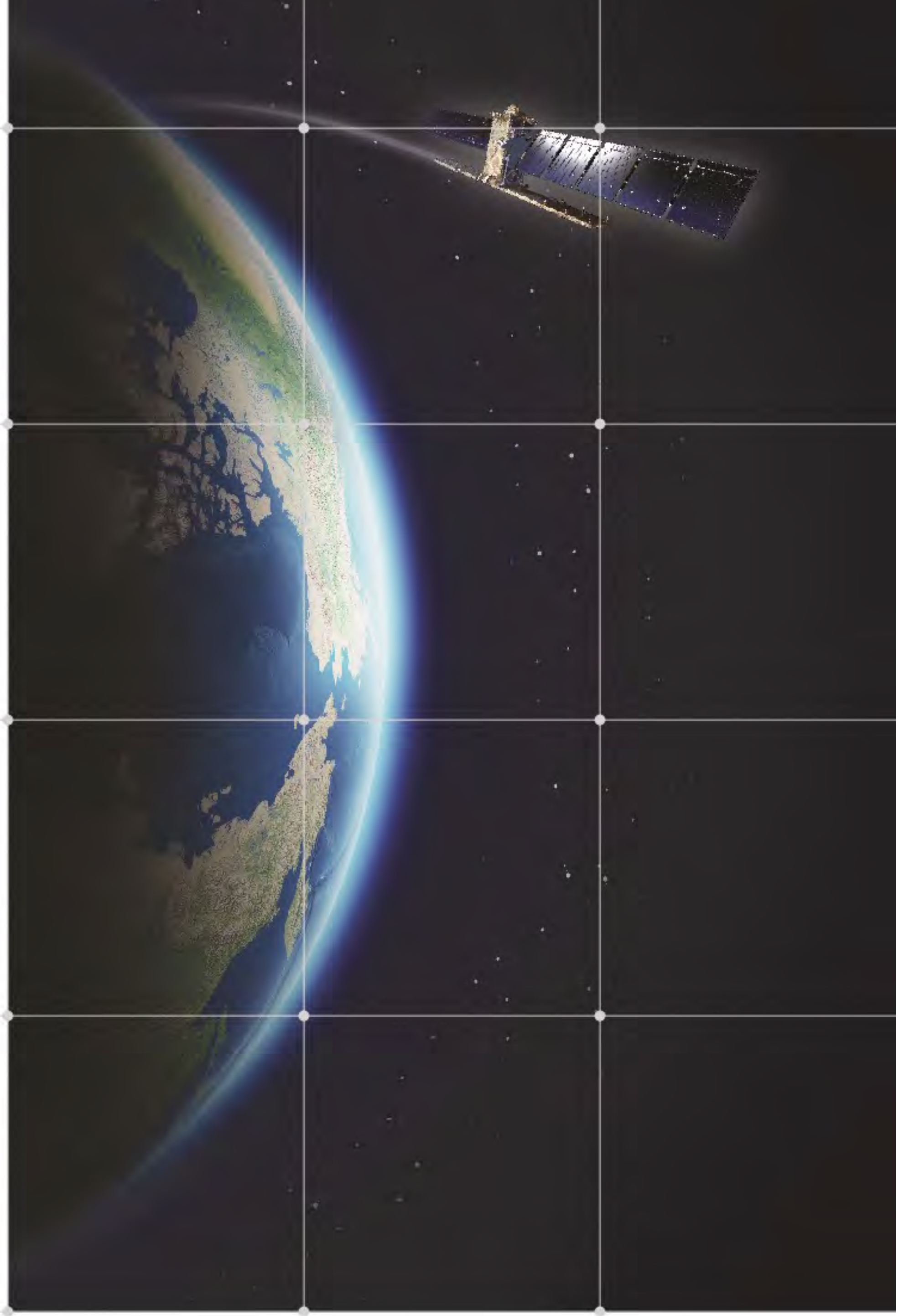


Figure 18: Diagram of the calibration methodology applied over the site.



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APPENDIX K

ZONE 7 2020 URBAN WATER MANAGEMENT PLAN

2020 Urban Water Management Plan

June 2021

ZONE 7 WATER AGENCY
Delivering Quality, Reliability and Safety

2020 Urban Water Management Plan

Prepared for

Zone 7 Water Agency

Project No. 411-60-20-18

Project Manager: Rhodora Biagtan, PE	June 2021 Date
QA/QC Review: Jim Connell, PE	June 2021 Date

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Water. Engineered.

FINAL REPORT | JUNE 2021

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LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
Act	Urban Water Management Planning Act
ACWA	Association of California Water Agencies
ACWD	Alameda County Water District
AF	Acre-Feet
AFY	Acre-Feet Annually
AIP	Agreement in Principle
AMP	Asset Management Plan
BARDP	Bay Area Regional Desalination Project
BARR	Bay Area Regional Reliability
BART	Bay Area Rapid Transit
BAWAC	Bay Area Water Agencies Coalition

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BAWSCA	Bay Area Water Supply and Conservation Agency
Cal Water	California Water Service-Livermore District
CalWEP	California Water Efficiency Partnership
CASGEM	California Statewide Groundwater Elevation Monitoring
CCTV	Closed-Circuit Television
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	Cubic Feet Per Second
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Program
COA	Coordinated Operations Agreement
COLs	Chain of Lakes
Cr(VI)	Hexavalent Chromium
CUWA	California Urban Water Agencies
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
cm	Centimeter
DCP	Delta Conveyance Project
DCR	Delivery Capability Report
DEIR	Draft Environmental Impact Report
DERWA	DSRSD-EBMUD Recycled Water Authority
District	Alameda County Flood Control and Water Conservation District
DMMs	Demand Management Measures
DOC	Dissolved Organic Carbon
DRA	Drought Risk Assessment
DSRSD	Dublin San Ramon Services District
DVWTP	Del Valle Water Treatment Plant
DWR	Department of Water Resources
DWR Guidebook	2020 Urban Water Management Plans Guidebook for Urban Water Suppliers
DYTP	Dry Year Transfer Program
EBMUD	East Bay Municipal Utility District
EDSP	Eastern Dublin Specific Plan
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ET_o	Evapotranspiration
FEMA	Federal Emergency Management Agency

GHG	Greenhouse Gas
GIS	Geographic Information Systems
GMP	Groundwater Management Plan
gpcd	Gallons Per Capita Per Day
GPQ	Groundwater Pumping Quota
GSA	Groundwater Sustainability Agency
HET	High-Efficiency Toilet
HEW	High-Efficiency Clothes Washers
HMP	Hazard Mitigation Plan
INSP	Isabel Neighborhood Specific Plan
InSAR	Interferometric Synthetic Aperture Radar
kWh	Kilowatt-hours
LAVWMA	Livermore-Amador Valley Water Management Agency
LHMP	Local Hazard Mitigation Plan
LVE	Los Vaqueros Reservoir Expansion
M&I	Municipal and Industrial
MCL	Maximum Contaminant Level
MG	Million Gallon
MGD	Million Gallons Per Day
MGDP	Mocho Groundwater Demineralization Plant
MIB	2-methylisoborneol
MMWD	Marin Municipal Water District
msl	Mean Sea Level
MTC	Metropolitan Transportation Commission
MWQI	Municipal Water Quality Investigations
NMP	Nutrient Management Plan
NOP	Notice of Preparation
PFAS	Polyfluoroalkyl Substances
PPWTP	Patterson Pass Water Treatment Plant
QWEL	Qualified Water Efficient Landscaper
RHNA	Regional Housing Needs Allocation
RUWMP	Regional Urban Water Management Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SB X7-7	Water Conservation Act of 2009
SBA	South Bay Aqueduct
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act

SMP	Salt Management Plan
SNMP	Salt and Nutrient Management Plan
SRVRWP	San Ramon Valley Recycled Water Program
SWP	State Water Project
T&O	Taste-and-Odor
TAF	Thousand Acre-Feet
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TOD	Transit-Oriented Development
TRE	TRE Altamira
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VW	Valley Water (formerly known as the Santa Clara Valley Water District)
WaterFix	California WaterFix Project
WBIC	Weather-Based Irrigation Controller
WEL	Water-Efficient Lawn
WMT Amendment	Water Management Tools Amendment
WRP	Water Reclamation Plant
WSCP	Water Shortage Contingency Plan
WSE	Water Supply Evaluation
WSIP	Water Storage Investment Program
WUE	Water Use Efficiency
Zone 7	Zone 7 Water Agency
Zone 7 Board	Zone 7 Board of Directors

EXECUTIVE SUMMARY

An Urban Water Management Plan (UWMP) helps water suppliers assess the availability and reliability of their water supplies and current and projected water use to help ensure reliable water service under different conditions. This water supply planning is especially critical for California currently, as climate change alters rainfall and snowfall (impacting water supply availability) and development occurs statewide (increasing the need for reliable water supplies). The Urban Water Management Planning Act (Act) requires larger water suppliers that provide water to urban users (whether directly or indirectly) to develop UWMPs every five years. UWMPs evaluate conditions for the next 20 years, so these regular updates ensure continued, long-term planning.

Zone 7 Water Agency (Zone 7) is a water wholesaler, meaning it sells water to other agencies who then sell it to individual water users (e.g., residents and businesses). These other agencies are known as water retailers. Zone 7’s retailers consist of the California Water Service (Cal Water), the City of Pleasanton (Pleasanton), the City of Livermore (Livermore), and the Dublin San Ramon Services District (DSRSD). Because Zone 7’s water supplies are provided to more than 3,000 users (through its retailers), it is required to prepare a UWMP.

This Executive Summary serves as a Lay Description of Zone 7's UWMP, as required by California Water Code §10630.5.

CALIFORNIA WATER CODE REQUIREMENTS

The California Water Code documents specific requirements for California water suppliers. The Act is included in the California Water Code and specifies the required elements of a UWMP, including discussing Zone 7’s water system and facilities, calculating how much water its customers use (i.e., water demand) and how much water Zone 7 can supply, and detailing how Zone 7 would respond during a drought or other water supply shortage. Also, a UWMP must describe what specific coordination steps were taken to prepare, review, and adopt the plan.

The Act has been revised over the years. The Water Conservation Act of 2009 (also known as Senate Bill [SB] X7-7) required retail water agencies to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. In 2020, retail water agencies are required to report on their compliance with SB X7-7.

The 2012 to 2016 statewide drought led to further revisions to the Act to improve water supply planning for long-term reliability and resilience to drought and climate change. These revisions were formalized in the 2018 Water Conservation Legislation and include:

- Five Consecutive Dry-Year Water Reliability Assessment: Analyze water supply reliability for five consecutive dry years over the planning period of this UWMP (see Chapter 7).
- Drought Risk Assessment: Assess water supply reliability from 2021 to 2025 assuming that the next five years are dry years (see Chapter 7).
- Seismic Risk: Identify the seismic risk to the agency’s water facilities and have a plan to address identified risks; the region’s Local Hazard Mitigation Plan may address this requirement (see Chapter 8).
- Energy Use Information: If data is available, include reporting on the amount of electricity used to obtain, treat, and distribute water (see Chapter 6).

- Water Shortage Contingency Plan (WSCP): Update the agency's plan to include an annual process for assessing potential gaps between planned water supply and demands; conform with the State's standard water shortage levels (including a shortage level greater than 50 percent) for consistent messaging and reporting; and provide water shortage responses that are locally appropriate (see Chapter 8 and Appendix G).
- Lay Description: Provide a lay description of the findings of the UWMP; this Executive Summary serves as the "Lay Description" for this 2020 UWMP.

Major components and other findings of Zone 7's 2020 UWMP are summarized below.

ZONE 7 WATER SYSTEM

Zone 7's water facilities produce, treat, store, and deliver treated or drinking water to its customers, which include its four retailers (Cal Water, DSRSD, Livermore, and Pleasanton) and a small number of other users. While this 2020 UWMP focuses on Municipal and Industrial customers that receive treated (potable) water, Zone 7 also serves untreated water supply, largely to agricultural users in the eastern part of Alameda County.

Zone 7 produces water by pumping it from wells (groundwater), collecting it from the local watershed (local surface water), and importing water from outside the area (imported water). All water must be treated before it can be safely consumed. In addition to treatment systems for groundwater wells, Zone 7 operates two surface water treatment plants to produce safe drinking water. Zone 7 also owns and operates an extensive network of pipelines and pumping facilities to deliver that drinking water to its retailers.

WATER USE BY ZONE 7 CUSTOMERS

Zone 7's water service area includes Livermore, Pleasanton, the City of Dublin, and the Dougherty Valley portion of the City of San Ramon via an out-of-service-area agreement with DSRSD. Zone 7 does not have land use authority and therefore does not make decisions on community growth; this role rests with the local jurisdictions. Many of these areas anticipate significant growth in the next 20 years, which would increase their demand for water. Thorough and accurate accounting of current and future water demands is critical for Zone 7's planning efforts. To continue delivering safe and reliable drinking water, Zone 7 must know how much water its customers currently use and how much they expect to use in the future.

Zone 7 coordinated closely with each of the four retailers to estimate water demands through the year 2045. This process involved reviewing development and planning documents for each city within Zone 7's service area. For all of Zone 7's customers (retailers and smaller customers), water demand is expected to increase approximately 24 percent (from 2020 levels) by 2045. Most of that growth is expected in the next ten years.

ZONE 7 WATER SUPPLIES

Imported water from the State Water Project (water originating in Lake Oroville and delivered to Zone 7 through reservoirs, rivers, aqueducts and pipelines that make up the State Water Project) makes up approximately 80 percent of Zone 7's water supply, with the remainder coming from groundwater (which also originated as imported water) and local surface water (water originating as rainfall within the local watershed). The future reliability of imported water is a concern. Drought, sea level rise, and natural disasters threaten the Sacramento-San Joaquin Delta (Delta), a critical component of the delivery system bringing water to Zone 7. As a result, Zone 7 is participating in and evaluating various projects that would provide alternate water supplies and/or storage or protect the existing delivery system against threats. These projects include installing a new diversion and conveyance system for Delta supplies (Delta Conveyance Project), desalinating brackish water (water with high salt content) (Bay Area Regional Desalination Project), reusing highly treated wastewater (potable reuse), participating in the construction of a new reservoir to capture surplus water from the Sacramento River (Sites Reservoir), and expanding an existing reservoir near Zone 7 for additional storage and adding a new connection to the South Bay Aqueduct (Los Vaqueros Reservoir Expansion).

Zone 7's future water supplies are expected to keep pace with water demands through temporary water transfers and long-term projects. In 2045, water supplies are expected to be approximately 49 percent higher than in 2020. Note, estimates of new supply are preliminary and subject to change as projects progress and are better defined, and as Zone 7 selects the projects to ultimately implement.

Zone 7 reviewed the amount of electricity used to obtain, treat, and distribute water. In Table 6-13 of this plan, the energy intensity of Zone 7's water service is calculated for a typical year's energy use (2019). The total energy intensity for Zone 7's water service is 342 kilowatt-hours per acre-foot (kWh/AF). Understanding the energy intensity allows Zone 7 to assess various water supply management and system operation strategies.

CONSERVATION TARGET COMPLIANCE

As a wholesale water agency, Zone 7 is not required meet 20 percent reduction targets by 2020 in accordance with SB X7-7. However, it has fully supported the achievement of SB X7-7 water use reduction targets by its retailers. Each of Zone 7's retailers has achieved and exceeded the goals of their water use reduction targets. Conservation continues to play a key role in achieving long-term water supply reliability for the Tri-Valley.

ZONE 7 WATER SERVICE RELIABILITY

The California Water Code asks agencies to evaluate their water service reliability by examining the impact of drought on their water supplies and comparing those reduced supplies during drought to the retailer's expected water demands. Specifically, agencies should calculate their water supplies during a single dry year and five consecutive dry years using historical records. For example, Zone 7 can estimate its imported water supply during a single dry year by looking at the imported water supply reduction during the driest year on record. If that previous dry year reduction was 50 percent, then Zone 7 can conservatively assume a similar 50 percent reduction in imported water supplies in a future dry year.

With continued strategic planning and implementation of key projects, Zone 7 is well-positioned to withstand the effects of a single dry year and a five-year drought. Water supplies exceed water demands during dry conditions, and this remains true for five-year droughts beginning in 2025, 2030, 2035, 2040, and 2045. Zone 7's drought risk was also specifically assessed between 2021 and 2025, assuming that the next five years are dry years. As shown in Table ES-1, Zone 7 expects to meet demands under these conditions, with any extra supplies largely going to storage for use during the following year(s) after accounting for system losses.

Table ES-1. Projected Supplies and Demands for Drought Risk Assessment: 2021-2025

SUPPLY SOURCE Calendar Year	Available Supply, AFY				
	2021	**2022**	**2023**	**2024**	**2025**
Equivalent Hydrologic Year	*Actual*	*1988*	*1989*	*1990*	*1991*
State Water Project Table A	4,000	8,900	48,400	10,500	20,200
State Water Project Carryover from Previous Year	8,900	10,300	9,600	12,800	9,900
Water Transfers	10,000	6,000	5,000	6,000	8,000
Arroyo Valle (Local Water)	700	700	6,900	6,900	2,700
Main Basin (Local Groundwater)	13,200	13,200	11,000	10,000	11,000
Semitropic Water Storage District (Groundwater Bank)	9,100	9,100	0	9,100	9,100
Cawelo Water District (Groundwater Bank)	10,000	10,000	0	5,000	1,900
Total Supplies	**55,900**	**58,200**	**80,900**	**60,300**	**62,800**
Total Demands	**45,200**	**47,600**	**48,500**	**49,400**	**50,300**
Difference/Surplus	**10,700**	**10,600**	**32,400**	**10,900**	**12,500**

As shown above, the water reliability assessment for a five-consecutive-dry-year period reveals that Zone 7's supplies are adequate to meet projected demands on average.

Still, there is a potential that operational constraints—especially during a Delta outage when there may be no or minimal water moving through the South Bay Aqueduct from the Delta—could result in shortages, particularly in the near-term before major water supply projects are implemented around 2030. Untreated water customers would be most vulnerable because of their reliance on Delta water. As described in the WSCP, in these cases, Zone 7 could call for voluntary or mandatory conservation and make operational adjustments to minimize such shortages. Furthermore, during dry periods, water reserves will be drawn down and need to be replenished in the following years.

WATER SHORTAGE CONTINGENCY PLAN

A WSCP describes an agency's plan for preparing for and responding to water shortages. Zone 7 updated its WSCP (see Appendix G) to include its process for assessing potential gaps between planned water supply and demands for the current year and the next potentially dry year. In coordination with its retailers, Zone 7 aligned its service area's water shortage levels with the State's shortage levels for consistent messaging and planned for locally appropriate water shortage responses. For example, a State 2 shortage (defined as an up to 20 percent shortage) has the same definition for Zone 7 as it does for the State. When Zone 7 anticipates or identifies that water supplies may not be adequate to meet the normal water supply needs of its customers, the Zone 7 Board may determine that a water shortage exists and consider a resolution (sample in WSCP, Appendix C) to declare a water shortage emergency and associated stage. The shortage stage provides direction on shortage response actions (WSCP, Section 4). Note that Zone 7 will also consider any statewide actions or declarations in any local declarations of a shortage stage.

UWMPs are required to include a seismic risk assessment and mitigation plan to assess and mitigate a water system's seismic vulnerabilities. In 2018, Zone 7 participated in the development of a regional local hazard mitigation plan, which found that earthquakes on the Hayward and Calaveras faults would be most significant. Seven days after an earthquake on the Hayward Fault, a utility facility has an approximately 52 percent chance of being fully functional. This percentage increases to approximately 84 percent for an earthquake on the Calaveras Fault and above 92 percent for earthquakes on the Greenville, Mt. Diablo, and San Andreas faults.

The WSCP may be used for foreseeable and unforeseeable events and is adopted concurrently with this UWMP by separate resolution to allow for updates as conditions change.

UWMP PREPARATION, REVIEW, AND ADOPTION

Zone 7 developed this 2020 UWMP in coordination with its retailers and the public. While preparing its UWMP, Zone 7 notified other stakeholders (e.g., Alameda County, Contra Costa County, Dublin, San Ramon) of its preparation, its availability for review, and the public hearing prior to adoption. Zone 7 encouraged community participation in the development of the 2020 UWMP using newspaper advertisements and web-based communication. These public notices included the time and place of the public hearing, as well as the location where the plan would be available for public inspection. Zone 7 also conducted public meetings before the public hearing, including a meeting with the Water Resources Committee on February 23, 2021 and a Zone 7 Board workshop on April 1, 2021.

The public hearing provided an opportunity for Zone 7's water users and the general public to become familiar with the 2020 UWMP and ask questions about Zone 7's water supply; its continuing plans for providing a reliable, safe, high-quality water supply; and its plans to address potential water shortages. Following the public hearing, the Zone 7 Board of Directors adopted the 2020 UWMP on May 19, 2021. A copy of the adopted Plan was submitted to the Department of Water Resources and is available on Zone 7's website (www.zone7water.com).

CHAPTER 1
Introduction

This chapter provides an introduction and overview of the Zone 7 Water Agency (Zone 7) 2020 Urban Water Management Plan (UWMP), including the importance and extent of Zone 7's water management planning efforts, changes since the preparation of Zone 7's 2015 UWMP, demonstration of consistency with the Delta Plan for participants in covered actions, and the organization of Zone 7's 2020 UWMP. This 2020 UWMP has been prepared jointly by Zone 7 staff and West Yost.

1.1 INTRODUCTION

The Urban Water Management Planning Act (Act) was originally established by Assembly Bill (AB) 797 on September 21, 1983. Passage of the Act was recognition by state legislators that water is a limited resource and a declaration that efficient water use and conservation would be actively pursued throughout the state. The primary objective of the Act is to direct "urban water suppliers" to develop a UWMP that provides a framework for long-term water supply planning and documents how urban water suppliers are carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future water demands. A copy of the current version of the Act, as incorporated in Sections 10610 through 10657 of the California Water Code, is provided in Appendix A of this plan.

1.2 IMPORTANCE AND EXTENT OF ZONE 7'S WATER MANAGEMENT PLANNING EFFORTS

The purpose of the UWMP is to document and communicate Zone 7's plans for developing and delivering municipal and industrial (M&I) water supplies (also referred to as potable water or treated water in this plan) to Zone 7's water service area and maintaining a reliable water supply system.

Every five years, Zone 7 updates its UWMP, documenting the latest results of Zone 7's water supply planning efforts. In particular, the 2019 Water Supply Evaluation Update[1] (2019 WSE Update) served as the foundation for the 2020 UWMP. An evaluation of Zone 7's water supply conditions, needs, and options was completed as part of the 2019 WSE Update. The Annual Report for the Sustainable Groundwater Management Program (2019 Water Year), Zone 7's Capital Improvement Program (CIP), and the 2020 Tri-Valley Municipal and Industrial Water Demand Study[2] (Regional Demand Study) also provided critical information. The 2020 UWMP, along with the reference documents listed above, are accessible through Zone 7's website at www.zone7water.com.

1.3 CHANGES FROM 2015 UWMP

The Act has been modified over the years in response to the State's water shortages, droughts, and other factors. A significant amendment was made in 2009, after the 2007 to 2009 drought, and as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 (SB X7-7). The Water Conservation Act of 2009 required agencies to

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[1] Zone 7 Water Agency, 2019. Water Supply Evaluation Update.

[2] Woodard & Curran, 2021. 2020 Tri-Valley Municipal and Industrial Water Demand Study. Available at www.zone7water.com after completion.

establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. The 2012 to 2016 statewide drought has led to further amendments to the California Water Code to improve water supply planning for long-term reliability and resilience to drought and climate change.

Summarized below are the major additions and changes to the California Water Code since Zone 7's 2015 UWMP was prepared.

- **Five Consecutive Dry-Year Water Reliability Assessment** [CWC §10635(a)]. The Legislature modified the dry-year water reliability planning from a "multi-year" time period to a "drought lasting five consecutive water years" designation. This statutory change requires the urban water supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period. This requirement is addressed in the water use assessment presented in Chapter 4; the water supply analysis presented in Chapter 6; and the water reliability determinations in Chapter 7 of this plan.
- **Drought Risk Assessment** [CWC §10635(b)]. The California Legislature created a new UWMP requirement for drought planning 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 the urban water supplier to assess 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. The DRA is discussed in Chapter 7 based on the water use information in Chapter 4; the water supply analysis is presented in Chapter 6; and the water reliability determinations are discussed in Chapter 7 of this plan.
- **Seismic Risk** [CWC §10632.5]. The Water Code now requires urban water suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan. Water supply infrastructure planning is correlated with the regional hazard mitigation plan associated with the urban water supplier. Zone 7's seismic risk is discussed in Chapter 8 of this plan.
- **Energy Use Information** [CWC §10631.2]. The Water Code now requires Suppliers to include readily obtainable information on estimated amounts of energy for their water supply extraction, treatment, distribution, storage, conveyance, and other water uses. Zone 7's energy use for its urban water deliveries are provided in Chapter 6.
- **Water Loss Reporting for Five Years** [CWC §10608.34]. The Water Code added the requirement that water retailers include the past five years of water loss audit reports as part of this UWMP. Although not required of wholesalers, Zone 7 voluntarily reported on its water losses in Chapter 4.
- **Water Shortage Contingency Plan** [CWC §10632]. In 2018, the Legislature modified the UWMP laws to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides the urban water supplier with an action plan for a drought or catastrophic water supply shortage. Although the new requirements are more prescriptive than previous versions, many of these elements have long been included in WSCPs, other sections of UWMPs, or as part of the urban water supplier's standard procedures and response actions. Many of these actions were implemented by the urban water suppliers during the last drought to successfully meet changing local water supply challenges. The WSCP is used by the California Department of Water Resources (DWR), the State Water Board, and the Legislature in addressing extreme drought conditions or

statewide calamities that impact water supply availability. Zone 7's WSCP is presented in Chapter 8 of this plan.

- **Groundwater Supplies Coordination** [CWC §10631(b)(4)]. In 2014, the Legislature enacted the Sustainable Groundwater Management Act to address groundwater conditions throughout California. Water Code now requires 2020 UWMPs to be consistent with Groundwater Sustainability Plans in areas where those plans have been completed by Groundwater Sustainability Agencies. This requirement is addressed in Chapter 6 of this plan.
- **Lay Description** [CWC §10630.5]. The Legislature included a new statutory requirement for the urban water supplier to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks. This section of the UWMP could be viewed as a go-to synopsis for new staff, new governing members, customers, and the media, and it can ensure a consistent representation of the supplier's detailed analysis. This requirement is addressed in the Executive Summary of this plan.
- **Water Loss Management** [CWC §10608.34(a)(1)]. The Legislature included a requirement for urban water suppliers to report on their plan to meet the water loss performance standards in their 2020 UWMPs. This requirement is addressed in the Demand Management Measures presented in Chapter 9 of this plan.

1.4 DEMONSTRATION OF CONSISTENCY WITH THE DELTA PLAN FOR PARTICIPANTS IN COVERED ACTIONS

Urban water suppliers that anticipate participating in or receiving water from a proposed project (covered action), such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta) should provide information in their 2015 and 2020 UWMPs that demonstrates consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit. 23, § 5003). To demonstrate reduced reliance on the Delta and improve regional self-reliance, urban water suppliers are to:

1. Complete an Urban Water Management Plan;
2. Identify, evaluate, and commence implementation of programs and projects included in the UWMP that are locally cost effective and technically feasible in reducing reliance on the Delta; and
3. Include expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance in their UWMPs, commencing in their 2015 UWMPs and continuing in their subsequent UWMPs. Programs and projects identified above should reduce the amount or percentage of water used from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply.

Zone 7 is an urban water wholesaler, as described in Section 2.1 of this plan. As a contractor of the State Water Project (SWP), Zone 7 and its retailers—California Water Service-Livermore District (Cal Water), the City of Livermore (Livermore), the City of Pleasanton (Pleasanton), and Dublin San Ramon Services District (DSRSD)—anticipate participating in a covered action and are therefore required to demonstrate reduced Delta reliance. Appendix B of this UWMP demonstrates Zone 7's consistency with Delta Plan Policy WR P1.

Zone 7 completed and adopted its 2015 UWMP in March 2016. This 2020 UWMP was completed and adopted by Zone 7 in May 2021. Chapter 6 (Water Supply Characterization) of Zone 7's 2015 and 2020 UWMPs identifies and evaluates existing and future projects whose implementation improves regional self-reliance. Chapter 9 (Demand Management Measures) of Zone 7's 2015 and 2020 UWMPs describes demand management measures that Zone 7 has implemented as part of its Water Conservation Program.

1.5 PLAN ORGANIZATION

This 2020 UWMP contains the appropriate sections and tables required per CWC Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this 2020 UWMP, and has been prepared based on guidance provided by DWR in their "2020 Urban Water Management Plans Guidebook for Urban Water Suppliers" (DWR Guidebook).

This 2020 UWMP is organized into the following chapters:

- Chapter 1: Introduction
- Chapter 2: Plan Preparation
- Chapter 3: System Description
- Chapter 4: Water Use Characterization
- Chapter 5: SBX7-7 Baseline, Targets, and 2020 Compliance
- Chapter 6: Water Supply Characterization
- Chapter 7: Water Service Reliability and Drought Risk Assessment
- Chapter 8: Water Shortage Contingency Plan
- Chapter 9: Demand Management Measures
- Chapter 10: Plan Adoption, Submittal, and Implementation

This 2020 UWMP also contains the following appendices of supplemental information and data related to Zone 7's 2020 UWMP:

- Appendix A: Legislative Requirements
- Appendix B: Demonstration of Reduced Delta Reliance
- Appendix C: DWR 2020 Urban Water Management Plan Tables
- Appendix D: DWR 2020 Urban Water Management Plan Checklist
- Appendix E: Agency and Public Notices
- Appendix F: Zone 7 Water Agency Water Supply Reliability Policy (Resolution 13-4230)
- Appendix G: Water Shortage Contingency Plan
- Appendix H: UWMP and WSCP Adoption Resolutions

Furthermore, this 2020 UWMP contains all the tables recommended in the DWR Guidebook, both embedded into the UWMP chapters where appropriate and included separately in Appendix C.

DWR's Urban Water Management Plan Checklist, as provided in the DWR Guidebook, has been completed by West Yost to demonstrate the plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix D.

CHAPTER 2
Plan Preparation

This chapter describes the preparation of Zone 7's 2020 UWMP and WSCP, including the basis for the preparation of the plan, individual or regional planning, units of measure, and plan coordination and outreach. Zone 7's reporting is based on the calendar year.

2.1 BASIS FOR PREPARING A PLAN

The Act requires every "urban water supplier" to prepare and adopt a UWMP, to periodically review its UWMP at least once every five years and make any amendments or changes which are indicated by the review. An "urban water supplier" is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually (AFY).

Zone 7 manages Water System CA0110010 and is primarily a wholesaler. While Zone 7 directly serves 13 retail municipal connections, including commercial and institutional water users, the total population served through direct connections is less than 3,000, and the five-year (2016-2020) average retail water demand is approximately 800 AFY. As a result, Zone 7 is considered primarily an "urban wholesale water supplier" for the purposes of the 2020 UWMP and only needs to address wholesaler requirements. This 2020 UWMP updates the 2015 UWMP and Zone 7's WSCP. Zone 7's last UWMP, the 2015 UWMP, was adopted by the Zone 7 Board of Directors (Zone 7 Board) on March 16, 2016.

Note that the California Environmental Quality Act (CEQA) does not apply to the preparation and adoption of a UWMP as stated in CWC 10652, and therefore did not require the public process associated with CEQA.

2.2 REGIONAL PLANNING

As described in Section 2.3, Zone 7 has prepared this 2020 UWMP on an individual reporting basis, not part of a regional planning process. However, Zone 7 regularly coordinates with its water retailer customers—DSRSD, Pleasanton, Livermore, and Cal Water—to ensure that a safe and reliable water supply is delivered to its existing customers and that plans for serving future customers are implemented as efficiently as possible. Zone 7 routinely coordinates with its retailers on water supply and water conservation matters, including preparation of Zone 7's 2019 WSE Update, 2020 UWMP, and WSCP update. Zone 7 also assisted the water retailer agencies in the preparation of their individual UWMPs.

2.3 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE

This 2020 UWMP has been prepared on an individual reporting basis covering only Zone 7's service area, as noted in Table 2-1. Zone 7 does not participate in a regional alliance, and it has not prepared a Regional Urban Water Management Plan (RUWMP). As described in Section 2.5, Zone 7 has notified and coordinated planning and compliance with appropriate regional agencies and constituents, including its retailers.

Table 2-1. Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.4 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

Zone 7 is a water wholesaler.

Zone 7's 2020 UWMP has been prepared on a calendar year basis, with the calendar year starting on January 1 and ending on December 31 of each year. Water use and planning data for the entire calendar year of 2020 have been included.

The water volumes in this 2020 UWMP are reported in units of acre-feet (AF).

Zone 7's reporting methods for this 2020 UWMP are summarized in Table 2-2.

Table 2-2. Agency Identification (DWR Table 2-3)

Type of Supplier (select one or both)	
☑	Supplier is a wholesaler
☐	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	

2.5 COORDINATION AND OUTREACH

This section discusses Zone 7's inter-agency coordination and coordination with the general public. The Act requires Zone 7 to coordinate the preparation of its UWMP and updates to its WSCP both internally with all Zone 7 departments and externally with other appropriate agencies, including other water suppliers that share a common source, water management agencies, and relevant public agencies. These agencies, as well as the public, participated in the coordination and preparation of this 2020 UWMP as summarized below.

2.5.1 Wholesale and Retail Coordination

Zone 7 provides wholesale water service to four customers: Cal Water, Livermore, Pleasanton, and DSRSD. In accordance with CWC Section 10631, Zone 7 provided supply information to the agencies receiving wholesale water supplies (i.e., retailers) shown in Table 2-3. As part of the Regional Demand Study, Zone 7 developed population and water demand projections in coordination with its retailers.

Table 2-3. Water Supplier Information Exchange (DWR Table 2-4 Wholesale)

☐	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed.
	Provide page number for location of the list.
☑	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.**
Water Supplier Name	
California Water Service Company	
City of Livermore	
City of Pleasanton	
Dublin San Ramon Services District	

2.5.2 Coordination with Other Agencies and the Community

As a contractor of the SWP, Zone 7 is heavily engaged with DWR, which owns, operates, and maintains the SWP. Through membership in the State Water Contractors, Zone 7 also regularly interacts with other water agencies receiving water from the SWP and serving a total of over 25 million people across the State. The State and Federal Contractors Water Agency is a Joint Powers Authority that brings together SWP contractors like Zone 7 and Central Valley Project (CVP) contractors to work towards assuring sufficient and reliable export water supplies from the SWP and CVP.

Through membership and active participation in the California Urban Water Agencies (CUWA), Zone 7 regularly confers with other urban water agencies across California on statewide water issues such as drought management, water supply reliability challenges, and water quality management. Zone 7 is also an active member of the Association of California Water Agencies (ACWA), the largest statewide coalition of public water agencies in the country representing water suppliers responsible for 90 percent of the water delivered to cities, farms, and businesses in California.

At the regional level, Zone 7 is actively engaged in the Bay Area Water Agencies Coalition (BAWAC), which is comprised of water agencies in Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara counties. BAWAC is committed to advancing water conservation in the region as part of the Bay Area Integrated Regional Water Management Plan. Zone 7 is also a member of the Bay Area Regional Reliability Partnership, which brings together nine Bay Area water agencies aiming to improve regional water supply reliability by working cooperatively on a mutually beneficial and regionally focused basis.

Zone 7 also actively encourages local community participation in water management activities and specific water-related projects. Zone 7’s public participation program includes both active and passive means of obtaining input from the community, such as mailings, public meetings, and web-based communication. Zone 7’s website describes on-going projects and posts announcements of planned rate increases to fund these water projects. Water supply planning documents are posted on Zone 7’s website, along with monthly water inventories to inform the public of water supply conditions over the year.

As part of the 2020 UWMP and WSCP update, Zone 7 conducted public meetings including a Water Resources Committee meeting on February 23, 2021, a Zone 7 Board workshop on April 1, 2021, and a public hearing on May 19, 2021. A public comment period was conducted before the hearing from May 3 to May 19, 2021. Public noticing, pursuant to Section 6066 of the Government Code, was conducted prior to commencement of a public comment period. Public hearing notices are included in Appendix E of this plan. During the public comment period, the Draft 2020 UWMP, which includes an updated WSCP, was made available on Zone 7’s website and at its administrative office.

As noted above, Zone 7 coordinated the preparation of this 2020 UWMP and WSCP with its retailers. In addition, Zone 7 sent a notice of preparation to the following agencies:

- California Water Service
- City of Livermore
- City of Pleasanton
- Dublin San Ramon Services District (DSRSD)
- Department of Water Resources
- Alameda County
- Contra Costa County
- City of Dublin
- City of San Ramon
- Contra Costa Water District (CCWD)
- East Bay Municipal Utility District (EBMUD)
- Livermore-Amador Valley Water Management Agency (LAVWMA)
- DSRSD-EBMUD Recycled Water Authority (DERWA)

The public hearing provided an opportunity for all Zone 7 water users and the general public to become familiar with the UWMP and ask questions about Zone 7's water supply and its plans for continuing to provide a reliable, safe, high-quality water supply.

2.5.3 Notice to Cities and Counties

CWC Section 10621 (b) requires agencies to notify the cities and counties to which they serve water at least 60 days in advance of the public hearing that the plan is being updated and reviewed. On November 24, 2020, a notice of preparation was sent to the cities and counties and other stakeholders, to inform them of the UWMP and WSCP update process and schedule, and to solicit input for the 2020 UWMP and updated WSCP. A second notice was issued on March 10, 2021 that included a notice of the amendment of the 2015 UWMP to incorporate demonstration of consistency with Delta Plan Policy WR P1. A copy of these notifications are included in Appendix E. The notifications to cities and counties, the public hearing notifications, and the public hearing and adoption are discussed in Chapter 10.

CHAPTER 3
System Description

This chapter describes Zone 7's history as a water agency, as well as its water system facilities and service area. In addition, this chapter discusses the climate, population, demographics, and land use within Zone 7's service area.

3.1 GENERAL DESCRIPTION

Of the ten active zones of the Alameda County Flood Control and Water Conservation District (District), Zone 7 is the only one that provides water services in addition to flood protection. Zone 7 manages water resources and provides wholesale treated potable water supply to water retailers in the Livermore-Amador Valley, serves treated water directly to a small number of direct retail customers, and serves untreated water to agriculture. This section provides an overview of Zone 7 and its water system.

3.1.1 Zone 7 History

The District was created in 1949 by the California State Legislature through passage of the Alameda County Flood Control and Water Conservation District Act to control flood and storm waters and to conserve water for beneficial uses. The District is also vested with the power to store water in surface or underground reservoirs within or outside of the District for the common benefit of the District; conserve and reclaim water for present and future use within the District; appropriate and acquire water and water rights; and import water into the District.

In 1957, residents of Livermore-Amador Valley voted to create a separate Zone 7 Water Agency in response to groundwater overdraft, poor drainage and flood hazards, and uncertainty over future water supplies. Zone 7 is governed by a locally elected, seven-member Board of Directors (Zone 7 Board). Each director is elected at-large by residents within Zone 7's service area to a four-year term. The Zone 7 Board sets policy and provides direction to Zone 7 management and staff.

Zone 7's key water resource management responsibilities include:

- Serving as the contractor with DWR for the State Water Project
- Managing the local water right on Arroyo Valle
- Procuring other water supplies as necessary to meet demands
- Providing wholesale treated water supply
- Providing untreated water for agriculture
- Sustainably managing the Livermore Valley Groundwater Basin
- Operating and maintaining water treatment and transmission systems
- Managing regional stormwater for public safety and protection of property

Under Zone 7's Groundwater Management Program, Zone 7 administers oversight of the local groundwater basin—the Livermore Valley Groundwater Basin—and prevents groundwater overdraft. Furthermore, the Sustainable Groundwater Management Act of 2014 (SGMA) designates Zone 7 as the exclusive local agency to become the Groundwater Sustainability Agency (GSA) for the groundwater basins within its statutory boundaries. In January 2017, Zone 7 formally accepted its role of GSA for the Livermore Valley Groundwater Basin.

3.1.2 Zone 7 Retailers

Zone 7 is the water wholesaler for the Livermore-Amador Valley, also commonly referred to as the Tri-Valley, serving Livermore, Pleasanton, the City of Dublin (Dublin), and part of the City of San Ramon (San Ramon). Dougherty Valley in San Ramon, which is located in Contra Costa County, is served via an out-of-service-area agreement with DSRSD. Zone 7 supplies treated water to four retail water supply agencies (retailers) in the Tri-Valley: Cal Water, DSRSD, Livermore, and Pleasanton.

These retailers deliver water for M&I purposes within their individual service areas. Zone 7 works closely with its retailers on Tri-Valley water issues.

Throughout this UWMP, the terms “potable,” “treated,” and “M&I” are used interchangeably to describe Zone 7’s water supply to its urban water retailers.

3.1.3 Zone 7 Water System Facilities

As shown on Figure 3-1, Zone 7 has a robust water supply system consisting of an aqueduct, surface water treatment plants, wells, a groundwater demineralization plant, and a storage and transmission system.

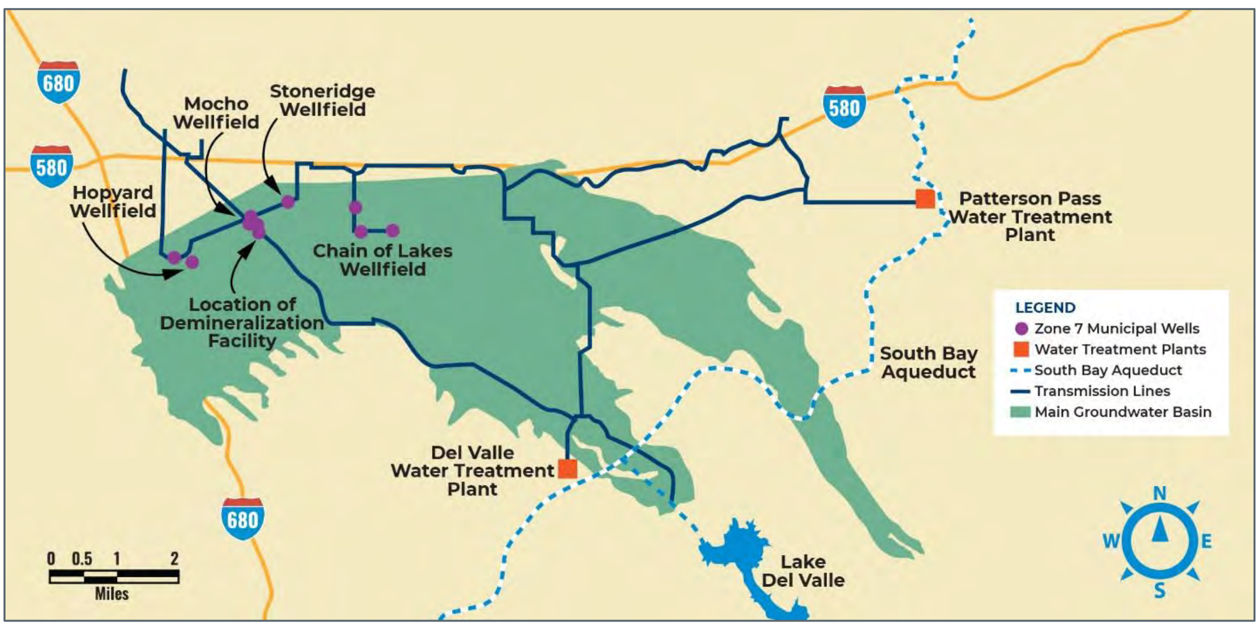

Figure 3-1. Zone 7 Facilities

3.1.3.1 South Bay Aqueduct

Zone 7 imports raw surface water from the SWP through the South Bay Aqueduct (SBA) for direct irrigation use by agricultural users; for treatment and transmission to retailers and direct retail customers; and for groundwater recharge. The SBA, which is owned, operated, and maintained by DWR as part of the SWP system, starts from Bethany Reservoir near the City of Tracy in the northeastern corner of Zone 7’s service area and leaves the service area southwest of San Antonio Reservoir, ultimately terminating in the City of San Jose. The SBA serves the Alameda County Water District (ACWD) and Valley Water (VW, formerly known as the Santa Clara Valley Water District), in addition to Zone 7 (collectively, SBA contractors). The SBA delivers SWP water pumped from the Delta and water released from Lake Del Valle, which is part of the SWP system. Other water supplies procured by Zone 7 (e.g., via water transfer agreements) are also delivered through the Delta and SBA system. The SBA also conveys Delta water to Lake Del Valle for storage and later use by SBA contractors.

3.1.3.2 Surface Water Treatment Plants

Zone 7 operates two water treatment plants: the Del Valle Water Treatment Plant (DVWTP) and the Patterson Pass Water Treatment Plant (PPWTP).

Built in the 1970s, the DVWTP is located along the SBA, just south of Lake Del Valle, and has an average capacity of 36 million gallons per day (MGD), although it is permitted to operate up to 40.9 MGD. The DVWTP can receive water either directly from the SBA or from Lake Del Valle. As shown on Figure 3-2, the treatment processes include newly installed ozone disinfection, along with coagulation, flocculation, clarification, multi-media biofiltration, and chlorine for backup/supplemental disinfection. In addition, chloramine is added to maintain a disinfectant residual in the transmission system.

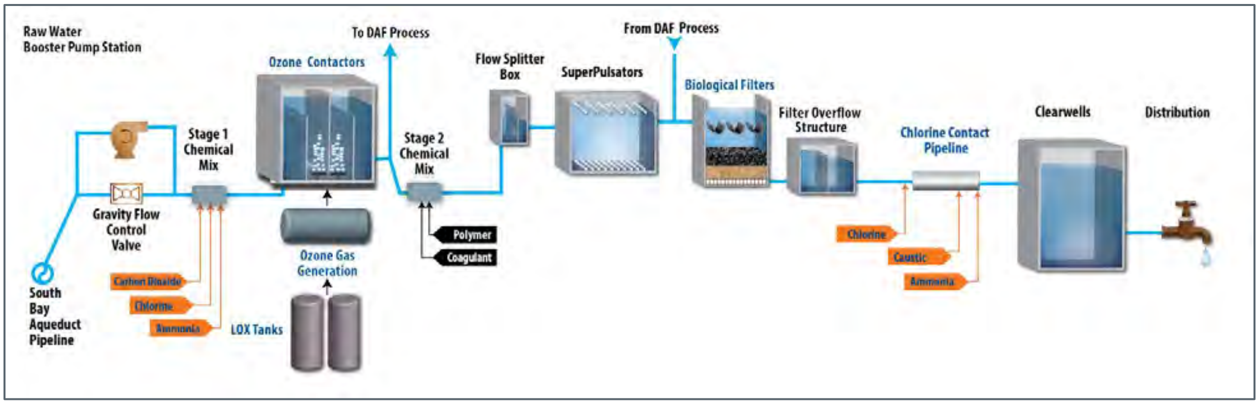

Figure 3-2. DVWTP Treatment Processes

Constructed in the early 1960s, the PPWTP is also strategically located along the SBA, just south of Interstate 580 (I-580), and has a production capacity of 12 MGD. A pilot parallel ultrafiltration plant at the same site is no longer in use. Zone 7 is currently upgrading the PPWTP, including increasing production capacity to 24 MGD, adding new ozonation facilities, and installing a new 5 million gallon (MG) treated water storage tank. These improvements, along with replacement and upgrade of aging plant components, are expected to be completed by spring 2022. Because the PPWTP is upstream of Lake Del Valle, it is not able to physically receive water from this water supply source. There is a 30-MG raw water reservoir onsite, operated by DWR. Once upgrades are complete, treatment processes will include ozonation, coagulation, flocculation, clarification, biological filtration, and chlorine for backup/supplemental disinfection. Similar to the DVWTP, chloramine is used to maintain a disinfectant residual in the transmission system.

3.1.3.3 Wells

Zone 7 owns and operates ten municipal supply wells located in four wellfields. The Hopyard, Mocho, Stoneridge, and Chain of Lakes wellfields are situated in the west side of the service area. Their rated capacities are summarized in Table 3-1 below. The total combined pumping capacity of all wells is approximately 39.0 MGD. Of the total pumping capacity, 10.8 MGD is intended primarily for use in emergency and drought conditions. Therefore, total groundwater pumping capacity under normal operating conditions is approximately 28.2 MGD. Zone 7 uses the wells to supplement the DVWTP and

PPWTP during daily peaks in demands, during the dry season to meet higher average monthly demands, and during emergencies or outage(s) of the DVWTP and/or PPWTP.

Table 3-1. Zone 7 Groundwater Well Capacities

Wellfield	Facility	Rated Capacity	
		gpm	MGD
Hopyard	Hopyard 6	3,817	5.5
	Hopyard 9	1,110	1.6
	Hopyard Subtotal	**4,927**	**7.1**
Mocho 1 and 2	Mocho 1[a]	0	0
	Mocho 2	2,221	3.2
	Mocho 1 and 2 Subtotal	**2,221**	**3.2**
Mocho 3 and 4[b]	Mocho 3	4,164	6.0
	Mocho 4	3,678	5.3
	Mocho 3 and 4 Subtotal	**7,842**	**11.3**
Stoneridge	--	4,580	6.6
Chain of Lakes	Chain of Lakes 1	2,498	3.6
	Chain of Lakes 2	3,470	5.0
	Chain of Lakes 5	1,527	2.2
	Chain of Lakes Subtotal	**7,495**	**10.8**
	Total	**27,066**	**39.0**

(a) Mocho 1 will be on standby for the foreseeable future.
(b) When the demineralization facility is operating, water production is lower due to brine concentrate losses.

3.1.3.4 Mocho Groundwater Demineralization Plant

A reverse osmosis membrane-based demineralization facility (Mocho Groundwater Demineralization Plant or MGDP) was installed in 2009 at the Mocho 3 and 4 wellfield to improve delivered water quality (lower Total Dissolved Solids [TDS] and hardness) and mitigate salt build-up in the groundwater basin via export of brine from the MGDP. This facility can produce up to 6.1 MGD of demineralized water. Under normal operation, 20 percent of the influent to the MGDP is lost through brine disposal.

3.1.3.5 Storage and Transmission System

Zone 7's treated water transmission system is shown on Figure 3-1. It has four treated water storage reservoirs within the system: Dougherty Reservoir (joint use with DSRSD), DVWTP Clearwells 1 and 2, and PPWTP Clearwell. These four facilities provide a total storage volume of 13.5 MG. The new clearwell under construction at the PPWTP will add 5 MG of storage to the system.

Zone 7's transmission system consists of approximately 40 miles of pipeline ranging from 12 to 52 inches in diameter. Elevations across the transmission system range from 520 to 680 feet above mean sea level (msl) on the eastern side of the service area, to approximately 330 feet above msl on the western side of the service area.

3.2 SERVICE AREA BOUNDARY

Zone 7's water service area is shown on Figure 3-3. It is located about 40 miles southeast of San Francisco and encompasses approximately 425 square miles of the eastern portion of Alameda County, including the Livermore-Amador Valley, Sunol Valley, and portions of the Diablo Range. Zone 7 also serves a portion of Contra Costa County (Dougherty Valley in San Ramon) through an out-of-service-area agreement with DSRSD.

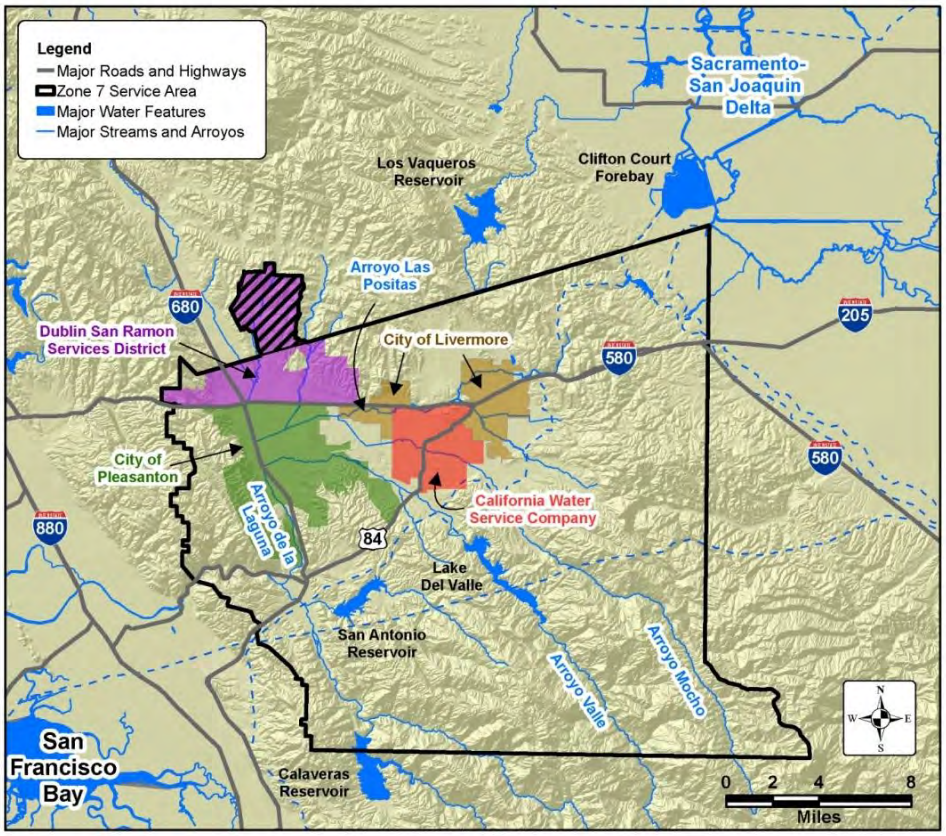

Figure 3-3. Zone 7 Service Area Boundary Map

3.3 SERVICE AREA CLIMATE

Climate in Zone 7's service area is characteristically Mediterranean, with hot, dry summers and cool, moist winters. This section discusses historical climate in Zone 7's water service area (using Pleasanton as an example) and the potential effects of climate change.

3.3.1 Historical Climate

The historical climate characteristics affecting water management in the Zone 7's water service area, including average evapotranspiration (ET_o), rainfall, and temperature, are shown in Table 3-2. The average annual precipitation is approximately 17.2 inches, while the total evapotranspiration is approximately 51.5 inches. Average monthly temperatures vary from 47 to 70 degrees Fahrenheit throughout the year.

Note that the Livermore portion of the service area tends to have warmer temperatures, with average high temperatures nearly reaching 90 degrees Fahrenheit during the summer.

Table 3-2. Monthly Average Climate Data Summary

Month	Standard Monthly Average ET_o[a], inches	Average Total Rainfall[b], inches	Average Temperature[b], degrees Fahrenheit
January	1.51	2.83	47.4
February	2.17	2.70	50.6
March	3.63	2.95	53.8
April	4.94	1.47	56.9
May	6.16	0.57	61.1
June	7.10	0.23	67.0
July	7.53	0.09	70.2
August	6.61	0.09	69.3
September	4.98	0.12	67.2
October	3.50	1.09	61.0
November	1.93	1.66	52.6
December	1.41	3.36	47.1
Total	**51.5**	**17.2**	**--**

(a) Source: California Irrigation Management Information System (CIMIS) data for Station #191: Pleasanton (downloaded November 11, 2020).
(b) Source: CIMIS data for Station #191: Pleasanton (data from October 2004 through October 2020).

3.3.2 Potential Effects of Climate Change

California Water Code now requires water suppliers to account for the impacts of climate change on water supplies and supply reliability. A discussion of the effects of climate change on water demands, supplies, and reliability can be found in Chapters 4, 6, and 7 of this UWMP. This section summarizes those discussions.

In general, climate change is expected to increase water demand for irrigation and the year-to-year variability of demands. This is the result of increased temperatures (which increases evapotranspiration) and more variability in precipitation (which impacts supply availability and reliability). Also, natural disasters such as wildfires, droughts, and floods are expected to increase in both frequency and intensity.

Responding to climate change generally takes two forms: mitigation and adaptation. Mitigation means reducing the contribution to the causes of climate change (e.g., greenhouse gas emissions). Adaptation is the process of responding to the effects of climate change by modifying systems and behaviors to function in a warmer and more variable climate.

In the water sector, climate change mitigation is generally achieved by reducing energy use, increasing energy efficiency, and/or replacing fossil fuel-based energy sources with renewable energy sources. Zone 7 has a solar facility at the DVWTP and continues to explore ways to increase the renewable energy portion of its energy portfolio. Zone 7 obtains energy from various sources that are already about 90 percent carbon-free and 70 percent renewable.

Because water requires energy to move, treat, use, and discharge, water conservation results in energy conservation. Adaptation initiatives include alternative water supply/storage options that Zone 7 is considering (further discussed in Chapter 6). These options bolster Zone 7's ability to adapt to climate change through additional storage, providing a buffer against more variable hydrology (Sites Reservoir and Los Vaqueros Reservoir Expansion), and potable reuse and desalination, which are not as vulnerable to hydrologic variations. Sites Reservoir performs well under the greater rainfall expected under climate change. SWP infrastructure improvements are also key adaptation tools: the Delta Conveyance Project will address higher sea levels and greater salinity in the Delta and the greater vulnerability of the Delta levees.

3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

3.4.1 Service Area Population

The current population within Zone 7's service area is estimated at 266,000. Current and projected populations within Zone 7's service area are presented in Table 3-3 and are based on Zone 7's Regional Demand Study. By 2045, the population in Zone 7's service area is projected to grow by approximately 20 percent to 323,000.

Table 3-3. Population – Current and Projected (DWR Table 3-1 Wholesale)

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	266,000	284,000	299,000	312,000	323,000	323,000
NOTES: Current and projected populations are based on the Regional Demand Study and are rounded to the nearest thousand people.						

3.4.2 Other Social, Economic, and Demographic Factors

The California Water Code now requires UWMPs to include service area socioeconomic information as part of the system description. However, differences in household water use across sociodemographic groups in Zone 7's service area have not been studied, nor does Zone 7 differentiate water management by sociodemographic factors. To comply with the new regulation, the following social, economic, and demographic information from the U.S. Census Bureau[3] is provided. Information is for Livermore-Pleasanton Census County Division during the five-year period from 2014 to 2018.

- The average number of people per household was 2.9
- The median household income was $135,132
- The owner-occupied housing unit rate was 70 percent, with a median home value of $815,700
- The median gross rent was $2,214 per month

[3] United States Census Bureau. American Community Survey, 2014-2018 ACS 5-Year Data Profile for Livermore-Pleasanton Census County Division

- The median age was 39.6 years
- Of persons 25 years or older, 94.4 percent had earned at least a high school diploma or equivalent, and 54.6 percent had earned a bachelor's degree or higher
- By race/ethnicity, 51.9 percent of people were White, 2.3 percent were Black, 0.2 percent were American Indian or Alaska Native, 27 percent were Asian, 0.4 percent were Hawaiian Native or Pacific Islander, 4.2 percent were two or more races, and 14 percent were Hispanic or Latino
- 26.1 percent of residents were foreign born

3.5 LAND USES WITHIN SERVICE AREA

This section describes the current and projected land uses for each municipality within Zone 7's service area. Land use information is based on each city's adopted General Plan and specific plans, and the Regional Demand Study, which used the latest information on planned development that was provided by the retailers and City planners to develop demand projections. The final subsection reviews long-range land use planning for the Tri-Valley region overall.

3.5.1 City of Livermore

Existing land use within Livermore is predominantly single-family residential. Multi-family residential parcels are found primarily on major streets along with retail services. Office and retail parcels comprise Livermore's downtown, while industrial uses are concentrated on the eastern side of Livermore near I-580. The remainder of Livermore's existing land uses consist of public, institutional, parks/recreation/open space, agricultural, airport, and undeveloped land.

The Isabel Neighborhood Specific Plan (INSP) is a significant component of Livermore's projected land use. Currently under review, the INSP guides development for approximately 1,138 acres surrounding the previously proposed Isabel Bay Area Rapid Transit (BART) station in Livermore's western water service area. Land uses within the INSP include business park; service, neighborhood, and large office commercial; educational/institutional; open space; and various residential designations ranging in density from attached dwellings and low-rise garden apartments to multi-story condominiums.

3.5.2 City of Dublin

Land use planning for Dublin consists of three areas: the Primary Planning Area, the Eastern Extended Planning Area, and the Western Extended Planning Area. Most of the Primary Planning Area has been developed, with primary land uses including single-family residential, business park/industrial, open space, and parks. One exception within the Primary Planning Area is Downtown Dublin, which is being redeveloped to focus on higher density, mixed-use projects following the opening of the West Dublin BART station.

Development opportunities are also limited in the Western Extended Planning Area, where approximately 85 percent of the Western Extended Planning Area's 3,132 acres lies outside Dublin's Urban Limit Line. The Urban Limit Line protects natural resources in Dublin's western hills, and Dublin will not extend services or facilities (e.g., utilities or roads) beyond the Urban Limit Line. Most of the Western Extended Planning Area acreage within the Urban Limit Line has been designated open space, with the remainder reserved for low density residential development.

A significant portion of future development within Dublin will occur within the Eastern Extended Planning Area. This is formalized in the Eastern Dublin Specific Plan (EDSP), which provides a framework for growth and development of approximately 3,300 acres east of the Camp Parks Reserve Forces Training Area. While residential designations within the EDSP area range from rural residential/agriculture to high density multi-family, approximately 55 percent of new dwelling units will be single-family residential. Non-residential land uses within the EDSP area include retail, service, office, governmental, research and development, and light industrial.

3.5.3 City of San Ramon

The following land use discussion focuses on the portions of San Ramon that DSRSD serves. This includes the southern and Dougherty Valley areas of San Ramon, to which DSRSD provides wastewater and potable/recycled water services, respectively. Note that Zone 7 only serves as a wholesale treated water provider to the Dougherty Valley portion.

San Ramon is divided into nine planning subareas, four of which overlap DSRSD's wastewater and potable water service areas: Westside, Southern San Ramon, Dougherty Hills, and Dougherty Valley. The Westside subarea is mostly unincorporated open hillsides, though an area along San Ramon Valley Boulevard is designated primarily for residential development and a neighborhood shopping center. In contrast, the Southern San Ramon and Dougherty Hills subareas are suburban communities with primarily residential land uses. Development of Dougherty Valley is detailed in the Dougherty Valley Specific Plan, which envisioned residential neighborhood clusters served by their own public facilities, a mixed-use activity center (Village Center), and a backdrop of broad open space. The development of the Dougherty Valley area is substantially complete.

3.5.4 City of Pleasanton

Existing land use within Pleasanton generally consists of distinct residential neighborhoods typically separated from non-residential land uses to reduce the potential incompatibility of non-residential and residential uses. Pleasanton was predominantly a residential community until 1980, when industrial, commercial, and office development increased. This non-residential development includes the Stoneridge Mall, seven major business parks, five major hotels, and a variety of service centers. Abundant open space surrounds the developed areas of Pleasanton.

Pleasanton's current General Plan[4] encourages mixed land uses and transit-oriented development (TOD), particularly near the BART stations, for future growth. Mixed use development combines office, commercial, hotel, institutional, and residential land uses on a single site or adjacent, interrelated sites. TOD provides walkable, mixed use communities designed around transit stations. Mixed use developments (including TODs) would provide the opportunity for people to use alternative modes of transportation to automobiles since residential and non-residential land uses would be combined or integrated on a single or nearby site.

To identify future growth in Pleasanton's service area, Zone 7's Regional Demand Study obtained a list of known proposed development projects from Pleasanton's Community Development Department. These proposed projects include mixed use, single-family residential, and multi-family residential developments.

[4] City of Pleasanton, 2005. Pleasanton General Plan 2005-2025.

3.5.5 Long-Range Land Use Planning

This section discusses long-range land use planning that may affect water management. Long-range planning includes years beyond the planning horizon of this UWMP but should be noted for consideration in future UWMP updates.

The Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) is preparing Plan Bay Area 2050, which provides long-range plans to guide the growth of the nine-county region. Plan Bay Area 2050 is expected to be completed in 2021 and integrates strategies for transportation, housing, the environment, and the economy. ABAG published the *Draft RHNA Methodology Release* in December 2020 to support Plan Bay Area 2050; this methodology has been used to develop "illustrative" RHNA allocations for each city and county in the region. Allocations will be finalized in 2021 through the remaining steps of the RHNA process. The proposed housing unit allocations for the cities in Zone 7's service area are 3,719 for Dublin, 4,449 for Livermore, 5,965 for Pleasanton, and 5,111 for San Ramon.[5]

ABAG is expected to approve a Final Methodology and issue Draft Allocations in spring 2021. Issuing the Draft Allocations will be followed by an appeal period, with ABAG issuing Final Allocations by the end of 2021. Each of the cities in Zone 7's service area will need to update the Housing Element of their respective general plans. Although the region's RHNA allocation may not affect Zone 7's projected long-term water demand projections, it may accelerate the rate at which demand increases in the near term. Zone 7 will incorporate those updates in a future UWMP.

[5] Association of Bay Area Governments, December 2020. Release of ABAG Draft RHNA Methodology and Final Subregional Shares, Appendix 3.

CHAPTER 4
Water Use Characterization

This chapter describes and quantifies Zone 7’s past, current, and projected potable water demands. Water demand projections are based on the projected growth within the Zone 7’s service area. Zone 7’s Regional Demand Study was completed concurrently with the preparation of this UWMP and was used to inform this chapter.

4.1 NON-POTABLE VERSUS POTABLE WATER USE

Potable water is water that is safe to drink and typically has had various levels of treatment and disinfection. Non-potable water is not safe to drink and includes both recycled water and raw water. Zone 7 provides wholesale potable water to its retailers for M&I purposes within their service areas. Six direct retail customers, including commercial and institutional water users, are also served by Zone 7; they represent a small percentage of Zone 7’s overall water demand.

In addition to treated water, Zone 7 supplies raw or untreated water for agricultural purposes to approximately 3,500 acres, primarily consisting of vineyards in the southern portion of Livermore Valley. Zone 7 does not produce nor distribute recycled water directly, however three retailers—DSRSD, Livermore, and Pleasanton—provide recycled water (mainly for landscape irrigation) within their respective service areas.

4.2 WATER USE BY SECTOR

Zone 7’s service area includes a diverse, vibrant, and rapidly growing community that supports a population of approximately 266,000 people and a myriad of vital and dynamic commercial, agricultural, and industrial enterprises. The eastern reaches of Zone 7’s service area include oil wells and acres of energy-generating windmills, while other areas include large employers such as Kaiser Permanente, Safeway, Oracle, Providian Financial, SAP, and Lawrence Livermore National Laboratory. The area also supports several award-winning wineries. Industrial water use is not a major component of water use in the area, but industrial users do exist, such as The Clorox Company (chemical company), Roche Molecular Systems (medical diagnostic products), and A-1 Enterprise (waste hauler).

For any given year, surplus water is used in the following ways: recharge of the local groundwater basin, storage in groundwater banks in Kern County (Semitropic Water Storage District and Cawelo Water District), storage in the SWP system as “carryover” in San Luis Reservoir, and storage of local water in Lake Del Valle.

4.2.1 Past and Current Water Use

Zone 7’s actual historical and current (i.e., 2020 calendar year) potable water demands are reported in Table 4-1 and Table 4-2, respectively.

Table 4-1. Historical Water Demands

Water Use Sector	Water Demands(a), AFY		
	2004	2009	2015
Retailer Demand	42,371	38,083	24,300
Untreated Water Demand	3,530	4,920	5,600
Direct Retail Demand	775	233	300
Losses	523	1,900	800
Total	**47,199**	**45,136**	**31,000**

(a) As reported in Zone 7's 2005, 2010, and 2015 UWMPs. Zone 7's 2005 and 2010 UWMPs used 2004 and 2009, respectively, as the "current" year.

Table 4-2. Demands for Potable and Non-Potable Water – Actual (DWR Table 4-1 Wholesale)

Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume*
Sales to other agencies	Retailer Demand	Drinking Water	38,020
Agricultural irrigation	Untreated Water Demand	Raw Water	5,810
Retail demand for use by suppliers that are primarily wholesalers with a small volume of retail sales	Direct Retail Demand	Drinking Water	730
Losses		Drinking Water	180
		TOTAL	44,740

**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes are in AF.

4.2.2 Projected Water Use

This section presents water demand projections for Zone 7's service area on a 25-year planning horizon and, for the DRA, a characteristic five-year basis.

Zone 7 works closely with its retailers to develop the demand projection under "Sales to other agencies," which represents most of Zone 7's demand. The projected water demands provided are based on the Regional Demand Study, which Zone 7 prepared in coordination with its retailers. Zone 7 also develops projections for its direct retail customers, untreated water (agricultural) customers, and losses (i.e., unaccounted-for water) in its water supply system.

The primary goal of the Regional Demand Study was to develop a regional, land-use based water demand forecasting model that can be used for planning efforts, including this UWMP. Historically, the retailers have conducted independent demand forecasting, with Zone 7 using those forecasts to develop a regional forecast (after some adjustment). The Regional Demand Study developed a consistent method for estimating demands across the Tri-Valley region, while still considering the unique characteristics of each of Zone 7's retailers, including demographic data, historical water use, demand hardening patterns, and future projections for land use and population.

The Regional Demand Study forecasts demands by parcel, allowing Zone 7 and the retailers to analyze how current and near future developments may trigger changes in demand forecasts, as well as how changes in land use or unique demand management approaches may change the outcomes. General Plans, Specific Plans, and other current information on planned development (provided by the retailers and city planners) were incorporated as much as possible in the Regional Demand Study. The focus of the Regional Demand Study was developing an estimate of the demand at buildout, which is expected to occur around 2040. Demands for 2045 were assumed to be the same as in 2040. Note that the Regional Demand Study evaluated multiple scenarios; the Baseline Scenario was considered the most appropriate buildout demand scenario to use for planning purposes.

The Regional Demand Study provided a demand curve from present to buildout by interpolating data between 2019 and buildout. For this plan, Zone 7 is using a demand forecast that holds 2021 demands at 2020 levels, reflecting expected conservation in 2021 as a result of dry conditions, and incorporates the retailers' delivery requests for the years 2022 to 2025. Retailers submit their five-year delivery requests to Zone 7 annually, and these requests are the basis of Zone 7's contractual obligations. Demands for 2026 to 2039 are then linearly interpolated between the 2025 delivery request and the estimated Baseline Scenario demand at buildout developed in the Regional Demand Study. This method results in higher demands in the near term and is considered a more conservative approach for the period before buildout. Figure 4-1 compares the Regional Demand Study results with the demand forecast used in the 2020 UWMP.

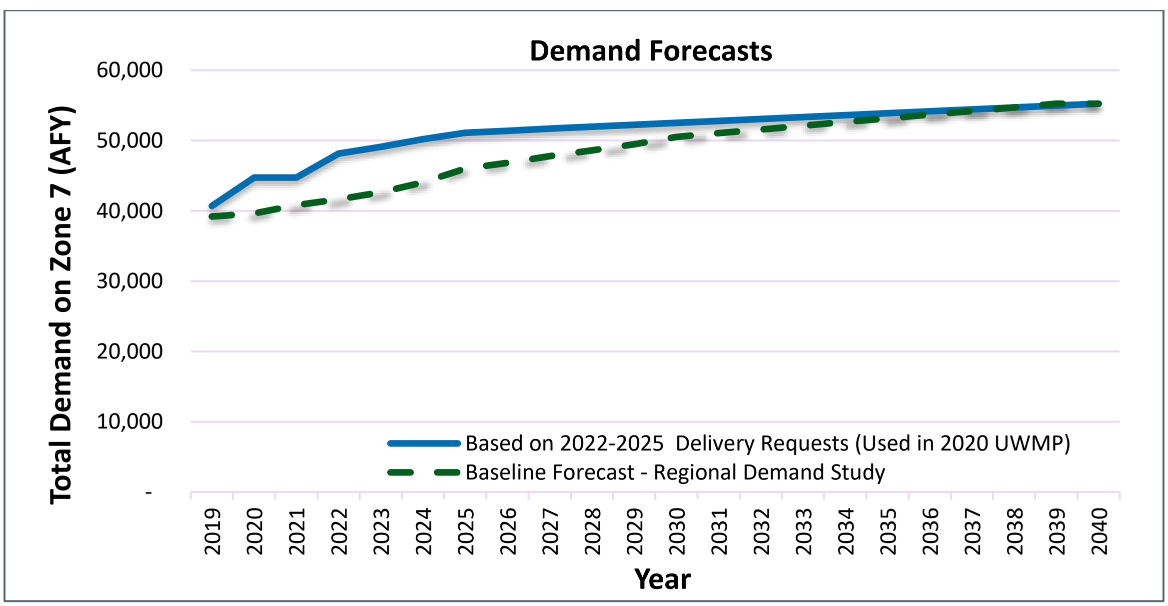

Figure 4-1. Comparison of Demand Forecasts

Uncertainty is inherent with any type of projection; the rate of increase of demands and the ultimate demands will be affected by economic and local development conditions, regulations (e.g., land use ordinances), technology (e.g., water efficiency of future appliances), consumer behavior, climate conditions, and other factors. The 2020 UWMP demand projections are lower than the 2015 UWMP projections due to continuing water conservation post-drought and the expectation that long-term conservation is necessary to meet regulations. Zone 7 will continue to re-evaluate demand trends annually.

4.2.2.1 25-Year Planning Horizon

Table 4-3 reports Zone 7's total projected potable and raw water demands through the year 2045. As noted above, retailer demand projections were developed using general plans and other land use information for each city in Zone 7's service area and adjusted to account for climate change, recycled water use, and expected conservation. Retailer demand projections also reflect the retailers' delivery requests from 2022 to 2025.

Table 4-4 summarizes Zone 7's actual and projected water use. Because Zone 7 does not provide recycled water supply for recycled water use, data is not provided for recycled water demand. Note that the demands shown in Table 4-3 include customer demands from Zone 7, as well as treatment and transmission system losses. Surplus water that goes into storage in the Kern County groundwater banks or additional water stored in the groundwater basin or SWP system in any given year is not reflected in Table 4-3.

Table 4-3. Use for Potable and Raw Water – Projected (DWR Table 4-2 Wholesale)

Use Type	Additional Description (as needed)	Projected Water Use * Report To the Extent that Records are Available				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool.		2025	2030	2035	2040	2045 (opt)
Sales to other agencies	Retailer Demand	43,000	43,200	43,400	43,700	43,700
Agricultural irrigation	Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Retail demand for use by suppliers that are primarily wholesalers with a small volume of retail sales	Direct Retail Demand	800	800	800	800	800
Losses		1,000	1,000	1,300	2,500	2,500
	TOTAL	50,300	52,800	53,800	55,300	55,300
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: Volumes are in AF.						

Table 4-4. Total Water Use (Potable and Non-Potable) (DWR Table 4-3 Wholesale)

	2020	2025	2030	2035	2040	2045 (opt)
Potable and Raw Water From Tables 4-1W and 4-2W	44,740	50,300	52,800	53,800	55,300	55,300
Recycled Water Demand* From Table 6-4W	0	0	0	0	0	0
TOTAL WATER DEMAND	44,740	50,300	52,800	53,800	55,300	55,300
**Recycled water demand fields will be blank until Table 6-4 is complete.*						
NOTES: Volumes are in AF. Zone 7 does not produce nor distribute recycled water directly. However, several retailers do provide recycled water in Zone 7's service area. Table references refer to DWR table numbers.						

4.2.2.2 Characteristic Five-Year Water Use

Water Code Section 10635(b) requires urban suppliers to include a five-year DRA in their UWMP. A key component of the DRA is estimating demands for the next five years (2021-2025) without drought conditions (i.e., unconstrained demand). Chapter 7 details the DRA, but the five-year demand projections are summarized in Table 4-5 by water use sector. The retailer demand forecast (i.e., sales other agencies) holds 2021 demands at 2020 levels, reflecting expected conservation in 2021 as a result of dry conditions, and incorporates the retailers' delivery requests for the years 2022 to 2025.

Table 4-5. Projected Water Demands for Drought Risk Assessment

Water Use Sector	Water Demands, AFY				
	2021	2022	2023	2024	2025
Sales to other agencies[(a)]	38,000	40,300	41,200	42,100	43,000
Agricultural irrigation	5,500	5,500	5,500	5,500	5,500
Retail demand for use by suppliers that are primarily wholesalers with a small volume of retail sales	700	800	800	800	800
Losses	1,000	1,000	1,000	1,000	1,000
Total[(b)]	**45,200**	**47,600**	**48,500**	**49,400**	**50,300**

(a) Retailer demand projections assume 2020 demand levels for the year 2021 and are based on retailer delivery requests for 2022-2025.
(b) Differences due to rounding.

4.3 DISTRIBUTION SYSTEM WATER LOSSES

As a wholesaler, Zone 7 is not required to perform water loss audits and reporting. However, Zone 7 monitors water loss and conducts audits for reliability planning and water demand projections.

The volume of water loss in Zone 7's transmission system for the previous five calendar years (2016-2020) is provided in Table 4-6. Note that the water loss for 2020 is unusually low, which may be related to the metering at the Del Valle Water Treatment Plant. Zone 7 continues to investigate metering accuracy to support improved management of water losses in the system.

Table 4-6. 12-Month Water Loss Audit Reporting (DWR Table 4-4 Wholesale)

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
01/2016	1,321
01/2017	2,022
01/2018	1,740
01/2019	632
01/2020	180

[1] *Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*
[2] ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes are in AF.

The State is currently developing standards for retailer water distribution system water loss. At this time, the standards have not yet been adopted.

4.4 CLIMATE CHANGE CONSIDERATIONS

Climate change may impact Zone 7's future water demand and use patterns. Warmer temperatures are expected to increase irrigation demand and lengthen the growing season. In addition, climate change may increase the frequency and intensity of wildfires, which would increase the fire industry's water demands. Increased water efficiency and conservation, along with expanded use of recycled water by Zone 7's retailers, could mitigate the effects of climate change on water demands.

The Regional Demand Study accounts for climate change by increasing outdoor water demands by 5 percent by 2040. This demand multiplier starts at 0 percent in 2020, increases linearly to 5 percent in 2040, and remains at 5 percent through 2045. As the actual impact of climate change on water use becomes clearer, this value can easily be updated in the model that informs the Regional Demand Study.

A general discussion regarding the potential impacts of climate change on Zone 7's water supplies is provided in Chapter 6.

CHAPTER 5
SB X7-7 Baseline, Targets, and 2020 Compliance

Since Zone 7 is a water wholesaler and serves only a small number of urban water users directly, it is not required to meet any water conservation targets associated with the Water Conservation Act of 2009. However, Zone 7 fully supports its water retailers in achieving their water conservation targets. This chapter details the extent of that support.

5.1 BACKGROUND

In November 2009, SB X7-7 was signed into law as part of a comprehensive water legislation package. The Water Conservation Act addressed both urban and agricultural water conservation. The legislation set a goal of achieving a 20 percent statewide reduction in urban per capita water use by December 31, 2020 (i.e., “20 by 2020”). To meet the urban water use target requirement, each retail supplier was required to determine its baseline water use, as well as its target water use for the year 2020.

Wholesale water suppliers like Zone 7 are not required to establish and meet baselines and targets for daily per capita water use, nor are wholesalers required to complete the SB X7-7 Compliance Forms; however, wholesale agencies are required to provide an assessment of present and proposed programs and policies that will help retail water suppliers achieve their SB X7-7 water use reduction targets. Chapter 9 of this plan details Zone 7’s programs and policies for water conservation and demand management.

5.2 ZONE 7 SUPPORT TO RETAILERS

Zone 7 fully supported the achievement of SB X7-7 water use reduction targets by its retailers. Zone 7 provides regional coordination of conservation programs, which include community workshops and other events, school education programs, and rebate and giveaway programs.

Zone 7’s Conservation Coordinator actively engages in various conservation-oriented regional and state organizations, including the CUWA and the California Water Efficiency Partnership (CalWEP). The Coordinator tracks conservation-related state legislation and local ordinances and integrates them into the Zone 7 conservation program development process to ensure timely compliance and achievement of conservation goals.

Zone 7 also fully supports the current and expanded use of recycled water in the Tri-Valley—resulting in lower consumption of potable water supplies—by updating the Salt Management Plan to address nutrient management and by supporting retailer grant applications for recycled water infrastructure funding. Additionally, Zone 7 has been working closely with its retailers in exploring potential options for expanding recycled water use beyond irrigation applications (i.e., potable reuse), as discussed in Chapter 6 (Section 6.2.9.1.3).

CHAPTER 6
Water Supply Characterization

This chapter describes the Zone 7's water supply portfolio, including purchased or imported water, groundwater, and other surface water supply. This section includes a description of each water source, limitations on each water source, storage, and water exchange opportunities. Zone 7's projects to increase water supply reliability are also discussed in this chapter.

6.1 WATER SUPPLY ANALYSIS OVERVIEW

Zone 7's water supplies are used to meet treated water demands from M&I customers (i.e., water retailers and direct retail customers) and untreated water demands from agricultural customers. Zone 7's existing incoming water supplies—or sources of new water in any given year—are all surface water supplies, delivered to the Tri-Valley via the SBA. These sources of incoming supplies are primarily comprised of SWP water (specifically Table A) and local water from Arroyo Valle captured in Lake Del Valle, as described in Section 6.2. Other potential sources of incoming supplies include surplus SWP water (i.e., Article 21 water), the Yuba Accord (a type of water transfer), and other water transfers.

In years of abundant supply, Zone 7 places water in storage both locally and outside its service area to prepare for future dry years, emergencies, and planned facility outages. Zone 7 typically reserves about 10,000 AF of SWP Table A water to carry over for use in the following year, with water stored in the SWP's San Luis Reservoir. Incoming supplies are also stored in the Livermore Valley Groundwater Basin through artificial recharge when excess surface water is available from the SWP. Finally, surplus water can be transferred to non-local storage in groundwater banks in Kern County (i.e., Semitropic Water Storage District and Cawelo Water District). Unused Arroyo Valle runoff is stored in Lake Del Valle for use during the following year. If needed during dry years, emergencies, or planned facility outages, stored water is released to meet demands.

On average, imported surface water directly provides 80 percent of the water that Zone 7 supplies, locally captured watershed runoff makes up on average 10 percent, and previously-imported supplies stored in the local groundwater basin make up the remaining 10 percent. Groundwater is not considered a separate source of water supply because Zone 7 only extracts groundwater that is recharged from surface water supplies as described in Section 6.2.2. Using the groundwater basin as a local storage reservoir is critical for long-term reliability in the Tri-Valley, as it does not rely on external conveyance facilities. Given the highly variable hydrology in California—and corresponding variable water supplies—the use of storage facilities, both local and outside of the Tri-Valley, is key to Zone 7's strategy for maintaining water supply system reliability.

Zone 7 is currently evaluating a number of local, regional, and statewide projects for improved water supply reliability and to meet additional water demands through buildout in the Tri-Valley as described in Section 6.2.9. A "portfolio" of these projects could provide additional water and/or storage to Zone 7's water supply system.

In addition to water provided by Zone 7, water supplies for the Tri-Valley are supplemented by additional groundwater pumping and recycled water. Two of the retailers, Cal Water and Pleasanton, pump groundwater under their Groundwater Pumping Quotas (3,069 AFY and 3,500 AFY, respectively), which supplement the potable water supply provided by Zone 7 in their respective service areas. DSRSD and Livermore produce recycled water to meet non-potable or irrigation water demands in the Tri-Valley.

In this chapter, the management of each supply in correlation with other supplies is discussed, along with the measures that Zone 7 has taken to acquire and develop additional sources of water and additional storage.

Anticipated availability of Zone 7's water supplies under a normal water year is provided in this chapter. The availability of Zone 7's water supplies under a single dry year and a drought lasting five years, as well as more frequent and severe periods of drought are described in detail in Chapter 7 of this UWMP, along with the basis of those estimates.

6.2 WATER SUPPLY CHARACTERIZATION

As described above, Zone 7's water supply has two major components: 1) incoming water supplies available through contracts and water rights each year, and 2) accumulated water supplies in storage derived from previous years. Incoming water supplies typically consist of annually allocated imported surface water supply and local surface water runoff. Accumulated or "banked" water supplies are available in local and non-local storage locations.

Three of Zone 7's retailers—DSRSD, Livermore, and Pleasanton—also produce and/or supply recycled water to their service areas; more details about recycled water are available in Section 6.2.6.1. Two retailers, Pleasanton and Cal Water, pump groundwater directly in addition to the water supply provided by Zone 7. DSRSD has a contract with Zone 7 wherein Zone 7 will pump groundwater on DSRSD's behalf.

To optimize use of its local resources, Zone 7 practices conjunctive use of the Livermore Valley Groundwater Basin, which is detailed in Section 6.2.2. Zone 7 also stores local runoff from the Arroyo Valle watershed in the local reservoir (Lake Del Valle), which is owned and operated by the DWR.

Two long-term water storage ("banking") agreements with agencies south of Zone 7's service area in Kern County (Semitropic Water Storage District and Cawelo Water District) provide additional flexibility in managing annual fluctuations in supplies. These agreements are described in Section 6.2.5.

To mitigate the risk associated with significant reliance on imported water supply, Zone 7 continues to develop local sources of water and to diversify its water supply portfolio. In April 2019, Zone 7 completed its 2019 WSE Update, a follow-up to its 2016 Water Supply Evaluation Update that documents Zone 7's current water supplies based on new information and experience gained since the 2012-2016 statewide drought. The 2019 WSE Update also evaluates various future water supply portfolios, which are discussed in Section 6.2.9.

In this section, Zone 7's water supplies and their management in relation with each other are described in detail. Zone 7's efforts to meet future water demands are also discussed.

6.2.1 Purchased or Imported Water

Purchased or imported water consists of SWP water and water transfers through the Yuba Accord and other agreements.

6.2.1.1 State Water Project (SWP)

Imported water from the SWP, which is owned and operated by DWR, is by far Zone 7's largest water source, providing over 80 percent of the treated water supplied to its customers on an annual average basis.

SWP water originates within the Feather River watershed, is captured in and released from Lake Oroville, and flows through the Delta before it is conveyed by the SBA to Zone 7 and two other water agencies (VW and ACWD). Much of the SWP water continues to southern California via the California Aqueduct. Lake Del Valle is part of the SWP's SBA system and is used for storage of SWP water, as well as local runoff.

At Zone 7, SWP water is directly used to meet treated water demands from M&I customers—primarily wholesale to water retailers and some direct retail customers—and untreated water demands from agricultural customers. It is also used to recharge the local groundwater basin, as discussed in Section 6.2.2, and to fill non-local groundwater storage in Kern County.

The following sections describe Zone 7's contract with DWR for SWP water and the types of water Zone 7 receives under this contract.

6.2.1.1.1 Contract with DWR

DWR provides water supply from the SWP to 29 SWP contractors, including Zone 7, in exchange for contractor payment of all costs associated with providing that supply. DWR and each of the contractors entered into substantially uniform long-term water supply SWP contracts in the 1960s with 75-year terms. The first set of contracts originally terminated in 2035, and most of the remaining contracts terminated within three years after that. Zone 7's original contract was executed in 1961 and was set to expire in 2036. Over the last few years, there have been a number of key amendments to the SWP contracts, as described below:

- ***Contract Extension***

  The majority of the capital costs associated with the development and maintenance of the SWP is financed using revenue bonds. These bonds have historically been sold with 30-year terms. It has become more challenging in recent years to affordably finance capital expenditures for the SWP because bonds used to finance these expenditures are limited to terms that only extend to the year 2035, significantly less than 30 years from 2021. To ensure continued affordability of debt service to SWP contractors, it was necessary to extend the termination date of the contracts to allow DWR to continue to sell bonds with 30-year terms ("Water Supply Contract Extension Project").

  Public negotiations to extend the SWP contracts took place between DWR and the SWP contractors during 2013 and 2014. An Agreement in Principle (AIP) was reached and was the subject of analysis under the requirements of the California Environmental Quality Act (CEQA) (Notice of Preparation dated September 12, 2104). On December 11, 2018, the DWR Director approved the Water Supply Contract Extension Project. On January 18, 2019, DWR and Zone 7 agreed to extend the SWP water supply contract to at least December 31, 2085 ("Extension Amendment"). In accordance with CEQA, DWR also filed its Notice of Determination for the project with the Governor's Office of Planning and Research. In addition, DWR filed an action in Sacramento County Superior Court to validate the Contract Extension Amendments. The Extension Amendment is currently the subject of the validation action and two CEQA lawsuits. As of late March 2021, DWR and 22 SWP contractors have executed the Extension Amendment.

- ***Water Management Tools***

  In a December 2017 Notice to Contractors, DWR indicated its desire to supplement and clarify the water management tools in the SWP contracts through this public process. Seeking greater flexibility to manage the system in order to address changes in hydrology and further constraints placed on DWR's SWP operations, DWR and SWP contractors conducted public negotiations in 2017 to improve water management tools under a new amendment to the SWP contracts ("WMT Amendment"). The goal of the negotiations was to develop concepts to supplement and clarify the existing SWP contracts' water transfer and exchange provisions to provide improved water management amongst the SWP contractors.

  In June 2018, the SWP contractors and DWR completed an AIP, which included specific principles to accomplish this goal. These principles included adding contract language to include a process for transparency for transfers and exchanges. The principles also include amending existing contract provisions to provide new flexibility for single and multi-year non-permanent water transfers, allowing SWP contractors to set terms of compensation for transfers and exchanges, and providing for the limited transfer of non-Table A SWP water.

  In October 2018, a Draft Environmental Impact Report (DEIR) was circulated for the WMT Amendment. The AIP at that time included cost allocation for the California WaterFix project (WaterFix), a project aimed at improving conveyance of SWP water through the Delta. In early 2019, the Governor decided not to move forward with WaterFix, and DWR rescinded its approvals for WaterFix. After this shift, the SWP contractors and DWR held a public negotiation session and agreed to remove the WaterFix cost allocation sections from the AIP, while maintaining the water management provisions. The AIP for water management provisions was finalized on May 20, 2019. In February 2020, DWR amended and recirculated the Partially Recirculated DEIR for the State Water Project Supply Contract Amendments for Water Management and, in August 2020, DWR certified the Final EIR. The EIR is being challenged in court; however, the WMT Amendment became effective on February 28, 2021 for the SWP contractors that approved the amendment, including Zone 7. The enhanced ability to transfer and exchange SWP water will be available during litigation unless there is a final court order prohibiting its implementation.

- ***Delta Conveyance Project***

  The third set of amendments to the SWP contracts would allocate Delta Conveyance Project costs and benefits among the SWP contractors. The Delta Conveyance Project is the current DWR project designed to address the need for alternative conveyance in the Delta to reliably deliver SWP supplies. It replaces the WaterFix project and is described in more detail in Section 6.2.9.1.2. Public negotiations between DWR and the SWP contractors for the Delta Conveyance Project began in 2019 and were completed in April 2020. These negotiations led to an AIP for an Amendment to the State Water Contract regarding the Delta Conveyance Project. The AIP's goal was to equitably allocate costs and benefits of a Delta Conveyance Project and to preserve SWP operational flexibility. A decision by each participating SWP contractor for approving a contract amendment with DWR would not occur until after the environmental review for the Delta Conveyance Project is completed. That decision would likely occur in 2023, at the earliest.

6.2.1.1.2 SWP Supplies

The following sections describe the types of water available to Zone 7 from the SWP.

6.2.1.1.2.1 Table A Allocation

Each SWP contractor is limited to a maximum annual contract amount as specified in Article 6(c) and Table A of the SWP Contract; this amount is therefore commonly referred to as "Table A." As noted above, Zone 7 first entered into the SWP Contract in November 1961; as the SWP was expanded and as Zone 7 demands increased over the years, Zone 7's Table A amount was increased, reaching the amount of 46,000 AFY in 1997. Since then, Zone 7 has increased its supply from the SWP through a series of five permanent transfers. In December 1999, Zone 7 secured Table A SWP allocations from Lost Hills Water District of 15,000 AFY and Berrenda Mesa Water District of 7,000 AFY. In December 2000, 10,000 AFY of SWP allocation from Belridge Water Storage District was acquired. An additional 2,219 AFY was obtained from the same source in October 2003. Finally, 400 AFY of water was acquired from the Tulare Lake Basin Water Storage District in 2003. Together, these transfers have raised Zone 7's current Table A allocation to 80,619 AFY.

In practice, the actual amount of SWP water available to Zone 7 under the Table A allocation process (presented as % Table A) varies from year to year due to hydrologic conditions, water demands of other contractors, existing SWP stored water, SWP facility capacity, and environmental/regulatory requirements. The Table A allocation is typically less than 100% of the Table A amount. SWP reliability is defined based on the long-term average Table A allocation. DWR prepares a biennial report to assist SWP contractors and local planners in assessing the availability of supplies from the SWP. DWR issued its most recent update, the Final 2019 State Water Project Delivery Capability Report (2019 DCR)[6], in August 2020. In this update, DWR provides SWP supply estimates for SWP contractors to use in planning efforts, including the 2020 UWMP. The 2019 DCR includes DWR's estimates of SWP water supply availability under both existing (2020) and future conditions (2040).

DWR's estimates of SWP deliveries are based on a computer model that simulates monthly operations of the SWP and Central Valley Project systems. Key inputs to the model include system facilities, hydrologic inflows to the system, regulatory and operational constraints on system operations, and contractor demands for SWP water. In conducting its model studies, DWR must make assumptions regarding each of these key inputs.

In the 2019 DCR model for existing (2020) conditions, DWR assumed: existing facilities, hydrologic inflows to the model based on 82 years of historical inflows (1922 through 2003), current regulatory and operational constraints, and contractor demands at maximum Table A amounts. Note that the regulatory and operational constraints include the 2018 Coordinated Operations Agreement (COA) Amendment, 2019 Biological Opinions, and 2020 Incidental Take Permit. The 2018 COA Amendment lays out the terms under which the CVP operates with the SWP. The 2019 Biological Opinions for the Long-Term Operation of the CVP and SWP reflect the federal government's (U.S. Fish and Wildlife Service) opinion as to whether or not the operation of the CVP and SWP is likely to jeopardize the continued existence of threatened and endangered species or result in the destruction or adverse modification of critical habitat. Finally, the 2020 Incidental Take Permit is a requirement for the SWP's California Endangered Species Act (CESA) compliance with regards to state-protected longfin smelt and state- and federally-protected delta smelt, winter-run Chinook, and spring-run Chinook.

[6] Department of Water Resources, 2020. *State Water Project Delivery Capability Report 2019*.

To evaluate SWP supply availability under future conditions, the 2019 DCR included a model study representing hydrologic and sea level rise conditions at 2040. The future condition study used all of the same model assumptions as the study under existing conditions but reflected changes expected to occur from climate change, specifically, projected temperature and precipitation changes centered around 2035 (2020 to 2049) and a 45 centimeter (cm) sea level rise.

For Zone 7's Table A supply, the 2019 DCR's existing condition was assumed to represent 2020 (59% Table A reliability, 47,600 AFY)[7], and the future condition (54% Table A reliability, 43,500 AFY)[7] was applied to 2040; the years in between were interpolated between these two bookends[8]. Note that the effect of the proposed Delta Conveyance Project on SWP water supply yield is still being analyzed and has not been included.

As a SWP contractor, Zone 7 has the option to store unused Table A water from one year to the next in the SWP's San Luis Reservoir, when there is storage capacity available. This "carryover" water is also called Article 12e or 56c water, in reference to the relevant contract terms. Article 12e water must be taken by March 31 of the following year, but Article 56c water may remain as carryover as long as San Luis Reservoir storage is available. The analysis in this UWMP assumes Zone 7 carries over 10,000 AF of water each year on average.

6.2.1.1.2.2 Article 21 Water (Interruptible or Surplus Water)

Under Article 21 of Zone 7's SWP contract, Zone 7 also has access to excess water supply from the SWP that is available only if: 1) it does not interfere with SWP operations or Table A allocations, 2) excess water is available in the Delta, and 3) it will not be stored in the SWP system. As described in the 2019 DCR, Article 21 water deliveries are highly variable. This water becomes available during short time windows in the wet season when there is excess water in the system (due to storms) that DWR cannot store in San Luis Reservoir. When Article 21 water becomes available, SWP contractors can request delivery, and the available water is distributed generally in proportion to the Table A contract amounts of those contractors requesting delivery. Delivery of Article 21 water requires accessible storage during very wet conditions and/or the ability to use the water directly without impacting Table A deliveries to Zone 7. Historically, these conditions have been difficult to meet for Zone 7 and have resulted in infrequent and low yields. ***Therefore, Zone 7 is not assuming any water supply yield from Article 21 at this time.*** As Zone 7 develops the Chain of Lakes project, which will increase Zone 7's local storage and ability to capture Article 21 water as described in Section 6.2.9.3.1, Zone 7 will re-evaluate the potential increase in Article 21 yield.

6.2.1.1.2.3 Article 56d Water (Turnback Pool Water)

Article 56d is a contract provision that allows SWP contractors with unused Table A water to sell that water to other SWP contractors via a "turnback pool" administered by DWR on an annual basis. Historically, only a few SWP contractors have been able to make turnback pool water available for purchase, particularly in normal or dry years.

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[7] Data for Existing and Future conditions were derived from Table 8 of the AltSWPReporting_Existing_DCR2019.xlsm and AltSWPReporting_Future_DCR2019.xlsm files, respectively, provided by DWR as addenda to the 2019 DCR.

[8] For comparison, the 2015 UWMP assumed 62% Table A reliability (50,000 AFY). The 2019 WSE Update assumed 49% Table A reliability (39,500 AF). Table A allocations over the last ten years have ranged between 5% and 85%, with an average of 48%.

With the enhanced ability to directly transfer or exchange SWP water from one SWP contractor to another under the Water Management Tools contract amendment described earlier, it is expected that there will not be much water available under Article 56d in the future. ***Zone 7 is therefore assuming no supplies are available from this source under normal conditions.***

6.2.1.1.3 Yuba Accord

In 2008, Zone 7 entered into a contract with DWR to purchase additional water under the Lower Yuba River Accord (Yuba Accord). The original contract expires in 2025, and several amendments have been made to the original agreement over the years, including a new pricing agreement executed in 2020.

There are four different types ("Components") of Yuba Accord water made available as a water purchase or transfer; Zone 7 has the option to purchase Components 1, 2, and 3 water during drought conditions, and Component 4 water when the Yuba County Water Agency has determined that it has water supply available to sell.

Water is primarily available during dry years under the Yuba Accord, and the amount is highly variable: 400 AF in 2014, approximately 300 AF in 2015, and 3,000 AF in 2020. ***For planning purposes, Zone 7 currently does not assume any water supply yield specifically from the Yuba Accord, although 'water transfers' (see Section 6.2.8) could potentially include any supplies from the Yuba Accord.***

6.2.2 Groundwater

Zone 7 has managed local surface water and groundwater resources for beneficial uses in the Livermore Valley Groundwater Basin for more than 50 years. Consistent with its management responsibilities, duties, and powers, Zone 7 is designated in the 2014 SGMA as the exclusive Groundwater Sustainability Agency (GSA) within its jurisdictional boundaries.

6.2.2.1 Basin Description

Zone 7 overlies the Livermore Valley Groundwater Basin; the Main Basin is the portion of the Basin that contains high-yielding aquifers and generally the best-quality groundwater. Figure 6-1 provides a map of the Basin, identifying the Main Basin and sub-basins. More detailed descriptions of the Basin and Main Basin are available in Zone 7's Groundwater Management Plan (GMP)[9]. The associated Annual Report for the 2019 Water Year[10] is also available online.

As defined in DWR Bulletin 118 Update 2003 (California's Groundwater), the Basin (DWR Basin 2-10) extends from the Pleasanton Ridge east to the Altamont Hills and from the Livermore Uplands north to the Tassajara Uplands. The Basin is not adjudicated, and DWR has identified it as medium priority; Basin 2-10 is not identified as either in overdraft or expected to be in overdraft. Surface drainage features include Arroyo Valle, Arroyo Mocho, and Arroyo Las Positas as principal streams, with Alamo Creek, South San Ramon Creek and Tassajara Creek as minor streams. All streams converge on the west side of the basin to form Arroyo de la Laguna, which flows south and joins Alameda Creek in Sunol Valley and ultimately drains to the San Francisco Bay. Some geologic structures restrict the lateral movement of

[9] Jones & Stokes, 2005. Groundwater Management Plan for Livermore-Amador Valley Groundwater Basin.

[10] Zone 7 Water Agency, 2020. Annual Report for the Groundwater Management Program 2019 Water Year.

groundwater, but the general groundwater gradient is from east to west, towards Arroyo de la Laguna, and from north to south along South San Ramon Creek and Arroyo de la Laguna.

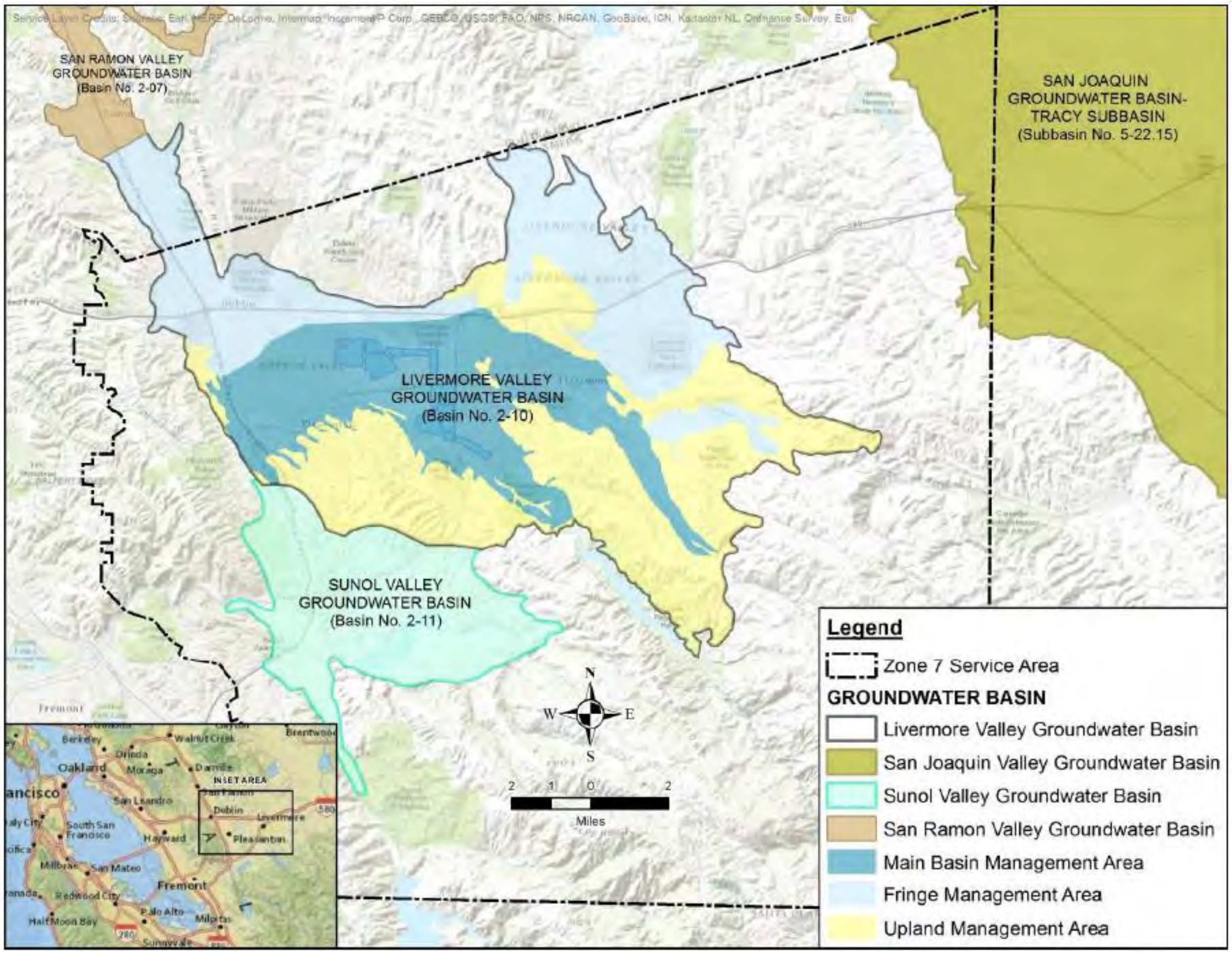

Figure 6-1. Livermore Valley Groundwater Basin

The entire floor of the Livermore Valley and portions of the upland areas on all sides of the valley overlie groundwater-bearing materials. The materials are mostly continental deposits from alluvial fans, outwash plains, and lakes. They include valley-fill materials, the Livermore Formation, and the Tassajara Formation. Under most conditions, the valley-fill and Livermore Formation yield adequate to large quantities of groundwater to all types of wells, with the larger supply wells being in the Main Basin. The Main Basin is composed of the Castle, Bernal, Amador, and Mocho II sub-basins, with an estimated total storage capacity of 254,000 AF.

6.2.2.2 Groundwater Management

The 2005 GMP[9] documented all of Zone 7's then-current groundwater management policies and programs and was developed to satisfy the requirements set forth in the California Groundwater Management Planning Act (Water Code Sections 10750, *et seq*.). More recently, a Salt and Nutrient Management Plan has been incorporated into the GMP. Zone 7 prepares annual reports that summarize the results of the groundwater monitoring, evaluation, and management efforts by water year; the most recent version of the annual report is for the 2019 water year (October 1, 2018 through September 30, 2019). In addition to the annual reports completed over the years, Zone 7 completed the Alternative Groundwater Sustainability Plan for the Livermore Valley Groundwater Basin (Alternative GSP) in 2016 as required under SGMA.

For Zone 7's operations, the Main Basin is considered a storage facility and not a long-term water supply, because Zone 7 does not have access to naturally recharged water ("sustainable yield"). Zone 7 only pumps groundwater that has been artificially recharged with surface water supplies. As part of this conjunctive use program, Zone 7's policy is to maintain groundwater levels above historic lows in the Main Basin to minimize the risk of inducing land subsidence. Currently, this is accomplished by releasing SWP water to the arroyos for percolation and replenishment of the aquifers and by managing pumping activities.

Zone 7 established historic lows based on the lowest measured groundwater elevations in various wells in the Main Basin. The difference between water surface elevations when the Main Basin is full and water surface elevations when the Main Basin is at historic lows defines Zone 7's operational storage. Of the estimated total storage capacity of 254,000 AF, operational storage is about 126,000 AF based on Zone 7's experience operating the Main Basin, with the remaining 128,000 AF considered emergency reserve storage.

6.2.2.2.1 Groundwater Level Monitoring and Storage Estimates

Zone 7 routinely monitors groundwater levels within the Main Basin. Some of the data collected is submitted to DWR under the California Statewide Groundwater Elevation Monitoring (CASGEM) program. All the data is reflected in the annual reporting on the Groundwater Management Program.

Two independent methods are used to estimate groundwater storage: 1) Hydrologic Inventory, and 2) Nodal Groundwater Elevation. The Hydrologic Inventory method computes storage change each quarter from basin supply and demand data; this method can also be used to forecast future water storage conditions. The Nodal Groundwater Elevation method computes storage from hundreds of water level measurements. Zone 7 continues to refine the calculation methods; the average of the two results is generally used as the estimate of total groundwater storage volume.

Figure 6-2 depicts Main Basin storage levels calculated using the average of these two methods in thousand acre-feet (TAF). Note the declines in storage due to drought, particularly between 1987 and 1992 and more recently between 2012 and 2015. Stored groundwater at the end of the 2020 water year was approximately 240,000 AF, with 112,000 AF of groundwater available as operational storage.

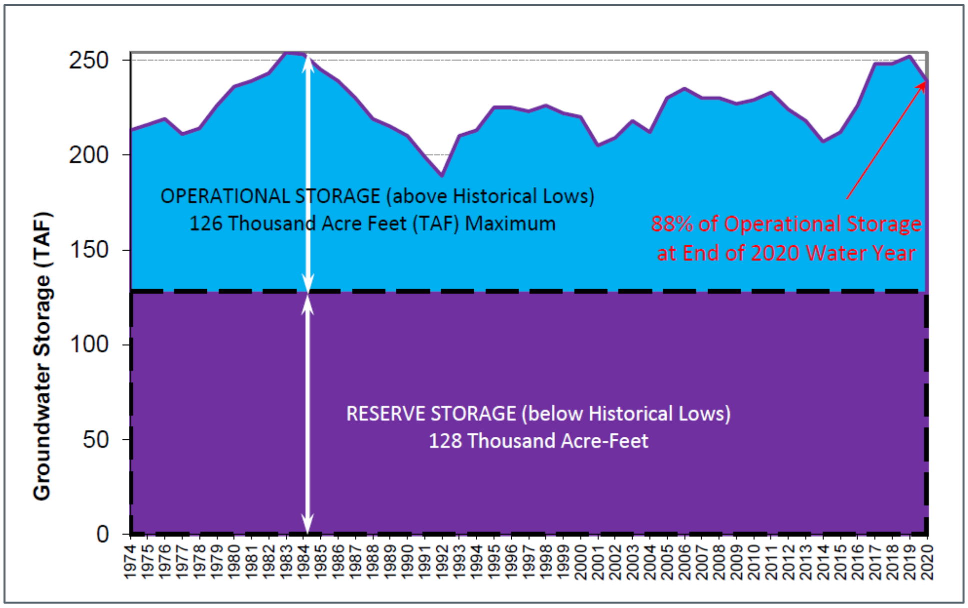

Figure 6-2. Main Basin Groundwater Storage

6.2.2.2.2 Current Sustainable Yield and Groundwater Allocation

Long-term natural sustainable yield is contractually defined as the average amount of groundwater annually replenished by natural recharge in the Main Basin—through percolation of rainfall, natural stream flow, and irrigation waters, and inflow of subsurface waters—and which can therefore be pumped without lowering the long-term average groundwater volume in storage. In contrast, "artificial recharge" is the aquifer replenishment that occurs from artificially induced or enhanced stream flow. With artificial recharge, more groundwater can be sustainably extracted from the Main Basin each year. Zone 7 only uses groundwater that has been artificially recharged by Zone 7.

The natural sustainable yield of the Main Basin has been determined to be about 13,400 AFY, which is about 11 percent of the operational storage. This long-term natural sustainable yield is based on over a century of hydrologic records and projections of future recharge conditions. Table 6-1 summarizes how this sustainable yield is allocated among non-Zone 7 groundwater users.

Each retailer has an established "Groundwater Pumping Quota" (GPQ), formerly referred to as the "Independent Quota" in the original Municipal and Industrial water supply contract between Zone 7 and each retailer. Pleasanton and Cal Water pump their own GPQ, while Zone 7 pumps DSRSD's GPQ. Livermore has not had any groundwater pumping capability for many years and has therefore not been using their GPQ. Averages are maintained by allowance of "carryover"—limited to 20 percent of the GPQ—when less than the GPQ is used in a given year. A retailer must pay a "recharge fee" for all groundwater pumped exceeding their GPQ and any carryover. This practice helps avoid a repeat of historical over-drafting of the basin by the larger municipal users. The fee covers the cost of importing and recharging additional water into the Main Basin. The balance of the natural sustainable yield is pumped for other municipal, agricultural, and gravel mining uses.

Table 6-1. Natural Sustainable Yield Demand Components

Demand Component of the Sustainable Yield	Sustainable Average, AFY
Pleasanton	3,500
Cal Water	3,069
DSRSD	645
Retailer Subtotal[(a)]	**7,214**
Other groundwater pumping[(b)]	1,186
Agricultural pumping	400
Mining area losses[(c)]	4,600
Total	**13,400**

(a) Based on calendar year. Livermore has a GPQ of 31 AF, but it has not been used for many years.
(b) For drinking water supply.
(c) Includes mining area evaporation, discharges that are diverted to arroyos and flow out of the Main Basin area, and losses incurred during gravel production and export.

Zone 7's groundwater extraction for its treated water system does not use the natural sustainable yield from the Main Basin; instead, Zone 7 pumps only water that has been recharged as part of its artificial recharge program using its available surface water supplies. During high demand periods, groundwater is used to supplement surface water supply delivered via the SBA. Groundwater is also used when the SBA is out of service due to maintenance and improvements or when Zone 7’s surface water treatment plants are operating under reduced capacity due to construction, repairs, etc. Finally, Zone 7 taps into its stored groundwater under emergency or drought conditions, when there may be insufficient surface water supply available. Zone 7 also pumps groundwater out of the Main Basin during normal water years to help reduce the salt loading in the Main Basin in accordance with the Salt Management Plan.

The MGDP has been in operation since 2009 to achieve additional salt removal. During emergency or drought conditions, MGDP operations may be reduced to maximize available water supply and avoid water loss due to brine disposal from the MGDP, as discussed in Section 3.1.3.4.

Table 6-2 presents Zone 7’s groundwater pumping over the last five years. On average, Zone 7 plans to recharge about 9,200 AFY in the future, which means Zone 7 can pump an equivalent 9,200 AFY from the Main Basin on average as indicated in Table 6-3.

Table 6-2. Groundwater Volume Pumped (DWR Table 6-1 Wholesale)

☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☑	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
Alluvial Basin	Livermore Valley Groundwater Basin	1,871	4,859	5,691	10,433	12,400
	TOTAL	1,871	4,859	5,691	10,433	12,400
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: Volumes are in AF. Zone 7 pumps only water that has been recharged as part of its artificial recharge program using its surface water supplies. Actual groundwater used as supply is lower than the total groundwater volume pumped shown in the table because of demineralization losses at the MGDP.						

Table 6-3. Actual and Projected Artificial Recharge and Groundwater Extraction during Normal Water Years[a]

Volume, AF	Actual	Projected (Normal Years)				
	2020	2025	2030	2035	2040	2045
Artificial Recharge	1,400	9,200	9,200	9,200	9,200	9,200
Groundwater Extraction	12,400[b]	9,200	9,200	9,200	9,200	9,200
Net Change	**-11,000**	**0**	**0**	**0**	**0**	**0**

(a) Zone 7 does not use the Main Basin's natural sustainable yield, so it only pumps what it artificially recharges.
(b) Actual groundwater extracted in 2020 includes 600 AF of demineralization losses at the MGDP.

6.2.2.2.3 Artificial Recharge and Groundwater Extraction by Zone 7

Before the construction of the SWP in the early 1960s, groundwater was the sole water source for the Livermore-Amador Valley. This resource has gone through several periods of extended withdrawal and subsequent recovery. The Main Basin was over drafted in the 1960s when approximately 110,000 AF of groundwater was extracted. The Main Basin was allowed to recover from 1962 to 1983. It was during this era that Zone 7 first conducted a program of groundwater replenishment by recharging imported surface water via its streams or arroyos ("in-stream recharge" or "artificial recharge") for storage in the Main Basin, supplying treated surface water to customers to augment groundwater supplies, and regulating municipal pumping by other users.

Figure 6-3 shows Zone 7's total annual artificial recharge amounts, pumping amounts, and cumulative net impacts to operational storage from the 1974 water year to the 2020 water year. Zone 7's operational policy is to maintain the balance between the combination of natural and artificial recharge and withdrawal or pumping to maintain groundwater levels above the emergency reserve storage. Zone 7 has generally been able to pump as much groundwater as it has needed to over the last five years; however, during the recent drought, decreases in groundwater elevation did noticeably affect the production of certain wells. Zone 7 is continuing to study the groundwater basin and developing new tools (such as an improved groundwater model) to better understand the levels of groundwater extraction possible under various conditions and contributing factors such as groundwater connectivity, spatial distribution of groundwater in the Main Basin, and others.

Since 1974, Zone 7 has artificially recharged over 67,000 AF more water than it has pumped, helping to offset demands and keep the Main Basin's groundwater levels above the historical lows. Between 1974 and 2007 Zone 7 had artificially recharged approximately 70,000 AF more than it had pumped during that same time; however, since 2007, Zone 7 has artificially recharged about 3,000 AF less than it has pumped, primarily due to construction work on the SBA, recent drought conditions, and lower-than-average SWP allocations over that same time period. Overall net groundwater storage remains significantly above historical lows, as shown on Figure 6-2.

Zone 7 plans to augment its current groundwater in-stream recharge capacity with off-stream recharge using the future Chain of Lakes, which is described further in Section 6.2.9.

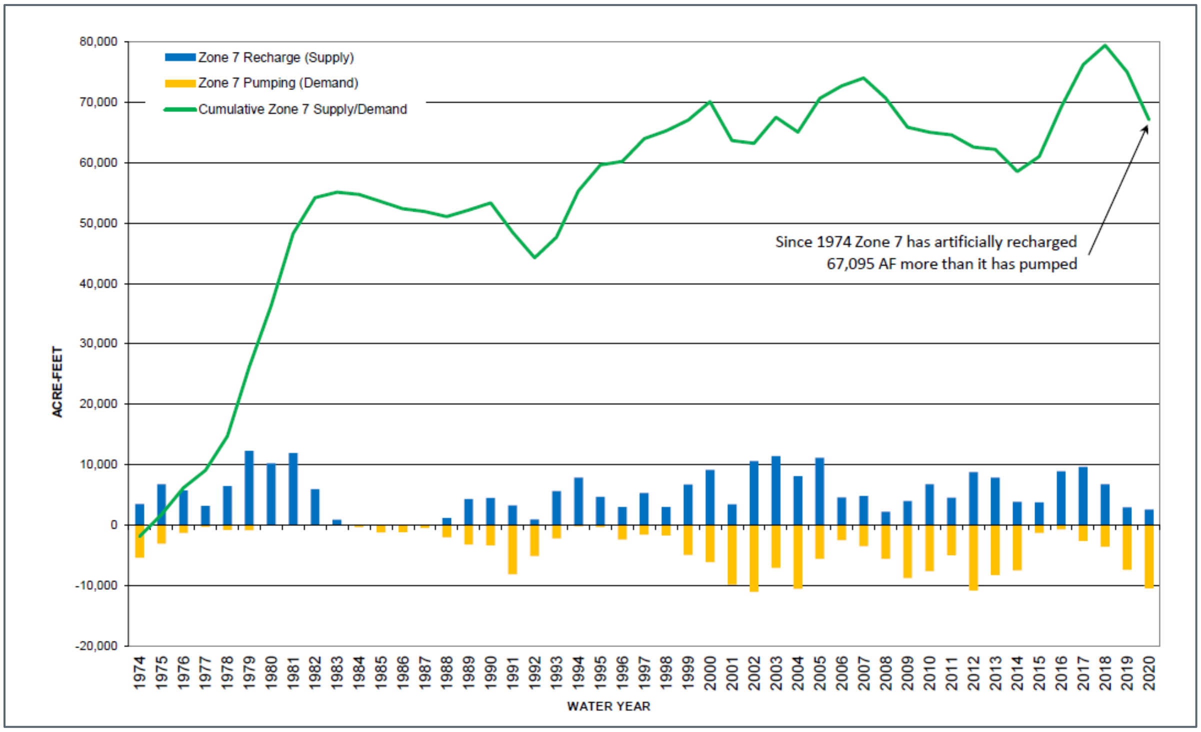

Figure 6-3. Artificial Recharge, Pumping, and Net Cumulative Impacts to Operational Storage

6.2.2.2.4 Groundwater Quality Monitoring and Protection

In general, the Main Basin contains good-quality groundwater that meets all state and federal drinking water standards; groundwater is chloraminated to match the disinfectant residual in the transmission system. Zone 7 has several groundwater wells with naturally-occurring hexavalent chromium (Cr(VI)) concentrations near the Maximum Contaminant Level (MCL) and polyfluoroalkyl substances (PFAS) above the notification limit. In response, Zone 7 is actively managing flows from the affected wells. For example, Cr(VI) levels at the Stoneridge well is being managed through system blending and/or blending with other wells. Also, the PFAS levels in the Mocho 2 well currently require blending with the other wells in that wellfield and/or being sent through the MGDP. These conditions are being monitored and may change in the future.

Over the last few decades, there has been a slow degradation of groundwater quality as evidenced by rising TDS and hardness levels. To address this problem, Zone 7 developed a Salt Management Plan[11] (SMP), which was approved by the Regional Water Quality Control Board (RWQCB) in 2004, satisfying a condition of the Master Water Recycling Permit. The SMP was incorporated into Zone 7's GMP in 2005. Salinity levels are being addressed primarily through groundwater pumping and demineralization[12]. Zone 7 completed construction of the 6.1-MGD MGDP in 2009 in the Mocho wellfield. The facility simultaneously allows for the removal and export of concentrated minerals or salts from the Main Basin and the delivery of treated water with reduced TDS and hardness levels to Zone 7's customers. Table 6-4 lists the average TDS and hardness for each year from 2016 through 2020.

[11] Zone 7 Water Agency, 2004. Salt Management Plan.

[12] The brine concentrate resulting from the treatment system is exported to the San Francisco Bay via a regional wastewater export pipeline.

Table 6-4. Groundwater Quality: TDS and Hardness (2016-2020)		
Year	Total Dissolved Solids (TDS), mg/L	Hardness, mg/L
2016	685	416
2017	673	395
2018	673	409
2019	687	417
2020	683	433

Zone 7 implements a wastewater and recycled water monitoring program as part of the GMP. In the 2020 water year, about 14 percent (1,036 AF) of the recycled water produced in the Tri-Valley area was applied to landscapes over the Main Basin; the remainder was applied on areas outside of the Main Basin, primarily on areas overlying the Dublin and Camp fringe basins and the Tassajara uplands. There is also a small amount of untreated wastewater (681 AF in the 2020 water year) that is discharged to the Main Basin as leachate from wastewater treatment ponds located in southern Livermore, from onsite domestic wastewater systems (septic systems), and from leaking wastewater and recycled water pipelines that run throughout the Basin.

Nitrates and salinity have historically been the primary water quality constituents-of-concern in wastewater and recycled water, but nitrates have become less of a concern since 1995, when the Livermore Water Reclamation Plant—which, along with DSRSD's Regional Wastewater Treatment Facility, is one of the two wastewater treatment facilities in the area feeding into recycled water facilities—reduced nitrates in its effluent. Salinity is addressed by the SMP, as discussed above. In 2015, Zone 7 completed a Nutrient Management Plan (NMP)[13], which provides an assessment of the existing and future groundwater nutrient concentrations relative to the current and planned expansion of recycled water projects and future development in the Livermore Valley. The NMP also presents planned actions for addressing positive nutrient loads and high groundwater nitrate concentrations in localized Areas of Concern where the use of septic systems is the predominant method for sewage disposal. The NMP was prepared as a supplement to the SMP; together, they are a Salt and Nutrient Management Plan (SNMP), which has been incorporated into the GMP and Alternative GSP.

Under the Toxic Sites Surveillance Program, Zone 7 documents and tracks polluted sites across the groundwater basin that pose a potential threat to drinking water and interfaces with lead agencies to ensure that the Main Basin is protected. Information is gathered from state, county, and local agencies, as well as from Zone 7's well permitting program and the State Water Resources Control Board's GeoTracker website and compiled in a geographic information systems (GIS) database. In general, there are two types of spills potentially threatening the Livermore Valley Groundwater Basin: petroleum-based fuel products and industrial chemical contaminants. In the 2020 water year, Zone 7 tracked the progress of 56 active sites where contamination has been detected in groundwater or is threatening groundwater. More details on the affected sites and their remediation can be found in the annual report.[14]

[13] Zone 7 Water Agency, 2015. Nutrient Management Plan – Livermore Valley Groundwater Basin.

[14] Zone 7 Water Agency, 2020. Annual Report for the Sustainable Groundwater Management Program 2019 Water Year.

6.2.2.2.5 Land Surface Elevation Monitoring Program

Previously, Zone 7's Land Surface Elevation Monitoring Program involved contracting with a licensed land surveyor to measure land surface elevations within the Main Basin boundary twice per year. The program included a network of approximately 40 elevation benchmarks encompassing Zone 7's production wellfields and spanning the Bernal and Amador Subareas within the Main Basin.

In the 2016 water year, Zone 7 contracted with TRE Altamira (TRE) to evaluate Interferometric Synthetic Aperture Radar (InSAR) as an alternative to land surveying for subsidence monitoring. TRE analyzed InSAR data from three different satellites over a 24-year period (from 1992 to 2016) which included approximately 120 satellite images with between 415 and 1,202 measuring points per square mile. Each measuring point contains a deformation time series, including cumulative displacement, average deformation rate, acceleration, and seasonal amplitude. The study results correlated well with topographic surface measurements taken by land surveys within the same time period. An added benefit of the InSAR dataset was that it included a larger area (i.e., the entire Main Basin) than the land surveying.

Starting in the 2019 water year, Zone 7 retired the land surveying program and transitioned to InSAR for monitoring land subsidence. In general, observed land surface elevation changes between September 2018 to September 2019 near Zone 7's municipal wells were within the range Zone 7 considers to be "elastic deformation" (i.e., rebound to their original location when groundwater levels return to previous levels).

6.2.3 Surface Water – Arroyo Valle

Zone 7, along with ACWD, has a water right (Permit 11319 [Application 17002]) to divert flows from Arroyo Valle. Runoff from the Arroyo Valle watershed above Lake Del Valle is stored in the lake, which is managed by DWR as part of the SWP. Lake Del Valle also stores imported surface water deliveries from the SWP and serves both a flood control function, as well as a recreational one. In late fall, DWR typically lowers lake levels in anticipation of runoff from winter storm events. Water supply in Lake Del Valle is made available to Zone 7 via the SBA through operating agreements with DWR. Inflows to Lake Del Valle, after accounting for permit conditions, are equally divided between ACWD and Zone 7 under their respective permits.

Zone 7's latest modeling forecasts future average yields from Arroyo Valle to Zone 7 at approximately 5,500 AFY, using historical hydrology adjusted for climate change impacts. Previous planning documents, including the 2015 UWMP, assumed an average yield of 7,300 AFY, and the ten-year calendar year average (2011-2020) has been 3,500 AFY. Construction of the Chain of Lakes Arroyo Valle diversion structure and pipeline (discussed in Section 6.2.9) will allow Zone 7 to capture more of the storm releases from Lake Del Valle and will likely increase the yield from this water supply in the future. The conservative average yield estimate of 5,500 AFY is consistent with the 2019 WSE Update; it will be re-evaluated as more climate change downscaled information is developed and as the Chain of Lakes projects progress.

6.2.4 Stormwater and Local Storage

Zone 7 has two existing local storage options: Lake Del Valle and the Main Basin. Lake Del Valle stores both runoff from the Arroyo Valle watershed and imported surface water deliveries from the SWP. Zone 7 can store up to about 7,500 AF of its share of Arroyo Valle runoff in the lake; runoff collected in any given year is required to be delivered to Zone 7 by the end of the following year. The Main Basin is used conjunctively and is artificially recharged with SWP water. Zone 7 relies on the operational storage capacity of 126,000 AF in the Main Basin.

6.2.5 Non-Local Storage

In addition to local storage, Zone 7 also participates in the two non-local (also called “out-of-basin”) groundwater banking programs described below; both banks are located in Kern County. Note that while these banking programs provide a water source during drought years, they represent water previously stored from Zone 7’s surface water supplies during wet years. Therefore, they do not have a net contribution to Zone 7’s water supply over the long-term and in fact result in some operational losses as described below. While the out-of-basin groundwater banks significantly enhance system reliability, this banked water supply requires Banks Pumping Plant in the Delta and the SBA to be operational; low SWP Table A allocations (and generally low levels of water movement in the SWP system) can limit the delivery of these banked supplies via exchange. Figure 6-4 shows the historical operation of the Kern County banks—note the successful use of the groundwater banks to augment water supplies during the recent drought, and the recovery in the following years.

Point of Delivery Agreements with DWR and Kern County Water Agency, a SWP contractor, allow Zone 7 to store SWP water in and recover water from Semitropic Water Storage District (Semitropic) and Cawelo Water District (Cawelo). Semitropic and Cawelo are member units of Kern County Water Agency, which manages water deliveries to these agencies. Zone 7 has been storing water in the water banks operated by Semitropic since 1998 and by Cawelo since 2006. In November 2020, the Zone 7 Board authorized the execution of amendments to existing Point of Delivery Agreements that would extend water delivery terms for storage in Semitropic and Cawelo through 2030 and recovery of banked water through 2035.

6.2.5.1 Semitropic Water Storage District

Zone 7 originally acquired a storage capacity of 65,000 AF in the Semitropic groundwater banking program in 1998. Subsequently, Zone 7 agreed to participate in Semitropic’s Stored Water Recovery Unit, which increased pumpback capacity and allowed Zone 7 to contractually store an additional 13,000 AF. Zone 7 currently has a total of 78,000 AF of groundwater banking storage capacity available to augment water supplies during drought and emergency conditions and as needed. Zone 7 can store up to 5,883 AFY in the Semitropic groundwater bank. Note that a 10 percent loss is associated with water stored in Semitropic.

Under the contract terms, Zone 7 can request up to 9,100 AF of pumpback and up to 8,645 AF of exchange water. Pumpback is water that is pumped out of the Semitropic aquifer and into the SWP system. Exchange water is water that is transferred between Zone 7 and Semitropic by adjusting the amounts of Table A water delivered to Zone 7 and Semitropic; the availability of this type of water depends on the SWP allocation. During the recent drought, Zone 7 was able to recover 9,900 AF in 2014 and about 12,800 AF in 2015. Zone 7 has largely been storing water in Semitropic over the past few years but did recover 324 AF in 2016 and 1,000 AF in 2020.

6.2.5.2 Cawelo Water District

Similar to the arrangements with Semitropic, Zone 7 has 120,000 AF of groundwater banking storage capacity available with Cawelo, as executed in a 2006 agreement. Zone 7 can store up to 5,000 AFY in the bank. Zone 7 can request up to 10,000 AFY of pumpback (or SWP exchange water) from Cawelo. During the recent drought, Zone 7 was able to recover 10,000 AF, delivered evenly over 2014 and 2015. Most of this water was used directly, while the rest was stored in San Luis Reservoir for use the following year. Zone 7 only accumulates 50 percent of the water sent to storage in Cawelo; the other 50 percent goes towards water loss and compensation to Cawelo.

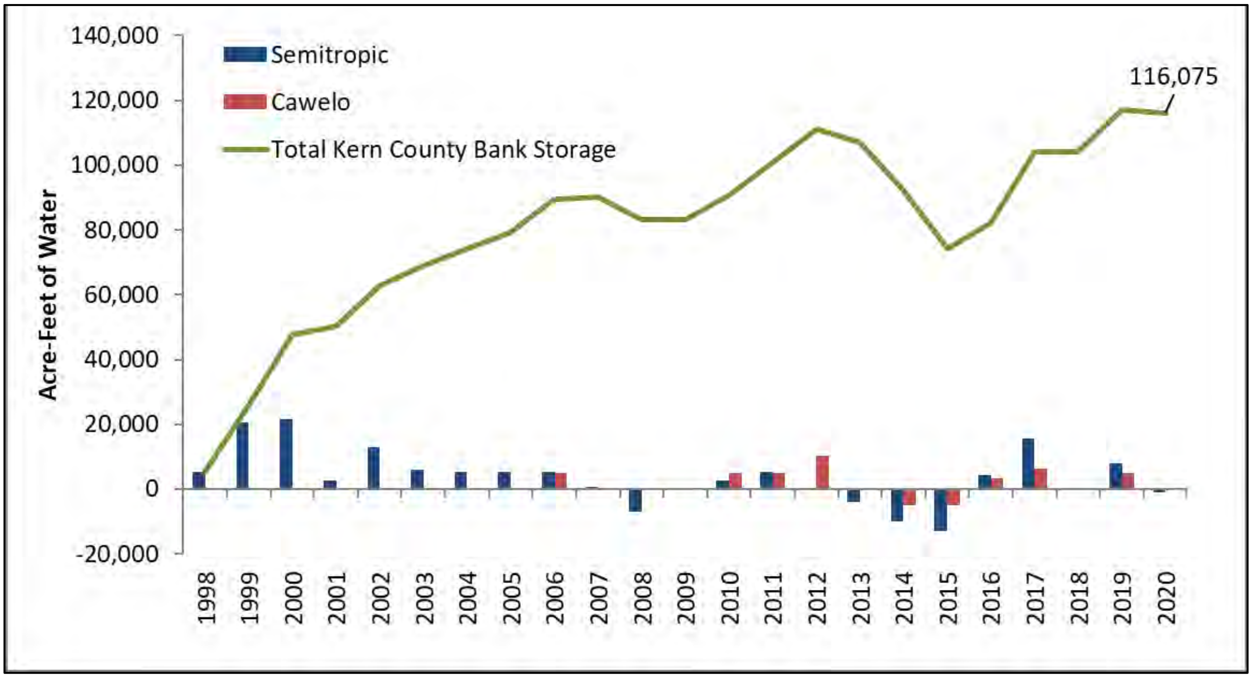

Figure 6-4. Kern County Groundwater Banks Operations

6.2.6 Wastewater and Recycled Water

Zone 7 does not currently handle wastewater nor recycled water; however, three local agencies—all water supply retailers—are involved in wastewater and recycled water activities as listed in Table 6-5. Further details regarding recycled water use in Zone 7's service area can be found in the 2020 UWMPs of Livermore, Pleasanton, and DSRSD. In the Zone 7 service area, recycled water is currently only used for non-potable applications, primarily landscape irrigation.

Table 6-5. Local Agencies Involved in Wastewater and Recycled Water

Local Agency	Collects Wastewater	Treats and Discharges Wastewater	Produces Recycled Water	Distributes Recycled Water
Livermore	✓	✓	✓	✓
Pleasanton	✓			✓
DSRSD	✓	✓	✓	✓

6.2.6.1 Recycled Water Coordination

As the groundwater basin management agency, Zone 7 is cognizant of the potential salt loading impacts arising out of recycled water use. Zone 7 has taken a proactive approach to mitigate such impacts, particularly within the Main Basin.

Recognizing that recycled water is an important part of a complete water resource management program for the Livermore-Amador Valley, Zone 7 is incorporating its use in future water supply planning. In joint efforts with the retailers, Zone 7 supports the search for safe, economically feasible, and publicly acceptable methods to increase local water resources, including the use of recycled water.

To encourage and optimize future recycled water use, Zone 7 will continue to work with the retailers to develop recycled water use projects for non-potable uses (e.g., irrigation) in the Livermore-Amador Valley and to identify potential opportunities for storage—which would facilitate expanded recycled water use—during non-irrigation months. This coordination includes supporting retailer applications for State and federal grants for construction of additional recycled water infrastructure. The feasibility of developing potable reuse will also continue to be evaluated as detailed in Section 6.2.9.1.3.

Plans for water recycling within the Zone 7 service area are coordinated amongst Zone 7, the retailers, the wastewater/recycled water agencies (DSRSD, Livermore, and Pleasanton), the regulatory agencies such as the Division of Drinking Water and the RWQCB, and planning agencies such as the City of Livermore Community Development Department. Zone 7 reviews recycled water plans both from a water supply management perspective and from a groundwater protection perspective. Given Zone 7's integral role in water supply and groundwater management in the Livermore-Amador Valley, Zone 7 is a co-permittee under the Master Water Recycling Permit issued by the RWQCB in December 1993 (Order No. 93-159).

Provision D.1.c.ii of the Master Water Recycling Permit requires the development of a SMP to assess and manage cumulative salt loading impacts on the Livermore Valley Groundwater Basin (Basin). Approved in October 2004 by the RWQCB, the SMP identified demineralization with export of the brine stream as the best means of mitigating salt loading in the Basin. DSRSD and Pleasanton are now operating under State Water Board General Order WQ 2016-0068-DDW, while Livermore still operates under Master Permit Order 96-011. The SWRCB's 2009 Recycled Water Policy required the development of a Nutrient Management Plan, which Zone 7 completed in 2015; a combined SNMP has been incorporated into the GMP originally developed in September 2005. All of these documents were developed in close consultation with the retailers and other stakeholders.

Recharging with low TDS water is a cornerstone of the SMP. Zone 7 is also currently operating a demineralization facility (MGDP) to help manage the salt loading in the Main Basin. The MGDP has the added benefit of providing softer water to Zone 7's potable water customers in the western portion of Zone 7's service area, where there is a regional concentration of groundwater production facilities with relatively high levels of TDS. Expansion of recycled water use over the groundwater basin will require additional measures to mitigate the associated additional salt loading.

6.2.6.2 Wastewater Collection, Treatment, and Disposal

DSRSD and Livermore treat all the wastewater collected within the city limits of Pleasanton, Dublin, and Livermore, and portions of San Ramon. Wastewater transport out of the area is handled through the LAVWMA, a joint-powers authority (JPA) composed of DSRSD, Livermore, and Pleasanton. Since 1979, LAVWMA has owned the conveyance facilities that transport treated wastewater from the treatment plants west over the Dublin grade, and eventually to the East Bay Dischargers Authority, which dechlorinates the effluent and discharges it through a deepwater pipeline into San Francisco Bay.

Since Zone 7 does not handle wastewater or recycled water, Table 6-6 is intentionally blank.

Table 6-6. Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3 Wholesale)

☑	Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. The Supplier will not complete the table below.											
							2020 volumes [1]					
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list*	Treatment Level *Drop down list*	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total	0	0	0	0	0

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

6.2.6.3 Recycled Water System Description

In Livermore, recycled water was first used in the early 1960’s to irrigate grain fields surrounding the Livermore Municipal Airport. When the Las Positas Golf Course opened in 1966, the course was also irrigated with secondary treated recycled water. After the treatment plant upgrade in 1974, Livermore started outdoor irrigation with tertiary treated recycled water. In 2002, ultraviolet disinfection was added to the treatment process in lieu of chlorine. Today, Livermore provides disinfected tertiary treated recycled water to the northwestern portion of the City. The distribution system consists of two aboveground reservoirs with a holding capacity of 1.88 MG each. There are approximately 20 miles of distribution pipeline ranging in size from 4 to 18 inches in diameter, with 168 metered connections. There are also 100 recycled water fire hydrants available for contractors to use during construction and for firefighting and system maintenance. Currently, recycled water is provided for several uses including landscape and agricultural irrigation, fire protection, construction, street sweeping and toilet and urinal flushing. In 2020, the Livermore Water Reclamation Plant (WRP) distributed approximately 2,270 AF of recycled water, with 2,180 AF used within the Livermore Municipal Service Area.

In 1995, DSRSD and EBMUD, a major water and wastewater retailer serving a portion of San Ramon, formed a JPA called the “DSRSD-EBMUD Recycled Water Authority” (DERWA). This entity operates the San Ramon Valley Recycled Water Program (SRVRWP), which supplies recycled water to portions of DSRSD’s and EBMUD’s service areas. Through DERWA’s SRVRWP, DSRSD began supplying tertiary-treated water (sand filtration or microfiltration followed by UV disinfection) in 2006 for landscape irrigation. In 2015, Pleasanton entered into an agreement with DERWA for purchase of recycled water for its service area. In 2020, DERWA supplied approximately 4,270 AF of recycled water combined to DSRSD’s and Pleasanton’s service area. By 2040, it is estimated that DERWA will serve approximately 3,040 AF to DSRSD and 1,800 AF to Pleasanton, for a total of 4,840 AF of recycled water. Within Zone 7’s service area, existing uses for recycled water include landscape irrigation, fire protection, commercial/industrial use, golf course irrigation, and construction.

6.2.6.4 Potential, Current, and Projected Recycled Water Uses

Zone 7 does not handle recycled water, so Table 6-7 and Table 6-8 are intentionally blank. Further details regarding recycled water use in Zone 7's service area can be found in the 2020 UWMPs of Livermore, Pleasanton, and DSRSD.

Table 6-7. Current and Projected Retailers Provided Recycled Water Within Service Area (DWR Table 6-4 Wholesale)

☑	Recycled water is not directly treated or distributed by the Supplier. The Supplier will not complete the table below.						
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment *Drop down list*	2020*	2025*	2030*	2035*	2040*	2045* *(opt)*
	Total	0	0	0	0	0	0
*** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.							

Table 6-8. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5 Wholesale)

☑	Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2015 Projection for 2020*	2020 Actual Use*
Total	0	0
****Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*		

6.2.7 Desalinated Water

Opportunity for a desalinated water project is available to Zone 7 through the Bay Area Regional Desalination Project (BARDP), a joint effort with CCWD, EBMUD, San Francisco Public Utilities Commission (SFPUC), Zone 7, and VW. The BARDP involves constructing a regional brackish water treatment plant in eastern Contra Costa County. Previous studies assumed that Zone 7 could receive up to a 5,600-AFY share from the BARDP; the estimated Zone 7 water yield from this project will be refined further and will depend on project yield and demands from the final participants. The project is still in the planning phase and there is no formally approved project at this time. If a project is approved, it could be in service by 2030. The project is detailed in Section 6.2.9.1.1.

As noted in Section 6.2.2, Zone 7 desalinates a portion of its groundwater.

6.2.8 Water Exchanges and Transfers

Zone 7 periodically supplements existing supplies with short-term transfers when needed and intends to more regularly acquire water transfers over the coming decade until major supply reliability project(s) come online starting around 2030. The proposed water transfers include water from the Yuba Accord and the Dry Year Transfer Program (DYTP) administered by the SWP contractors but could also include transfer agreements between Zone 7 and other SWP contractors and potentially Zone 7 and other water purveyors. The DYTP coordinates and negotiates water sales between interested SWP contractors and sellers in the Feather River watershed. A transfer agreement with another SWP contractor using the SWP system—which Zone 7 is already invested in—is likely the most expedient and cost-effective transfer option. Transfer water would be conveyed to Zone 7 through the Delta and the SBA; the transfer amount could vary from year-to-year depending on hydrology but could average between 5,000 to 10,000 AFY. For the 2020 UWMP, ***Zone 7 is assuming 5,000 AFY in water transfers through 2030***.

Zone 7 will continue to pursue and evaluate transfer opportunities in the Bay Area and statewide. Through the Bay Area Regional Reliability Partnership, Zone 7 is participating in a reclamation grant-funded project to develop a "Regional Water Market Program," which will identify transfer types and opportunities and develop a road map to facilitate transfers and exchanges in the Bay Area. The Delta Conveyance Project, discussed in Section 6.2.9.1.2, may also create opportunities for long-term water transfers between SWP contractors across the state.

6.2.9 Future Water Projects

Zone 7 anticipates future supply deficits as SWP reliability continues to decline and Zone 7's service area population grows. As a result, Zone 7 is pursuing several water supply reliability projects to obtain additional water storage and water supplies, address the need for alternative conveyance in the Delta, and improve access to groundwater and local emergency supplies. The 2019 WSE Update evaluated potential future water projects and their impacts on the reliability of Zone 7's water supply system. Zone 7 expects that a portfolio (likely a subset) of these projects will be needed to address future supply deficits; these projects are described below.

6.2.9.1 Supply Projects

6.2.9.1.1 Bay Area Regional Desalination Project (BARDP)

Brackish water desalination for Zone 7 would be accomplished through the BARDP. The project is shown on Figure 6-5 and would involve constructing a regional brackish water treatment plant in eastern Contra Costa County producing 10-20 MGD. Water would be diverted using CCWD's Mallard Slough Pump Station. Using an existing water right license and permit, both held by CCWD, and/or a new water right, Zone 7 could potentially receive up to 5,600 AFY. Zone 7 could take delivery of this new water supply through a reliability intertie with EBMUD or through the Delta/SBA by exchanging water with CCWD. Furthermore, this project could potentially provide a new water supply component for the Los Vaqueros Reservoir Expansion (LVE) project and make use of LVE's additional storage and new conveyance facilities.

There has been recent renewed interest in desalination as part of the Bay Area Regional Reliability Partnership, and there may be new developments in the near-term. The water yield of the project is being re-evaluated, and the participating agencies may change. As noted in Section 6.2.7, BARDP is still in the planning phase, and there is no formally approved project at this time. If a project is approved over the next few years, it could be in service by 2030.

For the 2020 UWMP, 5,000 AFY was assumed as the total potential yield from BARDP and/or potable reuse (described in Section 6.2.9.1.3) with either or both systems operational by 2030. As noted above, BARDP water could potentially be conveyed through a new intertie supplying the west side of Zone 7's transmission system. This mode of delivery provides an alternative conveyance not subject to Delta outages.

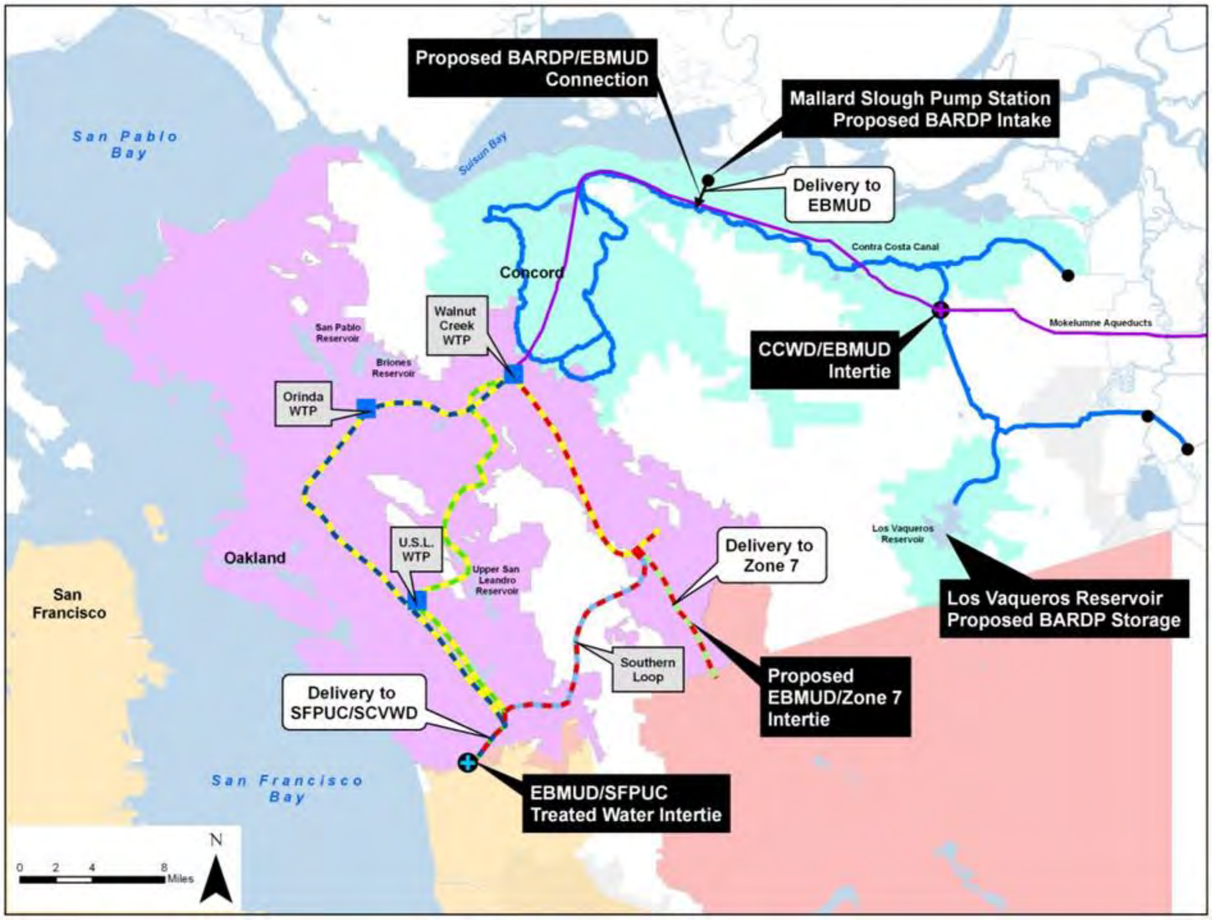

Figure 6-5. Bay Area Regional Desalination Project: Diversion and Conveyance Facilities

6.2.9.1.2 Delta Conveyance Project

Accounting for imported and local surface water, the retailers' GPQs, and recycled water, the Tri-Valley area receives approximately 70 percent of its incoming water supplies through the Delta as delivered by DWR. For Zone 7, the Delta conveys about 90 percent of its existing incoming supplies under normal conditions. SWP water, carryover water, water banked in Kern County and transfer water all come through the Delta.

This key conveyance component of the SWP is increasingly threatened by ecosystem considerations, seismic risk, and climate change/sea level rise, reducing the reliability of the SWP system. DWR's proposed Delta Conveyance Project (DCP) would install a new tunnel to convey freshwater from north of the Delta to a point south of the Delta. The DCP will likely increase SWP reliability and improve water quality, but an alternate conveyance system for the majority of Zone 7's water is the significant benefit as follows:

- A major Northern California earthquake could take out levees in the Delta. Experts suggest that fresh water supply through the Delta could be lost for months, if not a year or two. The DCP would provide an alternative conveyance of freshwater from north of the Delta (near Sacramento) to a point south of the Delta (near Byron) while levee repairs and other work are being completed.

- The South Delta is currently about 3 feet above sea level, while the North Delta is about 15 feet above sea level. Climate change projections call for sea level rise of 5 to 10 feet. This could render the South Delta unusable for portions of the year due to saltwater intrusion. The DCP would provide an alternative conveyance of freshwater from north of the Delta to a point south of the Delta when the Delta is too saline.

In July 2017, DWR approved the California WaterFix Project, which was a dual conveyance project that involved two new diversion points and two tunnels moving water from the Sacramento River north of the Delta under the Delta to SWP and Central Valley Project water pumping facilities in the South Delta. In the State of the State address in January 2019, Governor Newsom announced that he did not support WaterFix as configured but that he did support a single-tunnel conveyance project.

In January 2020, DWR released a Notice of Preparation (NOP) of an Environmental Impact Report (EIR) pursuant to CEQA for the DCP. Note that the DCP is part of Governor Newsom's portfolio approach to water management. While the proposed project in the DCP is a single tunnel up to 6,000 cubic feet per second (cfs), DWR is considering alternatives including capacities ranging from 3,000 to 7,500 cfs. Anticipated benefits include: 1) water supply reliability and SWP resiliency (climate change adaptation/stormwater capture, sea-level rise adaptation, seismic resilience), 2) South Delta flow pattern improvements for fisheries, 3) water transfer capacity and carriage water savings, and 4) water quality improvements for SWP deliveries. Potential DCP facilities are shown on Figure 6-6.

As described in Section 6.2.1.1.2.1, Zone 7 has a long-term contract with DWR for a Table A amount of 80,619 AFY from the SWP, but SWP reliability has decreased significantly over the years. Estimates of SWP reliability (i.e., projected long-term average of Table A allocations) have been adjusted over the years as they account for changing regulatory and operational conditions, among other factors. The 2019 DCR estimates SWP reliability to decrease from an average Table A allocation of 59 percent in 2020 to 54 percent Table A in 2040. The potential increase in SWP reliability from the DCP has not been incorporated in the 2019 DCR and will be evaluated once the project and its operational and permitting terms are better defined***.***

As described above, the DCP will protect the reliability of SWP supplies from the effects of climate change and seismic events, among other risks. DWR's current schedule for the DCP environmental planning and permitting extends through the end of 2024. The DCP will potentially be operational in 2040 following extensive planning, permitting, and construction. ***Since the DCP is not anticipated to be in service until the end of the 2020 UWMP planning period, its impacts on supply have not been incorporated in DWR's 2019 DCR and have not been included in this plan.*** With permitting efforts over the next few years, quantitative information on the reliability associated with the DCP will be included in the 2025 UWMP.

Through mid-2024, DWR will be completing environmental planning efforts on the DCP. In November 2020, the Zone 7 Board approved continued participation in the DCP at a 2.2 percent participation level based on Zone 7's Table A amount of 80,619 AF. The Board also approved Zone 7 funding of these efforts up to $2,800,000 for calendar years 2021 and 2022. A separate future request for Zone 7 Board action would address participation and funding beyond 2022.

Continued participation by Zone 7 in the planning efforts will allow Zone 7 to elect to participate in the DCP implementation in the future based on information developed in the planning process, allow access by Zone 7 to information related to benefits and costs, and provide Zone 7 influence throughout the process. The work over the next two to four years will inform the Zone 7 Board's decision-making as the DCP continues to advance.

As a contractor of the SWP, Zone 7 is working very closely with DWR and other water agencies, environmental groups, regulatory agencies, and natural resource agencies to address the declining reliability of the SWP through the DCP and other efforts. More details on the challenges faced by the Delta and the SWP can be found in Chapter 7 (Section 7.1.1.1).

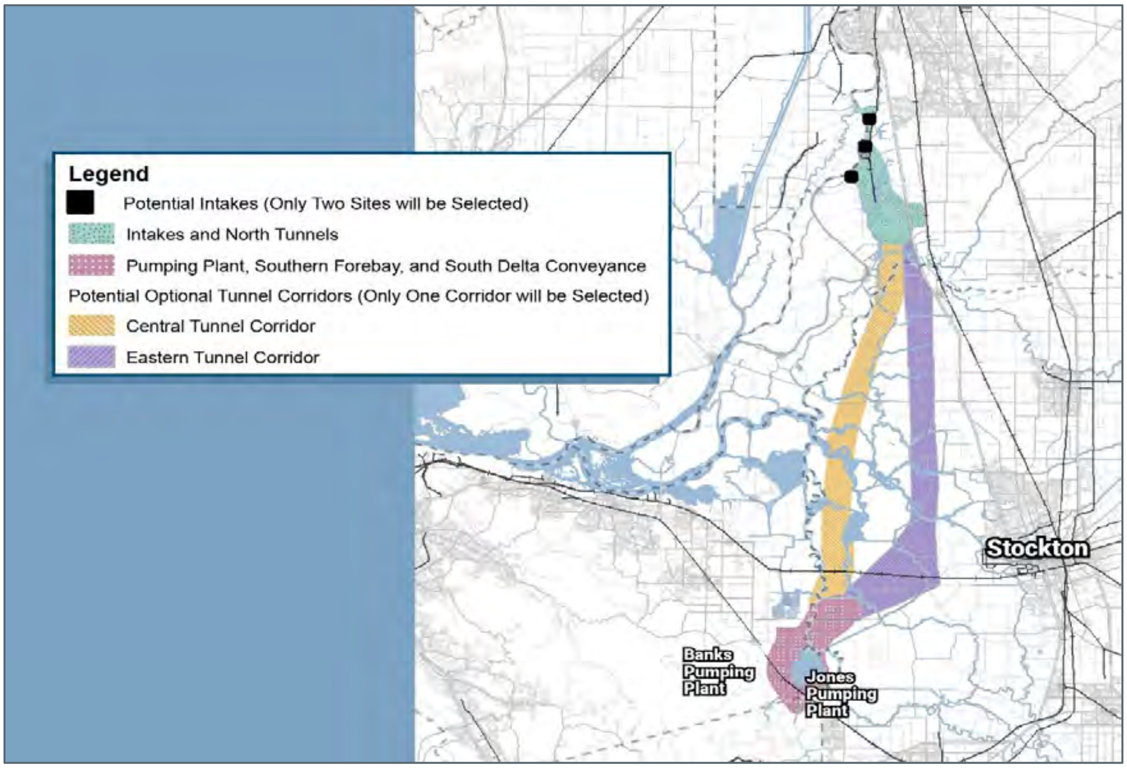

Figure 6-6. Delta Conveyance Project: Potential Facilities

6.2.9.1.3 Potable Reuse

Potable reuse is the use of purified water derived from wastewater effluent to supplement potable water supplies. While recycled water, the use of treated wastewater for non-potable uses such as irrigation, has been available for many years in the Tri-Valley, potable reuse would be a new use of local wastewater resources collected by DSRSD and Livermore. Its main benefits include local production and control, drought resistance, and use of an existing water resource.

In 2018, the Tri-Valley Water Agencies completed the Joint Tri-Valley Potable Reuse Technical Feasibility Study[15] (Potable Reuse Study) with these goals: 1) to evaluate the feasibility of a wide range of potable reuse options for the Tri-Valley based on technical, financial, and regulatory considerations, and 2) assuming that potable reuse is found to be technically feasible, to recommend next steps for the agencies. The Potable Reuse Study also refined cost estimates for potable reuse.

The Potable Reuse Study investigated three potential end uses for purified water in detail: 1) groundwater augmentation or recharge via injection wells, 2) groundwater recharge via Chain of Lakes surficial recharge, and 3) raw water augmentation to Zone 7's Del Valle Water Treatment Plant. Looking at annual

[15]Tri-Valley Agencies and Carollo Engineers, *Joint Tri-Valley Potable Reuse Technical Feasibility Study*, May 2018.

yields ranging from 5,500 to 10,000 AFY, the Potable Reuse Study concluded that potable reuse is technically feasible for the Tri-Valley, with benefits to reliability and water quality. The lower yield would use only Livermore wastewater supply with year-round operations, while the higher yield would be achieved with seasonal availability of DSRSD wastewater supply. Water availability would increase over time as development occurs in the Tri-Valley and more wastewater is generated and collected. In other words, the maximum yield is expected to only be available after a certain point in the future; only a fraction of the maximum yield is available before buildout.

In the 2019 WSE Update, raw water augmentation was modeled with the option for a two-phased project that initially produces a lower yield but increases to the maximum yield in 2035 (following a growth in available wastewater). Reflecting a more conservative estimate of future wastewater availability, the 2019 WSE Update used a reduced yield of 4,000 AFY starting in 2027 and 7,000 AFY after 2035. Conservation regulations have set low indoor water use targets for California, which are expected to reduce future wastewater flows. The estimates in the Potable Reuse Study had not incorporated the recently set statewide indoor water use targets. Future analyses will adjust estimates as necessary based on actual indoor water use trends and updated projections of wastewater availability for potable reuse.

Zone 7, along with the retailers, are completing a number of technical studies over the next few years that will support continued evaluation of potable reuse options and their costs and benefits. ***For planning purposes, the 2020 UWMP assumes 5,000 AFY of future supply from BARDP (discussed in Section 6.2.9.1.1) and/or potable reuse, with either or both systems online by 2030.***

6.2.9.1.4 Sites Reservoir

Sites Reservoir is a proposed new 1,500,000 AF off-stream storage reservoir in northern California near Maxwell. Sacramento River flows will be diverted during excess flow periods and stored in the off-stream reservoir and released for use in the drier periods. Shown on Figure 6-7, Sites Reservoir aims to supplement and optimize use of the State's existing storage and conveyance systems such as the CVP's Shasta Reservoir and the SWP's Oroville Reservoir, which collects much of the water for the SWP system.

The participants in the Sites Reservoir project include 31 entities, including Zone 7 and several other SWP contractors. Sites Reservoir is currently undergoing environmental planning and permitting and is expected to provide approximately 240 TAF per year[16] of additional deliveries on average to participating agencies under existing conditions. Operations modeling will continue to be refined over the next few years to reflect a range of permit and operational conditions, which will define the ultimate yield. For example, it is uncertain at this time whether the delivery of Sites Reservoir releases using SWP facilities in the Delta could result in a "carriage loss," which would reduce the net yield to Zone 7 and other SWP contractors. Full operation of the Sites Reservoir is estimated to start by 2029 following environmental planning, permitting, and construction.

Sites Reservoir is expected to provide water supply, environmental, flood, and recreational benefits. Consequently, Sites Reservoir was conditionally awarded $816 million from the California Water Commission for ecosystem, recreation, and flood control benefits under Proposition 1. The US Bureau of Reclamation (Reclamation) may also invest in Sites Reservoir under the Water Infrastructure Improvements for the Nation Act and recently transmitted a final Federal Feasibility Report to Congress for the project.

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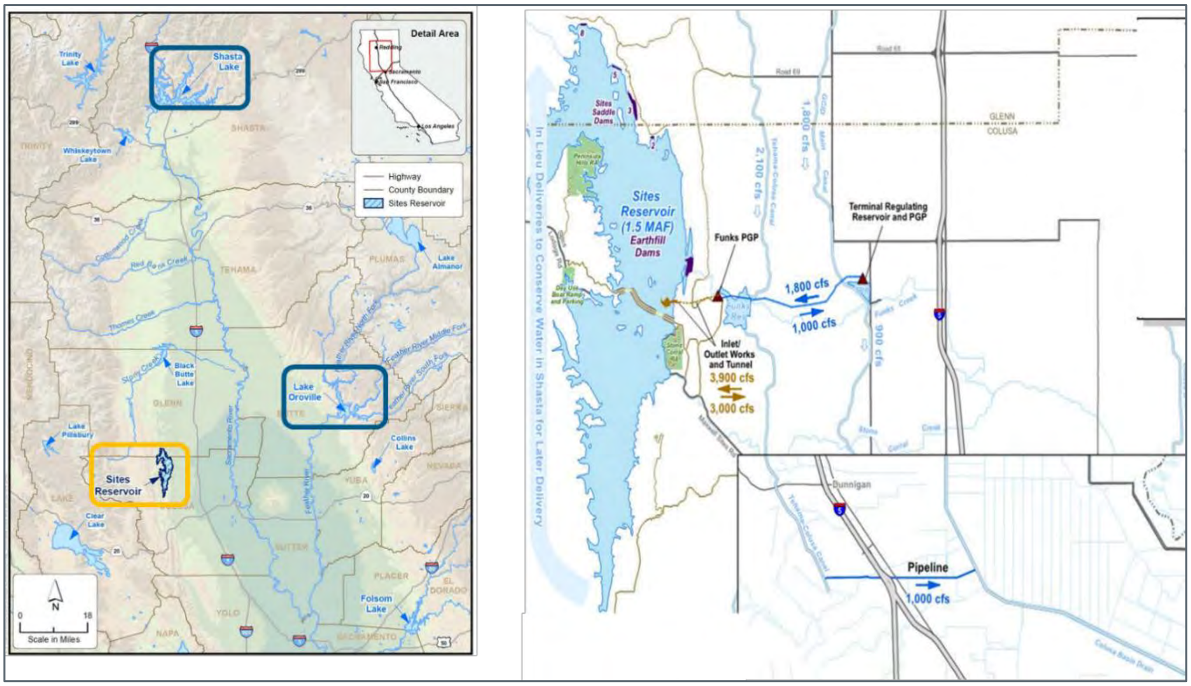
[16] Sites Project Management Team, 2020. Sites Project Value Planning Alternatives Appraisal Report.

The Sites Project Authority (Authority) was formed on August 26, 2010 as a JPA to pursue the development and construction of Sites Reservoir. The Authority is governed by a 12-member Board of Directors representing Sacramento Valley leadership in government and water management. Water agencies across California—including Zone 7—that are investing in the project are members of the Sites Reservoir Project Committee, which oversees the planning efforts and provides recommendations to the Authority.



Source: Sites Project Authority

Figure 6-7. Sites Reservoir Project: Location and Facilities

Sites Reservoir could provide both water supply and storage for Zone 7. In December 2016, the Zone 7 Board authorized participation in Phase 1 at a cost of $850,000. In December 2019, the Zone 7 Board authorized participation in Phase 2 (2019 Sites Reservoir Project Agreement) at a cost of $600,000. The Zone 7 Board then approved continued participation in Phase 2 through December 2021 at an amount not-to-exceed $1,000,000 in July 2020. Key work under these two phases include planning, design, financial analysis, and environmental review and permitting.

In the 2019 WSE Update, Zone 7 considered 5,000 to 10,000 AFY of average yield from Sites Reservoir, in combination with other water supply options. The availability of this supply was varied based on hydrology, with more water delivered to Zone 7 during dry years. At Zone 7's request, water would be released from Sites Reservoir annually to the Sacramento River, then conveyed by the SWP system through the Delta and to the SBA. Based on model results, Sites Reservoir's key benefit is the availability of water during dry years when the shortage risk is greatest. Sites Reservoir is a good complement to the DCP, which could potentially increase SWP yield during wet years. Because Sites Reservoir provides both storage and new supply, it adds flexibility to Zone 7's water supply system; for example, the timing of deliveries from Sites Reservoir could be modified to maximize yields from other water supplies and/or to accommodate delivery timing restrictions of other supplies. For Zone 7, water could be released from Sites Reservoir annually to the Sacramento River, generally during dry and critical years, then conveyed by the SWP system through the Delta and to the SBA.

Recently, the Zone 7 Board re-affirmed continued participation in Sites Reservoir at a 10,000 AFY share. ***This plan therefore assumes an average water supply of 10,000 AFY to Zone 7 from Sites Reservoir.***

6.2.9.2 Storage Project – Los Vaqueros Reservoir Expansion (LVE)

Constructed in 1997, Los Vaqueros Reservoir is an off-stream reservoir owned by CCWD and located in southeastern Contra Costa County (see Figure 6-8). It currently has a capacity of 160,000 AF following its expansion (Phase 1) from 100,000 AF in 2012. CCWD is planning to further expand the reservoir to 275,000 AF (Phase 2) and construct the Transfer-Bethany Pipeline, which would connect the reservoir to the SBA and the California Aqueduct. The LVE's key objectives are to: 1) develop water supplies for environmental water management, and 2) increase water supply reliability for Bay Area water agencies. In addition, the LVE would improve water quality for municipal and industrial customers in the San Francisco Bay Area while providing improved habitat and recreation and flood control benefits.

Recognizing LVE's potential benefits as emergency conveyance and storage, the Zone 7 Board approved participation in the Los Vaqueros Reservoir Expansion Project Planning in September 2016, with a $100,000 cash contribution. In January 2019, the Zone 7 Board approved continued participation in the project's planning activities through execution of the Multi-Party Agreement in an amount not-to-exceed $355,000. In August 2020, the Zone 7 Board approved continued participation in the LVE Multi-Party Agreement through December 2021 at a cost up to $1.014 million.

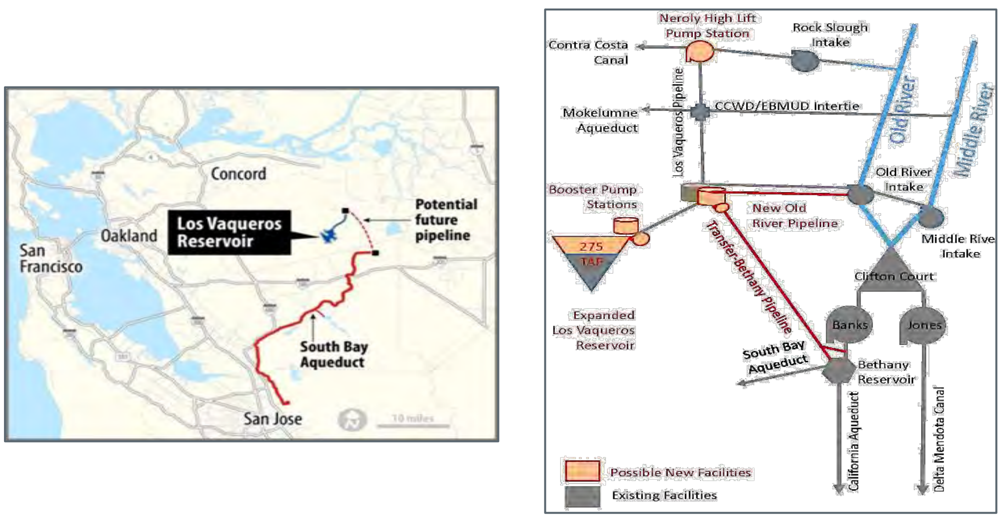


Figure 6-8. Los Vaqueros Reservoir: Location and Facilities (Source: CCWD)

Under the LVE, water would be diverted from the Delta at CCWD's Rock Slough, Old River, and Middle River Intakes, and at the Freeport Intake on the Sacramento River. This water could then be delivered to agencies within CCWD's service area, the Bay Area, the Delta, neighboring regions, and the south-of-Delta wildlife refuges. Under existing and new water right and permit conditions, CCWD would be able to divert different types of water, including: Delta surplus water under CCWD's Los Vaqueros water right, Central Valley Project water, SWP water, Mokelumne River water, and other water acquired by project partners through transfer agreements. Existing and new facilities would be used to store and convey water under the LVE (Figure 6-8).

Water could be stored in Los Vaqueros Reservoir for later use or delivered directly to partners. Potential LVE participants envision different operational schemes for the reservoir and associated facilities, and these various scenarios are continuing to be evaluated through modeling by CCWD staff. While some new water supply may be available from LVE, Zone 7 is primarily evaluating the project as storage due to the uncertainty of the availability of such supplies given increasing Delta restrictions. The 2019 WSE Update assumed emergency storage in Los Vaqueros Reservoir at 10,000 AF.

In 2017, CCWD and Reclamation completed the Draft Supplement to the Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the LVE. The project was successfully selected for funding under the State's Water Storage Investment Program (WSIP) in July 2018 of up to $459 million based on its environmental and other public benefits. Reclamation also contributes to LVE costs, which are estimated to total $1.1 billion. Reclamation and CCWD published final environmental documents for the LVE in February 2020. A JPA is planned to be formed in spring 2021 to oversee project planning, design, and operation. Work is proceeding on the project's design, engineering, environmental and other permitting, financial analysis, and operations planning. The Transfer-Bethany Pipeline is scheduled for completion by around 2025 and the expanded reservoir by around 2030.

6.2.9.3 Infrastructure Projects

6.2.9.3.1 Chain of Lakes (COLs) Diversion Structures and Pipeline

The future Chain of Lakes (COLs), shown on Figure 6-9, is a series of former or active gravel quarry pits located in the heart of the Livermore-Amador Valley. The COLs will ultimately consist of ten lakes named Lakes A through I and Cope Lake, connected through a series of conduits. Zone 7 currently owns Lake I and Cope Lake and expects Lakes A and H to be transferred to Zone 7 within the next few years, once reclamation is completed. The remaining lakes (B through G) will be transitioned to Zone 7 over the next decades, likely through 2060. The COLs will ultimately cover approximately 1,500 acres and have about 150,000 AF of total storage volume; 31,000 AF is estimated to be available for operational storage.

Zone 7 envisions using the COLs as a large facility for water management and related purposes, including surface storage of local runoff, SWP water, other potential future sources of surface water, stormwater, and, possibly recycled water. This surface water storage capability allows Zone 7 to facilitate increased recharge of the Main Basin and perfect its water right on the Arroyo Valle, thereby increasing future yields from this local supply. Lake I is currently planned to be the key recharge lake. More details on the potential future use of the COLs can be found in the 2020 Update of the Preliminary Lake Use Evaluation for the Chain of Lakes[17].

Zone 7 is also planning the Chain of Lakes Pipeline, a multi-use pipeline that will connect the northern COLs area with Lake A and the SBA/DVWTP. The concept of the pipeline is to convey excess surface water supply—including imported water and local water from the Arroyo Valle—to the COLs for storage and groundwater recharge. The pipeline will also supply raw water from the COLs to the DVWTP for use under emergency and drought situations. A pipeline alignment study is underway and scheduled for completion in 2021. Design of this pipeline will consider future facilities and potential uses of the lakes.

[17] Zone 7 Water Agency, 2020. Addendum 1 – 2020 Update Preliminary Lake Use Evaluation for the Chain of Lakes.

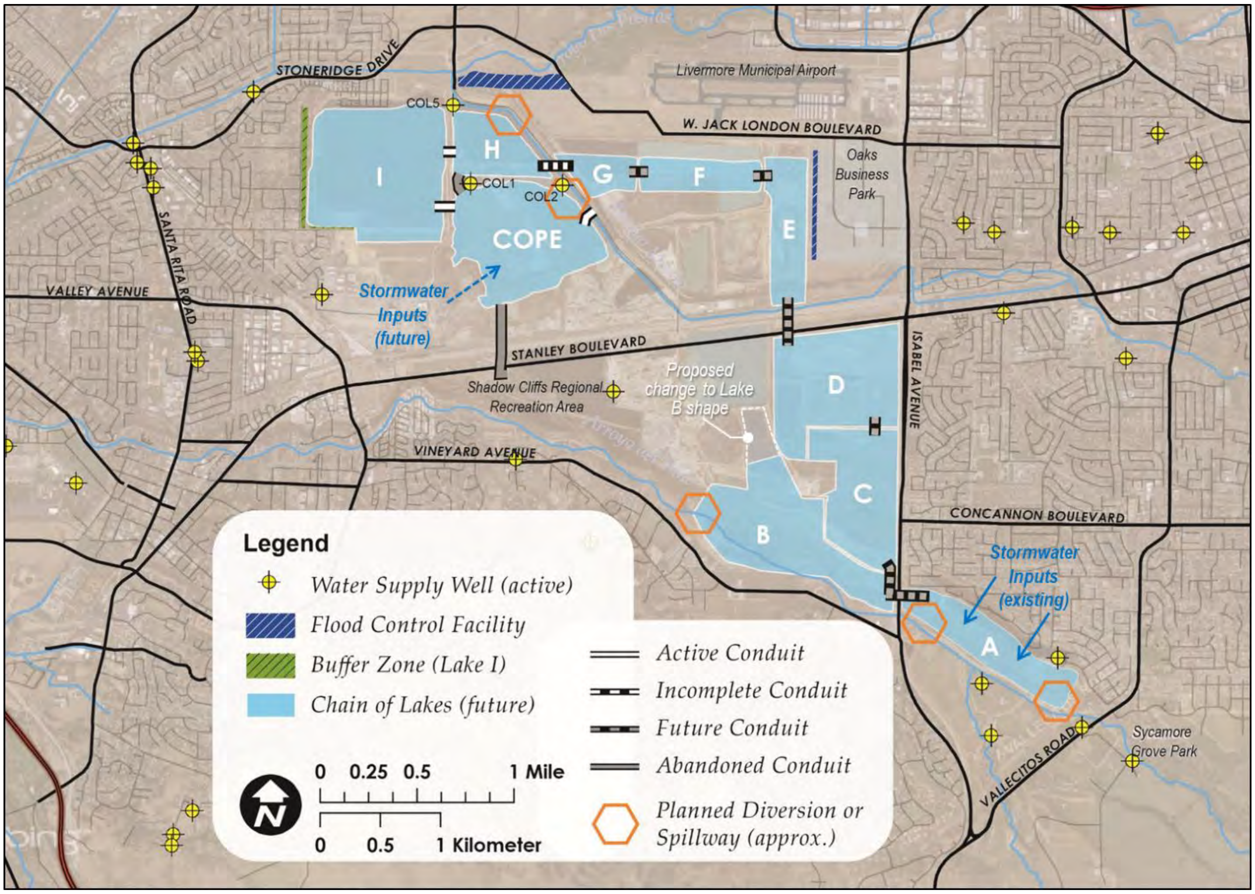


Figure 6-9. Chain of Lakes: Existing and Planned Facilities

6.2.9.3.2 New Wells

Additional municipal water supply wells could maximize access to existing local storage in the Main Basin during droughts and facility outages. These wells would be constructed in the Chain of Lakes (two wells, 8.6 MGD), Busch Valley wellfield (one well, 2.9 MGD), and the Bernal wellfield (3.6 MGD), resulting in about 15 MGD of additional capacity. New wells are planned to be in-service incrementally over the next ten to fifteen years.

6.2.9.3.3 Reliability Intertie with EBMUD

Zone 7 is planning to construct a 30-inch diameter treated water pipeline connection with EBMUD on the west side of Zone 7's transmission system. This reliability would provide an additional or alternative means of delivering water to Zone 7 during Delta and/or SBA outages and is planned to be in service by around 2030.

6.2.9.4 Summary of Future Water Projects

Table 6-9 summarizes Zone 7's potential future water supply projects, including planned implementation schedule, use conditions, and expected increase in supply. Other projects detailed above either do not increase incoming supply (groundwater wells and EBMUD intertie) or are too preliminary to quantify additional supply at this time (DCP, COLs, and LVE).

Table 6-9. Expected Future Water Supply Projects or Programs (DWR Table 6-7 Wholesale)

☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
6-21 through 6-30	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description *(if needed)*	Planned Implementation Year	Planned for Use in Year Type *Drop Down list*	Expected Increase in Water Supply to Supplier*
	Drop Down Menu	*If Yes, Supplier Name*				
Bay Area Regional Desalination Project	*Yes*	Contra Costa Water District, SFPUC, Santa Clara Valley Water District	Brackish water desalination in eastern Contra Costa County	2030	All Year Types	5,600
Delta Conveyance Project	*Yes*	Department of Water Resources and other SWP contractors	Construction of new intakes and tunnel as part of the State Water Project	2040	All Year Types	TBD
Los Vaqueros Reservoir Expansion	*Yes*	Contra Costa Water District, and a number of Bay Area M&I water agencies plus Grassland Water District and San Luis & Delta-Mendota Water Authority.	Expansion of Los Vaqueros Reservoir and construction of the Transfer-Bethany Pipeline, which would connect the reservoir to the South Bay Aqueduct and California Aqueduct	2025 (Pipeline) and 2030 (Reservoir Expansion)	Dry Years	TBD
Potable Reuse	*Yes*	Livermore, DSRSD, Pleasanton, Cal Water	Use of purified water derived from wastewater effluent to supplement potable water supplies	2030	All Year Types	4,000-7,000
Sites Reservoir	*Yes*	Sites Project Authority and Sites Reservoir Project Committee members	Construction of a new 1.5 million AF off-stream reservoir in Colusa County	2030	All Year Types	10,000
SWP Transfers	*Yes*	Other SWP contractor/s	Temporary water transfer agreement/s until major projects are implemented	2021	All Year Types	varies

****Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes are in AF. These projects are in the conceptual or planning stages. Zone 7 is participating in the planning efforts of these potential future water supply and/or storage projects to evaluate their benefits, including water supply yield. Implementation of these projects has not been approved by the Zone 7 Board but it is expected that a subset of these projects will be needed to meet future water demands and increase the reliability of Zone 7's system. The partners listed above are potential partners; final participation will be determined when the project has been approved by the respective agencies' governing boards. The 'expected increase in water supply...' are estimates at this time and may need to be adjusted when a final project has been approved. The 'planned implementation year' may also vary depending on project progress.

6.2.10 Summary of Existing and Planned Sources of Water

Each year, Zone 7 provides a status report of water in storage and available water for use during the upcoming five years. An example of the data presented in this Annual Review of Sustainable Water Supply is contained in Table 6-10 and Table 6-11, which show Zone 7's existing water storage volumes and actual supply sources for 2020.

Table 6-10. Zone 7's 2020 Water Storage and Operational Storage Capacity

Storage Option		Water in Storage through December 2020, AF	Operational Storage Capacity, AF
Local	Lake Del Valle	0	7,500
	Main Basin	115,000	126,000
Non-Local Groundwater Banks	Semitropic	86,230	78,000
	Cawelo	29,900	120,000
Other Non-Local	SWP - Carryover	0	Varies
	Total	**231,130**	**At least 331,500**

Table 6-11. 2020 Water Supplies Actual (DWR Table 6-8 Wholesale)

Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water	SWP Table A	16,124	Other Non-Potable Water	
Purchased or Imported Water	Yuba Accord	2,100	Other Non-Potable Water	
Purchased or Imported Water	Water Transfer	5,000	Other Non-Potable Water	
Supply from Storage	SWP Carryover	10,800	Other Non-Potable Water	
Groundwater (not desalinated)	Main Basin	12,000	Other Non-Potable Water	
Surface water (not desalinated)	Arroyo Valle	8,700	Other Non-Potable Water	
Supply from Storage	Non-Local Storage	1,000	Other Non-Potable Water	
	Total	55,724		0
***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.*				
NOTES: Volumes are in AF. These amounts reflect net yield for Yuba Accord and groundwater (i.e., they do not include carriage loss from Yuba Accord [900 AF] and brine disposal from groundwater production [400 AF]). Arroyo Valle supply includes carryover from 2019 (8,100 AF) and 2020 yield (600 AF).				

Table 6-12 summarizes Zone 7's average projected water supplies available during a normal hydrologic water year. Under dry, drought, or emergency conditions, the percentage distribution of sources used by Zone 7 to meet demands may shift; in particular, Zone 7 is likely to tap into water stored in the various storage facilities listed in Table 6-10. Note, however, that even under normal water supply conditions, water from storage—particularly SWP carryover and local groundwater—is a key component of Zone 7's operations.

As shown in Table 6-12, it was assumed that the BARDP and/or potable reuse would provide approximately 5,000 AFY. Both desalination and potable reuse are considered drought-resistant water supplies. Sites Reservoir would provide 10,000 AFY of new supply. At this time, no additional yield has been included for the DCP; this will be revisited when the project is better defined. In the interim, water transfers would provide 5,000 AFY on average, until major water supply projects come online around 2030. Table 6-12 also shows that Zone 7's total projected normal year water supplies range from 76,700 AF in 2025 to 90,700 AF in 2030 and down to 83,200 AF at buildout around 2040.

Table 6-12. Water Supplies Projected (DWR Table 6-9 Wholesale)

Water Supply	Additional Detail on Water Supply	Projected Water Supply* Report To the Extent Practicable				
		2025	**2030**	**2035**	**2040**	**2045** (opt)
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	SWP Table A[a]	47,000	46,000	45,000	43,500	43,500
Purchased or Imported Water	Yuba Accord (available mainly in dry years)	0	0	0	0	0
Supply from Storage	SWP Carryover[b]	10,000	10,000	10,000	10,000	10,000
Surface water (not desalinated)	Arroyo Valle[c]	5,500	5,500	5,500	5,500	5,500
Groundwater (not desalinated)	Main Basin	9,200	9,200	9,200	9,200	9,200
Supply from Storage	Semitropic (used mainly in dry years)	0	0	0	0	0
Supply from Storage	Cawelo (used mainly in dry years)	0	0	0	0	0
Other	SWP/Other Transfer[d]	5,000	5,000			
Other	BARDP or Potable Reuse[e]		5,000	5,000	5,000	5,000
Purchased or Imported Water	Sites Reservoir[f]		10,000	10,000	10,000	10,000
	Total	76,700	90,700	84,700	83,200	83,200

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes are in AF.
a. Based on the 2019 Delivery Capability Report. "Existing" assumed for 2020, the "Future" applied to 2040; years in between were interpolated. The effect of the Delta Conveyance Project on water supply yield is still being analyzed and has not been included here.
b. Zone 7 regularly carries over SWP water from year to year, targeting approximately 10,000 AFY.
c. Arroyo Valle: From 2019 Water Supply Evaluation, observed ten-year (2008 to 2017) average was 6,200 AFY, reduced to 5,500 AFY to reflect climate change impacts. This will be refined as more information on the role of the Chain of Lakes on capturing Arroyo Valle water is developed over the coming years.
d. Zone 7 is pursuing water transfer agreements for the period through 2030.
e. These projects are under consideration as potential components of Zone 7's future water supply portfolio.
f. Zone 7 is currently participating in the planning phase of Sites Reservoir at a level of 10,000 AFY of average yield.

6.2.11 Climate Change Impacts

Since the SWP is the main source of Zone 7's water supplies, climate change impacts to the SWP will significantly impact Zone 7. As shown in Table 6-12, supplies derived from the SWP, including Table A deliveries, groundwater (i.e., stored SWP water), and SWP carryover, represent about 90 percent of Zone 7's 2025 supplies. This percentage remains high, with SWP-derived supplies comprising approximately 75 percent of Zone 7's total supplies in 2045. The scenarios in the 2019 SWP Delivery Capability Report that were used for this UWMP account for climate change impacts based on 2035 emissions level and 45 cm sea level rise; therefore, these impacts have been incorporated into Zone 7's water supply planning efforts.

Zone 7 has also evaluated the impacts of climate change to local water supplies (Arroyo Valle) for the 2019 WSE Update, which incorporates a more conservative risk-based analysis; as downscaling of climate change data is refined further, local climate change impacts will continue to be incorporated in future UWMPs.

6.3 ENERGY INTENSITY

In accordance with CWC §10631.2(a), the energy intensity to provide water service to Zone 7's customers over a one-year period is presented in this section to the extent that the information is available. The amount of energy to divert, pump, treat, and distribute the Zone 7's water supply within the system it owns and operates is included. The amount of energy that Zone 7's water retailers require to transport and deliver treated water to their customers are excluded from this plan.

Water energy intensity is the total amount of energy, calculated on a whole-system basis, used to deliver water to Zone 7's customers for use. Energy intensity is the total amount of energy in kilowatt-hours (kWh) expended on a per AF basis to take water from Zone 7's source to its point of delivery. Understanding the whole-system energy intensity would allow Zone 7 to make the following water supply management and system operation strategies:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water;
- Calculating energy savings and greenhouse gas (GHG) emissions reductions associated with water conservation programs;
- Identifying potential opportunities for receiving energy efficiency funding for water conservation programs;
- Informing climate change mitigation strategies; and
- Benchmarking energy use at each water acquisition and delivery step and comparing energy use among similar agencies.

In Table 6-13, the energy intensity of Zone 7's water service is calculated for 2019, as it provides a typical year's energy use. Energy data from 2020 was not used because the COVID-19 pandemic may have altered water use in Zone 7's service area as shelter-in-place and restrictions on businesses went into effect. The total energy intensity for Zone 7's water service is 342 kWh/AF, accounting for facilities under Zone 7's operational control. This represents average energy use and reflects the use of surface water and groundwater in 2019. The breakdown of energy use by Zone 7 was as follows: water treatment plants

(21.3 percent); wells, including treatment (72.4 percent); transmission system (3.2 percent); and offices (3.1 percent).

Groundwater production has a higher intensity than surface water treatment, about 700 kWh/AF versus 100 kWh/AF, because of the energy required to pump water from deep in the groundwater basin. Removal of salts from groundwater using the MGDP also takes a significant amount of energy. While significant energy is used to treat surface water, delivery from the water treatment plants is typically done by gravity (i.e., limited pumping required) because the plants are at a higher elevation than the service area.

Table 6-13. Recommended Energy Intensity – Total Utility Approach: Facilities Under Zone 7's Operational Control (DWR Table O-1B)

		Urban Water Supplier Operational Control		
Enter Start Date for Reporting Period	1/1/2019			
End Date	12/31/2019			
☐ Is upstream embedded in the values reported?		**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
Water Volume Units Used	*AF*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*36,185*	*0*	*36,185*
Energy Consumed (kWh)		*12,377,060*	*0*	*12,377,060*
Energy Intensity (kWh/volume)		*342.0*	*0.0*	*342.0*

Quantity of Self-Generated Renewable Energy

600,000 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

Water production and energy consumption data are based on metered data collected and provided by Zone 7.

Narrative:

Zone 7's water management processes that consume energy include raw water treatment; groundwater pumping, recharge, and treatment; and treated water pumping.

Note, however, that importing surface water into the Tri-Valley and into the treatment plants (and to the arroyos for recharging the groundwater basin, which Zone 7 eventually pumps as groundwater supply) does require a significant amount of energy. This conveyance of water supply is under DWR's operational control. About 1,165 kWh/AF[18] is consumed to convey water from the Delta into the SBA system and to facilities under Zone 7's operational control. Adding the energy intensity of the conveyance of water to

[18] DWR Bulletin 132-18, Table 7 of Appendix B.

Zone 7's system, the total energy intensity for Zone 7's water supply (i.e., from water sources to Zone 7's transmission system) becomes approximately 1,500 kWh/AF (1,165 + 342).

As discussed in Section 6.2.6, Zone 7 does not provide wastewater collection, treatment, or disposal services in its service area. Nor does it handle recycled water. Thus, Zone 7 has not included energy intensity data for those services.

As discussed in Section 3.3.2, Zone 7 has a solar facility at the DVWTP (which provided about 4 percent of Zone 7's energy supply) and continues to explore ways to increase the renewable energy portion of its energy portfolio. Zone 7 obtains energy from various sources which are already about 90 percent carbon-free and 70 percent renewable.

Sixty percent of the SWP system's energy needs are served by hydropower, a greenhouse gas emission-free energy source. By 2030, DWR, which operates the SWP, will cut its greenhouse gas emissions by 60 percent or more below 1990 levels.

CHAPTER 7
Water Service Reliability and Drought Risk Assessment

This chapter describes Zone 7's water service reliability under various hydrologic conditions, including a severe drought for the next five years. Responses to actual water shortage conditions are addressed in Chapter 8.

To analyze its water service reliability, Zone 7 developed a model that uses probability curves for key water system variables (e.g., rainfall or local runoff). The dynamic model also allows for a year-by-year analysis of water system operations in response to hydrologic conditions (e.g., drought). Originally developed about ten years ago, the Zone 7 Water Supply Risk Model is a powerful tool for water supply decision-making and planning. The model simulates water system behavior and calculates reliability forecasts on an annual time scale using a Monte Carlo technique that generates a range of future water supply conditions, random Delta outage scenarios, and uncertain climate impacts. This allows the model to simulate thousands of possible future scenarios and draw conclusions from the collective results, such as the probability of meeting a target level of reliability in a given year. Data from the 2019 DCR were incorporated into the model to represent latest information on the reliability of the SWP, the source of most of Zone 7's supply. The 2019 DCR includes potential climate change impacts on the SWP system, and the model also reflects potential climate change impacts on Zone 7's local surface water supply. Updated information about water supply projects were incorporated where available.

On October 17, 2012, the Zone 7 Board of Directors approved a revised Water Supply Reliability Policy (Resolution No. 13-4230, included as Appendix F), which adopts the following level-of-service goals to guide the management of Zone 7's treated water supplies and its CIP:

- **Goal 1**: Zone 7 will meet its treated water customers' water supply needs, in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands as specified in Zone 7's most recent UWMP, during normal, average, and drought conditions, as follows:
  - At least 85 percent of M&I water demands 99 percent of the time
  - 100 percent of M&I water demands 90 percent of the time
- **Goal 2**: Provide sufficient treated water production capacity and infrastructure to meet at least 80 percent of the maximum month M&I contractual demands should any one of Zone 7's major supply, production, or transmission facilities experience an extended unplanned outage of at least one week.

The water service reliability analysis presented here is based on future water supply options developed to meet the above Zone 7 policy over the long-term.

7.1 WATER SERVICE RELIABILITY ASSESSMENT

This section presents the constraints on Zone 7's existing and planned water sources and describes the historical basis for projecting available supplies in various hydrologic conditions (i.e., normal year, single dry year, and five consecutive dry years). Zone 7's water service reliability is then presented in five-year increments through 2045 based on earlier analysis of water use (discussed in Chapter 4) and supply (Chapter 6). Finally, this section discusses Zone 7's water management tools and options to promote regional supply reliability and minimize the need to import water from other regions.

7.1.1 Constraints on Water Sources

This section discusses the constraints on water supply sources that affect their reliability, and Zone 7's strategies for managing the risks associated with each supply.

7.1.1.1 Imported Water: State Water Project

Constraints on the SWP water supplies, including Delta conveyance, water quality, and SBA conveyance are discussed below.

7.1.1.1.1 Delta Conveyance

Zone 7's long-term contract with DWR for SWP water provides Zone 7 access to Table A water (and Article 56c water or carryover), Article 21 water, Article 56d water, and Yuba Accord water. As an SWP contractor, Zone 7 is also able to use SWP facilities for conveying water transfers or exchanges of SWP water (from another contractor) or from another water agency outside of the SWP system. SWP water moves through the Delta before it is conveyed by the California Aqueduct and the SBA to Zone 7's water facilities.

The instability of the aging levees in the Delta (including their vulnerability to seismic events and climate change), regulatory uncertainty, water quality issues including saltwater intrusion, and the declining health of the Delta ecosystem all challenge the long-term reliability of the SWP and, more generally, the water conveyance capability of the Delta. These issues directly challenge the Tri-Valley's long-term water supply reliability since a majority of Zone 7's water supply is and will continue to be tied to the Delta and SWP system.

In 2018, DWR published their Delta Flood Emergency Management Plan, which provides strategies for responding to Delta levee failures. This plan includes a strategy to establish an emergency freshwater pathway from the central Delta along Middle River and Victoria Canal to the export pumps in the south Delta. The plan also includes the pre-positioning of emergency construction materials at existing and new stockpile and warehouse sites in the Delta. The plan has found that using pre-positioned stockpiles of rock, sheet pile and other materials, multiple earthquake-generated levee breaches and levee slumping along the freshwater pathway can be repaired in less than six months.

The DWR Delta Levees Subventions and Special Projects Programs have prioritized, funded, and implemented levee improvements along the emergency freshwater pathway and other water supply corridors in the central and south Delta. These efforts are complementary to the Delta Flood Emergency Management Plan, which, along with pre-positioned emergency flood fighting materials, ensures reasonable seismic performance of levees and timely pathway restoration after a severe earthquake.

Furthermore, Zone 7 and other SWP contractors are currently working with DWR and other key stakeholders to address the many complex issues undermining the Delta through the proposed DCP. The proposed new diversion structure in the northern Delta provides alternative intakes in case the Delta is affected by an earthquake, levee failure, or some other catastrophic event that impacts water quality and prevents pumping from the Delta. The DCP would also provide alternative intakes that could be used to minimize harm to endangered and threatened species in the Delta. DWR is working closely with regulatory and natural resource agencies to address regulatory uncertainty and protect the Delta ecosystem under an adaptive management framework based on the best available science. With these benefits, the DCP is expected to significantly alleviate constraints on SWP operation and provide more water supply reliability.

Zone 7 is also participating in the LVE project, which includes construction of the Transfer-Bethany Pipeline. This pipeline would provide an alternative means of conveying water supply to Zone 7 when the Delta is inaccessible. More details can be found in Chapter 6 of this plan.

7.1.1.1.2 Water Quality

Until the DCP is constructed and operational, there continue to be water quality concerns associated with transport through the Delta. In 1982, DWR formed the Interagency Delta Health Aspects Monitoring Program to monitor water quality in the Delta and protect human health. The program was renamed the Municipal Water Quality Investigations Program (MWQI Program) in 1990. From a municipal water supply perspective, water quality issues in the Delta are associated with salinity from seawater intrusion, wastewater effluent discharges, agricultural drainages from the islands, and recreational activities. Water quality issues of specific concern to Zone 7 are:

- **Algal byproducts:** Parameters of concern include compounds that cause taste-and-odor (T&O) and algal toxins. T&O is primarily a problem in the warmer months, when algal blooms may be present. It can affect supplies from the Delta and from Lake Del Valle (which stores SWP water). Algae produce geosmin and 2-methylisoborneol (MIB), which are key T&O-causing compounds in surface water supply. Algal toxins derived from blue-green algae can also be a concern. Zone 7’s new ozonation facilities (recently installed at the DVWTP and scheduled for completion at the PPWTP in 2022) effectively treat algal byproducts. Without ozonation, high levels of algal byproducts in both Delta and Lake Del Valle supplies may necessitate temporarily switching to groundwater supplies; blending of sources is also an option depending on the source of algal byproducts and severity.
- **Total and dissolved organic carbon (TOC/DOC):** Zone 7 treats organic carbon with coagulant and disinfectant chemicals, and therefore higher levels of organic carbon increase costs. In addition, TOC/DOC help form disinfectant byproducts (DBPs), which are regulated compounds in drinking water. Historically, Zone 7’s water treatment plants (WTPs) have managed high TOC/DOC by increasing coagulant dosages. However, this operational change results in greater sludge production and limits plant production. The use of ozone reduces coagulant and chlorine demands, thus reducing typical chlorination DBPs; however, formation of ozonation DBPs such as bromate will need to be controlled.
- **Turbidity:** like TOC/DOC, turbidity affects the amount of chemicals used in treatment and Zone 7’s ability to meet drinking water standards. It also can reduce the production capacities of Zone 7’s WTPs, requiring increased groundwater production under high demands. Coagulant dosages can be adjusted to address high turbidity (which can happen after big storms), but if filters require more frequent backwashing, then production may be decreased.
- **Salinity or TDS:** salinity has significant impacts on SWP operations and the availability of water. To meet the salinity objectives in the Delta, water exports from the Delta may be restricted, reducing the amount of water supply available during certain times of the year. Salinity intrusion can be a problem during dry years, when there is insufficient freshwater to repel salinity. Sea level rise due to climate change is also expected to increase salinity in Delta. Finally, levee breaks—due to earthquakes and other factors—would result in significant saltwater intrusion from the Bay as water floods affected islands in the Delta that are below sea level.

- **Algal blooms:** in addition to T&O and the threat of algal toxins, algal blooms can significantly degrade filter performance through clogging. Filter clogging reduces plant production capacities and could require supplemental groundwater use.

As noted above, Zone 7 has state-of-the-art ozonation facilities at the DVWTP, and ozonation facilities will be operational at the PPWTP in 2022. Ozonation improves treatment of T&O, TOC/DOC, turbidity, and algal blooms and significantly increasing the surface water system's reliability.

In 2008, the SBA contractors (ACWD, VW, and Zone 7) developed the SBA Watershed Protection Program to protect water quality once the water from the Delta reaches the SBA. The primary objectives of the SBA Watershed Protection Program include developing a Watershed Management Program for the SBA system, including Lake Del Valle and Bethany Reservoir, and protecting local drinking water and water resources from identified contaminant sources (e.g., septic tanks) for urban, agricultural, recreational, and environmental uses.

7.1.1.1.3 SBA Conveyance

One of the main limitations of Zone 7's water system is the lack of interties. All of Zone 7's imported water supplies are conveyed through the Delta and the SBA; Arroyo Valle water is also conveyed through the SBA. Zone 7 has been working closely with DWR, VW, and ACWD to improve the reliability of the SBA. Between 2003 and 2012, DWR made improvements to the SBA within Zone 7's service area to increase capacity and improve reliability. The work included a new pump station (180 cubic feet per second (cfs)) and inline reservoir (500 AF), and increased the canal carrying capacity to 380 cfs. As part of this project, Zone 7 installed an emergency slide gate to maintain service in the event of a pipeline rupture downstream. Zone 7 will continue coordinating with DWR and South Bay Contractors to improve the reliability of the entire SBA system.

In addition, Zone 7 is pursuing the following projects to diversify its conveyance options:

- **Reliability Intertie**: Zone 7 is also planning for the construction of a reliability intertie with another major water agency that would provide an alternative means of conveying water to Zone 7's service area when the Delta and/or the SBA undergo an outage. For example, an intertie with EBMUD could convey treated water supply to the western portion of Zone 7's service area.
- **Chain of Lakes Pipeline**: This pipeline would allow for access to water stored in the Chain of Lakes as an alternative local water supply; water would be accessible to the DVWTP via one of the SBA turnouts.

7.1.1.2 Groundwater

Chapter 6 details the issues affecting Zone 7's use of the Main Basin, specifically water quality management and prevention of overdraft.

Zone 7 is actively implementing its SNMP. Salinity levels are being addressed primarily through groundwater pumping and demineralization using the MGDP in the Mocho wellfield. The facility simultaneously allows for the export of concentrated minerals or salts from the Main Basin while improving the water quality of treated water.

Zone 7 has several groundwater wells with naturally-occurring Cr(VI) concentrations near the MCL and PFAS above the notification limit. In response, Zone 7 is actively managing flows from the affected wells. Conditions are regularly monitored, and management actions may change in the future. A PFAS treatment facility is under consideration for construction based on pending regulations.

Zone 7 continues to study the groundwater basin and develop new tools (e.g., an improved groundwater model) to better understand the levels of groundwater extraction possible under various conditions while maintaining levels above the historical levels that have been reached in certain portions of the Main Basin ("historic lows"). Zone 7 also plans to augment its ability to recharge the Main Basin (e.g., through the COLs) to increase local storage and allow for more pumping when necessary. Recharging the Main Basin will improve both water supply reliability and salt management. Zone 7 plans to build an additional demineralization facility to continue to decrease the salt content of the Main Basin.

Finally, Zone 7 plans to build additional wells to allow for improved management of groundwater levels and to increase groundwater production capacity during droughts and surface water-related outages. A new booster pump station will improve Zone 7's ability to convey groundwater throughout Zone 7's service area and increase production capacity.

7.1.1.3 Arroyo Valle and Lake Del Valle

ACWD and Zone 7 both have water rights to divert water from the Arroyo Valle. This water is captured and stored in Lake Del Valle, which is owned and operated by DWR. Because Lake Del Valle is used for water supply storage, flood control, and recreation, withdrawing water from the lake needs to be coordinated with the lake's other uses. Typically, DWR lowers the lake elevation after Labor Day for flood control purposes, allowing Zone 7 and ACWD to put runoff from the Arroyo Valle to beneficial use. In the summer months, lake elevations are raised for recreational purposes. Historically, access to Zone 7's stored water in Lake Del Valle has not been problematic, unless there is an outage on the Del Valle Branch pipeline. Zone 7 closely coordinates use of Arroyo Valle water with both ACWD and DWR.

Water collected from the local watershed is protected under the SBA Watershed Protection Program Plan. In general, the water quality of Arroyo Valle runoff is good and does not affect the reliability of this water supply; however, as noted above, T&O can also affect supplies from Lake Del Valle. Zone 7 treats T&O using ozonation, although a switch to groundwater supplies is sometimes necessary under excessive levels of T&O compounds. Algal blooms in the lake can also reduce production capacities, though new ozonation facilities at the DVWTP have significantly reduced the impact.

7.1.1.4 Local Storage

Constraints for Zone 7's existing local storage options, the Main Basin and Lake Del Valle, are discussed in Sections 7.1.1.2 and 7.1.1.3, respectively. The future COLs will provide significant local storage, but uncertainty surrounds its complete transfer to Zone 7. Favorable economic conditions could extend gravel mining operations, and even after mining ceases, reclamation must occur. These steps could delay a full COLs transition to about 2060. Zone 7 continues to work closely with the mining companies and quarry operators so planning efforts can be coordinated. With the Chain of Lakes Pipeline, Zone 7 can enhance its use of the available lakes in the interim period.

7.1.1.5 Non-Local Storage

Access to banked water in Semitropic and Cawelo—both located downstream of Zone 7—requires exchange(s) with other SWP contractors located south of Kern County (e.g., Metropolitan Water District). There must be sufficient water flowing through the Delta and California Aqueduct system to facilitate these exchanges, which could be challenging during a drought. Furthermore, the banked water must be conveyed through the Delta, rendering this supply susceptible to the Delta disruptions described in Section 7.1.1.1.

During the recent drought, access to banked water became uncertain because of the historically low Table A allocation (leading to minimal amounts of water moving through the SWP) and the potential cessation of pumping in the Delta to control salinity intrusion. DWR was able to manage salinity so that Delta pumping could continue, and, with coordination among stakeholders including Zone 7, DWR prioritized the delivery of banked water to Zone 7 and other SBA contractors. Ultimately, even during the serious drought conditions in 2014 and the minimal 5 percent SWP allocation, Zone 7 was able to successfully recover almost 15,000 AF, or approximately 78 percent of the maximum recovery requested by Zone 7. In 2015, Zone 7 recovered approximately 18,000 AF from non-local storage.

Zone 7 will continue to coordinate closely with DWR, other SWP contractors, Semitropic, and Cawelo to ensure the future reliability of the banked water supplies.

Some of Semitropic's wells are affected by arsenic. This is currently being managed through treatment before the affected groundwater water is pumped into the California Aqueduct. Arsenic criteria have been established for this "pump-in" by the DWR Facilitation Group to mitigate any impacts to the downstream SWP contractors. Semitropic and the banking partners have developed a coordination process for discussing arsenic treatment. While the presence of arsenic in the Semitropic groundwater bank is likely to increase the cost of this water storage option, it is not likely to affect its overall reliability.

7.1.2 Year Type Characterization

The quantity available from each of Zone 7's water supply sources varies from year-to-year depending on hydrologic conditions. Consequently, Zone 7 reviewed historical data and developed a projected yield for each water supply source under three conditions: (1) normal water year, (2) single dry year, and (3) five-consecutive-year drought. Each condition is defined as follows:

- **Normal Water Year**: The year in the historical sequence most closely representing average runoff or allocation levels and patterns.
- **Single Dry Year**: The year in the historical sequence with the lowest annual runoff or allocation.
- **Five-Consecutive-Year Drought**: Zone 7 considers a six-year "design drought" as part of its water supply analyses (e.g., 2019 WSE Update). Selection of the design drought corresponds with the driest six-year sequence on record, 1987-1992. This same sequence was utilized in the UWMP to maintain consistency with Zone 7's water supply planning efforts and is more conservative than the minimum required five-year drought scenario.

For each of Zone 7's sources, this section presents the available supply under the hydrologic conditions described above. Data presented below were derived from historical conditions, adjustments to account for climate change impacts and other projected trends, DWR's 2019 DCR (using modeling estimates that separated Table A allocations from carryover deliveries), and Zone 7's Water Supply Risk Model results.

7.1.2.1 State Water Project

The quantity of water available from the SWP, including Table A, Article 21 and Article 56d, Yuba Accord, and carryover water are discussed below.

7.1.2.1.1 Table A Water

The current reliability of SWP supplies is derived from the 2019 DCR, which is described in more detail in Chapter 6. DWR's estimates of SWP deliveries are based on a computer model that simulates operations of the SWP and CVP systems. Note that DWR's model currently only includes hydrology from 1922-2003; future updates will extend this range into later years. The 2019 DCR uses the following assumptions to model current (2020) conditions: existing facilities, hydrologic inflows to the model based on 82 years of historical inflows (1922 through 2003), current regulatory and operational constraints, and contractor demands at maximum Table A amounts. To evaluate SWP supply availability under future conditions, the 2019 DCR included a model study representing hydrologic and sea level rise conditions at 2040.

For Zone 7, the 2019 DCR's existing condition was assumed to represent 2020 (59 percent Table A reliability, 47,600 AFY[19]) , and the future condition (54 percent Table A reliability, 43,500 AFY[19]) was applied to 2040; the years in between were interpolated between these two bookends. Note that while the proposed DCP is designed to increase the SWP's reliability, the quantitative effect on SWP water supply yield is still being analyzed and has not been included at this time to allow for a more conservative analysis.

Figure 7-1 illustrates projected SWP allocations from 1922 to 2003[20] using the results from the 2019 DCR for existing and future conditions. As shown on Figure 7-1, 1965 (52 percent) closely represents the average allocation (54 percent) under future conditions, while 1987 to 1992 closely represents the driest six-year period included in DWR's model. This dry period includes SWP allocations ranging from 10 percent to 67 percent under future (2040) conditions.

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[19] This is the average reliability (Table A allocation) based on DWR's modeling in the 2019 DCR.

[20] DWR plans to extend the modeling period past 2003 in future versions of their model, which will be reflected in future Delivery Capability Reports.

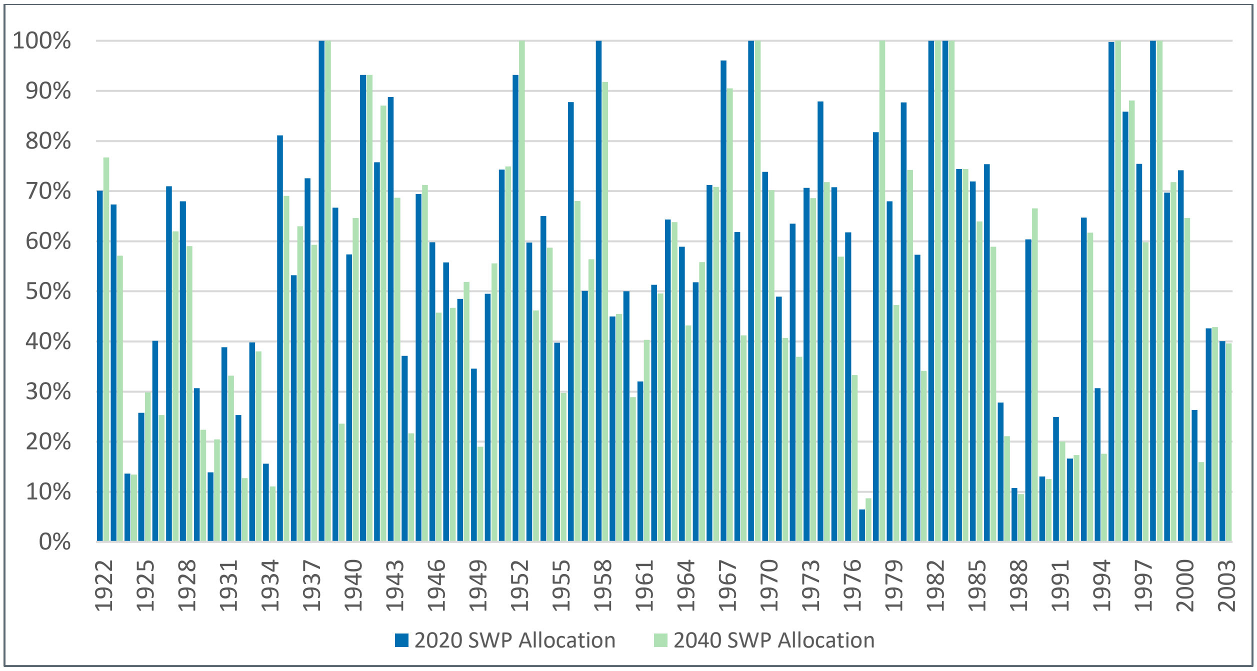

Figure 7-1. Existing and Future SWP Table A Allocations from the 2019 Delivery Capability Report

Figure 7-1 also indicates that the lowest allocation over the modeling period used by DWR occurs in 1977 at 9 percent Table A allocation (2040 conditions); however, the 2014 actual allocation was lower at 5 percent. The extremely dry sequence from the beginning of January 2013 through the end of 2014 was one of the driest two-year periods in the historical record. The extraordinarily dry conditions in 2013 and 2014 resulted in the historically lowest 5 percent Table A allocation that was only available starting in the fall of 2014. This UWMP uses a conservative assumption that a 5 percent allocation of SWP Table A amounts represents the worst-case single dry year scenario. Note that a 5 percent allocation of SWP Table A amounts corresponds to 9 percent of normal year SWP Table A amounts.

Table 7-1 summarizes the basis of water year and available supply for Zone 7 from the SWP.

Table 7-1. Basis of Water Year and Available Supply: SWP Table A Water (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	43,500	100%
Single-Dry Year	2014	4,000	9%
Consecutive Dry Years 1st Year	1987	16,900	39%
Consecutive Dry Years 2nd Year	1988	8,100	19%
Consecutive Dry Years 3rd Year	1989	54,000	124%
Consecutive Dry Years 4th Year	1990	10,500	24%
Consecutive Dry Years 5th Year	1991	16,100	37%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the State Water Project Table A. Volumes are in AF. The Average, Single Dry Year, and Multiple Dry Years are based on 2040 Future SWP Reliability Allocations.

7.1.2.1.2 Article 21 Water and Article 56d Water

As a contractor of the SWP, Zone 7 also has access to Article 21 water (interruptible or surplus water) and Article 56d water (turnback pool water). Neither Article 21 nor Article 56d water were included in this UWMP for planning-level purposes. Zone 7's access to Article 21 water may increase in the future once the Chain of Lakes Pipeline is in service; this access will be reflected in a future UWMP as appropriate. Water that could have been part of the Article 56d turnback pool will now be available through water transfers, which are a component of Zone 7's supply, as described below.

7.1.2.1.3 Yuba Accord

Water is primarily available during dry years under the Yuba Accord, but the amount is relatively small: 400 AF in 2014, approximately 300 AF in 2015, and 3,000 AF in 2020. For planning purposes, Zone 7 currently does not assume any water supply yield specifically from the Yuba Accord, although Zone 7 will continue to pursue this supply when available. Water from the Yuba Accord could contribute to Zone 7's supply as a water transfer.

7.1.2.1.4 Carryover

As a SWP contractor, Zone 7 can carry water from one year to the next in San Luis Reservoir – also called Article 56(c) water. The amount of carryover depends on DWR's allocation for that year. For example, if allocations are equal to or less than 50 percent of Zone 7's Table A amount, then carryover is limited to 25 percent of Zone 7's total Table A amount, or approximately 20,200 AFY (25 percent of 80,619 AF). However, if allocations are at least 75 percent of Zone 7's Table A amount, then carryover increases to 50 percent of Zone 7's total Table A amount, or approximately 40,300 AFY (50 percent of 80,619 AF).

If the San Luis Reservoir level gets too high, a portion of Zone 7's carryover can be lost; this condition is more likely when the reservoir is relatively full and hydrologic conditions are above normal. Zone 7 manages carryover to avoid or minimize losses. As part of its operating agreement with DWR, Zone 7 can also carry inflow from Arroyo Valle in Lake Del Valle from one year to the next.

Typically, any carryover into a normal water year would be used in that year; however, a similar amount of current year supply would also be carried over for use in the following year. Zone 7 typically targets carryover of about 10,000 AF of water from one year into the next. In the past, Zone 7 had significant carryover water available (greater than 15,000 AF), and much of this supply was used during the 2012-2016 drought. Available carryover supplies were derived from the Water Supply Risk Model analysis using averages over the period 2025-2040. The estimate of available supplies reflects Monte Carlo simulations of Zone 7's use of supplies and resulting storage levels.

Table 7-2 summarizes the average available carryover under each water year type; base years were chosen to match those for the SWP Table A supply. Modeled average carryover over 2025-2040 was estimated at about 12,700 AF, while carryover is reduced significantly during multiple dry years, averaging about 2,000 AF during the latter four years of drought. Zone 7 would likely pursue additional water transfers during such periods to increase these carryover levels. As indicated in Chapter 6, Zone 7 normally plans for about 10,000 AF of carryover.

Table 7-2. Basis of Water Year and Available Supply: Carryover Water (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	10,000	100%
Single-Dry Year	2014	15,500	155%
Consecutive Dry Years 1st Year	1987	15,500	155%
Consecutive Dry Years 2nd Year	1988	2,800	28%
Consecutive Dry Years 3rd Year	1989	1,800	18%
Consecutive Dry Years 4th Year	1990	1,800	18%
Consecutive Dry Years 5th Year	1991	1,800	18%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Multiple versions of this table are being used; this table is for Carryover. Volumes are in AF. Average is based on Zone 7's normal operational target. Other data are from averages of a long-term modeling run from the Water Supply Risk Model.			

7.1.2.2 Water Transfers

A transfer agreement with another SWP contractor using the SWP system—which Zone 7 is already invested in—is likely the most expedient and cost-effective transfer option. The transfer amount could vary from year-to-year depending on hydrology but could average between 5,000 and 10,000 AFY. For the 2020 UWMP, Zone 7 is assuming a constant 5,000 AFY in water transfers through 2030.

Table 7-3 summarizes the basis of water year and available supply from SWP transfers. Base years were chosen to match those of the SWP, although as noted above, 5,000 AF was assumed for all year types.

Table 7-3. Basis of Water Year and Available Supply: SWP/Other Transfers (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	5,000	100%
Single-Dry Year	2014	5,000	100%
Consecutive Dry Years 1st Year	1987	5,000	100%
Consecutive Dry Years 2nd Year	1988	5,000	100%
Consecutive Dry Years 3rd Year	1989	5,000	100%
Consecutive Dry Years 4th Year	1990	5,000	100%
Consecutive Dry Years 5th Year	1991	5,000	100%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Multiple versions of this table are being used; this table is for Water Transfers. Volumes are in AF. Amounts are likely to vary from year-to-year but variability has not been quantified at this time.			

7.1.2.3 Local Surface Water: Arroyo Valle

Figure 7-2 shows estimated and measured historical inflows from Arroyo Valle into Lake Del Valle. Note that inflows are used for environmental releases and for water supply to Zone 7 and ACWD. Some inflows may end up as flood releases when there is insufficient capacity in the lake and insufficient ability for Zone 7 and ACWD to store/use the water.

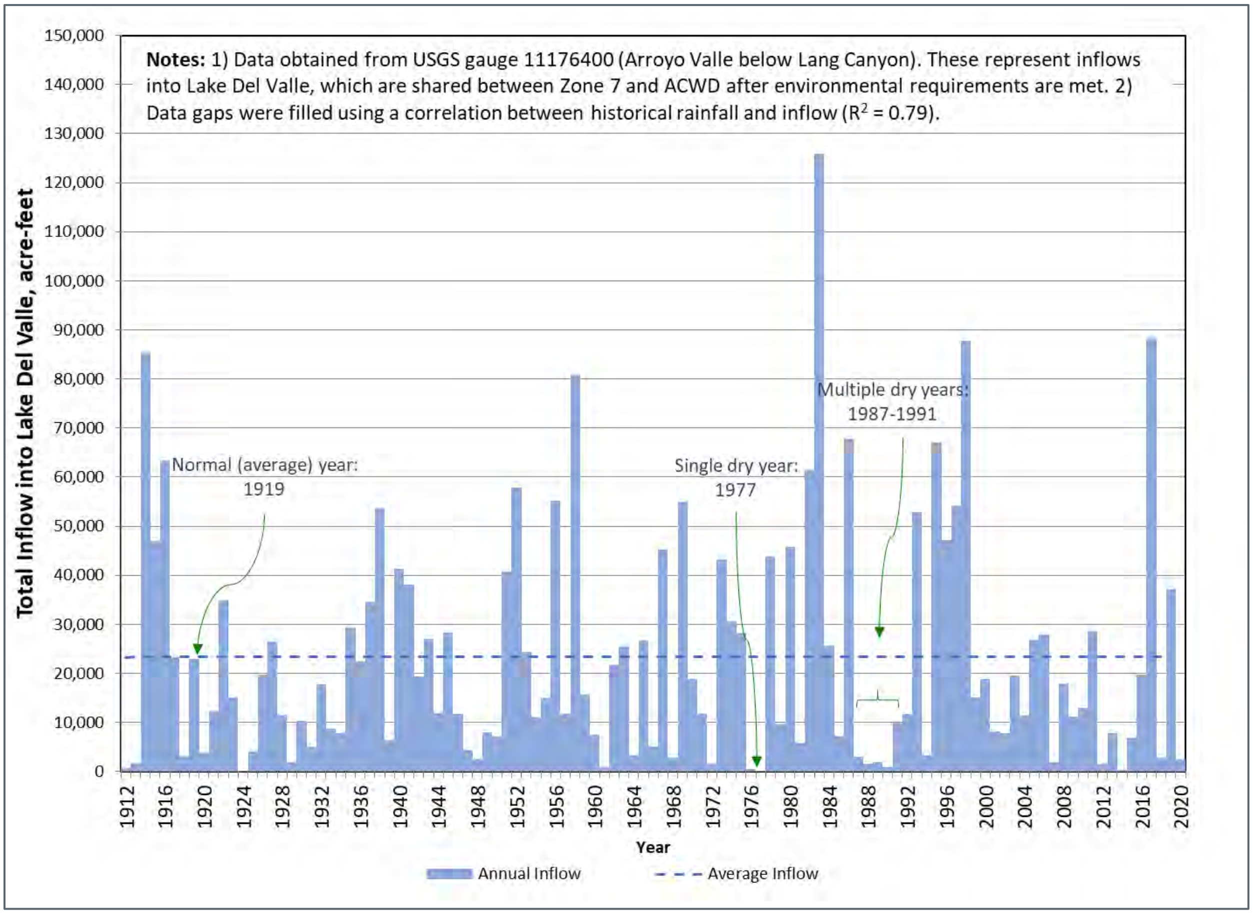

Figure 7-2. Estimated and Measured Inflows from Arroyo Valle into Lake Del Valle

Zone 7's latest modeling forecasts future average yields from Arroyo Valle to Zone 7 at approximately 5,500 AFY, using historical hydrology adjusted for climate change impacts. The ten-year calendar year average (2011-2020) has been 3,500 AFY; local climate change effects on the watershed are expected to reduce the yield over time. Conversely, construction of the Chain of Lakes Arroyo Valle diversion structure and pipeline (discussed in Section 6.2.9) will allow Zone 7 to capture more of the storm releases from Lake Del Valle, and likely increase the yield from this water supply in the future. The conservative average yield estimate of 5,500 AFY is consistent with the 2019 WSE Update; it will be re-evaluated as more climate change downscaled information is developed and as the COLs projects progress and additional yield could be better quantified.

Based on water supply yields to Zone 7, the year closest to the average supply is 1919, while the lowest 5-year average is from 1987 to 1991. The analysis in this UWMP assumes that inflow is available during a single dry year and uses a base year of 1977. Table 7-4 summarizes the basis of water year and available supply for Zone 7 from local runoff under the Arroyo Valle water right permit.

Table 7-4. Basis of Water Year and Available Supply: Arroyo Valle (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1919	5,500	100%
Single-Dry Year	1977	0	0%
Consecutive Dry Years 1st Year	1987	1,700	31%
Consecutive Dry Years 2nd Year	1988	1,500	27%
Consecutive Dry Years 3rd Year	1989	1,500	27%
Consecutive Dry Years 4th Year	1990	1,500	27%
Consecutive Dry Years 5th Year	1991	1,500	27%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the Arroyo Valle and includes carryover from the previous year. Volumes are in AF. Based on SWP Table A base years. Other data are from averages of a long-term modeling run from the Water Supply Risk Model.

7.1.2.4 Local Storage

As mentioned previously, Zone 7's existing local storage options include Lake Del Valle and the Main Basin. With future completion of the COLs Pipeline around 2025, Zone 7 could begin to use the COLs for storage of imported or local surface water, which will also enhance groundwater recharge in the Main Basin. Furthermore, the pipeline will allow for access to stored water in the COLs. The stored water in the lakes is a combination of surface water and groundwater. In Zone 7's Water Supply Risk Model, the water supply accounting for the COLs is closely tied to groundwater storage levels. The amounts shown in Table 7-5 indicate the amount of water supply that could be conveyed to the DVWTP during droughts and emergencies. It would not be used during normal years.

Table 7-5. Basis of Water Year and Available Supply: Chain of Lakes (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	10,100	100%
Single-Dry Year	2014	8,300	82%
Consecutive Dry Years 1st Year	1987	8,800	87%
Consecutive Dry Years 2nd Year	1988	7,900	78%
Consecutive Dry Years 3rd Year	1989	6,900	68%
Consecutive Dry Years 4th Year	1990	6,000	59%
Consecutive Dry Years 5th Year	1991	5,200	51%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
****Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Multiple versions of this table are being used; this table is for stored water in the Chain of Lakes that could be conveyed to the Del Valle Water Treatment Plant. Volumes are in AF.			

The use of Lake Del Valle is tied to SWP reliability, discussed under Section 7.1.2.1, and to the availability of local water from the Arroyo Valle, discussed under Section 7.1.2.3. The following focuses on the reliability of the groundwater supply from the Main Basin.

Based on a review of current well capacities and groundwater modeling, Zone 7 estimates that it can pump approximately 28,000 AF over a one-year period, assuming the Main Basin is approximately greater than or equal to 80 percent full. This annual limit is projected to increase to as high as 34,400 AF once all the Well Master Plan[21] wells are in service. For conservative planning-level purposes in this UWMP, Zone 7 staff included limits on the total volume of groundwater pumped during multiple dry years to ensure that water surface elevations remain above historic lows during a multiple-dry year event. The pumping

[21] CH2M Hill, 2003. Well Master Plan.

is limited by the groundwater basin level, ensuring less pumping as the basin level decreases. A historical low within the model prohibits groundwater levels from dipping below this value.

Table 7-6 summarizes the available supply under each water year type. Base years were chosen to match those of the SWP, as this reflects the need for supplemental local groundwater supply. Note that the averages of 2025-2040 long-term projection runs from the Water Supply Risk Model were used and these values are groundwater pumping capacity, or groundwater availability, and not volumes of groundwater pumped. Zone 7 normally targets about 9,200 AFY of groundwater pumping.

Table 7-6. Basis of Water Year and Available Supply: Main Basin (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1965	29,200	100%
Single-Dry Year	2014	27,600	95%
Consecutive Dry Years 1st Year	1987	27,600	95%
Consecutive Dry Years 2nd Year	1988	25,100	86%
Consecutive Dry Years 3rd Year	1989	20,600	71%
Consecutive Dry Years 4th Year	1990	15,100	52%
Consecutive Dry Years 5th Year	1991	9,700	33%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Multiple versions of this table are being used; this table is for groundwater from the Main Basin. Volumes are in AF. Data shown are from averages of a long-term modeling run from the Water Supply Risk Model. Values show groundwater pumping capacity, or availability, not volumes pumped. Zone 7 targets average groundwater pumping at 9,200 AFY.			

7.1.2.5 Non-Local Storage

The water supply reliability of the Semitropic Water District and Cawelo Water District non-local supplies is discussed below.

7.1.2.5.1 Semitropic Water District

Zone 7 has 78,000 AF of groundwater banking storage capacity available through Semitropic to augment water supplies during drought conditions. During non-drought periods, Zone 7 can store up to 5,883 AFY into the Semitropic groundwater bank. During droughts, Zone 7 can request up to 9,100 AFY of pumpback and up to 8,645 AFY of exchange water, though the availability of exchange water depends on projected SWP deliveries.

Table 7-7 summarizes the projected Semitropic stored water that would likely be available under normal, single-dry, and five consecutive dry years. The values are based on averages of 2025-2040 long-term projection runs from the Water Supply Risk Model, and reflect storage levels, conveyance/delivery capacity, and potential Delta outages built into the Water Supply Risk Model that could affect access to this supply. Note that Zone 7 generally does not rely on water stored in Semitropic during normal water years, so while water may be available, it would generally not be used. Base years were chosen to match those of the SWP.

Table 7-7. Basis of Water Year and Available Supply: Semitropic (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	13,000	100%
Single-Dry Year	2014	6,500	50%
Consecutive Dry Years 1st Year	1987	10,000	77%
Consecutive Dry Years 2nd Year	1988	10,000	77%
Consecutive Dry Years 3rd Year	1989	10,000	77%
Consecutive Dry Years 4th Year	1990	10,100	78%
Consecutive Dry Years 5th Year	1991	10,100	78%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
****Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Multiple versions of this table are being used; this table is for the Semitropic Water Storage District's banking program. Volumes are in AF. Average year value is the average from 2025-2040 of a long-term model run from the Water Supply Risk Model. Other data are from averages of a long-term modeling run from the Water Supply Risk Model. Note that Zone 7 typically does not recover water from Semitropic during normal years.			

7.1.2.5.2 Cawelo Water District

Zone 7 has 120,000 AF of groundwater banking storage capacity available with Cawelo to augment water supplies during drought conditions. During non-drought periods, Zone 7 can bank 5,000 AFY[22]. During droughts, Zone 7 can request up to 10,000 AFY of pumpback.

Table 7-8 summarizes the projected Cawelo stored water supply that would be available under normal, single-dry, and five consecutive dry years. Base years were chosen to match those of the SWP. The values are based on averages of 2025-2040 long-term projection runs from the Water Supply Risk Model, and reflect storage levels, conveyance/delivery capacity, and potential Delta outages built into the Water Supply Risk Model that could affect access to this supply. Note that Zone 7 generally does not rely on water stored in Cawelo during normal water years, so while water may be available, it would generally not be used. Base years were chosen to match those of the SWP.

Table 7-8. Basis of Water Year and Available Supply: Cawelo (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	9,700	100%
Single-Dry Year	2014	7,100	73%
Consecutive Dry Years 1st Year	1987	9,700	100%
Consecutive Dry Years 2nd Year	1988	9,700	100%
Consecutive Dry Years 3rd Year	1989	9,700	100%
Consecutive Dry Years 4th Year	1990	9,700	100%
Consecutive Dry Years 5th Year	1991	9,700	100%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
****Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Multiple versions of this table are being used; this table is for the Cawelo Water District's banking program. Volumes are in AF. Average year value is the average from 2025-2040 of a long-term model run from the Water Supply Risk Model. Other data are from averages of a long-term modeling run from the Water Supply Risk Model.			

[22] Zone 7 only gets storage credit for 50 percent of the water provided to Cawelo. Per the existing contract, Zone 7 can only send 10,000 AF in any given year to Cawelo; therefore, the maximum contractual credit is 5,000 AF (50 percent of 10,000 AF).

7.1.2.6 Sites Reservoir

Sites Reservoir is assumed to increase Zone 7's water supplies by an average of 10,000 AFY beginning in 2030. Delivery would vary based on hydrology and Zone 7's needs, and available storage. Deliveries would be coordinated with SWP deliveries.

Table 7-9 summarizes the water supply assumptions for Sites Reservoir used in this plan, with water supplies assumed to be available by 2030. Base years were chosen to match those of the SWP.

Table 7-9. Basis of Water Year and Available Supply: Sites Reservoir Project (DWR Table 7-1 Wholesale)

Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	10,000	100%
Single-Dry Year	2014	15,300	153%
Consecutive Dry Years 1st Year	1987	16,800	168%
Consecutive Dry Years 2nd Year	1988	17,700	177%
Consecutive Dry Years 3rd Year	1989	16,300	163%
Consecutive Dry Years 4th Year	1990	15,900	159%
Consecutive Dry Years 5th Year	1991	15,800	158%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the Sites Reservoir Project. Volumes are in AF. Dry year values are based on 2040 conditions from the Water Supply Risk Model.

7.1.2.7 Other New Water Supplies: BARDP and/or Potable Reuse

As discussed in Section 6.2.9.1, Zone 7 is pursuing desalination and potable reuse to potentially increase future supplies. This plan assumes the total potential yield from BARDP and/or potable reuse is 5,000 AFY, with either or both systems operational by 2030.

These projects remain in early planning stages. Consequently, projected supplies are preliminary and subject to change. Zone 7 will monitor each project's progress and update supply projections as appropriate. Table 7-10 summarizes the water supply assumptions used in this UWMP, with water supplies assumed to be available by 2030. Base years were chosen to match those of the SWP. Because these supplies are generally drought-resistant, they have been assumed to provide a constant 5,000 AFY under all conditions.

Table 7-10. Basis of Water Year and Available Supply: Other Potential New Water Supplies – Bay Area Regional Desalination Project and/or Potable Reuse (DWR Table 7-1 Wholesale)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	5,000	100%
Single-Dry Year	2014	5,000	100%
Consecutive Dry Years 1st Year	1987	5,000	100%
Consecutive Dry Years 2nd Year	1988	5,000	100%
Consecutive Dry Years 3rd Year	1989	5,000	100%
Consecutive Dry Years 4th Year	1990	5,000	100%
Consecutive Dry Years 5th Year	1991	5,000	100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

****Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for Bay Area Regional Desalination Project and/or potable reuse. Volumes are in AF. Because these supplies are generally drought-resistant, they have been assumed to provide a constant 5,000 AFY under all conditions.

7.1.3 Water Service Reliability

This section presents comparisons of projected water supplies and demands from 2025 through 2045 under the following hydrologic conditions: normal year, single dry year, and five consecutive dry years. Zone 7's projected demands are presented in Chapter 4, while supply sources are described in Chapter 6.

The estimated average amounts of water available during various hydrologic conditions are summarized in Table 7-11. The yields presented reflect the expected range of water supply available based on historical use records, hydrologic records, and existing supplies and storage options, or expected increases in yield or capacity due to new facilities and supplies.

Table 7-11. Summary of Estimated Available Water Supply

Water Source	Yield, AFY		
	Normal Year	Single Dry Year	Five Consecutive Dry Years
SWP – Table A[(a)]	43,500	4,000	8,100-54,000
SWP – Carryover[(b)]	10,000	15,500	1,800-15,500
Water Transfers[(c)]	5,000	5,000	5,000
Arroyo Valle	5,500	0	1,500-1,700
Sites Reservoir[(d)]	10,000	15,300	15,800-17,700
BARDP and/or Potable Reuse[(e)]	5,000	5,000	5,000
From Storage			
Main Basin[(f)]	29,200	27,600	9,700-27,600
Semitropic[(g)]	13,000	6,500	10,000-10,100
Cawelo[(g)]	9,700	7,100	9,700
Chain of Lakes[(h)]	10,100	8,300	5,200-8,800

(a) Based on 2040 future SWP reliability Table A allocations.
(b) Zone 7's operational target is typically 10,000 AF for normal years.
(c) Zone 7 is pursuing water transfer agreements for the period through 2030. Amounts may vary from year-to-year, but variability has not been quantified.
(d) Supplies from Sites Reservoir are assumed to be available by 2030.
(e) Supplies from these sources are assumed to be available by 2030.
(f) These are estimated available supplies, not necessarily what would be pumped. Zone 7's typical operational target is around 9,200 AF for normal years.
(g) Semitropic and Cawelo supplies are typically not used during normal years.
(h) The Chain of Lakes Pipeline, which provides access to water stored in the Chain of Lakes, is assumed to be completed around 2025. Water stored in the Chain of Lakes is assumed to be available by 2030 and would not be used during normal years.

7.1.3.1 Water Service Reliability – Normal Year

Table 7-12 shows that under normal hydrologic conditions, Zone 7's supplies are adequate to meet projected demands. Surplus supplies are stored as carryover, used to recharge the Main Basin, and stored in the Kern County groundwater banks. Note that the supplies shown below are representative of expected normal conditions or normal operational targets.

Table 7-12. Normal Year Supply and Demand Comparison (DWR Table 7-2 Wholesale)

	2025	2030	2035	2040	2045 *(Opt)*
Supplies					
SWP Table A	47,000	46,000	45,000	43,500	43,500
Yuba Accord	0	0	0	0	0
Turnback Pool	0	0	0	0	0
SWP Carryover	10,000	10,000	10,000	10,000	10,000
Arroyo Valle	5,500	5,500	5,500	5,500	5,500
Main Basin	9,200	9,200	9,200	9,200	9,200
Semitropic	0	0	0	0	0
Cawelo	0	0	0	0	0
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir Project	0	10,000	10,000	10,000	10,000
Transfers	5,000	5,000	0	0	0
Chain of Lakes	0	0	0	0	0
Supply totals *(autofill from Table 6-9)*	76,700	90,700	84,700	83,200	83,200
Demands					
Retailer Demand	43,000	43,200	43,400	43,700	43,700
Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,000	1,300	2,500	2,500
Demand totals *(autofill from Table 4-3)*	50,300	52,800	53,800	55,300	55,300
Difference	26,400	37,900	30,900	27,900	27,900
NOTES: Volumes are in AF. Table references refer to DWR table numbers. Surplus supplies are stored as carryover, used to recharge the Main Basin, and stored in the Kern County groundwater banks.					

7.1.3.2 Water Service Reliability – Single Dry Year

Table 7-13 shows that in a single dry year, Zone 7's supplies are adequate to meet projected demands on average. The values in Table 7-13 reflect average output from Zone 7's water supply risk model, which was initialized given 2020 conditions and configured to simulate a single-dry year beginning in each year required in the drought risk assessment (e.g., 2025, 2030, etc.). The model simulates 10,000 trials to reflect varying hydrologic conditions. Given this model configuration, reported availability may differ slightly from values in the tables in Section 7.1.2.

The single dry year is based on 2014 critically dry conditions—worst case for State Water Project. This scenario assumes the worst local conditions with no local water available. Note that conservation is not included in the demands; any extra supply as a result of conservation will remain in storage or go towards storage.

There is a potential for operational constraints, especially during a Delta outage when there may be no or minimal water moving through the SBA from the Delta, could result in shortages, particularly in the near-term before major water supply projects are implemented. Untreated water customers would be most vulnerable because of their reliance on Delta water. As described in the WSCP, in these cases, Zone 7 could call for voluntary or mandatory conservation and also make operational adjustments to minimize such shortages.

7.1.3.3 Water Service Reliability – Five Consecutive Dry Years

Table 7-14 through Table 7-18 show that in five consecutive dry years, Zone 7's supplies are adequate to meet projected demands on average.

The values in Table 7-14 through Table 7-18 reflect average output from Zone 7's water supply risk model, which was initialized given 2020 conditions and configured to simulate a five-consecutive-dry years scenario beginning in each year required in the reliability assessment (e.g., 2025, 2030, etc.). The model simulates 10,000 trials to reflect varying hydrologic conditions. The five-consecutive-dry year scenario reflects hydrologic years 1987-1991, which are randomly shuffled throughout the 10,000 trials (e.g., hydrologic year 1988 may not follow 1987 within the five-consecutive-years sequence). Given this model configuration, reported availability may differ slightly from long-term average values identified in the tables in Section 7.1.2. As noted previously, Zone 7 generally uses a six-year drought (1987-1992) for water supply planning purposes. While not required for the UWMP, Table 7-20 shows conditions during the sixth year of drought.

As noted previously, operational constraints, especially during a Delta outage when there may be no or minimal water moving through the SBA from the Delta, could result in shortages. Untreated water customers would be most vulnerable because of their reliance on Delta water. As described in the WSCP, in these cases, Zone 7 could call for voluntary or mandatory conservation and also make operational adjustments to minimize such shortages. The possibility and amount of such shortages decrease as major water supply projects are implemented starting around 2030.

Table 7-13. Single Dry Year Supply and Demand Comparison (DWR Table 7-3 Wholesale)

	2025	2030	2035	2040	2045 (Opt)
Supplies					
SWP Table A	4,400	4,400	4,400	4,400	4,400
Yuba Accord	0	0	0	0	0
Turnback Pool	0	0	0	0	0
SWP Carryover	15,500	12,000	13,800	12,600	12,700
Arroyo Valle	0	0	0	0	0
Main Basin	27,600	29,900	31,800	32,200	32,500
Semitropic	6,500	6,600	6,600	6,500	6,500
Cawelo	7,100	7,100	7,100	7,100	7,000
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir Project	0	14,200	15,700	15,300	15,100
Transfers	4,500	4,600	0	0	0
Chain of Lakes	0	8,300	9,800	9,400	9,100
Supply totals*	65,600	92,100	94,200	92,500	92,300
Demands					
Retailer Demand	43,000	43,200	43,400	43,700	43,700
Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,000	1,300	2,500	2,500
Demand totals*	50,300	52,800	53,800	55,300	55,300
Difference	15,300	39,300	40,400	37,200	37,000
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES: Volumes are in AF.					

Table 7-14. First Dry Year Supply and Demand Comparison (DWR Table 7-4 Wholesale)

Projections - First Year	2025	2030	2035	2040	2045
Supplies					
SWP Table A	19,900	19,500	19,500	19,500	19,400
SWP Carryover	15,500	12,000	13,800	12,600	12,700
Arroyo Valle	1,700	1,700	1,700	1,700	1,700
Main Basin	27,600	29,900	31,800	32,200	32,500
Semitropic	10,000	9,900	10,000	10,000	9,900
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	15,300	17,000	16,800	16,600
Water Transfers	4,800	4,800	0	0	0
Chain of Lakes		8,800	10,000	9,600	9,300
Total Supplies	**89,200**	**116,600**	**118,500**	**117,100**	**116,800**
Demands					
Retailer Demand	43,000	43,200	43,400	43,700	43,700
Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,000	1,300	2,500	2,500
Total Demands	**50,300**	**52,800**	**53,800**	**55,300**	**55,300**
Difference	38,900	63,800	64,700	61,800	61,500
NOTES: Volumes are in AF.					

Table 7-15. Second Dry Year Supply and Demand Comparison (DWR Table 7-4 Wholesale)

Projections - Second Year	2026	2031	2036	2041	2046
Supplies					
SWP Table A	20,200	19,800	19,800	19,600	19,600
SWP Carryover	2,800	4,400	3,500	3,100	3,100
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	25,100	29,400	31,400	31,600	31,900
Semitropic	10,000	10,000	10,000	10,000	10,000
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	18,100	18,300	17,700	17,800
Water Transfers	4,900	0	0	0	0
Chain of Lakes	600	7,900	8,800	8,400	8,200
Total Supplies	**74,800**	**105,800**	**108,000**	**106,600**	**106,800**
Demands					
Retailer Demand	43,000	43,200	43,500	43,700	43,700
Untreated Water Demand	6,900	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,060	1,600	2,500	2,500
Total Demands	**51,700**	**53,360**	**54,200**	**55,300**	**55,300**
Difference	23,100	52,440	53,800	51,300	51,500
NOTES: Volumes are in AF.					

Table 7-16. Third Dry Year Supply and Demand Comparison (DWR Table 7-4 Wholesale)

Projections - Third Year	2027	2032	2037	2042	2047
Supplies					
SWP Table A	20,200	19,800	19,700	19,700	19,600
SWP Carryover	1,800	2,700	2,500	2,300	2,300
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	20,600	28,300	30,300	30,300	30,700
Semitropic	10,000	10,000	9,900	10,000	9,900
Cawelo	9,700	9,800	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	16,600	16,400	16,300	16,300
Water Transfers	4,900	0	0	0	0
Chain of Lakes	400	6,900	7,700	7,500	7,300
Total Supplies	**69,100**	**100,600**	**102,700**	**102,300**	**102,300**
Demands					
Retailer Demand	43,100	43,300	43,500	43,700	43,700
Untreated Water Demand	7,100	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,120	1,800	2,500	2,500
Total Demands	**52,000**	**53,520**	**54,400**	**55,300**	**55,300**
Difference	17,100	47,080	48,300	47,000	47,000
NOTES: Volumes are in AF.					

Table 7-17. Fourth Dry Year Supply and Demand Comparison (DWR Table 7-4 Wholesale)

Projections - Fourth Year	2028	2033	2038	2043	2048
Supplies					
SWP Table A	20,200	19,500	19,800	19,700	19,800
SWP Carryover	1,800	2,100	2,000	1,900	1,900
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	15,100	26,900	28,800	28,600	28,900
Semitropic	10,100	10,000	10,000	10,000	10,000
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	16,000	16,000	15,900	15,900
Water Transfers	4,900	0	0	0	0
Chain of Lakes	300	6,000	6,700	6,600	6,500
Total Supplies	**63,600**	**96,700**	**99,500**	**98,900**	**99,200**
Demands					
Retailer Demand	43,100	43,300	43,600	43,700	43,700
Untreated Water Demand	7,350	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,180	2,000	2,500	2,500
Total Demands	**52,250**	**53,580**	**54,700**	**55,300**	**55,300**
Difference	11,350	43,120	44,800	43,600	43,900
NOTES: Volumes are in AF.					

Table 7-18. Fifth Dry Year Supply and Demand Comparison (DWR Table 7-4 Wholesale)

Projections - Fifth Year	2029	2034	2039	2044	2049
Supplies					
SWP Table A	20,200	19,800	19,700	19,600	19,600
SWP Carryover	1,800	1,900	1,900	1,900	1,900
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	9,700	25,200	27,000	26,500	26,900
Semitropic	10,100	10,000	10,000	10,000	10,000
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	15,800	15,800	15,800	15,700
Water Transfers	4,900	0	0	0	0
Chain of Lakes	300	5,200	5,900	5,900	5,800
Total Supplies	**58,200**	**94,100**	**96,500**	**95,900**	**96,100**
Demands					
Retailer Demand	43,100	43,400	43,600	43,700	43,700
Untreated Water Demand	7,600	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,240	2,300	2,500	2,500
Total Demands	**52,500**	**53,740**	**55,000**	**55,300**	**55,300**
Difference	5,700	40,360	41,500	40,600	40,800
NOTES: Volumes are in AF.					

Table 7-19. Sixth Dry Year Supply and Demand Comparison (DWR Table 7-4 Wholesale)

Projections - Sixth Year	2030	2035	2040	2045	2050
Supplies					
SWP Table A	19,900	19,500	19,500	19,300	19,300
SWP Carryover	1,800	1,900	1,800	1,800	1,800
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	7,100	23,400	24,900	24,100	24,400
Semitropic	10,000	10,000	10,000	9,900	9,900
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	5,000	5,000	5,000	5,000	5,000
Sites Reservoir	15,300	15,700	15,800	15,800	15,800
Water Transfers	4,900	0	0	0	0
Chain of Lakes	900	4,500	5,100	5,300	5,200
Total Supplies	**76,100**	**91,200**	**93,300**	**92,400**	**92,600**
Demands					
Retailer Demand	43,200	43,400	43,700	43,700	43,700
Untreated Water Demand	7,800	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,300	2,500	2,500	2,500
Total Demands	**52,800**	**53,800**	**55,300**	**55,300**	**55,300**
Difference	23,300	37,400	38,000	37,100	37,300
NOTES: Volumes are in AF.					

7.1.4 Water Management Tools and Options

Zone 7 promotes regional supply reliability and reduced reliance on water imports by:

- Evaluating and pursuing new water supply options, including potable reuse and brackish water desalination;
- Supporting the expansion of recycled water use for irrigation;
- Working closely with its retailers to implement an active conservation program; and
- Optimizing and expanding local storage.

In addition, Zone 7 is a member of the Bay Area Regional Reliability (BARR) partnership, which brings together eight Bay Area water agencies to improve regional water supply reliability. In addition to Zone 7, these agencies include: ACWD, SFPUC, the Bay Area Water Supply and Conservation Agency (BAWSCA), CCWD, EBMUD, Marin Municipal Water District (MMWD), and VW. The BARR partners have agreed to work cooperatively to address water supply reliability concerns and drought preparedness on a mutually beneficial and regionally focused basis. Near- and long-term joint water supply reliability projects may be evaluated through BARR, such as use of the capacity of existing facilities, changes to infrastructure (including new interties, recycled water, water conservation, expanded treatment, regional desalination, and water transfers and exchanges), and other projects or institutional arrangements that encourage a regional approach to achieving water supply reliability in the Bay Area.

As part of its existing CIP, Zone 7 is planning to construct a reliability intertie with another major water agency (e.g., EBMUD or SFPUC) to help mitigate some of the risk during a major water supply interruption from the Delta and to create opportunities for transfers/exchanges. This intertie could allow Zone 7 to acquire emergency water supplies to help meet minimum health and safety water supply needs during a major Delta outage, assuming the partnering agency has available supply and the transmission capacity available during the emergency period. A conceptual 24- to 30-inch diameter intertie with EBMUD could connect to the west side of Zone 7’s transmission system and convey up to 10 to 15 MGD of supply. Additional wells would also increase access to local groundwater and improve its management, while a new booster pump station would improve conveyance of groundwater across the Tri-Valley. The new Chain of Lakes Pipeline would allow for access to water stored locally in the Chain of Lakes.

7.2 DROUGHT RISK ASSESSMENT

In accordance with CWC Section 10612, urban water suppliers must conduct a DRA, which evaluates the risk of a severe drought occurring for the next five consecutive years (2021-2025). Supply conditions for the DRA shown here are based on the multi-year drought scenario, with adjustments to consider plausible changes in climate, regulations, and other locally applicable criteria.

This section reviews the data and methods used to define the DRA water shortage condition and evaluates each water source’s reliability under the proposed drought condition. Finally, total water supplies during the five-year drought are compared to projected demands, accounting for any applicable supply augmentation or demand reduction measures available to Zone 7.

7.2.1 Data, Methods, and Basis for Water Shortage Condition

The water shortage condition for the DRA is the same as the five-consecutive-dry years drought described in Section 7.1.2. Since the DRA can be updated outside of the UWMP five-year plan cycle, the narrative description of the data and basis for the water shortage condition is repeated in this section.

The DRA assumes 5, 11, 60, 13, and 25 percent Table A allocations for 2021-2025, respectively. The last four years reflect the last four years of the multiple-dry year scenario previously discussed, based on 2020 values from the 2019 DCR. Data for 2021 reflect current projected available supplies. Projections are based on existing facilities and the expected availability of supplies from various sources given the constraints previously described. Surplus water is stored for use during subsequent years; a portion is also lost to evaporation, unavailable as carriage loss under water transfers, and lost to brine disposal.

7.2.2 DRA Water Source Reliability

Table 7-20 summarizes Zone 7's available supplies and projected demands for each year of the DRA.

Table 7-20. Projected Supplies and Demands for Drought Risk Assessment

SUPPLY SOURCE	Available Supply, AFY				
Calendar Year	2021	2022	2023	2024	2025
Equivalent Hydrologic Year	*Actual*	*1988*	*1989*	*1990*	*1991*
SWP Table A[a]	4,000	8,900	48,400	10,500	20,200
SWP Carryover	8,900	10,300	9,600	12,800	9,900
Water Transfers[b]	10,000	6,000	5,000	6,000	8,000
Arroyo Valle[c]	700	700	6,900	6,900	2,700
Main Basin (Local Groundwater)	13,200	13,200	11,000	10,000	11,000
Semitropic Water Storage District	9,100	9,100	0	9,100	9,100
Cawelo Water District	10,000	10,000	0	5,000	1,900
Total Supplies	**55,900**	**58,200**	**80,900**	**60,300**	**62,800**
Total Demands[d]	**45,200**	**47,600**	**48,500**	**49,400**	**50,300**
Surplus[e]	**10,700**	**10,600**	**32,400**	**10,900**	**12,500**

(a) Assumes 5, 11, 60, 13, and 25 percent Table A allocations from 2021 through 2025, respectively. 2021 reflects current projected available supplies, while 2022-2025 reflect the last four years of a multiple-dry year scenario.
(b) Includes Yuba Accord and other transfers.
(c) Includes carryover and current year's yield.
(d) Refer to Table 4-5 of this plan. Demands include treated and untreated customer demands and transmission system losses; conservation not included. Based on delivery requests for 2022-2025.
(e) Surplus largely goes toward storage for use the following year. A portion is also lost to evaporation, unavailable as carriage loss under water transfers, and lost to brine disposal; these losses can consume up to 900 AF of surplus water in this 5-year outlook.

7.2.3 Total Water Supply and Use Comparison

As shown in Table 7-21, during a five-year drought beginning in 2021, Zone 7's supplies are projected to be adequate to meet projected demands through 2025, even without water conservation. However, this would draw down Zone 7's stored supplies by about 112,000 AF by the end of 2025, from 240,000 AF to 128,000 AF.

Table 7-21. Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) (DWR Table 7-5)

2021	Total
Total Water Use	45,200
Total Supplies	55,900
Surplus/Shortfall w/o WSCP Action	10,700
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	10,700
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	47,600
Total Supplies	58,200
Surplus/Shortfall w/o WSCP Action	10,600
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	10,600
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	48,500
Total Supplies	80,900
Surplus/Shortfall w/o WSCP Action	32,400
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	32,400
Resulting % Use Reduction from WSCP action	0%
2024	**Total**
Total Water Use	49,400
Total Supplies	60,300
Surplus/Shortfall w/o WSCP Action	10,900
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	10,900
Resulting % Use Reduction from WSCP action	0%
2025	**Total**
Total Water Use	50,300
Total Supplies	62,800
Surplus/Shortfall w/o WSCP Action	12,500
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	12,500
Resulting % Use Reduction from WSCP action	0%

CHAPTER 8
Water Shortage Contingency Plan

This chapter summarizes Zone 7's WSCP, seismic risk to Zone 7's facilities, and WSCP adoption procedures. To allow for WSCP updates to be made outside of the UWMP preparation process, Zone 7's WSCP is included in this plan as Appendix G.

8.1 WATER SHORTAGE CONTINGENCY PLANNING BACKGROUND

Water shortages occur whenever the available water supply cannot meet the normally expected customer water use. These shortages can be due to several reasons, including population growth, climate change, drought, and catastrophic events. Drought, regulatory actions, and natural and manmade disasters may occur at any time. A WSCP presents how an urban water supplier plans to respond to a water shortage condition and helps prevent catastrophic service disruptions.

The 2018 Water Conservation Legislation set new requirements for water shortage contingency planning; Zone 7's WSCP has been updated to be consistent with these requirements.

In accordance with CWC §10632.3, the State defers to the implementation of the locally adopted WSCP to the extent practicable.

8.2 ZONE 7 WATER SHORTAGE CONTINGENCY PLAN

Zone 7's WSCP describes its strategic plan for preparing and responding to water shortages. The WSCP includes water shortage stages and associated shortage response actions, as well as Zone 7's legal authorities and communication protocols. Since Zone 7 is a water wholesaler, most compliance and enforcement efforts and monitoring/reporting is left to Zone 7's retailers.

Zone 7's WSCP is included in this plan as Appendix G to allow for updates outside of the UWMP preparation process. Zone 7 intends for its WSCP to be dynamic, so that it may assess response action effectiveness and adapt to foreseeable and unforeseeable events. When an update to the WSCP is proposed, the revised WSCP will undergo the process described in Section 8.4.

8.3 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC §10632.5(a) requires that UWMPs include a seismic risk assessment and mitigation plan to assess and mitigate a water system's seismic vulnerabilities. Local Hazard Mitigation Plans (LHMPs) may be incorporated in this UWMP to meet this requirement if they address seismic risk. Zone 7 participated in the development of a regional hazard mitigation plan, which was prepared collaboratively for the main cities within its service area—Dublin, Livermore, and Pleasanton. The 2018 Tri-Valley Local Hazard Mitigation Plan Update (2018 LHMP) addressed seismic risk and is incorporated into this UWMP by reference. The 2018 LHMP was finalized in September 2018 and submitted to the Federal Emergency Management Agency (FEMA), which found it in conformance with Title 44 Code of Federal Regulations Part 201.6 Local Mitigation Plans. The 2018 LHMP is available on each of the collaborating city's websites:

- Dublin (dublin.ca.gov) – under the "Government" menu, click on the "Disaster Preparedness" department. Links to the 2018 LHMP is provided under "Additional Resources."

- Livermore: (www.cityoflivermore.net) – under the “City Government” menu, hover over “LPFD Home” and then “About Our Department.” Click on “Disaster Preparedness,” and then click on “City Preparation” under the navigation menu.
- Pleasanton (www.cityofpleasantonca.gov) – under the “Government” menu, click on the “Community Development” department. On the “Community Development” page, click the “Planning Division” link. Under the navigation menu, hover over “Plans & Programs” and click on “Tri-Valley Hazard Mitigation Plan.”

Further, Zone 7 developed its own hazard mitigation plan (Zone 7 HMP) that addresses earthquake hazards. FEMA found the Zone 7 HMP in conformance with Title 44 Code of Federal Regulations Part 201.6 Local Mitigation Plans. To maintain security of the Zone 7 water system, the Zone 7 HMP is maintained as a confidential document. Zone 7 is in the process of implementing mitigation strategies, which are similar to those documented in the 2018 LHMP, as described below.

Earthquakes are common, relatively well-tracked, and studied in California. While California experiences hundreds of earthquakes each year, most are below 3.0 on the Richter Scale (i.e., magnitude 3.0) and cause minimal damage. The United States Geological Survey (USGS) roughly defines strong earthquakes (which can cause moderate damage to structures) as measuring greater than 5.0 on the Richter Scale, while major earthquakes measure more than 7.0 on the Richter Scale. In California, strong earthquakes occur every two to three years, and major earthquakes occur once a decade.

The Calaveras, Greenville, Hayward, and Mt. Diablo faults are in the vicinity of the Tri-Valley region. A 2016 report[23] by the USGS estimated the probabilities for magnitude-6.7 (or larger) earthquakes on major fault lines in the San Francisco Bay Area by the year 2043. The Hayward Fault has a 33 percent chance of one or more earthquakes of magnitude-6.7 or larger by 2043, while the Calaveras Fault has a 26 percent chance of one or more such earthquakes in that timeframe. The Greenville and Mt. Diablo faults each have a 16 percent chance of one or more earthquakes of magnitude-6.7 or larger by 2043.

The 2018 LHMP evaluated the impact of earthquakes on critical facilities and infrastructure using a Hazus analysis. Results for utilities infrastructure (including water system facilities) are presented in terms of level of damage and time to return to functionality. There are five damage levels (no damage, slight damage, moderate damage, extensive damage, and complete damage) and six time increments (1, 3, 7, 14, 30, and 90 days). Results are categorized by earthquake location; there are separate scenarios for earthquakes on each of the Calaveras, Greenville, Hayward, Mt. Diablo, and San Andreas faults.

According to the 2018 LHMP, earthquakes on the Hayward and Calaveras faults would be most significant. Over 80 percent of (120 total) utility facilities in the Tri-Valley region would experience at least moderate damage for an earthquake on the Hayward Fault, while approximately 44 percent would be at least moderately damaged by a Calaveras Fault earthquake. For earthquakes on the other faults analyzed (Greenville, Mt. Diablo, San Andreas), this number is below 15 percent. Seven days after an earthquake on the Hayward Fault, a utility facility has an approximately 52 percent chance of being fully functional. This percentage increases to approximately 84 percent for an earthquake on the Calaveras Fault and above 92 percent for earthquakes on the Greenville, Mt. Diablo, and San Andreas faults.

[23] U.S. Geological Survey (USGS), 2016. *Earthquake Outlook for the San Francisco Bay Region 2014-2043.*

Table 18-3 of the 2018 LHMP summarizes alternatives for mitigating the earthquake hazard on personal, corporate, and government scales. Mitigation options potentially applicable to Zone 7 include the following:

- Locate critical facilities outside hazard area where possible
- Harden infrastructure
- Provide redundancy for critical functions
- Include retrofitting and replacement of critical system elements in capital improvement plan
- Warehouse critical infrastructure components such as pipe materials
- Develop and adopt a continuity of operations plan

8.4 WATER SHORTAGE CONTINGENCY PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

The WSCP (Appendix G) is adopted concurrently with Zone 7's 2020 UWMP, by separate resolution. Prior to adoption, a duly noticed public hearing was conducted. A copy of the WSCP will be submitted to DWR within 30 days of adoption.

No later than 30 days after adoption, copies of the WSCP will be available at Zone 7's offices. A copy will also be provided to Alameda County, Contra Costa County, and Zone 7's retailers. An electronic copy of the WSCP will also be available for public review and download on Zone 7's website.

Zone 7's WSCP is an adaptive management plan and is subject to refinements as needed to ensure that Zone 7's shortage response actions and mitigation strategies are effective and produce the desired results. When a revised WSCP is proposed, the revised WSCP will undergo the process described in this section for adoption by the Zone 7 Board and distribution to Alameda County, Contra Costa County, Zone 7's customers, and the general public.

CHAPTER 9
Demand Management Measures

Zone 7 implements demand management measures (DMMs) to sustainably manage its water resources, reduce Delta reliance, and maintain the reliability of its water supply. This chapter describes Zone 7's Water Conservation Program, the status of its DMMs, and projected future implementation of water conservation measures.

9.1 DEMAND MANAGEMENT MEASURES FOR WHOLESALE SUPPLIERS

As discussed in Chapter 6, Zone 7 provides treated water supply to its retailers on a wholesale basis. As a wholesale agency, Zone 7 actively implements the following DMMs:

- Metering;
- Public education and outreach;
- Water Conservation Program coordination and staffing support;
- Wholesale Supplier Assistance Programs; and
- Asset management.

For each DMM above, the current program is described, followed by a description of how the DMM was implemented over the previous five years and plans for continued implementation.

As a wholesaler, Zone 7 provides regional coordination of conservation programs in the Tri-Valley area. For detailed descriptions of the individual conservation programs implemented by the retailers, see the 2020 UWMPs for Livermore, Pleasanton, Cal Water, and DSRSD.

Zone 7 is committed to supporting California's long-term conservation framework by: 1) reducing indoor water use to continue to make progress towards the 50 gallons per capita per day (GPCD) target required by state legislation, and 2) maintaining or reducing the outdoor water use component of water demand in the Tri-Valley. To meet these goals, Zone 7's conservation program has largely focused on public outreach and education and rebate programs, as described below. Proper metering also supports conservation efforts.

9.1.1 Metering

Zone 7's wholesale water deliveries are fully metered, and calibration is verified on an annual basis. All facilities except for three wholesale meters (Cal Water Turnout #7, Cal Water Turnout #8, and Livermore Turnout #8) are fully equipped with Supervisory Control and Data Acquisition (SCADA) and security alarms and are maintained by Zone 7 mechanical, electrical, and instrumentation staff. Maintenance is performed per contract with the receiving wholesale customer.

Zone 7 has metered its water deliveries over the past five years and plans to continue this effort into the future.

9.1.2 Public Education and Outreach

A description of Zone 7's public education and outreach programs, the implementation over the past five years, and plans for continued implementation is provided below.

9.1.2.1 DMM Description

Zone 7 promotes water conservation both independently and in coordination with its retailers. Zone 7 collaborates on water conservation programs, including public education and outreach, with its retailers through the Tri-Valley Water Conservation Task Force, which is discussed in further detail in Section 9.1.3.

Zone 7's outreach is conducted mainly through events/workshops and its website, which contains the following information:

- Links to educational resources on water conservation;
- Calendar of upcoming workshops and events;
- Rebate programs, including informational brochures and application forms;
- Landscaping and gardening tips; and
- Profiles of Tri-Valley residents saving water.

More recently, Zone 7 has also started using social media platforms such as Facebook. Zone 7's public education and outreach programs focusing on water conservation and water awareness include the annual and periodic activities listed in Table 9-1.

Table 9-1. Zone 7 Public Education and Outreach Programs	
Program	Summary
Bay Qualified Water Efficient Landscaper (QWEL)	QWEL is a WaterSense professional certification program that provides water conservation professionals and the landscape workforce with a thorough understanding of sustainable landscaping and efficient irrigation principles and practices. QWEL was administered by Zone 7 in-house with a contracted instructor from 2012-2017; a new regional program was launched in 2020. The California Water Efficiency Partnership (CalWEP) is currently hosting a regional QWEL training program—sponsored by ten Bay Area water providers, including Zone 7—which are taught using the newly updated QWEL curriculum in both English and Spanish.
Home & Garden Shows, Alameda County Fair	Zone 7 staff attend these public events to host a booth and/or participate in discussions on water quality, conservation, drought tolerant gardens, etc.
Living Arroyos	Living Arroyos is a unique community engagement opportunity that renews and enhances urban stream and riparian (streamside) habitats and reconnects people and the arroyos in their community. Working with volunteers, Living Arroyos educates the public about the value of the watershed and how best to protect it through waterwise and native landscaping and other means.
Media Campaigns	Zone 7 hosts annual campaigns, such as: • Fix a Leak Week - coordinating with EPA's annual Fix a Leak Week in March. • May Water Awareness Month - including support for the East Bay's Bringing Back the Natives Garden Tour. Zone 7 also launches specific campaigns, as needed, to boost awareness of rebate programs, water supply conditions, adjustment of watering, etc.
Public Workshops	Various workshops are hosted by Zone 7 and the retailers with focus on water awareness and waterwise gardening: • Zone 7 Open House with speakers and hands-on activities • East Bay California Native Plants Workshop • Water-Wise Gardening Workshop • Lawn Conversion "Parties" Historically, Zone 7 has primarily hosted in-person workshops. Zone 7 and the retailers are now planning more virtual workshops (webinars) as a response to the pandemic and the positive public response, with greater levels of participation due to accessibility.
Schools Program	The Zone 7 Schools Program has grown steadily over the years and expanded its outreach to provide standards-based water-science education for students in kindergarten through high school. The program currently reaches nearly 20,000 students annually.
Student Science Fair Water Projects	Zone 7 participates in middle and high school science & engineering fairs, with three winners in the water sciences category recognized by the Zone 7 Board and given awards.
Tri-Valley Water-Wise Gardening Website	The website was especially designed to showcase sustainable, climate-appropriate, and drought tolerant shrubs, trees and grass that thrive in the Tri-Valley area.
Zone 7 Newsletter	Zone 7 issues regular newsletters to customers including messaging on water conservation, flood preparedness, water rates, public meetings, and more.

9.1.2.2 Implementation Over the Past Five Years

Zone 7 had an active public outreach and education program over the past five years. Highlights of this DMM's accomplishments include:

- **Bay QWEL:** Through 2017, Zone 7 had trained a total of 154 graduates who have passed the QWEL EPA certification test. The regional Bay QWEL program began classes across the Bay Area in 2020, including students from Zone 7's service area.
- **Home & Garden Shows, Alameda County Fair:** Zone 7 participated in these events annually to promote water efficiency to thousands of Bay Area residents.
- **Living Arroyos Urban Watershed Partnership:** Zone 7 organized volunteer events focused on stream clean-up and enhancement with 250-500+ volunteers each year.
- **Media Campaigns:** in 2020, the Strategic Communications Plan was updated to reflect Zone 7's updated Five-Year Strategic Plan and to align with digital media trends. This included refreshed branding and more consistent messaging. In 2020, the "Wonderous World of Water" water quality campaign was launched to educate residents about the quality of their water and the water treatment infrastructure that treats and distributes the Tri-Valley's water. The "Flood Ready Freddy" flood preparedness campaign was also launched that fall to educate residents about the dangers of flooding and promote emergency preparedness. Staff is currently working on a new conservation campaign to expand messaging on water conservation. Zone 7 is also currently undertaking a complete website redesign scheduled to launch in the spring of 2021.
- **Public Workshops:** Zone 7 hosted or co-sponsored three to four workshops each year (only one in 2020 due to pandemic) on various topics, including stream management, water supply, and PPWTP upgrades. Each workshop had 30-70+ participants.
- **Schools Program:** Zone 7 provides Tri-Valley teachers free classroom programs covering water conservation, drinking water quality, and other topics. The Schools Program typically reaches 14,000-20,000 kindergarten through twelfth grade students each year.
- **Student Science Fair Water Projects:** every year, hundreds of Tri-Valley students participate in science fairs, and the Zone 7 Board recognizes three students for researching and developing exceptional water-related projects. These students receive awards from the Zone 7 Board and present their projects at a Zone 7 Board meeting.

- **Tri-Valley Water-Wise Gardening Website:** Zone 7 maintains this website, which provides information on how to design, install, and maintain a water-wise garden. Approximately 20,000 people visited the web site in 2020.

- **Zone 7 E-Newsletters:** Zone 7 distributes its E-Newsletter directly to 778 residents in the Tri-Valley. The E-Newsletter is sent at least monthly and contains updates on Zone 7 Board actions, water conservation tips, and special events. E-Newsletters are also shared monthly on Zone 7's Facebook page and website.

As noted above, Zone 7 has been enhancing outreach through increased use of social media over the last two years. In 2020, public in-person events were not conducted due to the pandemic; however, a webinar was hosted on Gardening with Natives.

9.1.2.3 Plans for Continued Implementation

Implementation of this DMM is ongoing and expected to help Zone 7 continue to achieve its water efficiency objectives by educating water users about the importance of water use efficiency and avoiding water waste. Based on the positive response and participation rate in the 2020 webinar, Zone 7 intends to sponsor and host more webinars as part of its outreach in coordination with the retailers and other organizations. Staff is currently drafting a new conservation campaign. The campaign will include media buys, a social media campaign, and videos to provide residents with actionable tips for saving water in and around the home.

9.1.3 Water Conservation Program Coordination and Staffing Support

A description of Zone 7's water conservation program coordination and staffing support, the implementation over the past five years, and plans for continued implementation is provided below.

9.1.3.1 DMM Description

The Tri-Valley Water Task Force (Task Force) was formed in 2005 and generally consists of Zone 7 and retailer conservation staff, as well as public outreach staff. The Task Force meets about six to eight times a year, as needed, to discuss and coordinate on current and future conservation programs, legislative activities related to conservation and water use efficiency, and public outreach and training activities. With Zone 7's Conservation Coordinator active in state-wide and regional organizations and committees, the Task Force also serves as a main venue for information/knowledge exchange among the agencies. During the recent drought, the Task Force led the coordination of drought response activities, with more active participation from management.

Zone 7 has designated staff to actively develop, promote, enforce, and maintain water conservation programs. Zone 7 has a full-time Water Conservation Coordinator position, supported by administrative staff as needed on rebate processing and customer inquiries. A full-time Communications Specialist currently leads public outreach and education activities, including administration of the Schools Program and media campaigns.

Key duties of the Water Conservation Coordinator include:

- Tracking of water conservation regulations and industry developments
- Rebate program development and management, including communication with customers and retailers
- Support/promotion for Bay QWEL sessions for water efficient landscaper trainings

- Grant coordination and program management
- Coordination with the retailers' water conservation representatives through the Tri-Valley Water Conservation Task Force
- Participation in California Water Efficiency Partnership
- Development/coordination of the conservation component of public outreach and education workshops, along with the Communications Specialist

9.1.3.2 Implementation over the Past Five Years

Zone 7 has continued to coordinate conservation program activities with the retailers through the Tri-Valley Water Conservation Task Force. At the federal, state, and regional levels, Zone 7 coordinates the program through the EPA's WaterSense program, Alliance for Water Efficiency, California Water Efficiency Partnership, Integrated Regional Water Management Program, and DWR committees/workgroups etc.

Over the past five years, Zone 7 has largely maintained its Water Conservation Program team. However, the Water Conservation Coordinator has been temporarily vacant since late March 2020 due to retirement. The duties of the Water Conservation Coordinator have been jointly fulfilled by a Water Resources Technician, Integrated Planning Manager, and Communications Specialist in the interim.

Over the past five years, Zone 7 has spent approximately $220,000 to $435,000 per year on conservation program-related efforts.

9.1.3.3 Plans for Continued Implementation

Implementation of this DMM is a vital element of Zone 7's Water Conservation Program and will therefore continue. While the positions or duties may shift, Zone 7 will continue robust coordination with the retailers and other organizations on conservation.

9.1.4 Wholesale Supplier Assistance Programs

Zone 7 offers several rebate programs in cooperation with three of its water retailers (Livermore, Pleasanton, and DSRSD). In recent years, Cal Water has administered its own statewide rebate conservation program. Zone 7 provides funding for the rebates and assists with the retailers' rebate administration, including follow-up with applicants. Zone 7 coordinates with its retailers to offer rebate programs to promote water efficiency. After making water efficient improvements, customers can apply for a rebate to have some of the associated costs reimbursed.

Along with three of its retailers (DSRSD, Livermore, and Pleasanton), Zone 7 currently jointly offers three rebate programs to encourage indoor and outdoor water savings: Water-Efficient Lawn Conversion, Weather-Based Irrigation Controllers, and High-Efficiency Clothes Washers. Cal Water oversees their own statewide conservation program. These programs can reduce the cost for customers to increase water efficiency, thereby reducing water demand. Each program is discussed below.

9.1.4.1 Water-Efficient Lawn Conversion

Customers who replace grass lawns with low-water-use, drought-tolerant, or Mediterranean plants can receive a rebate for up to 50 percent of the project cost, up to a maximum of $750 for single-family residences and $4,500 for multi-family residences or non-residential properties. Project plans are developed in coordination with retailers or Zone 7 and must be approved prior to removing the lawn to be converted.

9.1.4.2 Weather-Based Irrigation Controllers (WBIC)

Weather-based irrigation controllers automatically adjust watering based on precipitation, reducing unnecessary water use (e.g., immediately following rain). Installing weather-based irrigation controllers qualifies customers for a rebate of up to 50 percent of associated costs, up to a maximum of $75 for single-family residences, $100 for multi-family residences, or $3,000 for non-residential properties.

9.1.4.3 High-Efficiency Clothes Washers (HEW)

High-efficiency clothes washing machines use about 50 percent less water than conventional, top-loading models (20 to 30 gallons of water per load compared to 40 to 45 gallons per load). After switching to a high-efficiency clothes washer, the estimated savings for a typical household is about 5,100 gallons per year. Zone 7 and its retailers offer a rebate of up to $75 for the purchase and installation of a qualifying "ENERGY STAR Most Efficient" labeled high-efficiency clothes washer.

9.1.4.4 Implementation over the Past Five Years

The High-Efficiency Toilet (HET) rebate program ended in 2017, with HETs increasing in market saturation. There was a pause in the HEW program in December 2018, but that program was reinstated and is currently active. The WEL program remains active, as well as the WBIC program.

Over the past five years, Zone 7 coordinated with its retailers to provide $329,500 in rebates for the above listed programs with 330 HET, 1,734 HEW, 623 WBIC, and 93 WEL applications.

9.1.4.5 Plans for Continued Implementation

Zone 7 periodically updates its rebate conservation program based on market saturation conditions, funding availability, demand patterns, grant funding opportunities, regulations, and other factors. Zone 7 will be reviewing its conservation program strategy—including rebates—over the next few years based on updated demand information and upcoming regulatory requirements.

A new rebate program, "Garden by Number" is planned and will be launched as soon as pandemic conditions improve. Under this program, customers can select from one to five garden pallet designs and plant by number, streamlining transition to a drought-tolerant garden without the expense of a landscape architect/other contractor.

9.1.5 Asset Management

As water infrastructure assets age, renewal and replacement become critical. Zone 7 utilizes an asset management process that systematically prioritizes rehabilitation and replacement and ensures long-term infrastructure sustainability. To maintain a reliable and high-quality water supply, Zone 7's asset management strategy focuses on core framework areas such as long-range planning, life-cycle costing, proactive operations and maintenance, long-term funding strategies, and capital replacement plans.

Zone 7's Asset Management Plan (AMP) formally summarizes its asset management process and strategy by forecasting near-term renewal needs and long-term funding requirements through fiscal year 2057/2058. The AMP is updated regularly, with the most recent update in 2017[24].

In 2021, Zone 7 is in the process of completing a pipeline inspection program study to update the AMP pipeline condition evaluation process. The pipeline inspection program study reviewed Zone 7's water transmission pipeline network, pipeline failure risk factors (e.g., documented repairs, potential for corrosion, pipeline depth, geologic conditions), criticality in delivering water, and Zone 7's current inspection program. These factors were used to recommend updates to the inspection program including inspection methods (e.g., manned entry, closed-circuit television [CCTV], acoustical measurements, and electromagnetic measurements), inspection schedule, and costs for the inspections for future infrastructure improvements. The outcome of the study will be to determine the funding and frequency needed to properly inspect each Zone 7 pipeline. Each pipeline will be assessed for the proper inspection method, improvements needed for proper inspection, recurrence interval for inspection, and costs for the improvements and implementation of the inspection method.

9.2 WATER USE OBJECTIVES (FUTURE REQUIREMENTS)

In 2018, the State Legislature enacted two policy bills, (SB 606 (Hertzberg) and AB 1668 (Friedman)), to establish long-term water conservation and drought planning to adapt to climate change and the associated longer and more intense droughts in California. These two policy bills build on SB X7-7 and sets authorities and requirements for urban water use efficiency. The legislation sets standards for indoor residential use and requires the State Water Board, in coordination with DWR, to adopt efficiency standards for outdoor residential use; water losses; and commercial, industrial, and institutional (CII) outdoor landscape areas with dedicated irrigation meters. At the time of preparation of this UWMP, DWR and the State Water Board are in the process of developing efficiency standards. These standards will require urban water retailers to develop agency-wide water use objectives, provide annual reports, and update their UWMPs.

The State Legislature established indoor residential water use standards as 55 GPCD until January 2025, 52.5 GPCD from 2025 to 2029, and 50 GPCD in January 2030, or a greater standard recommended by DWR and the State Water Board. By June 30, 2022, the State Water Board is anticipated to adopt an outdoor residential use standard, a standard for CII outdoor landscape area with dedicated irrigation meters, and performance measures for CII water uses. At that time, the State Water Board will adopt guidelines and methodologies for calculating the water use objectives. In accordance with CWC §10609.20(c), the water use objective for urban water retailers will be based on the estimated efficient indoor and outdoor residential water use, efficient outdoor irrigation of CII landscaped areas, estimated water losses, and estimated water use for variances approved by the State Water Board aggregated across the population in its water service area.

By November 1, 2023, and November 1 of every year thereafter, Zone 7's water retailers are anticipated to calculate their urban water use objective and actual water use and provide an annual report to the State. By January 1, 2024, Zone 7's water retailers are anticipated to prepare their UWMP supplemental

[24] HDR, 2017. Asset Management Plan Long-Term Funding Forecast Update.

incorporating DMMs and other water efficiency standards that they plan to implement to achieve their water use objective by January 1, 2027.

Zone 7 will continue coordinating with its retailers and support their efforts in achieving their water use objectives through its Water Conservation Program.

9.3 CALIFORNIA WATER EFFICIENCY PARTNERSHIP

Zone 7 is a participating member of the CalWEP, which was established in 2018 to combine expertise on California water issues, challenges, and opportunities and advance water efficiency both on the agency-wide and statewide level. CalWEP evolved from the California Urban Water Conservation Council (CUWCC), which administered an agreement between DWR, water utilities, environmental organizations, and other interested groups to implement best water management practices for reducing consumption of California's water resources. Zone 7 was a participating member of CUWCC.

CalWEP also provides opportunities for networking and partnerships to improve water efficiency and conservation. Members are voluntarily organized into two main committees. The Research and Evaluation Committee collaboratively identifies and pursues research projects to benefit CalWEP members. The Program Committee shares needs, successes, and challenges, and identifies actionable steps for addressing water conservation program needs.

CHAPTER 10
Plan Adoption, Submittal, and Implementation

This chapter provides information regarding the notification, public hearing, adoption, and submittal of Zone 7's 2020 UWMP and updated WSCP. It also includes discussion on plan implementation and the process of amending the UWMP and the WSCP.

10.1 INCLUSION OF ALL 2020 DATA

Because 2020 is the final compliance year for SB X7-7, the 2020 UWMPs must contain data through the end of 2020. If a water supplier bases its accounting on a fiscal year (July through June) the data must be through the end of the 2020 fiscal year (June 2020). If the water supplier bases its accounting on a calendar year, the data must be through the end of the 2020 calendar year (December 2020).

As indicated in Section 2.4 of this plan, Zone 7 uses a calendar year for water supply and demand accounting; therefore, this 2020 UWMP includes data through December 2020.

10.2 NOTICE OF PUBLIC HEARING

In accordance with the Act, Zone 7 must provide an opportunity for the public to provide input on this 2020 UWMP and the WSCP. Zone 7 must consider all public input prior to its adoption. There are two audiences to be notified for the public hearing: cities and counties, and the public.

10.2.1 Notices to Cities and Counties

Zone 7 provided greater than a 60-day notice regarding the preparation of its 2020 UWMP and WSCP to cities and counties in its service area as discussed in Section 2.5 of this plan. In addition, Zone 7 provided notices to the following agencies:

- California Water Service
- Dublin San Ramon Services District
- Department of Water Resources
- Contra Costa Water District
- East Bay Municipal Utility District
- Livermore-Amador Valley Water Management Agency
- DSRSD-EBMUD Recycled Water Authority

Zone 7 coordinated the preparation of its UWMP and WSCP update internally and with its retailers. Included as Appendix E, the notice of preparation was sent to the cities and counties in Zone 7's service area and the above listed agencies. Upon substantial completion of this 2020 UWMP, Zone 7 provided the agencies listed above, including internally within Zone 7, notice of public hearing (Appendix E).

Notifications to cities and counties, in accordance with the Act, are summarized in Table 10-1.

Table 10-1. Notification to Cities and Counties (DWR Table 10-1 Wholesale)

☐	Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were**	
	Provide the page or location of this list in the UWMP.	
☑	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Dublin	Yes	Yes
Livermore	Yes	Yes
Pleasanton	Yes	Yes
San Ramon	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Alameda County	Yes	Yes
Contra Costa County	Yes	Yes

10.2.2 Notice to the Public

Zone 7 issued a Notice of Public Hearing to the public and provided a public review period following the notice, and prior to adoption, to allow ample time for public comments to be prepared and received.

A Notice of Public Hearing was issued in accordance with Government Code Section 6066 and was published twice in a local newspaper (East Bay Times) to notify all customers and local governments of the public hearing. In addition, the notice was posted on Zone 7's website. A copy of the published Notice of Public Hearing is included in Appendix E.

10.3 PUBLIC HEARING AND ADOPTION

Zone 7 encouraged community participation in the development of this 2020 UWMP, including its WSCP, using public notices and web-based communication. The notice included the time and place of the public hearing, as well as the location where the plan is available for public inspection.

The public hearing provided an opportunity for Zone 7 water users and the general public to become familiar with the 2020 UWMP and ask questions about Zone 7's water supply, its continuing plans for providing a reliable, safe, high-quality water supply, and its plans to mitigate various potential water shortage conditions. Copies of the draft UWMP, including the WSCP, were made available for public inspection at Zone 7's administrative office and on the Zone 7 website.

10.3.1 Public Hearing

A public hearing was held on May 19, 2021, during which the Zone 7 Board received and considered input from the public before adopting the 2020 UWMP and updated WSCP.

10.3.2 Adoption

Subsequent to the public hearing, this 2020 UWMP was adopted by the Zone 7 Board on May 19, 2021. Zone 7 adopted the updated WSCP separately so that it may be updated as necessary. Copies of the adopted resolutions are included in Appendix H.

10.4 PLAN SUBMITTAL

This 2020 UWMP will be submitted to DWR within 30 days of adoption and by July 1, 2021. The adopted 2020 UWMP will be submitted electronically to DWR using the Water Use Efficiency (WUE) data submittal tool. A CD or hardcopy of the adopted 2020 UWMP will also be submitted to the California State Library.

No later than 30 days after adoption, a copy of the adopted 2020 UWMP, including the WSCP, will be provided to the cities and counties within which Zone 7 provides water.

10.5 PUBLIC AVAILABILITY

No later than 30 days after submittal to DWR, copies of this plan, including the adopted WSCP, will be available at Zone 7's administrative office in Livermore, California for public review during normal business hours. An electronic copy of this 2020 UWMP will also be available for review and download on Zone 7's website.

10.6 AMENDING AN ADOPTED UWMP OR WATER SHORTAGE CONTINGENCY PLAN

Zone 7 may amend its 2020 UWMP and WSCP jointly or separately. If Zone 7 amends one or both documents, Zone 7 will follow the notification, public hearing, adoption, and submittal process described in Sections 10.2 through 10.4 above. In addition to submitting amendments to DWR through the WUE data portal, within 30 days after adoption, Zone 7 will submit copies of amendments or changes to the plans to the California State Library and the cities or counties within which Zone 7 provides water.

Appendix A

Legislative Requirements

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999]
(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 - 10609.42] *(Part 2.55 added by Stats.2009, 7th Ex. Sess., Ch. 4, Sec. 1.)*

CHAPTER 1. General Declarations and Policy [10608 - 10608.8] *(Chapter 1 added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1.)*

10608.

The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve stream flows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

(*Added* by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1. (SB 7 7x) Effective February 3, 2010.)

10608.4

It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

(Added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1. (SB 7 7x) Effective February 3, 2010.)

10608.8

(a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (a) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

(Added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1. (SB 7 7x) Effective February 3, 2010.)

WATER CODE - WAT

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999] *(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)*

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 - 10609.42] *(Part 2.55 added by Stats. 2009, 7th Ex. Sess., Ch. 4, Sec. 1.)*

CHAPTER 9. Urban Water Use Objectives and Water Use Reporting [10609 - 10609.38] *(Chapter 9 added by Stats. 2018, Ch. 15, Sec. 7.)*

10609. (a) The Legislature finds and declares that this chapter establishes a method to estimate the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently. This estimated aggregate water use is the urban retail water supplier's urban water use objective. The method is based on water use efficiency standards and local service area characteristics for that year. By comparing the amount of water actually used in the previous year with the urban water use objective, local urban water suppliers will be in a better position to help eliminate unnecessary use of water; that is, water used in excess of that needed to accomplish the intended beneficial use.

(b) The Legislature further finds and declares all of the following:

(1) This chapter establishes standards and practices for the following water uses:

(A) Indoor residential use.

(B) Outdoor residential use.

(C) CII water use.

(D) Water losses.

(E) Other unique local uses and situations that can have a material effect on an urban water supplier's total water use.

(2) This chapter further does all of the following:

(A) Establishes a method to calculate each urban water use objective.

(B) Considers recycled water quality in establishing efficient irrigation standards.

(C) Requires the department to provide or otherwise identify data regarding the unique local conditions to support the calculation of an urban water use objective.

(D) Provides for the use of alternative sources of data if alternative sources are shown to be as accurate as, or more accurate than, the data provided by the department.

(E) Requires annual reporting of the previous year's water use with the urban water use objective.

(F) Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective.

(3) This chapter requires the department and the board to solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter.

(4) This chapter preserves the Legislature's authority over long-term water use efficiency target setting and ensures appropriate legislative oversight of the implementation of this chapter by doing all of the following:

(A) Requiring the Legislative Analyst to conduct a review of the implementation of this chapter, including compliance with the adopted standards and regulations, accuracy of the data, use of alternate data, and other issues the Legislative Analyst deems appropriate.

(B) Stating legislative intent that the director of the department and the chairperson of the board appear before the appropriate Senate and Assembly policy committees to report on progress in implementing this chapter.

(C) Providing one-time-only authority to the department and board to adopt water use efficiency standards, except as explicitly provided in this chapter. Authorization to update the standards shall require separate legislation.

(c) It is the intent of the Legislature that the following principles apply to the development and implementation of long-term standards and urban water use objectives:

(1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.

(2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.

(3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

(4) The state should identify opportunities for streamlined reporting, eliminate redundant data submissions, and incentivize open access to data collected by urban and agricultural water suppliers.

(Amended by Stats. 2019, Ch. 497, Sec. 287. (AB 991) Effective January 1, 2020.)

10609.2. (a) The board, in coordination with the department, shall adopt long-term standards for the efficient use of water pursuant to this chapter on or before June 30, 2022.

(b) Standards shall be adopted for all of the following:

(1) Outdoor residential water use.

(2) Outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) A volume for water loss.

(c) When adopting the standards under this section, the board shall consider the policies of this chapter and the proposed efficiency standards' effects on local wastewater management, developed and natural parklands, and urban tree health. The standards and potential effects shall be identified by May 30, 2022. The board shall allow for public comment on potential effects identified by the board under this subdivision.

(d) The long-term standards shall be set at a level designed so that the water use objectives, together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter, would exceed the statewide conservation targets required pursuant to Chapter 3 (commencing with Section 10608.16).

(e) The board, in coordination with the department, shall adopt by regulation variances recommended by the department pursuant to Section 10609.14 and guidelines and methodologies pertaining to the calculation of an urban retail water supplier's urban water use objective recommended by the department pursuant to Section 10609.16.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.4. (a) (1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily.

(2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(b) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately reflects best practices for indoor residential water use than the standard described in subdivision (a). A report on the results of the studies and investigations shall be made to the chairpersons of the relevant policy committees of each house of the Legislature by January 1, 2021, and shall include information necessary to support the recommended standard, if there is one. The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.

(2) The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.6. (a) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use for adoption by the board in accordance with this chapter.

(2) (A) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(B) The standards shall apply to irrigable lands.

(C) The standards shall include provisions for swimming pools, spas, and other water features. Ornamental water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, shall be analyzed separately from swimming pools and spas.

(b) The department shall, by January 1, 2021, provide each urban retail water supplier with data regarding the area of residential irrigable lands in a manner that can reasonably be applied to the standards adopted pursuant to this section.

(c) The department shall not recommend standards pursuant to this section until it has conducted pilot projects or studies, or some combination of the two, to ensure that the data provided to local agencies are reasonably accurate for the data's intended uses, taking into consideration California's diverse landscapes and community characteristics.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.8. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the board in accordance with this chapter.

(b) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(c) The standards shall include an exclusion for water for commercial agricultural use meeting the definition of subdivision (b) of Section 51201 of the Government Code.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.9. For purposes of Sections 10609.6 and 10609.8, "principles of the model water efficient landscape ordinance" means those provisions of the model water efficient landscape ordinance applicable to the establishment or determination of the amount of water necessary to efficiently irrigate both new and existing landscapes. These provisions include, but are not limited to, all of the following:

(a) Evapotranspiration adjustment factors, as applicable.

(b) Landscape area.

(c) Maximum applied water allowance.

(d) Reference evapotranspiration.

(e) Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating the landscape.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.10. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.

(b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following:

(1) Recommendations for a CII water use classification system for California that address significant uses of water.

(2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.

(3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.

(c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled "Water Use Best Management Practices," including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California's commercial, industrial, and institutional sectors.

(d) (1) The board, in coordination with the department, shall adopt performance measures for CII water use on or before June 30, 2022.

(2) Each urban retail water supplier shall implement the performance measures adopted by the board pursuant to paragraph (1).

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.12. The standards for water loss for urban retail water suppliers shall be the standards adopted by the board pursuant to subdivision (i) of Section 10608.34.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.14. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and, no later than October 1, 2021, recommend for adoption by the board in accordance with this chapter appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective.

(b) Appropriate variances may include, but are not limited to, allowances for the following:

(1) Significant use of evaporative coolers.

(2) Significant populations of horses and other livestock.

(3) Significant fluctuations in seasonal populations.

(4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.

(5) Significant use of water for soil compaction and dust control.

(6) Significant use of water to supplement ponds and lakes to sustain wildlife.

(7) Significant use of water to irrigate vegetation for fire protection.

(8) Significant use of water for commercial or noncommercial agricultural use.

(c) The department, in recommending variances for adoption by the board, shall also recommend a threshold of significance for each recommended variance.

(d) Before including any specific variance in calculating an urban retail water supplier's water use objective, the urban retail water supplier shall request and receive approval by the board for the inclusion of that variance.

(e) The board shall post on its Internet Web site all of the following:

(1) A list of all urban retail water suppliers with approved variances.

(2) The specific variance or variances approved for each urban retail water supplier.

(3) The data supporting approval of each variance.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.15. To help streamline water data reporting, the department and the board shall do all of the following:

(a) Identify urban water reporting requirements shared by both agencies, and post on each agency's Internet Web site how the data is used for planning, regulatory, or other purposes.

(b) Analyze opportunities for more efficient publication of urban water reporting requirements within each agency, and analyze how each agency can integrate various data sets in a publicly accessible location, identify priority actions, and implement priority actions identified in the analysis.

(c) Make appropriate data pertaining to the urban water reporting requirements that are collected by either agency available to the public according to the principles and requirements of the Open and Transparent Water Data Act (Part 4.9 (commencing with Section 12400)).

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.16. The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, guidelines and methodologies for the board to adopt that identify how an urban retail water supplier calculates its urban water use objective. The guidelines and methodologies shall address, as necessary, all of the following:

(a) Determining the irrigable lands within the urban retail water supplier's service area.

(b) Updating and revising methodologies described pursuant to subparagraph (A) of paragraph (1) of subdivision (h) of Section 10608.20, as appropriate, including methodologies for calculating the population in an urban retail water supplier's service area.

(c) Using landscape area data provided by the department or alternative data.

(d) Incorporating precipitation data and climate data into estimates of a urban retail water supplier's outdoor irrigation budget for its urban water use objective.

(e) Estimating changes in outdoor landscape area and population, and calculating the urban water use objective, for years when updated landscape imagery is not available from the department.

(f) Determining acceptable levels of accuracy for the supporting data, the urban water use objective, and compliance with the urban water use objective.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.18. The department and the board shall solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter. The board shall hold at least one public meeting before taking any action on any standard or variance recommended by the department.

(Added by Stats. 2018, Ch. 15, Sec. 7. (AB 1668) Effective January 1, 2019.)

10609.20. (a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use objective shall be composed of the sum of the following:

(1) Aggregate estimated efficient indoor residential water use.

(2) Aggregate estimated efficient outdoor residential water use.

(3) Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.

(4) Aggregate estimated efficient water losses.

(5) Aggregate estimated water use in accordance with variances, as appropriate.

(d) (1) An urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water may adjust its urban water use objective by a bonus incentive calculated pursuant to this subdivision.

(2) The water use objective bonus incentive shall be the volume of its potable reuse delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use, on an acre-foot basis.

(3) The bonus incentive pursuant to paragraph (1) shall be limited in accordance with one of the following:

(A) The bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility.

(B) The bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility.

(4) For purposes of this subdivision, "existing facility" means a facility that meets all of the following:

(A) The facility has a certified environmental impact report, mitigated negative declaration, or negative declaration on or before January 1, 2019.

(B) The facility begins producing and delivering potable reuse water on or before January 1, 2022.

(C) The facility uses microfiltration and reverse osmosis technologies to produce the potable reuse water.

(e) (1) The calculation of the urban water use objective shall be made using landscape area and other data provided by the department and pursuant to the standards, guidelines, and methodologies adopted by the board. The department shall provide data to the urban water supplier at a level of detail sufficient to allow the urban water supplier to verify its accuracy at the parcel level.

(2) Notwithstanding paragraph (1), an urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality and accuracy to the data provided by the department. The department may provide technical assistance to an urban retail water supplier in evaluating whether the alternative data are appropriate for use in calculating the supplier's urban water use objective.

(Amended by Stats. 2019, Ch. 239, Sec. 2. (AB 1414) Effective January 1, 2020.)

10609.21. (a) For purposes of Section 10609.20, and notwithstanding paragraph (4) of subdivision (d) of Section 10609.20, "existing facility" also includes the North City Project, phase one of the Pure Water San Diego Program, for which an environmental impact report was certified on April 10, 2018.

(b) This section shall become operative on January 1, 2019.

(Added by Stats. 2018, Ch. 453, Sec. 4. (SB 875) Effective September 17, 2018. Section operative January 1, 2019, by its own provisions.)

10609.22. (a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use shall be composed of the sum of the following:

(1) Aggregate residential water use.

(2) Aggregate outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) Aggregate water losses.

(Amended by Stats. 2019, Ch. 239, Sec. 3. (AB 1414) Effective January 1, 2020.)

10609.24. (a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

(Amended by Stats. 2019, Ch. 239, Sec. 4. (AB 1414) Effective January 1, 2020.)

10609.25. As part of the first report submitted to the department by an urban retail water supplier no later than January 1, 2024, pursuant to subdivision (a) of Section 10609.24, each urban retail water supplier shall provide a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027.

(Added by Stats. 2019, Ch. 239, Sec. 5. (AB 1414) Effective January 1, 2020.)

10609.26. (a) (1) On and after January 1, 2024, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.

(2) In determining whether to issue an informational order, the board shall consider the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet the urban water use objective.

(3) The board shall share information received pursuant to this subdivision with the department.

(4) An urban water supplier may request technical assistance from the department. The technical assistance may, to the extent available, include guidance documents, tools, and data.

(b) On and after January 1, 2025, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

(c) (1) On and after January 1, 2026, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.

(2) In issuing a conservation order, the board shall identify specific deficiencies in an urban retail water supplier's progress towards meeting its urban water use objective, and identify specific actions to address the deficiencies.

(3) The board may request that the department provide an urban retail water supplier with technical assistance to support the urban retail water supplier's actions to remedy the deficiencies.

(d) A conservation order issued in accordance with this chapter may include requiring actions intended to increase water-use efficiency, but shall not curtail or otherwise limit the exercise of a water right, nor shall it require the imposition of civil liability pursuant to Section 377.

(Amended by Stats. 2019, Ch. 239, Sec. 6. (AB 1414) Effective January 1, 2020.)

10609.27. Notwithstanding Section 10609.26, the board shall not issue an information order, written notice, or conservation order pursuant to Section 10609.26 if both of the following conditions are met:

(a) The board determines that the urban retail water supplier is not meeting its urban water use objective solely because the volume of water loss exceeds the urban retail water supplier's standard for water loss.

(b) Pursuant to Section 10608.34, the board is taking enforcement action against the urban retail water supplier for not meeting the performance standards for the volume of water losses.

(Added by Stats. 2019, Ch. 203, Sec. 1. (SB 134) Effective January 1, 2020.)

10609.28. The board may issue a regulation or informational order requiring a wholesale water supplier, an urban retail water supplier, or a distributor of a public water supply, as that term is used in Section 350, to provide a monthly report relating to water production, water use, or water conservation.

(Added by Stats. 2018, Ch. 14, Sec. 12. (SB 606) Effective January 1, 2019.)

10609.30. On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.

(a) The report shall describe all of the following:

(1) The rate at which urban retail water users are complying with the standards, and factors that might facilitate or impede their compliance.

(2) The accuracy of the data and estimates being used to calculate urban water use objectives.

(3) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(4) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(5) The early indications of how implementing this chapter might impact the efficiency of statewide urban water use.

(6) Recommendations, if any, for improving statewide urban water use efficiency and the standards and practices described in this chapter.

(7) Any other issues the Legislative Analyst deems appropriate.

(Added by Stats. 2018, Ch. 14, Sec. 13. (SB 606) Effective January 1, 2019.)

10609.32. It is the intent of the Legislature that the chairperson of the board and the director of the department appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. It is the intent of the Legislature that the topics to be covered include all of the following:

(a) The rate at which urban retail water suppliers are complying with the standards, and factors that might facilitate or impede their compliance.

(b) What enforcement actions have been taken, if any.

(c) The accuracy of the data and estimates being used to calculate urban water use objectives.

(d) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(e) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

(Added by Stats. 2018, Ch. 14, Sec. 14. (SB 606) Effective January 1, 2019.)

10609.34. Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.

(Added by Stats. 2018, Ch. 14, Sec. 15. (SB 606) Effective January 1, 2019.)

10609.36. (a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.

(b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.

(c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

(Added by Stats. 2018, Ch. 14, Sec. 16. (SB 606) Effective January 1, 2019.)

10609.38. The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.

(Added by Stats. 2018, Ch. 14, Sec. 17. (SB 606) Effective January 1, 2019.)

DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES [10000 - 12999]
(Heading of Division 6 amended by Stats. 1957, Ch. 1932.)

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 - 10657] *(Part 2.6 added by Stats. 1983, Ch. 1009, Sec..)*

CHAPTER 1. General Declaration and Policy [10610 - 10610.4] ***(Chapter 1 added by Stats. 1983, Ch. 1009, Alec. 1.)***

10610 This part shall be known and may be cited as the "Urban Water Management Planning Act."

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

(Amended by Stats. 201B, Ch. 14, Sec. 18. (SB 606) Effective January 1, 201 9.)

10610.4 The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

CHAPTER 2. Definitions [10611 - 1 0618] ***(Chapter 2 added by Stats. 1983, Ch. 1009, iec. 1.)***

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10611.3 "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

Added by renumbering Section 10612 by Stats. 2018, Ch. 14, Sec. 20. (SB 606) Effective January 1, 2019.)

10611.5 "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

(Amended by Stats. 1995, Ch. 854, Sec. 3. Effective January 1, 1996.)

10612 "Drought risk assessment" means a method that examines water shortage risks based on the driest five- year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.

(Added by Stats. 2018, Ch. 14, Sec. 21. (SB 606) Effective January 1, 201 9.)

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

(Added by :3tats. 1983, Ch. 1009, Exec. 1.)

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

(Amended by Stats. 1995, *Ch. 854, Sec. 4. Effective January 1, 1996.)*

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10616.5 "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

(Added by Stats. 1995, Ch. 854, Sec. 5. Effective January 1, 1996)

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

(Amended by Stats. 1996, *Ch. 1023, Sec. 428. Effective January 29, 1996.)*

10617.5. “Water shortage contingency plan” means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

(Added by Stats. 2018, Ch. 14, Sec. 22. (SB 606) Effective January 1, 2019)

10618 “Water supply and demand assessment” means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

(Added by Stats. 2018, Ch. 14, Sec. 23 (SB 606). Effective January 1, 2019)

CHAPTER 3. Urban Water Management Plans [10620 - 10645] ***(Chapter 3 added by*** **Stabs.** ***1983, Ch. 1009, Sec. 1.)***

ARTICLE 1. General Provisions [10620 - 1 0621] ***(Article 1 added by Stats. 1 983, Ch. 1009, Sec. 1.)***

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (l) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

(Amended by Stats. 2018, Ch. 14, Sec. 24. (SB 606) Effective January 1, 2019.)

10621 (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier’s general rate case filings.

(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640)

(e) Each urban water supplier shall update and submit its 2015 plan to the department by July1, 2016

(f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1,2021

(Amended by Stats. 2019, Ch. 239, Sec. 7. (AB 1414) Effective January 1, 2020.)

CHAPTER 3. Urban Water Management Plans [10620 - 10645] ***(Chapter 3 added by Stats. 1983, Ch. 1009, Sec. 1.)***

ARTICLE 2. Contents of Plans [10630 - 1 0634] ***(Article 2 added by Stats. 1 983, Ch. 1009, Sec. 1.)***

10630 It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

(Amended by Stats. 2018, Ch. 14, Sec. 26. (SB 606) Effective January 1, 201 9.)

10630.5 Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

(Added by Stats. 2018, Ch. 14, Sec. 27. (SB 606) Effective January 1, 2019.)

10631 A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(A) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(B) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(C) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(d) (I) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use

plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) For the supplement required of urban retail water suppliers by paragraph (2) of subdivision (f) of Section 10621, a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027, pursuant to Chapter 9 (commencing with Section 10609) of Part 2.55.

(C) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per
capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (C) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

(Amended by Stats. 2018, Ch. 14, Sec. 28. (SB 606) Effective January 1, 2019.)

10631 1 (a) The water use projections required by Section 10631 shall include projected water use for single- family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

(Added by Stats. 2005, Ch. 727, Sec. 2. Effective January 1, 2006.)

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

(Amended by Stats. 2018, Ch. 14, Sec. 29. (SB 606a Effective January 1, 2019.)

10632 (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:

(1) The analysis of water supply reliability conducted pursuant to Section 10635.

(2) The procedures used in conducting an annual water supply and demand assessment

that include, at a minimum, both of the following:

(A) The written decision making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) 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. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions. Locally appropriate demand reduction actions to adequately respond to shortages.

(B) Locally appropriate operational changes.

(C) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(D) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption

procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

(Repealed and added by Stats. 2018, Ch. 14, Sec. 32. (SB 606) Effective January 1, 2019.)

10632.1 An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before June 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by June 1 of each year, whichever is later.

(Added by Stats. 2018, Ch. 14, Sec. 33. (SB 606) Effective January 1, 2019.)

10632.2. An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision

(a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section

10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

(Added by Stats. 2018, Ch. 14, Sec. 34. (SB 606) Effective January 1, 2019.)

10632.3 It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

(Added by Stats. 2018, Ch. 14, Sec. 35. (SB 606) Effective January 1, 2019.)

10632.5 (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

(Added by Stats. 2015, Ch. 681, Sec. 1. (SB 664a *Effective January 1, 2OJ* 6.g

10633 The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

(Amended by Stats. 2009, Ch. 534, Sec. 2. (AB 1465) Effective January 1, 2010.)

10634 The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

(Added by Stats. 2001, Ch. 644, Sec. 3. Effective January 1, 2002.)

CHAPTER 3. Urban Water Management Plans [10620 - 10645] ***(Chapter 3 added by*** **Stabs.** ***1983, Ch. 1009, Sec. 1.)***

ARTICLE 2.5. Water Service Reliability [10635- 10635.] ***(Article 2.5 added by Stats. 1995, Ch. 854, Sec. 11.)***

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(d) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(e) Nothing in this article is intended to change existing law concerning an urban water supplier’s obligation to provide water service to its existing customers or to any potential future customers

(Amended by Stats. 2018, Ch. 14, Sec. 36. (SB 606) Effective January 1, 2019.)

CHAPTER 3. Urban Water Management Plans [10620 - 10645] ***(Chapter 3 added by*** **Stabs.** ***1983, Ch. 1009, Sec. 1.)***

ARTICLE 3. Adoption and Implementation of Plans [1 0640 - 10645] ***Article 3 added by Stats. 1983, Ch. 1009, Sec. 1.)***

10640. (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(Amended by Stats. 2018, Ch. 14, Sec. 37. (SB 606a *Effective January 1, 2OJ* 9.g

10641 An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

(Amended by Stats. 2018, Ch. 14, Sec. 38. (SB 606a *Effective January 1, 20J* 9.g

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

(Amended by Stats. 2018, Ch. 14, Sec. 39. (SB 606$ *Effective January 1, 70J* 9.g

10643 An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

(Added by Stats. 1983, Ch. 1009, Sec. 1.)

10644 (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption.Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1)

shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

(Amended by Stats. 2018, Ch. 14, Sec. 40. (SB 606) Effective January 1, 2019.)

10645. (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(Amended by Stats. 2018, Ch. 14, Sec. 41. (SB 606) Effective January 1, 201 9.)

CHAPTER 4. Miscellaneous Provisions [1 0650 - 10657] ***(Chapter 4 added by :itats. 1 983, Ch. 1009, iec. 1.)***

10650 Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

(Amended by Stats. 2018, Ch. 14, Sec. 42. (SB 606) Effective January 1, 2019.)

10651 In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

(Amended by Stats. 2018, Ch. 14, Sec. 43. (SB 606) *Effective January 1, 2019*

10652 The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

(Amended by Stats. 1995, Ch. 854, Sec. 6. *Effective January 1, 1996.)*

10653 The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

(Amended by Stats. 2018, Ch. 14, Sec. 45. (SB 606) *Effective January 1, 2019)*

10654 An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

(Amended by Stats. 2018, Ch. 14, Sec. 44. (SB 606) *Effective January 1, 2019)*

10655 If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

(Amended by Stats. 1983, Ch. 1009, Sec. 1)

10656 An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

(Amended by Stats. 2018, Ch. 14, Sec. 46. (SB 606) *Effective January 1, 2019)*

10657 The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.

(Amended by Stats. 2018, Ch. 14, Sec. 47. (SB 606) *Effective January 1, 2019)*

Appendix B

Demonstration of Reduced Delta Reliance

FINAL | JUNE 2021

Zone 7 Water Agency
Reduced Reliance on the Delta

JOINTLY PREPARED BY

Table of Contents

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

AFY	Acre-Feet Per Year
BARDP	Bay Area Regional Desalination Project
Delta	Sacramento-San Joaquin Delta
DWR	Department of Water Resources
Guidebook	Urban Water Management Plan Guidebook 2020
M&I	Municipal and Industrial
Plan	Urban Water Management Plan
SWP	State Water Project
UWMP	Urban Water Management Plan
WR P1	Delta Plan Policy WR P1
Zone 7	Zone 7 Water Agency

Zone 7 Water Agency
Reduced Reliance on the Delta

The purpose of this document is to demonstrate compliance with the Sacramento-San Joaquin Delta Reform Act of 2009. The Sacramento-San Joaquin Delta Reform Act of 2009 is described below, followed by an analysis of Zone 7 Water Agency's (Zone 7) reduced reliance in accordance with State protocols and expected outcomes for reduced reliance on the Delta.

1.0 SACRAMENTO-SAN JOAQUIN DELTA REFORM ACT OF 2009

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a "covered action" in the Sacramento-San Joaquin Delta (Delta) must submit a written certification of consistency to the Delta Stewardship Council as to whether the covered action is consistent with applicable Delta Plan policies. Covered actions include a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta. Anyone may appeal a certification of consistency, and if the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency, and either no appeal is filed, or the Delta Stewardship Council denies the subsequent appeal.

An urban water supplier that anticipates participating in or receiving water from a proposed covered action is required to provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

> *(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:*
>
> *(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);*
>
> *(2) That failure has significantly caused the need for the export, transfer, or use; and*
>
> *(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.*

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

> *(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*
>
> *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
>
> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*

(C) *Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

The analysis and documentation provided below include all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. Including this document as an appendix in the 2015 and 2020 Urban Water Management Plans fulfills the requirements of WR P1 subsection (c)(1) Paragraph A.

2.0 REDUCED RELIANCE ANALYSIS

The data used in this analysis represent the regional efforts of the Zone 7 to serve its customers in the Tri-Valley, including municipal and industrial (M&I) retailers (California Water Service, Dublin San Ramon Services District, City of Livermore, and City of Pleasanton), M&I direct retail customers, and untreated water customers. The analysis was coordinated with Zone 7's retailers as part of the UWMP coordination process as described in the 2020 UWMP. In accordance with UMWP requirements, Zone 7's retailers report their demand and supply data for their respective service areas in their respective UWMPs. This appendix reports demands on Zone 7 and supplies served by Zone 7. The retailers report their other sources of supplies used to supplement Zone 7 supplies in their UWMPs as applicable (e.g., recycled water, groundwater pumped by the retailer). Zone 7 provided the info presented here to the retailers so they can appropriately represent the nature of their wholesale supplies from Zone 7, and those supplies' contributions to reduced Delta reliance.

The methodology used to determine Zone 7's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in Appendix C of Department of Water Resources' (DWR) Urban Water Management Plan Guidebook 2020 (Guidebook Appendix C) issued in April 2021, including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources. General assumptions include:

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the wholesale level, focusing on demands on Zone 7 and Zone 7's sources of supplies served to the Tri-Valley.
- As described in Chapter 6 of the 2020 UWMP, Zone 7 is currently pursuing a number of water supply and storage alternatives to bolster water system reliability while reducing reliance on the Delta. The future projects described in Chapter 6 and the demand management measures described in Chapter 9 fulfill the requirements of WR P1 subsection (c)(1) Paragraph B. For the purposes of the 2020 UWMP, a representative future water supply portfolio was selected; that portfolio is reflected in this analysis.

Tables 1 through 4 present the analysis of Zone 7's reduced Delta reliance using DWR's spreadsheet tool and fulfill the requirements of WR P1 subsection (c)(1) Paragraph C. Descriptions of the various inputs of the analysis are provided below:

- **Baseline (2010) and 2015-2045 Conditions** – The analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in DWR's Guidebook. Data for the 2010 baseline were taken from the 2010 UWMP (Table 9-11). To evaluate conditions relative to the baseline, actual conditions for 2015 (Table 4-1 of 2015 UWMP) and 2020 (Table 4-1 of 2020 UWMP) are presented. Normal year projections for 2025 through 2045 from the 2020 UWMP are then subsequently used. In its 2020 UWMP, Zone 7 does not include operational storage—groundwater recharge and State Water Project (SWP) carryover—in its current or projected demands. To maintain consistency with baseline and 2015 conditions, operational storage has been added to actual (2020) and projected (2025-2045) demands presented in Zone 7's 2020 UWMP.
- **Service Area Water Demands with Water Use Efficiency Accounted For** – These values reflect Zone 7's actual and projected water use, including water placed in storage as applicable.
- **Non-Potable Water Demands** – This item includes untreated water demands, raw water losses, and water placed in storage.
- **Water Supplies Contributing to Regional Self-Reliance**
  - ***Water Use Efficiency*** – This amount is calculated by DWR's spreadsheet tool based on Zone 7's baseline demand, actual demands, and expected future demands. The value shown is the reduction in per capita water demand from the baseline (2010) multiplied by the projected population for each. Because the Tri-Valley has successfully reduced potable water demands over time, conserved water is contributing significantly to Zone 7's regional self-reliance.
  - ***Conjunctive Use Projects*** – Zone 7's use of operational storage in the Main Basin is included here. The Main Basin is recharged with SWP water and local Arroyo Valle water. This water is locally available for use during normal operations, drought, and emergencies.
  - ***Local and Regional Water Supply and Storage Projects*** – This includes actual use and future projected use of local Arroyo Valle water.
  - ***Other Programs and Projects that Contribute to Regional Self-Reliance*** –As discussed in Chapter 6 of the 2020 UWMP, Zone 7 has included Sites Reservoir (10,000 acre-feet per year (AFY) of average yield) and 5,000 AFY from a combination of potable reuse and desalinated brackish water from the Bay Area Regional Desalination Project (BARDP) as a representative portfolio of future supplies. As stated in a letter from the Delta Stewardship Council to the Sites Project Authority on May 2, 2018, "Sites Reservoir would be located upstream from the Delta, outside the legal Delta boundary" and "does not meet the definition of a covered action"; consequently, Sites Reservoir has been categorized as a water supply contributing to regional self-reliance. Potable reuse, which would use locally generated wastewater, also contributes to regional self-reliance; the amount was assumed to be 2,500 AF from 2030 onwards for the purposes of this analysis.

- Water Supplies from the Delta Watershed
  - ***CVP/SWP Contract Supplies*** – Zone 7 derives a large portion of its supplies from the SWP system, as reflected in the analysis.
  - ***Transfers and Exchanges of Supplies from the Delta Watershed*** – Water transfers and exchanges that Zone 7 receives via the Delta and South Bay Aqueduct have been included here. This includes water from the Yuba Accord, Byron-Bethany Irrigation District, and future water transfers expected to be part of Zone 7's water supply portfolio through 2030.
  - ***Other Water Supplies from the Delta Watershed*** – SWP carryover water and actual recovered water from the Kern County groundwater banks delivered through the Delta have been included here. Note that future projections do not include water from the banks because that supply is not part of normal year operations. In addition, water from the BARDP (assumed at 2,500 AFY for the purposes of this analysis) has been included from 2030 onwards, since brackish water would be derived from the Delta.

Table 1. Optional Calculation of Water Use Efficiency (DWR Table C-1)

Service Area Water Use Efficiency Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For	66,200	47,900	55,040	69,500	72,000	73,000	74,500	74,500
Non-Potable Water Demands	20,000	22,500	16,110	24,700	27,000	27,500	27,500	27,500
Potable Service Area Demands with Water Use Efficiency Accounted For	46,200	25,400	38,930	44,800	45,000	45,500	47,000	47,000

Total Service Area Population	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Population	216,000	238,600	265,811	283,964	299,121	311,887	322,742	322,742

Water Use Efficiency Since Baseline (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Per Capita Water Use (GPCD)	191	95	131	141	134	130	130	130
Change in Per Capita Water Use from Baseline (GPCD)		(96)	(60)	(50)	(57)	(61)	(61)	(61)
Estimated Water Use Efficiency Since Baseline		25,634	17,924	15,937	18,979	21,209	22,031	22,031

Table 2. Calculation of Service Area Water Demands Without Water Use Efficiency (DWR Table C-2)

Total Service Area Water Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For	66,200	47,900	55,040	69,500	72,000	73,000	74,500	74,500
Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline		25,634	17,924	15,937	18,979	21,209	22,031	22,031
Service Area Water Demands without Water Use Efficiency Accounted For	66,200	73,534	72,964	85,437	90,979	94,209	96,531	96,531

Table 3. Calculation of Supplies Contributing to Regional Self-Reliance (DWR Table C-3)

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Water Use Efficiency		25,634	17,924	15,937	18,979	21,209	22,031	22,031
Water Recycling								
Stormwater Capture and Use								
Advanced Water Technologies								
Conjunctive Use Projects	9,200	2,000	12,000	9,200	9,200	9,200	9,200	9,200
Local and Regional Water Supply and Storage Projects	7,100	2,860	8,700	5,500	5,500	5,500	5,500	5,500
Other Programs and Projects that Contribute to Regional Self-Reliance					12,500	12,500	12,500	12,500
Water Supplies Contributing to Regional Self-Reliance	16,300	30,494	38,624	30,637	46,179	48,409	49,231	49,231

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	66,200	73,534	72,964	85,437	90,979	94,209	96,531	96,531

Change in Regional Self Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Water Supplies Contributing to Regional Self-Reliance	16,300	30,494	38,624	30,637	46,179	48,409	49,231	49,231
Change in Water Supplies Contributing to Regional Self-Reliance		14,194	22,324	14,337	29,879	32,109	32,931	32,931

Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Percent of Water Supplies Contributing to Regional Self-Reliance	24.6%	41.5%	52.9%	35.9%	50.8%	51.4%	51.0%	51.0%
Change in Percent of Water Supplies Contributing to Regional Self-Reliance		16.8%	28.3%	11.2%	26.1%	26.8%	26.4%	26.4%

Table 4. Calculation of Reliance on Water Supplies from the Delta Watershed (DWR Table C-4)

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
CVP/SWP Contract Supplies	51,400	16,100	16,100	47,000	46,000	45,000	43,500	43,500
Delta/Delta Tributary Diversions								
Transfers and Exchanges of Supplies from the Delta Watershed	4,645	380	7,100	5,000	5,000			
Other Water Supplies from the Delta Watershed		26,560	11,800	10,000	12,500	12,500	12,500	12,500
Total Water Supplies from the Delta Watershed	56,045	43,040	35,000	62,000	63,500	57,500	56,000	56,000

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	66,200	73,534	72,964	85,437	90,979	94,209	96,531	96,531

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Water Supplies from the Delta Watershed	56,045	43,040	35,000	62,000	63,500	57,500	56,000	56,000
Change in Water Supplies from the Delta Watershed		(13,005)	(21,045)	5,955	7,455	1,455	(45)	(45)

Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Percent of Water Supplies from the Delta Watershed	85%	59%	48%	73%	70%	61%	58%	58%
Change in Percent of Water Supplies from the Delta Watershed		-26%	-37%	-12%	-15%	-24%	-27%	-27%

3.0 EXPECTED OUTCOMES FOR REDUCED RELIANCE ON THE DELTA

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for Zone 7's Delta reliance and regional self-reliance based on the assumptions described in the previous section and DWR's analysis tool. The results show that Zone 7 is measurably reducing reliance on the Delta and improving regional self-reliance, based on the percentage of Zone 7's water supplies from the Delta Watershed.

Expected Outcomes for Regional Self-Reliance

- Near-term (2025) – Normal water year regional self-reliance is expected to increase by approximately 14,300 AFY from the 2010 baseline (see Table 3). Conserved water is the source of this increase.
- Long-term (2045) – Normal water year regional self-reliance is expected to increase by approximately 32,900 AFY from the 2010 baseline (see Table 3). Conserved water is a major contributor to this increase, supplemented by Sites Reservoir and potable reuse.

Expected Outcomes for Percent of Water Supplies from the Delta Watershed

- Near-term (2025) – Normal water year reliance on supplies from the Delta watershed is expected to decrease by 12 percent relative to the 2010 baseline (see Table 4).
- Long-term (2045) – Normal water year reliance on supplies from the Delta watershed is expected to decrease by 27 percent relative to the 2010 baseline (see Table 4).

4.0 NEW APPENDIX TO 2015 UWMP

The information contained in this Appendix is also included as a new Appendix G to Zone 7's 2015 UWMP, consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). As described in Chapter 10 of the 2015 and 2020 UWMPs, Zone 7 followed the required public notification, public review and hearing, and adoption processes required by the Urban Water Management Planning Act.

Zone 7's 2020 UWMP (including this Appendix), Water Shortage Contingency Plan, and Appendix G to the 2015 UWMP were adopted by the Zone 7 Board of Directors on May 19, 2021 (see Resolution Nos. 21-42 and 21-43 in Appendix H of the 2020 UWMP).

Appendix C

DWR 2020 Urban Water Management Plan Tables

Submittal Table 2-2: Plan Identification			
Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☑	Supplier is a wholesaler
☐	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one)	
☐	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed.
	Provide page number for location of the list.
☑	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.**
Water Supplier Name	
California Water Service Company	
City of Livermore	
City of Pleasanton	
Dublin San Ramon Services District	
NOTES:	

Submittal Table 3-1 Wholesale: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	266,000	284,000	299,000	312,000	323,000	323,000
NOTES: Current and projected populations are based on the Regional Demand Study and are rounded to the nearest thousand people.						

Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume*
Sales to other agencies	Retailer Demand	Drinking Water	38,020
Agricultural irrigation	Untreated Water Demand	Raw Water	5,810
Retail demand for use by suppliers that are primarily wholesalers with a small volume of retail sales	Direct Retail Demand	Drinking Water	730
Losses		Drinking Water	180
		TOTAL	44,740
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Volumes are in AF.			

Submittal Table 4-2 Wholesale: Use for Potable and Raw Water - Projected						
Use Type	Additional Description (as needed)	**Projected Water Use *** Report To the Extent that Records are Available				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool.		2025	2030	2035	2040	2045 (opt)
Sales to other agencies	Retailer Demand	43,000	43,200	43,400	43,700	43,700
Agricultural irrigation	Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Retail demand for use by suppliers that are primarily wholesalers with a small volume of retail sales	Direct Retail Demand	800	800	800	800	800
Losses		1,000	1,000	1,300	2,500	2,500
	TOTAL	50,300	52,800	53,800	55,300	55,300
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: Volumes are in AF.						

Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable and Raw Water From Tables 4-1W and 4-2W	44,740	50,300	52,800	53,800	55,300	55,300
Recycled Water Demand* From Table 6-4W	0	0	0	0	0	0
TOTAL WATER DEMAND	44,740	50,300	52,800	53,800	55,300	55,300
**Recycled water demand fields will be blank until Table 6-4 is complete.*						
NOTES: Volumes are in AF. Zone 7 does not produce nor distribute recycled water directly. However, several retailers do provide recycled water in Zone 7's service area. Table references refer to DWR table numbers.						

OPTIONAL Table 4-4 Wholesale: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
01/2016	1,321
01/2017	2,022
01/2018	1,740
01/2019	632
01/2020	180
[1] *Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.* [2] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES: Volumes are in AF.	

Submittal Table 6-1 Wholesale: Groundwater Volume Pumped

☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☑	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Alluvial Basin	Livermore Valley Groundwater Basin	1,871	4,859	5,691	10,433	12,400
	TOTAL	1,871	4,859	5,691	10,433	12,400

**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes are in AF. Zone 7 pumps only water that has been recharged as part of its artificial recharge program using its surface water supplies. Actual groundwater used as supply is lower than the total groundwater volume pumped shown in the table because of demineralization losses at the MGDP.

Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020

☑ Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water.
The Supplier will not complete the table below.

							2020 volumes [1]				
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list*	Treatment Level *Drop down list*	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total	0	0	0	0	0

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area							
☑	Recycled water is not directly treated or distributed by the Supplier. The Supplier will not complete the table below.						
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment *Drop down list*	2020*	2025*	2030*	2035*	2040*	2045* *(opt)*
	Total	0	0	0	0	0	0
*** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.							
NOTES:							

Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
☑	Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2015 Projection for 2020*	2020 Actual Use*
Total	0	0
Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*		
NOTES:		

Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
6-21 through 6-30	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description *(if needed)*	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier*
	Drop Down Menu	*If Yes, Supplier Name*			*Drop Down list*	
Bay Area Regional Desalination Project	*Yes*	Contra Costa Water District, SFPUC, Santa Clara Valley Water District	Brackish water desalination in eastern Contra Costa County	2030	All Year Types	5,600
Delta Conveyance Project	*Yes*	Department of Water Resources and other SWP contractors	Construction of new intakes and tunnel as part of the State Water Project	2040	All Year Types	TBD
Los Vaqueros Reservoir Expansion	*Yes*	Contra Costa Water District, and a number of Bay Area M&I water agencies plus Grassland Water District and San Luis & Delta-Mendota Water Authority.	Expansion of Los Vaqueros Reservoir and construction of the Transfer-Bethany Pipeline, which would connect the reservoir to the South Bay Aqueduct and California Aqueduct	2025 (Pipeline) and 2030 (Reservoir Expansion)	Dry Years	TBD
Potable Reuse	*Yes*	Livermore, DSRSD, Pleasanton, Cal Water	Use of purified water derived from wastewater effluent to supplement potable water supplies	2030	All Year Types	4,000-7,000
Sites Reservoir	*Yes*	Sites Project Authority and Sites Reservoir Project Committee members	Construction of a new 1.5 million AF off-stream reservoir in Colusa County	2030	All Year Types	10,000
SWP Transfers	*Yes*	Other SWP contractor/s	Temporary water transfer agreement/s until major projects are implemented	2021	All Year Types	varies
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: Volumes are in AF. These projects are in the conceptual or planning stages. Zone 7 is participating in the planning efforts of these potential future water supply and/or storage projects to evaluate their benefits, including water supply yield. Implementation of these projects has not been approved by the Zone 7 Board but it is expected that a subset of these projects will be needed to meet future water demands and increase the reliability of Zone 7's system. The partners listed above are potential partners; final participation will be determined when the project has been approved by the respective agencies' governing boards. The 'expected increase in water supply...' are estimates at this time and may need to be adjusted when a final project has been approved. The 'planned implementation year' may also vary depending on project progress.						

Submittal Table 6-8 Wholesale: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Purchased or Imported Water	SWP Table A	16,124	Other Non-Potable Water	
Purchased or Imported Water	Yuba Accord	2,100	Other Non-Potable Water	
Purchased or Imported Water	Water Transfer	5,000	Other Non-Potable Water	
Supply from Storage	SWP Carryover	10,800	Other Non-Potable Water	
Groundwater (not desalinated)	Main Basin	12,000	Other Non-Potable Water	
Surface water (not desalinated)	Arroyo Valle	8,700	Other Non-Potable Water	
Supply from Storage	Non-Local Storage	1,000	Other Non-Potable Water	
	Total	55,724		0

Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes are in AF. These amounts reflect net yield for Yuba Accord and groundwater (i.e., they do not include carriage loss from Yuba Accord [900 AF] and brine disposal from groundwater production [400 AF]). Arroyo Valle supply includes carryover from 2019 (8,100 AF) and 2020 yield (600 AF).

Submittal Table 6-9 Wholesale: Water Supplies — Projected						
Water Supply	Additional Detail on Water Supply	Projected Water Supply* Report To the Extent Practicable				
		2025	2030	2035	2040	2045 (opt)
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	SWP Table A[a]	47,000	46,000	45,000	43,500	43,500
Purchased or Imported Water	Yuba Accord (available mainly in dry years)	0	0	0	0	0
Supply from Storage	SWP Carryover[b]	10,000	10,000	10,000	10,000	10,000
Surface water (not desalinated)	Arroyo Valle[c]	5,500	5,500	5,500	5,500	5,500
Groundwater (not desalinated)	Main Basin	9,200	9,200	9,200	9,200	9,200
Supply from Storage	Semitropic (used mainly in dry years)	0	0	0	0	0
Supply from Storage	Cawelo (used mainly in dry years)	0	0	0	0	0
Other	SWP/Other Transfer[d]	5,000	5,000			
Other	BARDP or Potable Reuse[e]		5,000	5,000	5,000	5,000
Purchased or Imported Water	Sites Reservoir[f]		10,000	10,000	10,000	10,000
	Total	76,700	90,700	84,700	83,200	83,200

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Volumes are in AF.

a. Based on the 2019 Delivery Capability Report. "Existing" assumed for 2020, the "Future" applied to 2040; years in between were interpolated. The effect of the Delta Conveyance Project on water supply yield is still being analyzed and has not been included here.

b. Zone 7 regularly carries over SWP water from year to year, targeting approximately 10,000 AFY.

c. Arroyo Valle: From 2019 Water Supply Evaluation, observed ten-year (2008 to 2017) average was 6,200 AFY, reduced to 5,500 AFY to reflect climate change impacts. This will be refined as more information on the role of the Chain of Lakes on capturing Arroyo Valle water is developed over the coming years.

d. Zone 7 is pursuing water transfer agreements for the period through 2030.

e. These projects are under consideration as potential components of Zone 7's future water supply portfolio.

f. Zone 7 is currently participating in the planning phase of Sites Reservoir at a level of 10,000 AFY of average yield.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	43,500	100%
Single-Dry Year	2014	4,000	9%
Consecutive Dry Years 1st Year	1987	16,900	39%
Consecutive Dry Years 2nd Year	1988	8,100	19%
Consecutive Dry Years 3rd Year	1989	54,000	124%
Consecutive Dry Years 4th Year	1990	10,500	24%
Consecutive Dry Years 5th Year	1991	16,100	37%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the State Water Project Table A. Volumes are in AF. The Average, Single Dry Year, and Multiple Dry Years are based on 2040 Future SWP Reliability Allocations.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	10,000	100%
Single-Dry Year	2014	15,500	155%
Consecutive Dry Years 1st Year	1987	15,500	155%
Consecutive Dry Years 2nd Year	1988	2,800	28%
Consecutive Dry Years 3rd Year	1989	1,800	18%
Consecutive Dry Years 4th Year	1990	1,800	18%
Consecutive Dry Years 5th Year	1991	1,800	18%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for Carryover. Volumes are in AF. Average is based on Zone 7's normal operational target. Other data are from averages of a long-term modeling run from the Water Supply Risk Model.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1919	5,500	100%
Single-Dry Year	1977	0	0%
Consecutive Dry Years 1st Year	1987	1,700	31%
Consecutive Dry Years 2nd Year	1988	1,500	27%
Consecutive Dry Years 3rd Year	1989	1,500	27%
Consecutive Dry Years 4th Year	1990	1,500	27%
Consecutive Dry Years 5th Year	1991	1,500	27%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the Arroyo Valle and includes carryover from the previous year. Volumes are in AF. Based on SWP Table A base years. Other data are from averages of a long-term modeling run from the Water Supply Risk Model.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1965	29,200	100%
Single-Dry Year	2014	27,600	95%
Consecutive Dry Years 1st Year	1987	27,600	95%
Consecutive Dry Years 2nd Year	1988	25,100	86%
Consecutive Dry Years 3rd Year	1989	20,600	71%
Consecutive Dry Years 4th Year	1990	15,100	52%
Consecutive Dry Years 5th Year	1991	9,700	33%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for groundwater from the Main Basin. Volumes are in AF. Data shown are from averages of a long-term modeling run from the Water Supply Risk Model. Values show groundwater pumping capacity, or availability, not volumes pumped. Zone 7 targets average groundwater pumping at 9,200 AFY.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1965	13,000	100%
Single-Dry Year	2014	6,500	50%
Consecutive Dry Years 1st Year	1987	10,000	77%
Consecutive Dry Years 2nd Year	1988	10,000	77%
Consecutive Dry Years 3rd Year	1989	10,000	77%
Consecutive Dry Years 4th Year	1990	10,100	78%
Consecutive Dry Years 5th Year	1991	10,100	78%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the Semitropic Water Storage District's banking program. Volumes are in AF. Average year value is the average from 2025-2040 of a long-term model run from the Water Supply Risk Model. Other data are from averages of a long-term modeling run from the Water Supply Risk Model. Note that Zone 7 typically does not recover water from Semitropic during normal years.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1965	9,700	100%
Single-Dry Year	2014	7,100	73%
Consecutive Dry Years 1st Year	1987	9,700	100%
Consecutive Dry Years 2nd Year	1988	9,700	100%
Consecutive Dry Years 3rd Year	1989	9,700	100%
Consecutive Dry Years 4th Year	1990	9,700	100%
Consecutive Dry Years 5th Year	1991	9,700	100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the Cawelo Water District's banking program. Volumes are in AF. Average year value is the average from 2025-2040 of a long-term model run from the Water Supply Risk Model. Other data are from averages of a long-term modeling run from the Water Supply Risk Model.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1965	5,000	100%
Single-Dry Year	2014	5,000	100%
Consecutive Dry Years 1st Year	1987	5,000	100%
Consecutive Dry Years 2nd Year	1988	5,000	100%
Consecutive Dry Years 3rd Year	1989	5,000	100%
Consecutive Dry Years 4th Year	1990	5,000	100%
Consecutive Dry Years 5th Year	1991	5,000	100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for Bay Area Regional Desalination Project and/or potable reuse. Volumes are in AF. Because these supplies are generally drought-resistant, they have been assumed to provide a constant 5,000 AFY under all conditions.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1965	10,000	100%
Single-Dry Year	2014	15,300	153%
Consecutive Dry Years 1st Year	1987	16,800	168%
Consecutive Dry Years 2nd Year	1988	17,700	177%
Consecutive Dry Years 3rd Year	1989	16,300	163%
Consecutive Dry Years 4th Year	1990	15,900	159%
Consecutive Dry Years 5th Year	1991	15,800	158%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for the Sites Reservoir Project. Volumes are in AF. Dry year values are based on 2040 conditions from the Water Supply Risk Model.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ____________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	1965	5,000	100%
Single-Dry Year	2014	5,000	100%
Consecutive Dry Years 1st Year	1987	5,000	100%
Consecutive Dry Years 2nd Year	1988	5,000	100%
Consecutive Dry Years 3rd Year	1989	5,000	100%
Consecutive Dry Years 4th Year	1990	5,000	100%
Consecutive Dry Years 5th Year	1991	5,000	100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for Water Transfers. Volumes are in AF. Amounts are likely to vary from year-to-year but variability has not been quantified at this time.

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1965	10,100	100%
Single-Dry Year	2014	8,300	82%
Consecutive Dry Years 1st Year	1987	8,800	87%
Consecutive Dry Years 2nd Year	1988	7,900	78%
Consecutive Dry Years 3rd Year	1989	6,900	68%
Consecutive Dry Years 4th Year	1990	6,000	59%
Consecutive Dry Years 5th Year	1991	5,200	51%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Multiple versions of this table are being used; this table is for stored water in the Chain of Lakes that could be conveyed to the Del Valle Water Treatment Plant. Volumes are in AF.

Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supplies					
SWP Table A	47,000	46,000	45,000	43,500	43,500
Yuba Accord	0	0	0	0	0
Turnback Pool	0	0	0	0	0
SWP Carryover	10,000	10,000	10,000	10,000	10,000
Arroyo Valle	5,500	5,500	5,500	5,500	5,500
Main Basin	9,200	9,200	9,200	9,200	9,200
Semitropic	0	0	0	0	0
Cawelo	0	0	0	0	0
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir Project	0	10,000	10,000	10,000	10,000
Transfers	5,000	5,000	0	0	0
Chain of Lakes	0	0	0	0	0
Supply totals *(autofill from Table 6-9)*	76,700	90,700	84,700	83,200	83,200
Demands					
Retailer Demand	43,000	43,200	43,400	43,700	43,700
Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,000	1,300	2,500	2,500
Demand totals *(autofill from Table 4-3)*	50,300	52,800	53,800	55,300	55,300
Difference	26,400	37,900	30,900	27,900	27,900
NOTES: Volumes are in AF. Table references refer to DWR table numbers. Surplus supplies are stored as carryover, used to recharge the Main Basin, and stored in the Kern County groundwater banks.					

Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supplies					
SWP Table A	4,400	4,400	4,400	4,400	4,400
Yuba Accord	0	0	0	0	0
Turnback Pool	0	0	0	0	0
SWP Carryover	15,500	12,000	13,800	12,600	12,700
Arroyo Valle	0	0	0	0	0
Main Basin	27,600	29,900	31,800	32,200	32,500
Semitropic	6,500	6,600	6,600	6,500	6,500
Cawelo	7,100	7,100	7,100	7,100	7,000
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir Project	0	14,200	15,700	15,300	15,100
Transfers	4,500	4,600	0	0	0
Chain of Lakes	0	8,300	9,800	9,400	9,100
Supply totals*	65,600	92,100	94,200	92,500	92,300
Demands					
Retailer Demand	43,000	43,200	43,400	43,700	43,700
Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,000	1,300	2,500	2,500
Demand totals*	50,300	52,800	53,800	55,300	55,300
Difference	15,300	39,300	40,400	37,200	37,000
Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES: Volumes are in AF.					

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison

Projections - First Year	2025	2030	2035	2040	2045
Supplies					
SWP Table A	19,900	19,500	19,500	19,500	19,400
SWP Carryover	15,500	12,000	13,800	12,600	12,700
Arroyo Valle	1,700	1,700	1,700	1,700	1,700
Main Basin	27,600	29,900	31,800	32,200	32,500
Semitropic	10,000	9,900	10,000	10,000	9,900
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	15,300	17,000	16,800	16,600
Water Transfers	4,800	4,800	0	0	0
Chain of Lakes	0	8,800	10,000	9,600	9,300
Total Supplies	**89,200**	**116,600**	**118,500**	**117,100**	**116,800**
Demands					
Retailer Demand	43,000	43,200	43,400	43,700	43,700
Untreated Water Demand	5,500	7,800	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,000	1,300	2,500	2,500
Total Demands	**50,300**	**52,800**	**53,800**	**55,300**	**55,300**
Difference	38,900	63,800	64,700	61,800	61,500

NOTES: Volumes are in AF.

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison					
Projections - Second Year	2026	2031	2036	2041	2046
Supplies					
SWP Table A	20,200	19,800	19,800	19,600	19,600
SWP Carryover	2,800	4,400	3,500	3,100	3,100
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	25,100	29,400	31,400	31,600	31,900
Semitropic	10,000	10,000	10,000	10,000	10,000
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	18,100	18,300	17,700	17,800
Water Transfers	4,900	0	0	0	0
Chain of Lakes	600	7,900	8,800	8,400	8,200
Total Supplies	**74,800**	**105,800**	**108,000**	**106,600**	**106,800**
Demands					
Retailer Demand	43,000	43,200	43,500	43,700	43,700
Untreated Water Demand	6,900	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,060	1,600	2,500	2,500
Total Demands	**51,700**	**53,360**	**54,200**	**55,300**	**55,300**
Difference	23,100	52,440	53,800	51,300	51,500
NOTES: Volumes are in AF.					

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison					
Projections - Third Year	2027	2032	2037	2042	2047
Supplies					
SWP Table A	20,200	19,800	19,700	19,700	19,600
SWP Carryover	1,800	2,700	2,500	2,300	2,300
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	20,600	28,300	30,300	30,300	30,700
Semitropic	10,000	10,000	9,900	10,000	9,900
Cawelo	9,700	9,800	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	16,600	16,400	16,300	16,300
Water Transfers	4,900	0	0	0	0
Chain of Lakes	400	6,900	7,700	7,500	7,300
Total Supplies	**69,100**	**100,600**	**102,700**	**102,300**	**102,300**
Demands					
Retailer Demand	43,100	43,300	43,500	43,700	43,700
Untreated Water Demand	7,100	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,120	1,800	2,500	2,500
Total Demands	**52,000**	**53,520**	**54,400**	**55,300**	**55,300**
Difference	17,100	47,080	48,300	47,000	47,000
NOTES: Volumes are in AF.					

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison					
Projections - Fourth Year	2028	2033	2038	2043	2048
Supplies					
SWP Table A	20,200	19,500	19,800	19,700	19,800
SWP Carryover	1,800	2,100	2,000	1,900	1,900
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	15,100	26,900	28,800	28,600	28,900
Semitropic	10,100	10,000	10,000	10,000	10,000
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	16,000	16,000	15,900	15,900
Water Transfers	4,900	0	0	0	0
Chain of Lakes	300	6,000	6,700	6,600	6,500
Total Supplies	**63,600**	**96,700**	**99,500**	**98,900**	**99,200**
Demands					
Retailer Demand	43,100	43,300	43,600	43,700	43,700
Untreated Water Demand	7,350	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,180	2,000	2,500	2,500
Total Demands	**52,250**	**53,580**	**54,700**	**55,300**	**55,300**
Difference	11,350	43,120	44,800	43,600	43,900
NOTES: Volumes are in AF.					

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison					
Projections - Fifth Year	2029	2034	2039	2044	2049
Supplies					
SWP Table A	20,200	19,800	19,700	19,600	19,600
SWP Carryover	1,800	1,900	1,900	1,900	1,900
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	9,700	25,200	27,000	26,500	26,900
Semitropic	10,100	10,000	10,000	10,000	10,000
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	0	5,000	5,000	5,000	5,000
Sites Reservoir	0	15,800	15,800	15,800	15,700
Water Transfers	4,900	0	0	0	0
Chain of Lakes	300	5,200	5,900	5,900	5,800
Total Supplies	**58,200**	**94,100**	**96,500**	**95,900**	**96,100**
Demands					
Retailer Demand	43,100	43,400	43,600	43,700	43,700
Untreated Water Demand	7,600	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,240	2,300	2,500	2,500
Total Demands	**52,500**	**53,740**	**55,000**	**55,300**	**55,300**
Difference	5,700	40,360	41,500	40,600	40,800
NOTES: Volumes are in AF.					

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison					
Projections - Sixth Year	2030	2035	2040	2045	2050
Supplies					
SWP Table A	19,900	19,500	19,500	19,300	19,300
SWP Carryover	1,800	1,900	1,800	1,800	1,800
Arroyo Valle	1,500	1,500	1,500	1,500	1,500
Main Basin	7,100	23,400	24,900	24,100	24,400
Semitropic	10,000	10,000	10,000	9,900	9,900
Cawelo	9,700	9,700	9,700	9,700	9,700
BARDP/Potable Reuse	5,000	5,000	5,000	5,000	5,000
Sites Reservoir	15,300	15,700	15,800	15,800	15,800
Water Transfers	4,900	0	0	0	0
Chain of Lakes	900	4,500	5,100	5,300	5,200
Total Supplies	**76,100**	**91,200**	**93,300**	**92,400**	**92,600**
Demands					
Retailer Demand	43,200	43,400	43,700	43,700	43,700
Untreated Water Demand	7,800	8,300	8,300	8,300	8,300
Direct Retail Demand	800	800	800	800	800
Losses	1,000	1,300	2,500	2,500	2,500
Total Demands	**52,800**	**53,800**	**55,300**	**55,300**	**55,300**
Difference	23,300	37,400	38,000	37,100	37,300
NOTES: Volumes are in AF.					

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	45,200
Total Supplies	55,900
Surplus/Shortfall w/o WSCP Action	10,700
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	10,700
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	47,600
Total Supplies	58,200
Surplus/Shortfall w/o WSCP Action	10,600
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	10,600
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	48,500
Total Supplies	80,900
Surplus/Shortfall w/o WSCP Action	32,400
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	32,400
Resulting % Use Reduction from WSCP action	0%
2024	**Total**
Total Water Use	49,400
Total Supplies	60,300
Surplus/Shortfall w/o WSCP Action	10,900
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	10,900
Resulting % Use Reduction from WSCP action	0%
2025	**Total**
Total Water Use	50,300
Total Supplies	62,800
Surplus/Shortfall w/o WSCP Action	12,500
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	12,500
Resulting % Use Reduction from WSCP action	0%

Submittal Table 8-1 **Water Shortage Contingency Plan Levels**		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions** **(*Narrative description)***
1	Up to 10%	Implement actions per DWR Table 8-2 and DWR Table 8-3.
2	Up to 20%	Implement actions per DWR Table 8-2 and DWR Table 8-3.
3	Up to 30%	Implement actions per DWR Table 8-2 and DWR Table 8-3.
4	Up to 40%	Implement actions per DWR Table 8-2 and DWR Table 8-3.
5	Up to 50%	Implement actions per DWR Table 8-2 and DWR Table 8-3.
6	>50%	Implement actions per DWR Table 8-2 and DWR Table 8-3.
NOTES:		

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Expand Public Information Campaign	(see Note)	Public outreach to support voluntary conservation.	No
	Other	Up to the full shortage gap	Ask retailers for voluntary demand reduction, as needed.	No
2	Expand Public Information Campaign	(see Note)	Expand public outreach to support conservation.	No
	Other	Up to the full shortage gap	Ask retailers for voluntary or mandatory demand reduction, as needed. Only the latter will be enforced.	Yes
3*	Expand Public Information Campaign	(see Note)	Intensify public outreach to support conservation.	No
	Other	Up to the full shortage gap	Ask retailers for mandatory demand reduction.	Yes
NOTES: Expand public information campaign boosts water conservation overall, so no shortage gap reduction estimate provided. Actions introduced in a lower stage will also be used in higher stages, unless otherwise noted. *At Stage 3 and higher, Zone 7 will likely require its retailers to reduce demands up to the applicable shortage percentage.				

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Other actions (describe)	Up to the full shortage gap.	Optimize use of groundwater and surface water supplies and adjust use of locally vs. remotely stored water.
	Other actions (describe)	N/A	Improve monitoring, analysis, and tracking of customer water usage rates.
	Other actions (describe)	N/A	In anticipation of decreased revenue, reduce discretionary spending
2	Transfers	Up to the full shortage gap.	Pursue opportunities for additional water transfers to lower the shortage gap, beyond what is already in the Annual Sustainability Report.
	Exchanges	Up to the full shortage gap.	Pursue opportunities for (additional) water exchanges to lower the shortage gap.
	Implement or Modify Drought Rate Structure or Surcharge	N/A	Consider implementation of water shortage surcharge correlated with stage (requires Board approval).
	Other actions (describe)	N/A	Evaluate timing of maintenance activities that could negatively impact ability to manage water supplies/shortages, or could result in loss of water supply.
	Other actions (describe)	up to 100 AF	Consider greater incentives under rebate program and focus on high-consumption customers.
3	Other actions (describe)	unknown - depends on project/s identified	Review CIP program and accelerate projects facilitating immediate improvement in water supply management if feasible/necessary.
	Stored emergency supply	To be determined based on operational conditions.	Consider/plan for/implement pumpback into South Bay Aqueduct if no supplies are available from Delta pumping.
NOTES: Actions introduced in a lower stage will also be used in higher stages, unless otherwise noted.			

Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one)		
☐	Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were**	
	Provide the page or location of this list in the UWMP.	
☑	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
Dublin	Yes	Yes
Livermore	Yes	Yes
Pleasanton	Yes	Yes
San Ramon	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Alameda County	Yes	Yes
Contra Costa County	Yes	Yes
NOTES:		

Table O-1B: Recommended Energy Reporting - Total Utility Approach				
Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control		
End Date	12/31/2019			
☐ Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	*AF*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*36,185*	*0*	*36,185*
Energy Consumed (kWh)		*12,377,060*	*0*	*12,377,060*
Energy Intensity (kWh/volume)		*342.0*	*0.0*	*342.0*

Quantity of Self-Generated Renewable Energy

600,000 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

Water production and energy consumption data are based on metered data collected and provided by Zone 7.

Narrative:

Zone 7's water management processes that consume energy include raw water treatment; groundwater pumping, recharge, and treatment; and treated water pumping.

Appendix D

DWR 2020 Urban Water Management Plan Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X	X	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Executive Summary
X	X	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Executive Summary
X	X	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1
X	X	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5
X	X	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.5.2
X		Sections 2.6 and 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Not Applicable (N/A)
	X	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1
X	X	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.2
X	X	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
X	X	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4.1
X	X	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4.2
X	X	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.4.1
X	X	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X	X	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2
X	optional	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.3
X	X	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.2.1
X	X	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.2.1
X	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.3
X	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	N/A
X	X	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4
X		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	N/A
X		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	N/A
	X	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.2
X		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	N/A
X		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	N/A
X		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	N/A
X	X	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Chapters 6 and 7

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X	X	Section 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Chapters 6 and 7
X	X	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.2
X	X	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.2.9
X	X	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030,2035, 2040 and optionally 2045.	System Supplies	Section 6.2.10
X	X	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2.2
X	X	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Sections 6.2.2.1 and 6.2.2.2; link to plan provided in footnote 4 on page 6-7
X	X	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2.1
X	X	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2.1
X	X	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.2.1
X	X	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Sections 6.2.2.2.1 and 6.2.2.2.2
X	X	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2.2.2.2
X	X	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.2.8
X	X	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.2.6.2
X	X	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2.6.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X	X	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Sections 6.2.6.1, 6.2.6.3, and 6.2.6.4
X	X	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.2.6.4
X	X	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.2.6.1 and Section 6.2.9.1.3
X	X	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2.6.1
X	X	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.2.7
X	X	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier’s service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.2.6.2
X	X	Sections 6.2.8 and 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.2.9
X	X	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.3
X	X	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Sections 7.1.1.1.2, 7.1.1.2, and 7.1.1.3
X	X	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.1.4
X	X	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next20 years.	Water Supply Reliability Assessment	Section 7.1.3
X	X	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X	X	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5consecutive years.	Water Supply Reliability Assessment	Section 7.2.1
X	X	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.2.2
X	X	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.2.3
X	X	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.2.1 & Section 7.2.2
X	X	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Section 8.2 and Appendix G
X	X	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix G (Section 1.0)
X	X	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix G (Section 2.0)
X	X	Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix G (Section 2.1)
X	X	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier’s water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix G (Sections 2.2 and 2.3)
X	X	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix G (Section 3.0)
X	X	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix G (Section 3.0)
X	X	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix G (Section 4.3)

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X	X	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix G (Section 4.1)
X	X	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix G (Section 4.4)
X	X	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix G (Section 4.2)
X	X	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix G (Sections 4.1 and 4.3)
X	X	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Section 8.3
X	X	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix G (Section 5.0)
X	X	Sections 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix G (Section 5.0)
X		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	N/A
X	X	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix G (Section 7.0)
X	X	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix G (Section 7.0)
X	X	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix G (Section 2.1 and Section 7.0)
X	X	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix G (Section 8.0)
X	X	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix G (Section 8.0)
X		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix G (Section 9.0)
X		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix G (Section 11.0)
X	X	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 8.4 and Appendix G (Section 12.0)
X	X	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 8.4 and Appendix G (Section 12.0)
	X	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Chapter 9
X		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	N/A
X		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
X	X	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
X	X	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4
X	X	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.2 and Appendix E
X	X	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.3
X	X	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.2 and Appendix H
X	X	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (For Agency Review Use)
X	X	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
X	X	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
X	X	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
X	X	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
X	X	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A
X	X	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.6

Appendix E

Agency and Public Notices

Rhodora Biagtan

From:	Rank, Elke <erank@zone7water.com>
Sent:	Tuesday, November 24, 2020 4:21 PM
To:	drepp@cityofpleasantonca.gov; NFialho@cityofpleasantonca.gov; rdicandia@cityofpleasantonca.gov; dbruzzone@cityofpleasantonca.gov; citymanager@cityoflivermore.net; hfling@cityoflivermore.net; yzhang@cityoflivermore.net; mcintyre@dsrsd.com; jlee@dsrsd.com; Irene Suroso; Judy Zavadil; fvallejo; mstorms@calwater.com; J Freeman; weir@lavwma.com; info@lavwma.com; linda.smith@dublin.ca.gov; public.works@dublin.ca.gov; albert.lopez@acgov.org; danielw@acpwa.org; susan.muranishi@acgov.org; jgorton@sanramon.ca.gov; rbartlett@sanramon.ca.gov; spedowfski@sanramon.ca.gov; ryan.hernandez@dcd.cccounty.us; Jami.Napier@cob.cccounty.us; David.Twa@cao.cccounty.us; jrossi.derwa@gmail.com; clifford.chan@ebmud.com
Cc:	Flores, Amparo; Mahoney, Carol; Bradley, Alexandra; Rhodora Biagtan
Subject:	Notice for 2020 UWMP and WSCP

NOTICE OF REVIEW & POTENTIAL AMENDMENTS
2020 Urban Water Management Plan and Water Shortage Contingency Plan
November 24, 2020

Zone 7 Water Agency (Zone 7) is a water wholesaler serving over 260,000 people in Pleasanton, Livermore and Dublin in Alameda County, and the Dougherty Valley area of San Ramon in Contra Costa County. Zone 7 sells treated water to four retailers: City of Pleasanton, City of Livermore, Dublin San Ramon Services District and California Water Service Company.

Zone 7 is currently in the process of updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), which are required to be submitted to the California Department of Water Resources by July 1, 2021. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts. The WSCP provides a plan for response to various water supply shortage conditions.

Zone 7 coordinates with water management agencies, relevant public agencies and other water suppliers (including the four retailers) on the preparation of the UWMP and WSCP updates. Zone 7 will be reviewing the UWMP and WSCP and will make amendments and updates, as appropriate.

Additional notices regarding the status of the 2020 UWMP and WSCP, including schedules for public review and Zone 7 Board approval, will be distributed and posted on Zone 7's web site at www.zone7water.com.

Questions or comments regarding preparation of the UWMP and WSCP may be directed to Elke Rank, erank@zone7water.com.

Elke Rank | Associate Water Resources Planner
Zone 7 Water Agency
100 North Canyons Parkway Livermore, CA 94551
Direct: 925.454.5005 | Main: 925.454.5000 | E-mail: erank@zone7water.com

Zone 7 is hiring Engineers!

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7
100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551 • PHONE (925) 454-5000 • FAX (925) 454-5723

NOTICE OF REVIEW & POTENTIAL AMENDMENTS
2020 Urban Water Management Plan, Water Shortage Contingency Plan, and Consistency with Delta Plan Policy WR P1
March 10, 2021

Zone 7 Water Agency (Zone 7) is a water wholesaler serving over 260,000 people in Pleasanton, Livermore and Dublin in Alameda County, and the Dougherty Valley area of San Ramon in Contra Costa County. Zone 7 sells treated water to four retailers: City of Pleasanton, City of Livermore, Dublin San Ramon Services District and California Water Service Company.

Zone 7 is currently in the process of updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), which are required to be submitted to the California Department of Water Resources by July 1, 2021. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts. The WSCP provides a plan for response to various water supply shortage conditions.

Furthermore, Zone 7 is adding a new appendix to our previously adopted 2015 UWMP to incorporate demonstration of consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003).

Zone 7 coordinates with water management agencies, relevant public agencies and other water suppliers (including the four retailers) on the preparation of the UWMP and WSCP updates. Zone 7 will be reviewing the UWMP and WSCP and will make amendments and updates, as appropriate.

A Board workshop will be conducted on April 1, 2021 at 6 pm to discuss the Draft 2020 UWMP and WSCP, and the addition to the 2015 UWMP. Additional notices regarding the status of the 2020 UWMP and WSCP, including schedules for public meetings, public review and Zone 7 Board public hearing and adoption, will be distributed and posted on Zone 7’s web site at www.zone7water.com.

Questions or comments regarding preparation of the UWMP and WSCP may be directed to Elke Rank, erank@zone7water.com.

Rhodora Biagtan

From:	Rank, Elke <erank@zone7water.com>
Sent:	Monday, May 3, 2021 3:19 PM
To:	drepp@cityofpleasantonca.gov; NFialho@cityofpleasantonca.gov; rdicandia@cityofpleasantonca.gov; dbruzzone@cityofpleasantonca.gov; citymanager@cityoflivermore.net; hfling@cityoflivermore.net; yzhang@cityoflivermore.net; mcintyre@dsrsd.com; jlee@dsrsd.com; Irene Suroso; Judy Zavadil; fvallejo; mstorms@calwater.com; J Freeman; weir@lavwma.com; info@lavwma.com; linda.smith@dublin.ca.gov; public.works@dublin.ca.gov; albert.lopez@acgov.org; danielw@acpwa.org; susan.muranishi@acgov.org; jgorton@sanramon.ca.gov; rbartlett@sanramon.ca.gov; spedowfski@sanramon.ca.gov; ryan.hernandez@dcd.cccounty.us; Jami.Napier@cob.cccounty.us; David.Twa@cao.cccounty.us; jrossi.derwa@gmail.com; clifford.chan@ebmud.com; Laurie Sucgang; bosdis1@acgov.org; bosdist4@acgov.org
Cc:	Flores, Amparo; Mahoney, Carol; Bradley, Alexandra; Rhodora Biagtan
Subject:	Notice for 2020 UWMP, WSCP, and Consistency with Delta Plan Policy WR P1
Attachments:	UWMP Public Notice 5-3-2021.pdf

Follow Up Flag:	Follow up
Flag Status:	Flagged

[This message has originated from outside of West Yost]

Please see the attached notice for Zone 7's 2020 UWMP, WSCP, and Consistency with Delta Plan Policy WR P1.

Key dates:

- Zone 7's Board of Directors will hold a public hearing at their regularly scheduled meeting on Wednesday, May 19, 2021, at 7 p.m. to take public comment on the Public Draft 2020 UWMP and WSCP, and the addition to the 2015 UWMP.
- We encourage written comments to be submitted by Monday, May 17, 2021 to allow the Board of Directors opportunity to review before the hearing.

Best,
Elke

Elke Rank | Associate Water Resources Planner
Zone 7 Water Agency
100 North Canyons Parkway Livermore, CA 94551
Direct: 925.454.5005 | Main: 925.454.5000 | E-mail: erank@zone7water.com

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7
100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551 • PHONE (925) 454-5000 • FAX (925) 454-5723

NOTICE OF AVAILABILITY & NOTICE OF PUBLIC HEARING
2020 Urban Water Management Plan, Water Shortage Contingency Plan, and Consistency with Delta Plan Policy WR P1
May 3, 2021

Zone 7 Water Agency (Zone 7) is a water wholesaler serving over 260,000 people in Pleasanton, Livermore and Dublin in Alameda County, and the Dougherty Valley area of San Ramon in Contra Costa County. Zone 7 sells treated water to four retailers: City of Pleasanton, City of Livermore, Dublin San Ramon Services District and California Water Service Company.

Zone 7 has updated its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), which are required to be submitted to the California Department of Water Resources by July 1, 2021. The 2020 UWMP is a planning document, which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts. The WSCP provides a plan for response to various water supply shortage conditions. Furthermore, Zone 7 is adding a new appendix to the 2020 UWMP and to our previously adopted 2015 UWMP to incorporate demonstration of consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003).

Materials: These materials are posted for review on Zone 7's website, www.zone7water.com. A limited number of paper copies are available, on a first come-first served basis, at Zone 7's main office in Livermore; contact Elke Rank to make arrangements for pick-up (24-hour notice is required).

Public Hearing: Zone 7's Board of Directors will hold a public hearing at their regularly scheduled meeting on Wednesday, May 19, 2021, at 7 p.m. to take public comment on the Public Draft 2020 UWMP and WSCP, and the addition to the 2015 UWMP. The Board is expected to consider adoption of these items at this meeting, which will be held virtually. Meeting details will be posted on Zone 7's website at least 72 hours prior to the meeting.

Public Comments: We welcome public comments, either written or spoken. We encourage written comments to be submitted by Monday, May 17, 2021 to allow the Board of Directors opportunity to review before the hearing. All comments must be received by Zone 7 by the close of the public hearing on Wednesday, May 19, 2021.

Questions or comments regarding preparation of the UWMP and WSCP may be directed to Elke Rank, erank@zone7water.com.

NOTICE OF AVAILABILITY &
NOTICE OF PUBLIC HEARING
2020 Urban Water Management Plan,
Water Shortage Contingency Plan, and
Consistency with Delta Plan Policy WR P1
May 3, 2021

Zone 7 Water Agency (Zone 7) is a water wholesaler serving over 260,000 people in Pleasanton, Livermore and Dublin in Alameda County, and the Dougherty Valley area of San Ramon in Contra Costa County. Zone 7 sells treated water to four retailers: City of Pleasanton, City of Livermore, Dublin San Ramon Services District and California Water Service Company.

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Questions or comments regarding preparation of the UWMP and WSCP may be directed to Elke Rank, erank@zone7water.com.

PT/VT 6572876; May 3, 10, 2021

Appendix F

Zone 7 Water Agency Water Supply Reliability Policy (Resolution 13-4230)

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 13-4230

INTRODUCED BY DIRECTOR QUIGLEY
SECONDED BY DIRECTOR STEVENS

Water Supply Reliability Policy

WHEREAS, the Zone 7 Board of Directors desires to maintain a highly reliable Municipal and Industrial (M&I) water supply system so that existing and future M&I water demands can be met during varying hydrologic conditions; and

WHEREAS, the Board has an obligation to communicate to its M&I customers and municipalities within its service area the ability of Zone 7's water supply system to meet projected water demands; and

WHEREAS, the Board on August 18, 2004 adopted Resolution No. 04-2662 setting forth its Reliability Policy for Municipal & Industrial Water Supplies; and

WHEREAS, the Board desires to revise the Reliability Policy to reflect recent data, analysis, and studies.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby rescinds Resolution No. 04-2662 adopting the August 18, 2004 Reliability Policy for Municipal & Industrial Water Supplies; and

BE IT FURTHER RESOLVED that the Board hereby adopts the following level of service goals to guide the management of Zone 7's M&I water supplies as well as its Capital Improvement Program (CIP):

Goal 1.Zone 7 will meet its treated water customers' water supply needs, in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands as specified in Zone 7's most recent Urban Water Management Plan (UWMP), during normal, average, and drought conditions, as follows:

- At least 85% of M&I water demands 99% of the time
- 100% of M&I water demands 90% of the time

Goal 2:Provide sufficient treated water production capacity and infrastructure to meet at least 80% of the maximum month M&I contractual demands should any one of Zone 7's major supply, production, or transmission facilities experience an extended unplanned outage of at least one week.

BE IT FURTHER RESOLVED that to ensure that this Board policy is carried out effectively, the Zone 7 General Manager will provide a water supply status report to the Board every five years with the Zone 7 Urban Water Management Plan that specifies how these goals will be, or are being, achieved.

If the General Manager finds that the goals cannot be met during the first five years of the Urban Water Management Plan, then the Board will hold a public hearing within two months of the General Manager's finding to consider remedial actions that will bring Zone 7 into substantial compliance with the stated level of service goals. Remedial actions may include, but are not limited to, voluntary conservation or mandatory rationing to reduce water demands, acquisition of additional water supplies, and/or a moratorium on new water connections. After reviewing staff analyses and information gathered at the public hearing, the Board shall, as expeditiously as is feasible, take any additional actions that are necessary to meet the level of service goals during the following five-year period; and

BE IT FURTHER RESOLVED that the Zone 7 General Manager shall prepare an Annual Review of the Sustainable Water Supply Report which includes the following information:

(1) An estimate of the current annual average water demand for M&I water as well as a five-year projection based on the same information used to prepare the UWMP and CIP;
(2) A Summary of available water supplies to Zone 7 at the beginning of the calendar year;
(3) A comparison of current water demand with the available water supplies; and
(4) A discussion of water conservation requirements and other long-term supply programs needed to meet Zone 7 M&I water demands for single-dry and multiple-dry year conditions, as specified in the Zone 7's UWMP.

A summary of this review will be provided to M&I customers.

<u>Definitions</u>

Level of Service for Annual Water Supply Needs—the level of service is the percent of existing or projected water demand that Zone 7's water supply system can meet during two key conditions: (1) during various hydrologic conditions and (2) during unplanned outages of major facilities.
Capital Improvement Program (CIP)—the CIP is Zone7's formal program for developing surface and ground water supplies, along with associated infrastructure, including import water conveyance facilities, surface water treatment plants, groundwater wells, and M&I water transmission system to meet projected water demands.

Normal conditions—conditions that most closely represent median runoff or allocation from all normally contracted or available water supplies from the historic record.

Average conditions—conditions that most closely represent the average runoff or allocation from all normally contracted or legally available water supplies from the historic record.

Drought conditions—conditions that most closely represent reduced runoff or allocation level from the historic record from all normally contracted or legally available water supplies, including both single-dry and multiple-dry year conditions.

Single-dry year condition—a condition that most closely represents the lowest yield over a one-year period from the historic record from all normally contracted or legally available supplies.

Multiple-dry year condition—a condition that most closely represents three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

Available water supplies—consist solely of (1) water supplies that Zone 7 has contracted for (e.g., listed under Schedule A of the State Water Contract, dry-year water options, special contracts with other water districts, etc.) and (2) water actually stored in surface and subsurface reservoirs.

Maximum Month—the largest monthly average water use.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GRECI, MACHAEVICH, PALMER, QUIGLEY, RAMIREZ HOLMES STEVENS

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on October 17, 2012.

By____________________

President, Board of Directors

Appendix G

Water Shortage Contingency Plan

FINAL | JUNE 2021

Zone 7 Water Agency
Water Shortage Contingency Plan

JOINTLY PREPARED BY

Table of Contents

LIST OF TABLES

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LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AWSDA	Annual Water Supply and Demand Assessment
Cal Water	California Water Service-Livermore District
ccf	Hundred cubic feet
CIP	Capital Improvement Program
CWC	California Water Code
Delta	Sacramento-San Joaquin Delta
DSRSD	Dublin San Ramon Services District
DWR	Department of Water Resources
EOC	Emergency Operations Center
ERP	Emergency Response Plan
Legislature	California State Legislature
Livermore	City of Livermore
M&I	Municipal and Industrial
PIO	Public Information Officer
Pleasanton	City of Pleasanton
SB	Senate Bill
SBA	South Bay Aqueduct
UWMP	Urban Water Management Plan
WARN	Water/Wastewater Agency Response Network
WSCP	Water Shortage Contingency Plan
Zone 7	Zone 7 Water Agency
Zone 7 Board	Zone 7 Board of Directors

Water shortages occur whenever the available water supply cannot meet the normally expected customer water use. This can be due to several reasons, such as climate change, drought, and catastrophic events. Drought, regulatory action constraints, and natural and manmade disasters may occur at any time. In 2018, the California State Legislature (Legislature) enacted two policy bills, (Senate Bill (SB) 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman)) (2018 Water Conservation Legislation), to establish a new foundation for drought planning to adapt to climate change and the resulting longer and more intense droughts in California. The 2018 Water Conservation Legislation set new requirements for water shortage contingency planning.

Zone 7 Water Agency's (Zone 7) goal is to maintain a highly reliable Municipal and Industrial (M&I) water supply system to meet existing and future demands under various water supply conditions. Zone 7's Water Supply Reliability Policy (Resolution 13-4230), adopted on October 17, 2012 and included as Appendix A to this WSCP, guides the management of its water supplies to meet this goal.

This Water Shortage Contingency Plan (WSCP) reflects Zone 7's Water Supply Reliability Policy and describes its strategic plan in preparation for and responses to water shortages, including water shortage stages and associated shortage response actions. This WSCP provides a guide for Zone 7 to proactively prevent catastrophic service disruptions and has been updated to be consistent with the 2018 Water Conservation Legislation requirements. As part of this WSCP, Zone 7's legal authorities, communication protocols, compliance and enforcement, and monitoring and reporting are described.

Zone 7 intends for this WSCP to be dynamic so that it may assess response action effectiveness and adapt to emergencies and catastrophic events. Refinement procedures to this WSCP are provided to allow Zone 7 to modify this WSCP outside of the Urban Water Management Plan (UWMP) process.

1.0 WATER SUPPLY RELIABILITY ANALYSIS

Chapters 6 and 7 of Zone 7's 2020 UWMP present Zone 7's water supply sources and reliability, respectively. Findings show Zone 7 can reliably meet its projected demands through 2045 in normal and dry hydrologic conditions, including single dry years and five consecutive dry years.

Statewide water supply conditions, changes in groundwater levels, and actions by other agencies may impact Zone 7's available water supply. For Zone 7, a water shortage condition occurs when the available supply of potable water cannot meet its retailers' normal water demands for human consumption, sanitation, fire protection, and other beneficial uses. Zone 7's retailers include the California Water Service-Livermore District (Cal Water), the City of Livermore (Livermore), the City of Pleasanton (Pleasanton), and the Dublin San Ramon Services District (DSRSD).

The analysis associated with this WSCP was developed in the context of Zone 7's water supply sources and system reliability. In some cases, Zone 7 may be able to foresee its water shortage condition, but the water shortage may also be caused by an unforeseen emergency event. In general, Zone 7's water supply conditions may be affected by the following:

- SWP supply allocations and storage levels
- Sacramento-San Joaquin Delta (Delta) water quality

- Occurrence of threatened/endangered species near Banks Pumping Plant in the Delta
- Delta vulnerability to seismic events, changing environmental and regulatory requirements, and climate change
- Local hydrology affecting availability of Arroyo Valle water supply
- Contaminants in the Main Basin
- Outages of Delta (e.g., Banks Pumping Plant) and South Bay Aqueduct (SBA) facilities
- Outages of treated water production facilities

2.0 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Beginning July 1, 2022, California Water Code (CWC) §10632.1 requires water suppliers to submit an Annual Water Supply and Demand Assessment (AWSDA). Water suppliers will also be required to submit an Annual Water Shortage Assessment Report beginning July 1, 2022. Zone 7 plans to satisfy both requirements via its "Annual Review of the Sustainable Water Supply" (Annual Sustainability Report), which Zone 7 has been producing since it adopted an updated Water Supply Reliability Policy on October 17, 2012. The Annual Sustainability Report is submitted to the Zone 7 Board of Directors (Zone 7 Board) annually in April; the 2020 report is included in this WSCP as Appendix B. In addition to the Annual Sustainability Report, Zone 7 also prepares and updates its Water Supply Operations Plan over the course of the year. The Water Supply Operations Plan is a more detailed plan focused on the current year, but it also informs the longer-term outlook of the Annual Sustainability Report.

Zone 7's Annual Sustainability Report covers near-term planning of water supplies over the upcoming five years and includes the following:

- An estimate of the current annual demand for treated and untreated water, as well as a five-year projection (including water losses and water conservation) based on projections from Zone 7's retailers, observed trends, and other updated information. The Annual Sustainability Report is more focused on "Delivery Requests" submitted by the retailers, while Zone 7's Water Supply Operations Plan is generally based on forecasted demands based on observed trends updated over the year.
- A description and quantification of available water supplies to Zone 7 at the beginning of the calendar year and projected water supplies over the next five years.
- A comparison of current and projected water demand with the available water supplies to determine if a water shortage condition is anticipated.
- A review of water supply programs (to maintain long-term service reliability) and existing infrastructure and capabilities.
- A discussion of water conservation requirements and other long-term supply programs needed to meet Zone 7 treated and untreated water demands for single-dry and multiple-dry year conditions, as specified in Zone 7's UWMP.

Zone 7 will modify the contents of its Annual Sustainability Report as needed to meet the requirements of the AWSDA and the Annual Water Shortage Assessment Report. For the purposes of this WSCP, the Annual Sustainability Report is assumed to meet these requirements for the AWSDA and the Annual Water Shortage Assessment Report.

This section provides the decision-making process, key data inputs, and methodology necessary for Zone 7 to produce its Annual Sustainability Report. This process includes steps Zone 7 may take to declare a water shortage emergency and associated water shortage stage (see Section 3.0) and implement water shortage response actions (see Section 4.0).

2.1 Decision-Making Process

Zone 7 will use the decision-making process described below to consistently produce its Annual Sustainability Report but may adjust and improve this process as needed.

Zone 7 staff will prepare the Annual Sustainability Report and submit it to the California Department of Water Resources (DWR) by July 1 of each year under the new requirement effective on July 1, 2022. Key data inputs described in Section 2.2 will be gathered and the assessment will be conducted in accordance with Section 2.3.

The findings from the Annual Sustainability Report are presented to the Zone 7 Board in April of each year. If available supply will not meet expected demands, recommendations on determining a water shortage condition and associated actions will be included for Board consideration. Based on the findings of the Annual Sustainability Report, the Zone 7 Board is responsible for determining if a water shortage condition exists and whether to adopt a resolution declaring a water shortage emergency and an associated water shortage stage and authorizing water shortage actions (a sample resolution is provided in this WSCP as Appendix C). Recommended actions may include declaration of a water shortage emergency, declaration of a water shortage stage, and implementation of shortage response actions. Such actions will be coordinated interdepartmentally, with the Tri-Valley's water service providers, and with Alameda and Contra Costa counties for the possible proclamation of a local emergency.

To produce the Annual Sustainability Report, Zone 7 will follow the approximate schedule of activities and decision-making shown on Table 1 and Table 2, respectively. Due to variations in climate and hydrologic conditions and other factors from year-to-year, the dates shown in the tables are approximate and may be adjusted as needed. The intent of the schedule is to allow Zone 7 to implement shortage response actions to effectively address anticipated water shortage conditions in a timely manner while complying with the State's reporting requirements. Preparation of the Water Supply Operations Plan and Annual Sustainability Report is currently assigned to the Integrated Planning Section as the lead, with close coordination with other Zone 7 sections (i.e., Operations, Engineering, Groundwater, Water Quality, Finance). Executive Management approves the Annual Sustainability Report and Water Supply Operations Plans before presentation to the Water Resources Committee and Zone 7 Board.

Table 1. Schedule of Annual Sustainability Report and Water Supply Operations Plan Activities	
Schedule	Activities
Mid-December (prior year) to mid-January	Prepare Preliminary Water Supply Operations Plan and present to the Water Resources Committee of the Zone 7 Board. This gives a preview of water supply conditions and initiates planning for any potential actions.
January to mid-March (may continue over the year)	Monitor water supply, demand, and hydrologic condition trends and coordinate with DWR. Coordinate with groundwater banks to plan for any banked water recovery, if needed. Arrange for water transfer, if needed.
Mid-March to mid-April	Using the most current information, prepare the summaries of water supply sources for current year, a following dry year, and subsequent average three years for a five-year outlook. Describe sources and quantities considering factors affecting supply as described in Section 2.2.
Mid-March to mid-April	Document water demands for the current year and subsequent four years assuming the hydrologic conditions described above. Demands will generally be based on retailers' delivery requests. Describe demand types and quantities considering factors affecting demand as described in Section 2.2.
Mid-March to mid-April	Using the methodology described in Section 2.3, calculate Zone 7's water supply reliability over the five-year period. Determine if a water shortage condition is expected and recommend associated actions. Prepare the Annual Sustainability Report.
April Zone 7 Board Meeting	Present the findings and recommendations from the Annual Sustainability Report for Zone 7 Board consideration.
Late April-May	Update the Water Supply Operations Plan based on the latest information.
June	Present the Water Supply Operations Plan to the Water Resources Committee.
Before July 1	Submit the Annual Sustainability Report to DWR.
July-December	Update the Water Supply Operations Plan, as needed.

Table 2. Schedule of Decision-Making Activities		
Start Date	Activities	Approval
January to mid-March	Initiate any requests for banked water recovery and arrange for water transfers, as needed.	Executive Management
Mid-March to mid-April	If a water shortage emergency condition exists, prepare recommendations on water shortage condition determination and actions based on Annual Sustainability Report findings. Determine financial consequences of a water shortage emergency. Prepare resolution/s[(a)] approving determinations and actions.	Executive Management
April Zone 7 Board Meeting (currently third Wednesday)	Receive presentation of Annual Sustainability Report, including determinations and recommendations. Adopt resolution/s approving determinations and actions, as appropriate.	Zone 7 Board
January-April	Finalize water transfer requests and any new agreements, if needed. New agreements will require Zone 7 Board approval.	Zone 7 Board
(a) Sample resolutions are provided in Appendix C.		

2.2 Key Data Inputs

The State requires that the Annual Sustainability Report evaluate supplies and demands for, at a minimum, the current year and one subsequent dry year. Zone 7 provides a five-year outlook, assuming the last three years are of average conditions. The following key data inputs will be used to evaluate Zone 7's water supply reliability.

In reviewing planned water supplies, the Annual Sustainability Report will consider, as appropriate and applicable:

1. Hydrologic conditions
2. SWP supply availability
3. Local water availability
4. Storage conditions
5. Regulatory conditions
6. Contractual constraints
7. Surface water and groundwater quality conditions
8. Groundwater well production limitations
9. Infrastructure capacity constraints or changes
10. Capital improvement project implementation

Planned water supply sources and quantities will be described and shall be reasonably consistent with the supply projections in Chapter 6 of Zone 7’s most recent UWMP. If supply sources and projections differ significantly between the Annual Sustainability Report and the UWMP, Zone 7 will explain the differences as needed.

In reviewing planned unconstrained water demands (i.e., without conservation) for the five-year outlook, the Annual Sustainability Report will consider, as appropriate and applicable:

1. Retailers’ Delivery Requests
2. Local weather conditions
3. Demand trends
4. Water year type
5. Population changes (e.g., due to development projects)
6. Anticipated new demands (e.g., changes to land use)
7. Pending policy changes that may impact demands
8. Infrastructure capacities and constraints (Zone 7 and retailers)
9. Retailer groundwater pumping

Planned water demand types and quantities will be described and shall be reasonably consistent with the demand projections in Chapter 4 of Zone 7's most recent UWMP. If demands differ significantly between the Annual Sustainability Report and the UWMP, Zone 7 will explain the differences as needed.

2.3 Assessment Methodology

In preparing the Annual Sustainability Report, Zone 7 will use the following assessment methodology and criteria to evaluate the agency's water supply reliability for the current year and following dry year (followed by three years of average conditions). Zone 7 assesses the data listed in Section 2.2 to develop its supply and demand forecasts, which are then compared to determine Zone 7's water supply reliability. Zone 7's water supply will be deemed reliable if it can meet planned water demands. If water supply cannot meet planned water demands in the current year or the following dry year, the extent of the water shortage condition will be determined, and Zone 7 will prepare recommended response actions in accordance with this WSCP. Findings from the Annual Sustainability Report will be presented to the Zone 7 Board, along with the recommendations for action.

3.0 SIX STANDARD WATER SHORTAGE STAGES

To provide a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions, the 2018 Water Conservation Legislation mandates that water suppliers plan for six standard water shortage levels that correspond to progressive reductions of up to 10, 20, 30, 40, 50 percent, and greater than 50 percent from normal conditions. Each shortage condition should correspond to additional actions water suppliers would implement to meet the severity of the impending shortages.

For each of the State's standard shortage levels (also called "stages"), Table 3 summarizes the water shortage range (i.e., percent shortage from normal supplies) and a brief narrative description of the corresponding water shortage condition. These water shortage stages apply to both foreseeable and unforeseeable water supply shortage conditions. Zone 7's 2015 UWMP included four stages that addressed up to 35 percent water demand reduction in the first three stages and more than 35 percent water demand reduction in Stage 4. Table 3 presents Zone 7's reorganized stages, which align with the State's standard stages.

As described in Section 2.0, Zone 7 will prepare the Annual Sustainability Report to determine its water supply condition for at least the current year and the following one dry year. Preparing the Annual Sustainability Report helps Zone 7 ascertain and communicate the need to declare a water shortage emergency and water shortage stage due to anticipated conditions. In other cases, Zone 7 may need to declare a water shortage emergency due to unforeseen water supply interruptions. When Zone 7 anticipates or identifies that water supplies may not be adequate to meet the normal water supply needs of its customers, the Zone 7 Board may determine that a water shortage exists and consider a resolution (sample in Appendix C) to declare a water shortage emergency and associated stage. The shortage stage provides direction on shortage response actions. Note that Zone 7 will also consider any statewide actions or declarations in any local declarations of a shortage stage.

Table 3. Water Shortage Contingency Plan Levels (DWR Table 8-1)			
Shortage Level	Percent Shortage Range	Water Shortage Condition	Shortage Response Actions
1	Up to 10%	• Agency has adequate supply and seeks to preserve water resources for the future; or • Assessment shows that water supply is not able to meet normal demands by up to 10%; or • Definable event has reduced water supply by up to 10%.	Implement actions per Table 4 and Table 5
2	Up to 20%	• Assessment leads to a reasonable conclusion that water supplies may not adequately meet normal demands in the current or upcoming years; or • Assessment shows that water supply is not able to meet normal demands by up to 20%; or • Definable event has reduced water supply by up to 20%.	Implement actions per Table 4 and Table 5
3	Up to 30%	• Previous water conservation target has not been met; or • Assessment shows that water supply is not able to meet normal demands by up to 30%; or • Definable event has reduced water supply by up to 30%.	Implement actions per Table 4 and Table 5
4	Up to 40%	• Previous water conservation target has not been met; or • Assessment shows that water supply is not able to meet normal demands by up to 40%; or • Definable event has reduced water supply by up to 40%.	Implement actions per Table 4 and Table 5
5	Up to 50%	• Previous water conservation target has not been met; or • Assessment shows that water supply is not able to meet normal demands by up to 50%; or • Definable event has reduced water supply by up to 50%.	Implement actions per Table 4 and Table 5
6	>50%	• Previous water conservation target has not been met; or • Assessment shows that water supply is not able to meet normal demands by more than 50%; or • Definable event has reduced water supply by more than 50%.	Implement actions per Table 4 and Table 5
Notes: Assessment is based on findings from the Annual Sustainability Report. Zone 7 will also consider any statewide actions or declarations in any local declarations of a shortage stage.			

4.0 SHORTAGE RESPONSE ACTIONS AND EFFECTIVENESS

CWC §10632 (a)(4) requires shortage response actions that align with the defined shortage levels. Zone 7's shortage response actions consist of a combination of demand reduction (in coordination with its retailers), supply augmentation, and operational changes. Zone 7's suite of response actions depends on the event that precipitates a water shortage stage, the time of the year the event occurs, the water supply sources available, and the condition of its water system infrastructure. In general, Zone 7 plans to use a balanced and dynamic approach, adapting its response actions to close the gap between water supplies and water demand and meet the water use goals associated with the declared water shortage stage.

Zone 7's water system is fully metered, from production to retailer turnouts. Records of water deliveries to each retailer are prepared daily and can be used to track the effectiveness of Zone 7's response actions. Water production and water use can be compared to the previous year, previous month, or previous week. Water use can also be compared by retailer. This continuous monitoring allows Zone 7 to evaluate its demand reduction efforts in real-time and adjust its shortage response actions accordingly.

As noted above, Zone 7's overall shortage response will be dynamic to close the gap between water supply and demands to meet the goal of the declared stage. For example, Zone 7 may intensify its public outreach or work with its retailers to enforce water use prohibitions more vigorously if water demand reduction goals are not met.

The shortage response actions discussed below may be considered as tools that allow Zone 7 to respond to water shortage conditions. Because Zone 7 may continuously monitor and adjust its response actions to reasonably equate demands with available supply, the extent to which implementation of each action reduces the gap between water supplies and water demand is difficult to quantify and thus only estimated. Certain response actions, such as public outreach and enforcement, support the effectiveness of other response actions and do not have a quantifiable effect on their own.

4.1 Demand Reduction

Since Zone 7 operates as a wholesale water agency, it cannot set or enforce consumption limits at the customer (e.g., household) level. As a result, this WSCP does not include per capita allotment, penalties, or customer incentives for conservation for any customer sector. Zone 7's retailers will provide their demand reduction response actions in their respective UWMPs. However, Zone 7 may request that retailers reduce demands when supplies are insufficient. Up to Stage 2, Zone 7's demand reduction requests to its retailers may be voluntary or mandatory, depending on conditions. At Stage 3 and higher, Zone 7 will likely require its retailers to reduce demands up to the applicable shortage percentage.

Zone 7's other demand reduction actions include public outreach and financial actions through Zone 7 Board resolutions. Public outreach to support voluntary conservation begins with Stage 1 and expands and intensifies with increasing shortage stages. At any shortage stage, the Zone 7 Board will pass a resolution to officially declare a water shortage emergency and stage, and potentially a separate resolution for implementation of a water shortage surcharge (see sample resolutions in Appendix C).

Table 4 summarizes Zone 7's demand reduction actions, which are organized by the triggering water shortage level (i.e., stage), and each action includes an estimate of how much its implementation will reduce the shortage gap. For each demand reduction action, Table 4 also indicates if Zone 7 uses compliance actions such as penalties, charges, or other enforcement. Demand reduction actions are only listed in Table 4 in the stage when they are first implemented. Zone 7 will continue to use these actions in higher stages unless otherwise noted.

Table 4. Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions **_Drop down list_** _These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply._	How much is this going to reduce the shortage gap? _Include units used (volume type or percentage)_	Additional Explanation or Reference _(optional)_	Penalty, Charge, or Other Enforcement? **_For Retail Suppliers Only_** _Drop Down List_
1	Expand Public Information Campaign	(see Note)	Public outreach to support voluntary conservation.	No
	Other	Up to the full shortage gap	Ask retailers for voluntary demand reduction, as needed.	No
2	Expand Public Information Campaign	(see Note)	Expand public outreach to support conservation.	No
	Other	Up to the full shortage gap	Ask retailers for voluntary or mandatory demand reduction, as needed. Only the latter will be enforced.	Yes
3*	Expand Public Information Campaign	(see Note)	Intensify public outreach to support conservation.	No
	Other	Up to the full shortage gap	Ask retailers for mandatory demand reduction.	Yes
NOTES: Expanding public information campaign boosts water conservation overall, so no shortage gap reduction estimate provided. Actions introduced in a lower stage will also be used in higher stages, unless otherwise noted. *At Stage 3 and higher, Zone 7 will likely require its retailers to reduce demands up to the applicable shortage percentage.				

Zone 7 will monitor water production, demands, and changing conditions to determine the intensity of its public outreach, the extent of its enforcement actions, and the need to adjust its water shortage stage declaration as discussed in Section 9.0.

4.2 Additional Mandatory Restrictions

As a wholesaler, Zone 7 does not have direct authority to institute water use prohibitions. Zone 7 will support mandatory restrictions imposed by its retailers on their customers and coordinate with its retailers to provide consistent public outreach messaging.

4.3 Supply Augmentation and Other Actions

Chapter 6 of Zone 7's 2020 UWMP describes Zone 7's normal water supply portfolio, as well as dry-year and emergency supplies. Zone 7's non-local groundwater storage in the Kern County groundwater banks is largely intended to provide water supply during drought years or during definable water shortage events. Water transfer amounts would also be adjusted to meet supply deficits. These supply augmentation options are already included in the Annual Sustainability Report as needed to close the gap between supplies and demands, so they are not counted again as a potential shortage response.

Table 5 lists the supply augmentation methods and other actions (including operational changes described in Section 4.4) Zone 7 can utilize during each shortage level. These actions are only listed in Table 5 in the stage when they are first implemented. Zone 7 will continue to use these actions in higher stages unless otherwise noted.

Table 5. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Other actions (describe)	Up to the full shortage gap.	Optimize use of groundwater and surface water supplies and adjust use of locally vs. remotely stored water.
	Other actions (describe)	N/A	Improve monitoring, analysis, and tracking of customer water usage rates.
	Other actions (describe)	N/A	In anticipation of decreased revenue, reduce discretionary spending
2	Transfers	Up to the full shortage gap.	Pursue opportunities for additional water transfers to lower the shortage gap, beyond what is already in the Annual Sustainability Report.
	Exchanges	Up to the full shortage gap.	Pursue opportunities for (additional) water exchanges to lower the shortage gap.
	Implement or Modify Drought Rate Structure or Surcharge	N/A	Consider implementation of water shortage surcharge correlated with stage (requires Board approval).
	Other actions (describe)	N/A	Evaluate timing of maintenance activities that could negatively impact ability to manage water supplies/shortages, or could result in loss of water supply.
	Other actions (describe)	up to 100 AF	Consider greater incentives under rebate program and focus on high-consumption customers.
3	Other actions (describe)	unknown - depends on project/s identified	Review CIP program and accelerate projects facilitating immediate improvement in water supply management if feasible/necessary.
	Stored emergency supply	To be determined based on operational	Consider/plan for/implement pumpback into South Bay Aqueduct if no supplies are available from Delta pumping.
NOTES: Actions introduced in a lower stage will also be used in higher stages, unless otherwise noted.			

4.4 Operational Changes

Beginning with Stage 2, Zone 7 will adjust operations to minimize supply losses. This includes improved monitoring, analysis, and tracking of customer water usage and optimizing use of Zone 7's water supplies to emphasize shortage management. In addition, Zone 7 will evaluate the timing of maintenance activities that could negatively impact the ability to manage water supplies or shortages or could result in a loss of water supply.

At Stage 3 and beyond, Zone 7 will implement more significant operational changes, including reviewing its Capital Improvement Program (CIP) to accelerate projects that would immediately improve water supply management.

4.5 Emergency Response Plan

As stated in Section 3.0, Zone 7's water shortage stages outlined in Table 3 apply to both foreseeable and unforeseeable water supply shortage conditions. The latter includes catastrophic water shortage conditions, which are addressed in Zone 7's Emergency Response Plan (ERP). The ERP outlines preparation, response, and recovery procedures associated with unforeseeable incidents such as water supply contamination, earthquake, infrastructure failure, and other events.

Zone 7 has an Emergency Operations Center (EOC) and EOC Staff made up of personnel representing different skills and disciplines within Zone 7. The EOC Staff would respond in the event of a natural or man-made emergency.

If imported water deliveries from the Delta are interrupted, Zone 7 plans to meet its water demands with existing facilities using groundwater and Zone 7's share of water stored in Lake Del Valle. Retailers with groundwater pumping capacity—Pleasanton and Cal Water—may be asked to increase their groundwater pumping, if possible. Deliveries to Zone 7's retailers would be reduced as necessary if supplies are insufficient. In coordination with the retailers, Zone 7 would declare a water shortage emergency. The retailers' WSCPs and the associated voluntary and mandatory water consumption reductions would go into effect. Under this scenario, most of the Zone 7's untreated water customers reliant on the imported water from the Delta would receive no water.

Zone 7 has emergency generators (both portable and dedicated) at strategic locations in preparation for any regional power outage. These generators would allow both the Del Valle Water Treatment Plant and the Patterson Pass Water Treatment Plant to continue operating even under a power outage. Assuming no interruptions in surface water supply, Zone 7 would be able to provide service to all treated water contractors. If warranted by demand, Zone 7 would also operate groundwater wells, which have either a dedicated generator in place (Mocho 1) or have the necessary hook-ups to receive power from a portable generator. If the power failure were to occur during high demand season (i.e., summer months), Zone 7 may be unable to meet hourly peak demands throughout the transmission system. Zone 7 would work closely with the retailers to manage demands to minimize impacts.

Water storage, treatment, and pumping facilities have been constructed to meet earthquake safety standards and are inspected regularly. Zone 7 also participates in the Water/Wastewater Agency Response Network (WARN), a statewide public utility mutual assistance organization.

5.0 COMMUNICATION PROTOCOLS

In the event of a water shortage, Zone 7 must inform its customers, the general public and interested parties, and local, regional, and state entities. Communication protocols for foreseeable and unforeseeable events are provided in this section. In any event, timely and effective communication must occur for appropriate response to the event. Key Zone 7 staff are provided cell phones, emergency radios, and agency email accounts to communicate internally and externally.

5.1 Communication for Foreseeable Events

A water shortage may be foreseeable when Zone 7 conducts its Annual Sustainability Report as described in Section 2.0. For foreseeable water shortages, Zone 7 will follow the communication protocols and procedures detailed below. Zone 7 may trigger any of these protocols at any water shortage stage.

1. As Zone 7 prepares its Preliminary Water Supply Operations Plan, starting in mid-December, Zone 7 will communicate with DWR, the Kern County groundwater banks, and potential or existing water transfer partners to discuss Zone 7's water supply conditions, as needed.
2. Public outreach on conservation will begin as soon as late winter/early spring if hydrologic conditions are below normal. Messaging will be developed based on specific conditions and will be coordinated with the retailers.
3. Zone 7 will present the findings from the Annual Sustainability Report at the April Zone 7 Board meeting, including recommendations for a water shortage emergency and shortage response actions, as applicable.
4. If a water shortage emergency is anticipated, Zone 7 will coordinate interdepartmentally, with the region's water service providers and the cities they serve, and with Alameda and Contra Costa counties for the possible proclamation of a local emergency.
5. Zone 7 will communicate conditions to the general public using some or all of the following options, as needed at the various shortage levels: public meetings, press releases, digital newsletters, postings on Zone 7's website, social media posts and digital advertising (e.g., Google, newspaper ads, boosted Facebook posts), YouTube, NextDoor, newspaper ads, and public service radio announcements. Staff also keeps interest lists for specific interest groups and community members for targeted messaging.

5.2 Communication for Unforeseeable Events

A water shortage may occur during unforeseeable events such as earthquakes, fires, infrastructure failures, civil unrest, and other catastrophic events. Zone 7's ERP provides specific communication protocols and procedures to convey water shortage contingency planning actions during these events. Zone 7 may trigger any of these communication protocols at any water shortage stage, depending on the event.

In general, communications and notifications should proceed along the chain of command. Notification decisions will be made under the direction of the Incident Commander, while internal and external communications will be managed by the Public Information Officer (PIO). All Zone 7 staff are provided their communication responsibilities. The ERP provides a list of relevant contacts to notify at the local, regional, and state level.

The PIO is the official spokesperson for Zone 7 and is responsible for interfacing with the public, media, other agencies, and stakeholders. The PIO maintains a list of contacts to disseminate information to the public, typically via radio, television, newspapers, or social media. Zone 7 may also elect to make telephone calls to certain types of facilities (e.g., day care centers, homeless centers, hospitals) as appropriate.

To maintain the security of Zone 7's water system, the ERP is maintained as a confidential document and may not be incorporated in this UWMP.

6.0 COMPLIANCE AND ENFORCEMENT

When supplies are insufficient, Zone 7 can ask its retailers to reduce demands, but the specific compliance and enforcement mechanisms are at the discretion of the retailers. Zone 7 is committed to working with and supporting its retailers in implementing water shortage response actions.

7.0 LEGAL AUTHORITIES

Zone 7 has the legal authority to create, manage, and activate emergency plans and carry out the responsibilities of those plans under the California Emergency Services Act, which authorizes all political subdivisions of the state (i.e., special districts, cities, and counties) to conduct emergency operations. Zone 7 Board Resolution 95-1777 describes the process for declaration of an agency emergency by the General Manager, with subsequent ratification by the Zone 7 Board no later than ten days after such declaration.

When a water shortage is determined, Zone 7 will coordinate interdepartmentally, with the region's water service providers, and with Alameda and Contra Costa counties for the possible proclamation of a local emergency in accordance with California Government Code, California Emergency Services Act (Article 2, Section 8558).

In a duly noticed meeting, the Zone 7 Board will determine whether a water shortage emergency condition exists and, if so, the degree of the emergency and what regulations and restrictions should be enforced in response to the shortage. Zone 7 shall declare a water shortage emergency in accordance with CWC Chapter 3 Division 1.

> *Water Code Section Division 1, Section 350*
> *…The governing body of a distributor of a public water supply…shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.*

The water shortage emergency declaration triggers communication protocols described in Section 5.0 and compliance and enforcement actions described in Section 6.0.

8.0 FINANCIAL CONSEQUENCES OF WSCP

Zone 7 anticipates revenue losses and increased expenses during the potential water shortages described in this WSCP. Revenue losses result from decreased water sales due to conservation and/or lower amounts of water supply available to sell. Increased expenses can include supplemental water supply purchases, infrastructure improvements to increase treated water production or bolster system reliability, and higher water transfer costs.

Water conservation directly affects Zone 7's revenue stability, as Zone 7 currently recovers 60 percent of its revenue through volumetric or consumption-based rates, even though the majority of Zone 7's costs are fixed. Zone 7 prepares for these events through prudent financial planning, including water rate studies, and the establishment of reserves to offset revenue losses, smooth rates, and fund capital improvement projects. A water shortage surcharge may also be enacted by the Zone 7 Board to address revenue impacts from conservation.

8.1 Use of Financial Reserves

On May 15, 2019, the Zone 7 Board adopted the revised Reserve Policy per Resolution No. 19-37. The revised Reserve Policy condensed four reserves within the Water Enterprise Fund to three. This revision eliminated the Drought Contingency and Rate Stabilization Reserves and established the Reserve for Economic Uncertainties. The Reserve for Economic Uncertainties is designed to protect Zone 7 from the effects of fluctuations in water usage and the cost of imported water (to which Zone 7 is vulnerable) and other unforeseen events, such as a natural disaster, water shortage emergency, or other unanticipated adverse situations.

The Reserve for Economic Uncertainties is currently funded at the target level with a balance of $4.9 million. To mitigate potential revenue loss from demand reduction, Zone 7 may utilize funds in the Reserve for Economic Uncertainties in an amount up to the minimum reserve requirement to offset revenue loss. This reserve will be replenished over time with direction from the Zone 7 Board.

The 2012 to 2016 statewide drought provides an example of the financial impacts of water shortages on Zone 7 and the associated use of financial reserves. During the drought, Zone 7's retailers were required to meet mandatory conservation as stated in the Governor's Executive Order B-29-15 issued on April 1, 2015. Zone 7's retailers were very successful in implementing conservation and achieved approximately 40 percent conservation in 2015. As a result of voluntary and mandatory conservation efforts, Zone 7 reduced reserves by a total $25M within the Water Enterprise Fund over a three-year period starting in Fiscal Year 2013-2014 and ending in Fiscal Year 2015-2016.

8.2 Drought Rate Structures and Surcharges

If a declared water shortage emergency and associated stage generates a reduction in water usage and corresponding sales, use of reserves alone may not be sufficient for Zone 7 to maintain its fiscal health. Therefore, upon approval by the Zone 7 Board, Zone 7 may also implement a water shortage surcharge. The Zone 7 Board will determine when such a surcharge is necessary. To align with the State's standard water shortage level, Zone 7 plans to revise its water shortage surcharge as presented in Table 6.

Table 6. Water Shortage Surcharges

Water Shortage Stage	Demand Reduction Target	Water Shortage Surcharge per Hundred Cubic Feet (ccf)
1	≤ 10%	Not Applicable
2	11-20%	$0.26
3	21-30%	$0.59
4	31-40%	$1.04
5	41-50%	$1.67
6	> 50%	$2.60

A water shortage surcharge adopted by the Zone 7 Board becomes effective on the first day of the month following thirty days after adoption. The adopted water shortage surcharge will sunset after six months, unless extended or modified by action of the Zone 7 Board.

8.3 Other Measures

Zone 7 reviews its capital budget annually and re-prioritizes projects as needed given current and forecasted resources, needs, and funding availability. In some cases, projects may be accelerated or deferred. For example, in 2014, Zone 7 accelerated the construction of a new well and a pipeline to better meet water demands during the drought, and potential following dry years. Currently, Zone 7 is planning for a new booster pump station to increase Zone 7's water system reliability during times of drought and emergencies, increasing groundwater production and providing more flexibility to move available water in the system to where it is needed. The estimated project cost is $5.9M, paid by water rates; it will be completed in July 2023.

Zone 7 will continue to evaluate its capital budget and pursue grant opportunities where possible to meet demands and overcome future impacts to revenue and expenditures.

9.0 MONITORING AND REPORTING

In their UWMPs, Zone 7's retailers will detail their monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed to evaluate customer compliance with conservation goals. As mentioned above, Zone 7's water system is fully metered, including production at its water treatment facilities and groundwater wells. Zone 7 can also track deliveries to its retailers through their respective turnouts.

Zone 7 will work collaboratively with its retailers to monitor water use and support their reporting.

10.0 WSCP REFINEMENT PROCEDURES

This WSCP is an adaptive management plan. It is subject to refinements as needed to ensure that Zone 7's shortage response actions and mitigation strategies are effective and produce the desired results. Based on monitoring described in Section 6.0 and the need for compliance and enforcement actions described in Section 6.0, Zone 7 may adjust its response actions and modify its WSCP. Zone 7 will also seek input from staff, its retailers, and the public regarding the effectiveness of its WSCP and ideas for improvements.

When a revised WSCP is proposed, the revised WSCP will undergo the process described in Section 12.0 for adoption by the Zone 7 Board and distribution to Alameda County, Contra Costa County, Zone 7's retailers, and the general public.

11.0 SPECIAL WATER FEATURE DISTINCTION

Zone 7 is a water wholesaler and does not directly supply treated water to customers with water features; that is done by Zone 7's retailers. As described in their respective UWMPs, each retailer distinguishes water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.

12.0 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

This WSCP is adopted concurrently with Zone 7's 2020 UWMP, by separate resolution. Prior to adoption, a duly noticed public hearing was conducted. A copy of this WSCP will be submitted to DWR within 30 days of adoption.

No later than 30 days after adoption, copies of this WSCP will be available at Zone 7's offices. A copy will also be provided to Alameda County, Contra Costa County, and Zone 7's retailers. An electronic copy of this WSCP will also be available for public review and download on Zone 7's website.

Appendix A

Zone 7 Board Resolution No. 13-4230

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 13-4230

INTRODUCED BY DIRECTOR QUIGLEY
SECONDED BY DIRECTOR STEVENS

Water Supply Reliability Policy

WHEREAS, the Zone 7 Board of Directors desires to maintain a highly reliable Municipal and Industrial (M&I) water supply system so that existing and future M&I water demands can be met during varying hydrologic conditions; and

WHEREAS, the Board has an obligation to communicate to its M&I customers and municipalities within its service area the ability of Zone 7's water supply system to meet projected water demands; and

WHEREAS, the Board on August 18, 2004 adopted Resolution No. 04-2662 setting forth its Reliability Policy for Municipal & Industrial Water Supplies; and

WHEREAS, the Board desires to revise the Reliability Policy to reflect recent data, analysis, and studies.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby rescinds Resolution No. 04-2662 adopting the August 18, 2004 Reliability Policy for Municipal & Industrial Water Supplies; and

BE IT FURTHER RESOLVED that the Board hereby adopts the following level of service goals to guide the management of Zone 7's M&I water supplies as well as its Capital Improvement Program (CIP):

Goal 1.Zone 7 will meet its treated water customers' water supply needs, in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands as specified in Zone 7's most recent Urban Water Management Plan (UWMP), during normal, average, and drought conditions, as follows:

- At least 85% of M&I water demands 99% of the time
- 100% of M&I water demands 90% of the time

Goal 2:Provide sufficient treated water production capacity and infrastructure to meet at least 80% of the maximum month M&I contractual demands should any one of Zone 7's major supply, production, or transmission facilities experience an extended unplanned outage of at least one week.

BE IT FURTHER RESOLVED that to ensure that this Board policy is carried out effectively, the Zone 7 General Manager will provide a water supply status report to the Board every five years with the Zone 7 Urban Water Management Plan that specifies how these goals will be, or are being, achieved.

If the General Manager finds that the goals cannot be met during the first five years of the Urban Water Management Plan, then the Board will hold a public hearing within two months of the General Manager's finding to consider remedial actions that will bring Zone 7 into substantial compliance with the stated level of service goals. Remedial actions may include, but are not limited to, voluntary conservation or mandatory rationing to reduce water demands, acquisition of additional water supplies, and/or a moratorium on new water connections. After reviewing staff analyses and information gathered at the public hearing, the Board shall, as expeditiously as is feasible, take any additional actions that are necessary to meet the level of service goals during the following five-year period; and

BE IT FURTHER RESOLVED that the Zone 7 General Manager shall prepare an Annual Review of the Sustainable Water Supply Report which includes the following information:

(1) An estimate of the current annual average water demand for M&I water as well as a five-year projection based on the same information used to prepare the UWMP and CIP;
(2) A Summary of available water supplies to Zone 7 at the beginning of the calendar year;
(3) A comparison of current water demand with the available water supplies; and
(4) A discussion of water conservation requirements and other long-term supply programs needed to meet Zone 7 M&I water demands for single-dry and multiple-dry year conditions, as specified in the Zone 7's UWMP.

A summary of this review will be provided to M&I customers.

Definitions

Level of Service for Annual Water Supply Needs—the level of service is the percent of existing or projected water demand that Zone 7's water supply system can meet during two key conditions: (1) during various hydrologic conditions and (2) during unplanned outages of major facilities.
Capital Improvement Program (CIP)—the CIP is Zone7's formal program for developing surface and ground water supplies, along with associated infrastructure, including import water conveyance facilities, surface water treatment plants, groundwater wells, and M&I water transmission system to meet projected water demands.

Normal conditions—conditions that most closely represent median runoff or allocation from all normally contracted or available water supplies from the historic record.

Average conditions—conditions that most closely represent the average runoff or allocation from all normally contracted or legally available water supplies from the historic record.

Drought conditions—conditions that most closely represent reduced runoff or allocation level from the historic record from all normally contracted or legally available water supplies, including both single-dry and multiple-dry year conditions.

Single-dry year condition—a condition that most closely represents the lowest yield over a one-year period from the historic record from all normally contracted or legally available supplies.

Multiple-dry year condition—a condition that most closely represents three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

Available water supplies—consist solely of (1) water supplies that Zone 7 has contracted for (e.g., listed under Schedule A of the State Water Contract, dry-year water options, special contracts with other water districts, etc.) and (2) water actually stored in surface and subsurface reservoirs.

Maximum Month—the largest monthly average water use.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GRECI, MACHAEVICH, PALMER, QUIGLEY, RAMIREZ HOLMES STEVENS

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on October 17, 2012.

By____________________________

President, Board of Directors

Appendix B

2020 Annual Sustainability Report

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7
100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551 • PHONE (925) 454-5000 • FAX (925) 454-5727

ORIGINATING SECTION: Integrated Planning
CONTACT: Sal Segura/Amparo Flores

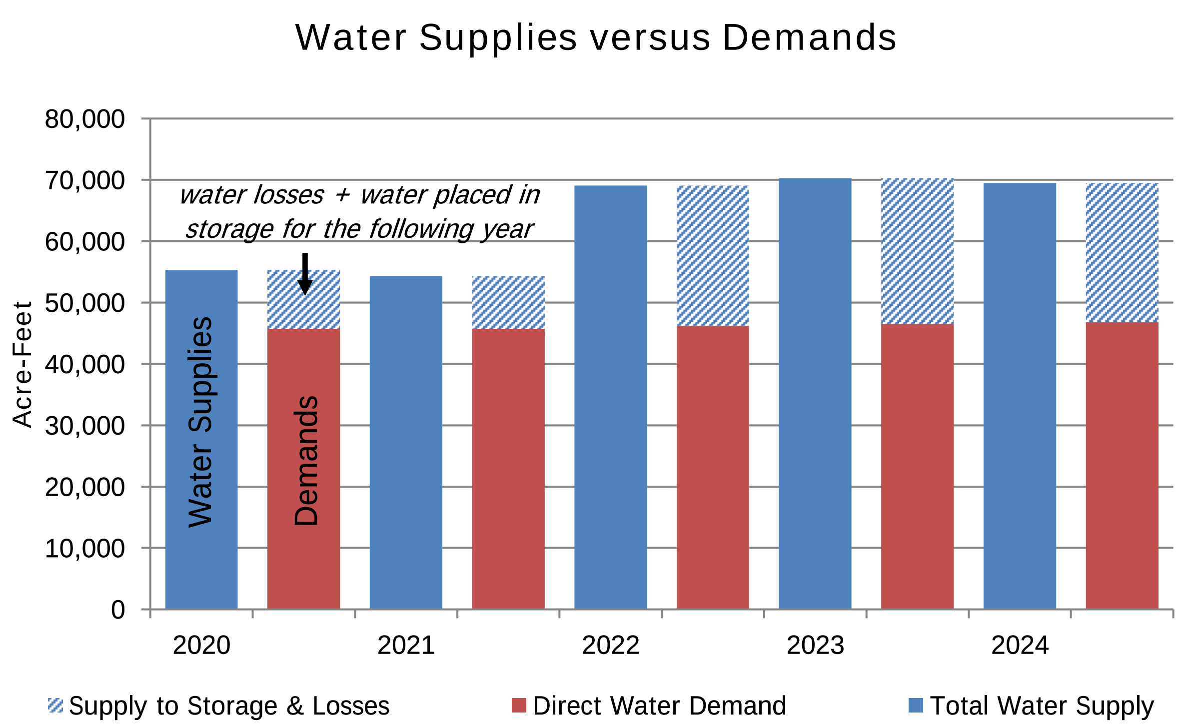
AGENDA DATE: April 15, 2020

SUBJECT: 2020 Annual Sustainability Report

SUMMARY:

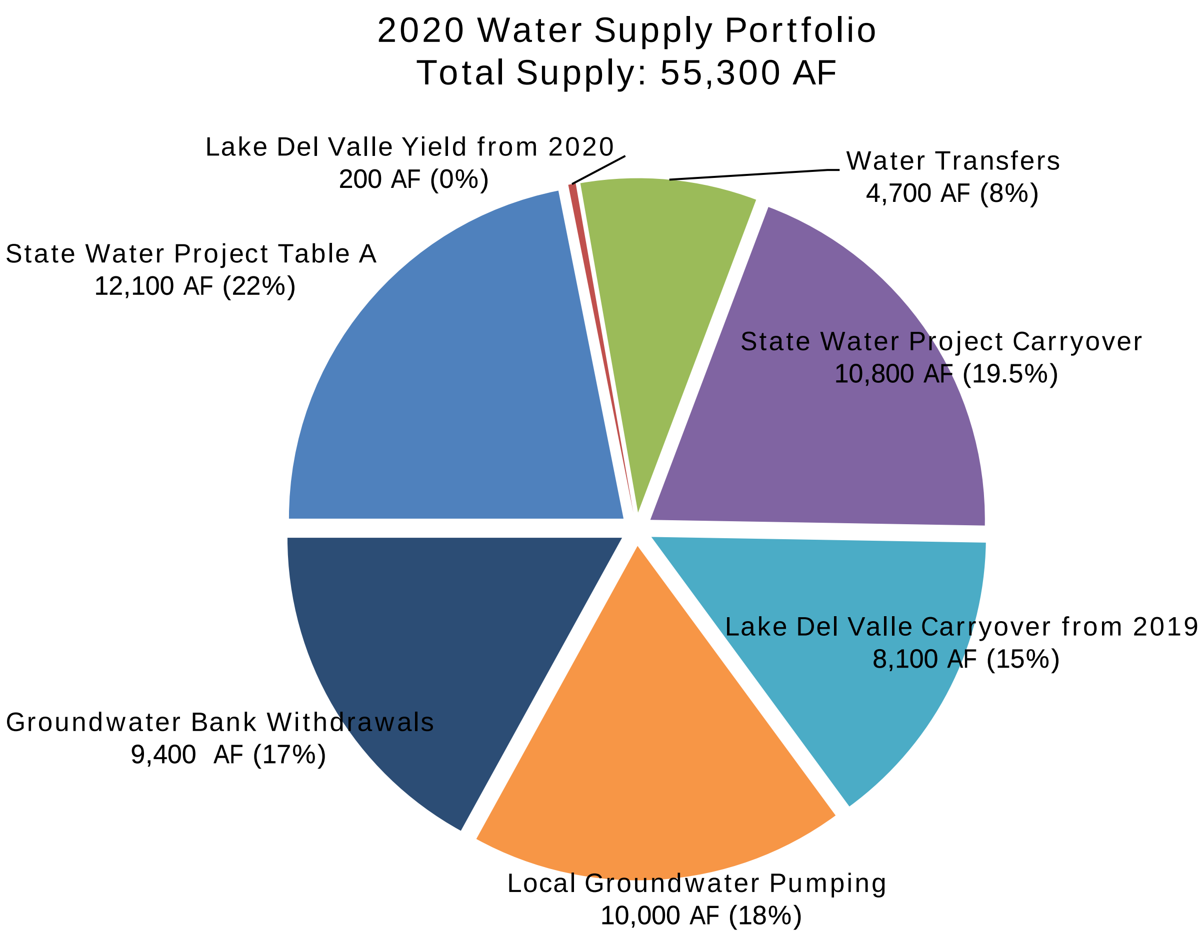
- Central to Zone 7 Water Agency's mission is the commitment to provide a reliable supply of high-quality water to the Tri-Valley.
- Zone 7's Water Supply Reliability Policy requires an annual review of sustainable water supplies. A key purpose of this report is to demonstrate Zone 7's ability to meet delivery requests over the next five years.
- As shown in Figure 1 below, a comparison of projected water supply and demand indicates that, based on supply availability, Zone 7 can deliver 100% of requested water deliveries in 2020 and 2021, even given low incoming supplies from the State Water Project (SWP) and Lake Del Valle (LDV), and even if conditions turn critically dry in 2021. Zone 7 also expects to meet demands over 2022-2024, assuming average conditions return over that time period.

Figure 1: Water Supplies versus Demands



- The SWP and LDV will provide a portion of 2020's water supply, but local and Northern Sierra dry conditions, and resulting low water allocation from the SWP, will require more use of groundwater and surface water already in storage. Stored water is also used in normal water operations to meet peak demands, accommodate the surface water treatment plant shutdowns, and to shift supply locations for improved system reliability. Zone 7 also expects to supplement water supplies with withdrawals from non-local groundwater banks, and water transfers (e.g., Yuba Accord and other transfers). Figure 2 shows the expected relative contributions of different water supplies in 2020.

Figure 2: Expected 2020 Water Supply Portfolio



- In June 2020, staff plan to provide an updated Operations Plan to the Water Resources Committee; this plan will reflect the latest actual supply and demand conditions and Zone 7's most feasible operational scenario for 2020.
- Zone 7 staff will continue to monitor both state and local conditions and will adjust operations and projections accordingly.
- Staff recommends that the Board maintain the ten percent voluntary conservation target for the Tri-Valley, consistent with the 2016 Board Resolution 16-142, considering the current dry conditions and the State's long-term conservation goals.

FUNDING:

Funding for water supply expenditures in 2020 are included in the approved budget. Future expenditures will be included in future budgets for Board approval.

RECOMMENDED ACTION:

Information only.

ATTACHMENT:

Annual Sustainability Report 2020

ANNUAL SUSTAINABILITY REPORT 2020

BACKGROUND

On October 17, 2012, Zone 7 Water Agency (Zone 7) adopted the Water Supply Reliability Policy (Resolution 13-4230, see Attachment A), which requires an annual review of sustainable water supplies (Annual Review). This memorandum presents the Annual Review and covers the following topics:

- Key hydrologic and water supply conditions
- Projected water demands for the next five years
- Projected water supplies for the next five years
- Comparison of supplies and demands for the next five years
- Programs necessary to continue meeting water demands going forward

SUMMARY OF FINDINGS

For calendar year 2020, Zone 7's planned incoming supplies consist of the following:

- 12,100 acre-feet (AF) based on a 15% State Water Project (SWP) allocation,
- 200 AF captured in Lake Del Valle (LDV) in 2020, and
- approximately 4,700 AF of water transfers through Yuba Accord and other water transfer options.

Given the dry conditions and low incoming supplies, Zone 7 is also planning to draw from storage as follows:

- 10,800 AF of SWP carryover from 2019 at the beginning of January 2020,
- 8,100 AF of net local runoff captured in LDV in 2019,
- 9,400 AF from Semitropic Water Storage District in Kern County, and
- 10,000 AF from the local groundwater basin.

Planned incoming water supplies, combined with withdrawal from various stored supplies, result in a total of 55,300 AF that will be used to meet customer demands of 45,700 AF. A portion of the remaining water will be unavailable as operational losses (evaporation and brine loss). As part of the water management strategy, the rest of the supplies will be redeposited into various storage locations for use in 2021. A comparison of projected water supply and demand indicates that Zone 7 can deliver 100% of requested water deliveries in 2020 and 2021, even if conditions turn critically dry in 2021. Zone 7 also expects to meet demands over 2022-2024, assuming average hydrologic conditions over that time period.

As described in the 2019 Water Supply Evaluation Update, Zone 7 has been participating in several potential future water supply and storage options to bolster long-term water supply reliability. A number of planned capital projects (new wells, the Chain of Lakes Pipeline, Chain of Lakes diversion structures, and reliability intertie) and the completed Chain of Lakes will bolster the reliability of Zone 7's water supply system over the coming years. These projects will also optimize the long-term yield from the Arroyo Valle, a key source of incoming supplies, and the use of the groundwater basin for storage.

Zone 7 will continue to monitor local and statewide hydrologic conditions, adjust operations as necessary to optimize use of available resources, remain prepared for another single or multi-year drought, and continue to coordinate regularly with the local water supply retailers, untreated water customers, and the Department of Water Resources (DWR) – the agency responsible for operating the SWP.

To guide Zone 7's efforts in pursuing short- and long-term water transfers, a 'Water Transfers 101 Workshop' is planned be conducted with the Water Resources Committee on April 20, 2020; transfer options and opportunities will be presented for consideration.

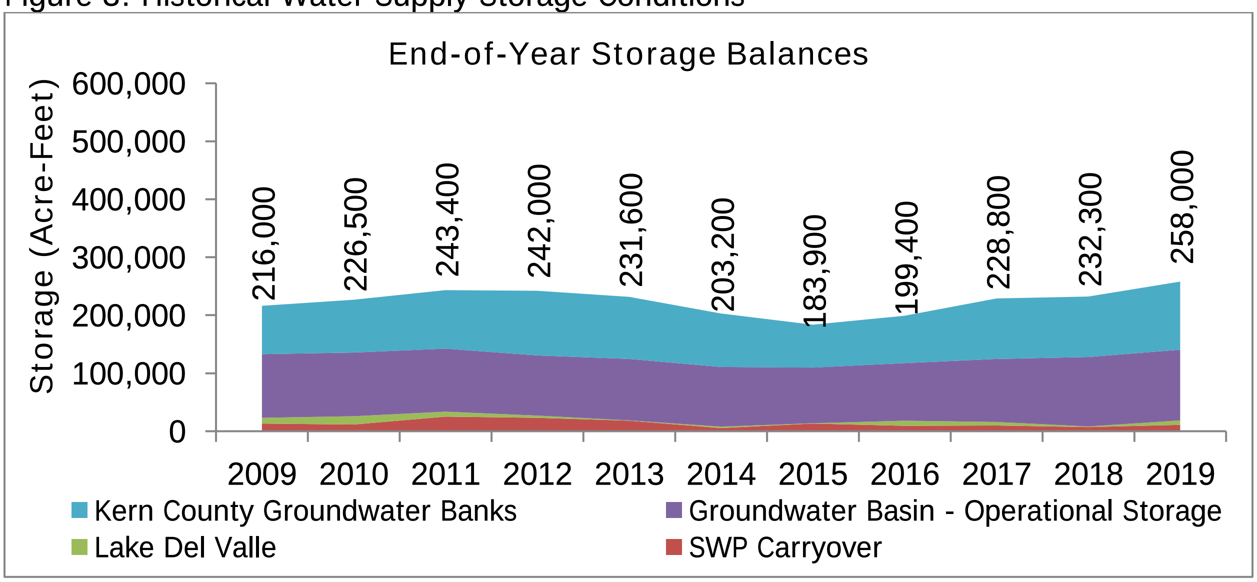
In light of the current dry conditions and the State's long-term conservation goals, Staff recommends that the Board maintain a ten percent (10%) voluntary conservation target for the Tri-Valley, consistent with the 2016 Board Resolution 16-142.

KEY HYDROLOGIC AND WATER SUPPLY CONDITIONS

Initial Storage Conditions (January 1, 2020)

Zone 7 started 2020 with a SWP carryover of 10,800 AF, LDV carryover of 8,100 AF, local groundwater operational storage of 122,000 AF (98% of capacity), and 117,100 AF of water stored in the Kern County groundwater banks (Semitropic Water Storage District [Semitropic] and Cawelo Water District [Cawelo]). At the beginning of 2020, Zone 7's storage portfolio had about 258,000 AF, as shown on Figure 3 below, showing continuing recovery from the recent drought. This does not include 128,000 AF of emergency storage in the local groundwater basin.

Figure 3: Historical Water Supply Storage Conditions



Reservoir Conditions

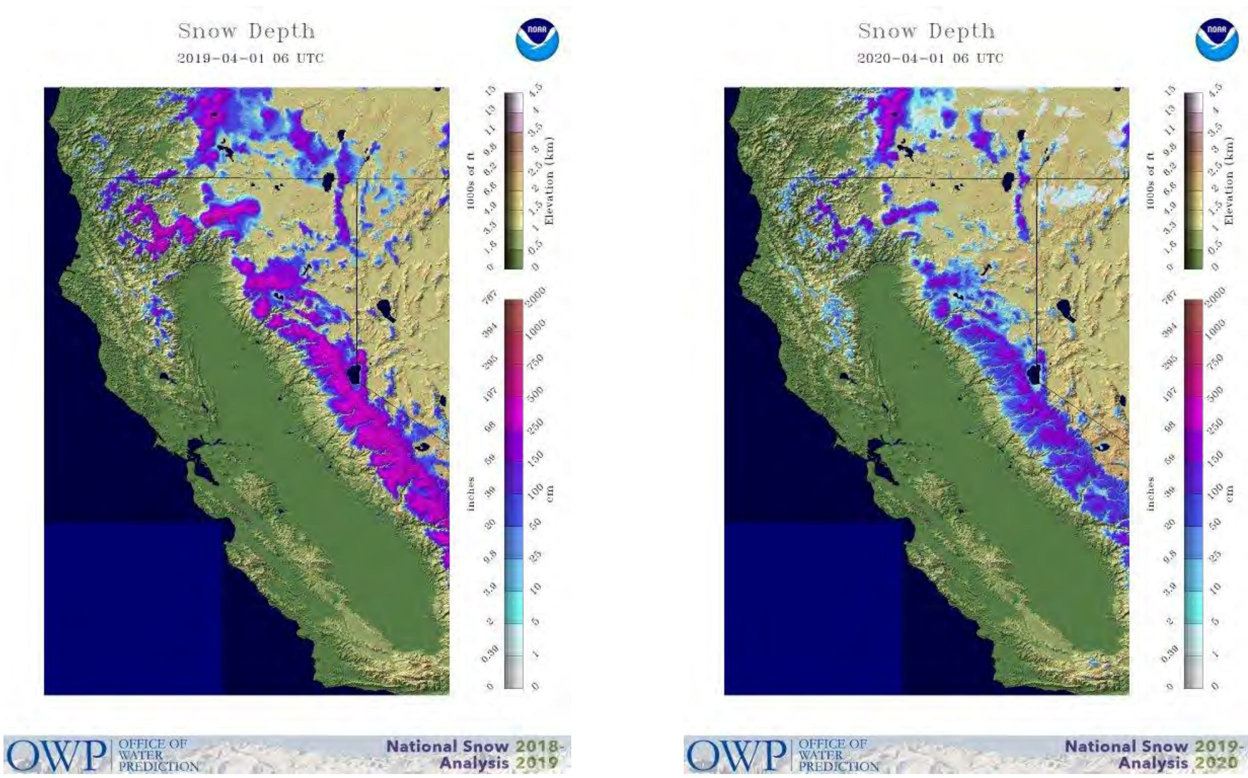
Storage in Oroville Reservoir, as of March 31, was at 2.29 million acre-feet (MAF) or 65% of capacity. Oroville Reservoir collects runoff from the Feather River watershed in northern California, the main source of supply for the SWP. San Luis Reservoir, the main reservoir for the SWP south of the Delta, was at 1.51 MAF or 74% of capacity. Zone 7's Table A carryover is stored in San Luis Reservoir; the reservoir is not expected to spill this year, which means Zone 7's full Table A carryover amount will be available for use.

Sierra Snowpack and Precipitation (April 1, 2020)

The statewide Sierra snowpack on April 1, 2020, was estimated at about 53% of average (see Attachment B), compared to 161% at the same time last year. April 1 is normally when the snowpack level peaks before the spring melt begins. The snowpack level in northern California, the main source of supply for the SWP during the spring and summer, is currently 57% of the April 1 average. Figure 4 presents a comparison of snow depths in the Sierras in April 2019 versus those anticipated for April 2020. The snowpack in 2020 is significantly shallower and more sparse than in 2019. In 2020, the predominant snow depth was 100 cm (~3 ft) versus the depth in 2019 of 500 cm (~17 ft).

Northern Sierra precipitation, which is a strong constituent in SWP allocation, was 24.2 inches as of March 31, 2020, or 56% of average (Attachment B).

<u>Figure 4: Statewide Snowpack in the Sierra Nevada: 2019 versus 2020</u>

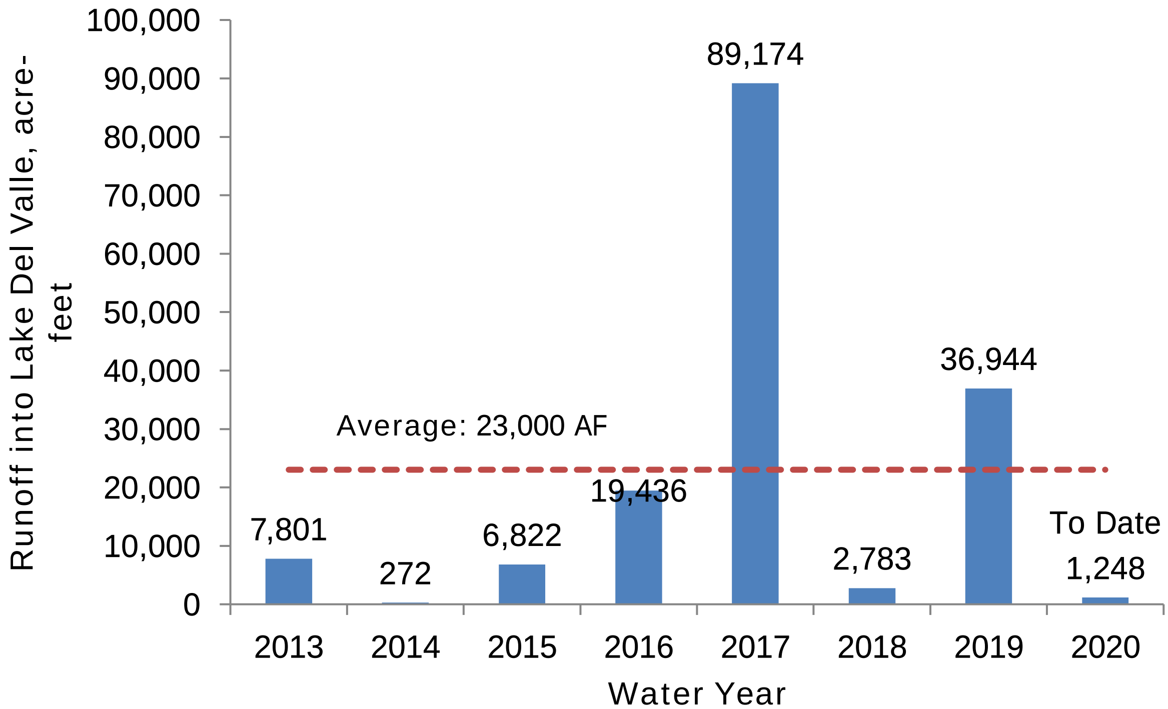


(Source: National Weather Service Remote Sensing Center, www.nohrsc.noaa.gov/nsa)

Local Runoff and Precipitation In 2020

The Tri-Valley area has experienced significantly less runoff this year compared to the same time last year. Figure 5 shows that as of April 1, 2020, runoff into Lake Del Valle is 5% of average (1,248 AF compared to 23,000 AF). Locally captured water is split with Alameda County Water District and stored in the lake for future use in accordance with Zone 7's water rights permit. Based on DWR's calculations, Zone 7 has approximately 8,300 AF of local water in Lake Del Valle as of April 1, 2020, including the 8,100 AF carried over from 2019. Local precipitation is at 46% of average year-to-date at Livermore Rainfall Station 15E for April 1, 2020 (Attachment B, note that due to station reporting delays, data from the most recent rainfall events in March were not available at the time of writing).

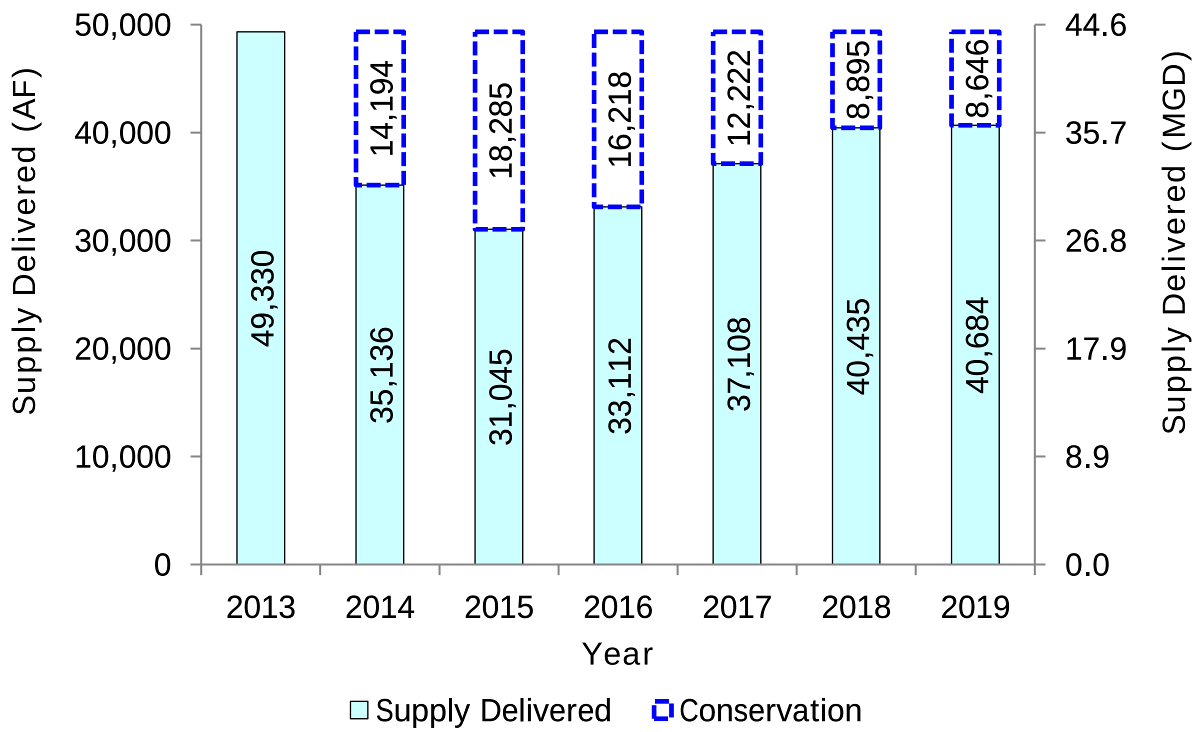
Figure 5: Runoff into Lake Del Valle (USGS Stream Gauge Arroyo Valle Below Lang Canyon)



Conservation in the Tri-Valley

The Tri-Valley's response to the recent drought reduced the required water supply delivery from Zone 7 relative to 2013 water demand by 29% in 2014, 37% in 2015, 33% in 2016, 25% in 2017, 18% in 2018 and 18% in 2019; this represents a cumulative water supply savings of 78,500 AF over the past six years. Figure 6 compares each calendar year to 2013. The Zone 7 Board lifted the local drought emergency in June 2017, but set a voluntary 10% conservation target to support ongoing statewide water conservation efforts, and the Tri-Valley community has continued exceeding the conservation target through 2019. Water supply conservation supports Zone 7's ability to meet retailer delivery requests in current and subsequent years.

Figure 6: Conservation in the Tri-Valley



2020 SWP Table A Allocation: 15% as of April 1, 2020

Zone 7 has a contract with DWR for up to 80,619 AF of SWP water in any given year; the percent of this amount Zone 7 will actually receive is called the "Table A" allocation. The 2020 SWP Table A allocation is 15% as of April 1, 2020, reflecting dry hydrologic conditions in the North Sierra. This is equivalent to 12,100 AF for Zone 7. The Table A allocation is expected to be finalized in May.

ANNUAL SUSTAINABILITY REPORT ASSUMPTIONS

To illustrate Zone 7's ability to meet delivery requests made by the retailers and the untreated water customers, the analysis in this memorandum conservatively assumes critically dry conditions (equivalent to 1977 conditions) in 2021, followed by average conditions in 2022 through 2024. As described in the 2019 Water Supply Evaluation

Update[1], projected average conditions equate to an assumed 49% SWP allocation or 39,500 AF, down from 60% or 48,400 AF used in previous years; this assumption also aligns with the average of actual conditions over the last ten years. Local water supply is expected to yield an average 6,200 AF per year, also based on actual recent conditions; this has been reduced from the 7,300 AF per year assumed in 2018. Each year, Zone 7 strives to carry over to the following year 10,000 AF in SWP facilities except in critically dry years (Table A or SWP Carryover). Any water captured locally in Lake Del Valle is also carried over into the following year. Reserving water for future years is good water management given the uncertainty and variability of hydrologic conditions from year to year.

PROJECTED WATER DEMANDS: NEXT FIVE YEARS

Each year, Zone 7 receives Municipal and Industrial (M&I) treated water delivery requests from the retailers for the next five years (Table 1 and Figure 7), which are used in the Annual Review. Zone 7 estimates demands for untreated water from agricultural customers' past usage. As shown in Table 1, the projected total water demand for direct use (treated and untreated water) in 2020 is about 12% higher than the actual 2019 water demand (45,700 vs 40,700 AF). Zone 7's retailers are predicting about 96% recovery to 2013 pre-drought treated water demand by 2024 (43,200 AF vs. 41,300, see Figure 7). Figure 8 shows untreated water demand projections used in the analysis.

As shown in Table 1, in addition to direct use, demands also include losses and water planned to be placed in storage for future use.

[1] Zone 7 Water Agency, 2019 Water Supply Evaluation Update. Available at: https://www.dropbox.com/s/fzhdf6olhcvnmyc/2019%20WSE%20Update.pdf?dl=0

Table 1: Actual and Projected Five-Year Demands (Direct Use), Water Planned for Storage, and Losses

DEMANDS/PLANNED FOR STORAGE/LOSS Acre-Feet	ACTUAL 2019	PROJECTIONS 2020	2021	2022	2023	2024
Hydrologic Year Equivalent	*2002*	*2015*	*1977*	*Average*	*Average*	*Average*
Table A Allocation	*75%*	*15%*	*10%*	*49%*	*49%*	*49%*
Direct Water Demand						
Treated Water Delivery Requests	36,200	40,200	40,200	40,700	41,000	41,300
Agricultural/Untreated Water Projection	4,500	5,500	5,500	5,500	5,500	5,500
Deposits into Storage						
Groundwater Recharge	3,600	200	0	6,700	8,300	8,400
Lake Del Valle Carryover	8,100	200	0	6,200	6,200	6,200
State Water Project Carryover	10,800	8,400	8,000	9,000	8,200	7,000
Semitropic Storage	8,900	0	0	0	0	0
Cawelo Storage	10,000	0	0	0	0	0
Losses						
Demineralization Concentrate-Brine	450	400	100	400	400	400
Lake Del Valle Evaporation Losses	600	400	500	600	700	700
Total	83,150	55,300	54,300	69,100	70,300	69,500

Notes:

(a) Projected demands were rounded to the nearest 100 acre-feet.

(b) Treated Water Delivery Request = M&I = Municipal and Industrial. Demands include retailer delivery requests, direct retail, Zone 7's unaccounted-for water (operational losses) and the groundwater pumping quota (GPQ) for Dublin San Ramon Services District.

(c) Retailer demand projections were provided as delivery requests by California Water Service Company, Dublin San Ramon Services District, City of Livermore, and City of Pleasanton. Zone 7 estimates demands for direct retail customers.

(d) Zone 7's untreated water demand is used primarily for agricultural and golf course irrigation; projections are based on recent past usage.

Figure 7: Historical and Projected Five-Year Treated Water Demands

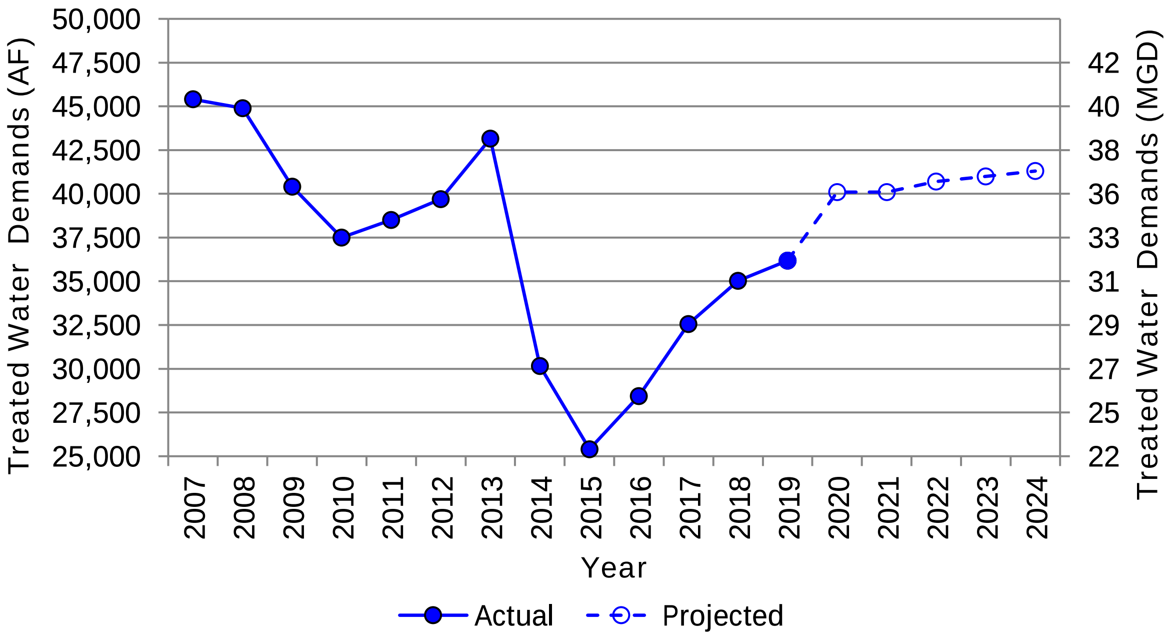
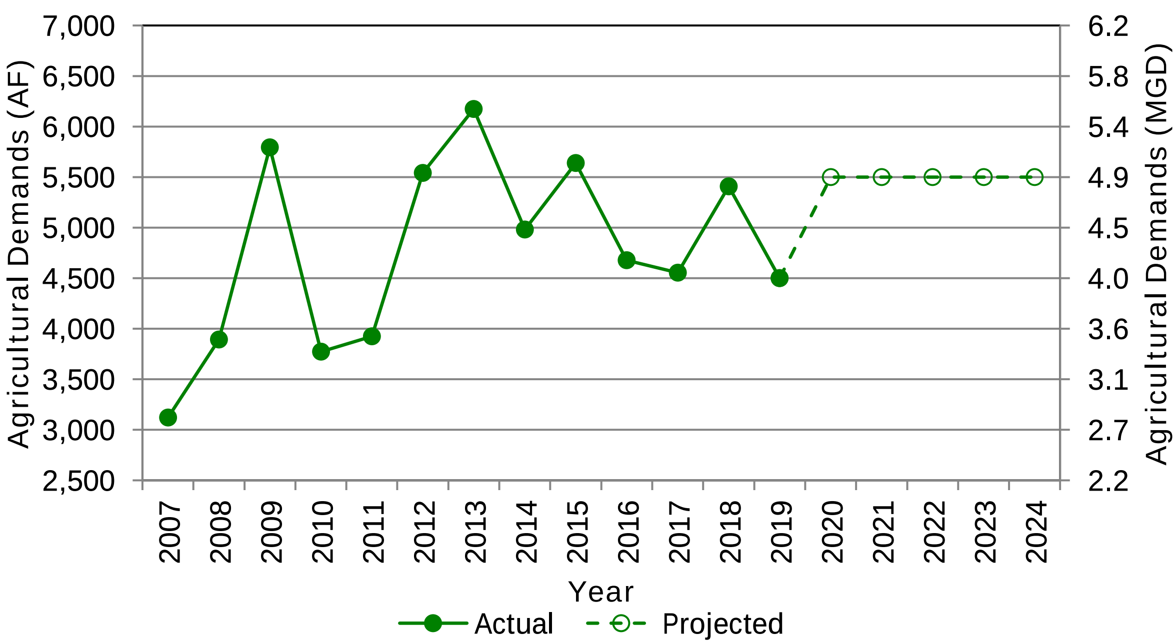


Figure 8: Historical and Projected Agricultural/Untreated Water Demands



Note that the State of California has been rolling out regulations designed to achieve the goals of the Long-Term Conservation Framework, which was developed in response to Governor Jerry Brown's 2016 Executive Order (B-37-16). For example, indoor residential water use is required to decrease to an average 55 gallons per capita per day (gpcd) by 2023; by 2030, the requirement will decrease to 50 gpcd. Future demands will therefore reflect a combination of water conservation (i.e., reduced per capita water consumption) and population growth in the Tri-Valley. Zone 7 will continue to coordinate closely with the retailers to verify demands and track the effects of conservation. A regional demand study is also underway to improve long-term demand estimates.

PROJECTED WATER SUPPLIES: NEXT FIVE YEARS

Incoming Supplies

Each year Zone 7 receives water from its contract with DWR for imported SWP water[2] and its local water right permit on Arroyo Valle. For 2020, Zone 7 is also planning to acquire about 5,000 AF of water transfers to supplement these supplies. Approximately 700 AF is expected to be available from Yuba Accord. For the remaining 4,000 AF, Zone 7 will pursue other water transfers such as a water transfer agreement with another SWP contractor. To preserve water in storage for dry or critically dry years, purchase of transfer water in 2021 and 2022 is also recommended to partially refill water withdrawn from storage.

Table 2 presents the expected yields in 2020 and estimates for 2021 assuming 1977 critically dry hydrologic conditions, followed by average allocation years from 2022 through 2024. Each year in the table below is paired with a comparable historical hydrologic year in anticipation of receiving a similar yield (e.g., Table A allocation). Figure 9 shows the incoming supplies for 2020 totaling 17,000 AF.

Water from Storage

Zone 7 currently stores surplus water in various storage facilities, including the local groundwater basin, LDV and Kern County groundwater banks (Semitropic and Cawelo) to help meet water demands as needed during dry years. Water is withdrawn from storage when needed to supplement that year’s incoming supply to meet demands. Water may also be shifted from one type of storage to another as part of water management; in 2020, for example, water is withdrawn from storage then a portion is subsequently redeposited into storage in other locations as required by operational needs. Figure 10 shows that Zone 7 plans to access 38,300 AF of its storage supplies in 2020. Table 2 shows Zone 7 is planning to recover banked water from Kern County in 2021 and 2022 based on assumed hydrologic conditions.

[2] This includes Table A or SWP carryover from 2019, which is discussed in the next section.

Table 2: Projected Supply Sources: Incoming Supplies and Water from Storage

SUPPLY SOURCES Acre-Feet	ACTUAL 2019	PROJECTIONS 2020	2021	2022	2023	2024
Hydrologic Year Equivalent	*2002*	*2015*	*1977*	*Average*	*Average*	*Average*
Table A Allocation	*75%*	*15%*	*10%*	*49%*	*49%*	*49%*
New Incoming Supplies						
State Water Project Table A	60,500	12,100	8,100	39,500	39,500	39,500
Lake Del Valle Yield	8,100	200	0	6,200	6,200	6,200
Yuba Transfer	0	700	1,000	1,000	1,000	1,000
Other Water Transfer	0	4,000	5,000	2,000	0	0
Withdrawals from Storage						
State Water Project Carryover	2,600	10,800	8,400	8,000	9,000	8,200
Lake Del Valle Carryover	1,000	8,100	200	0	6,200	6,200
Groundwater Production	9,900	10,000	14,500	8,400	8,400	8,400
Kern County Groundwater Bank: Semitropic	0	9,400	9,100	4,000	0	0
Kern County Groundwater Bank: Cawelo	0	0	8,000	0	0	0
Total	82,100	55,300	54,300	69,100	70,300	69,500

Notes:

[a] See Zone 7's 2015 Urban Water Management Plan for more details about Zone 7 supplies: http://www.zone7water.com/images/pdf_docs/water_supply/uwmp_2015.pdf.

[b] 2020 yield is based on 15% (current 2020 allocation) of 12,100 AF. Long-term average yield is 49% of Zone 7's Table A amount (80,619 AF) per DWR's Final 2016 Delivery Capability Report and recent conditions. A critically dry year has a 10% SWP Allocation.

[c] Zone 7 is planning to obtain water transfers in 2020, and if 2021 is critically dry, transfers are recommended in 2021 and 2022. To obtain a net yield of 700 AF of Yuba Transfer in 2020, Zone 7 has to purchase about 1,000 AF to cover conveyance losses in the Delta.

[d] Zone 7 stored 8,100 AF in LDV in 2019 and has captured an additional 200 AF in 2020. Additional capture is expected by the end of December 2020; however, to be conservative, only 200 AF is assumed for 2020. An average annual yield of 6,200 is assumed in line with recent conditions over the last ten years.

Figure 9: Incoming Water Supplies in 2020

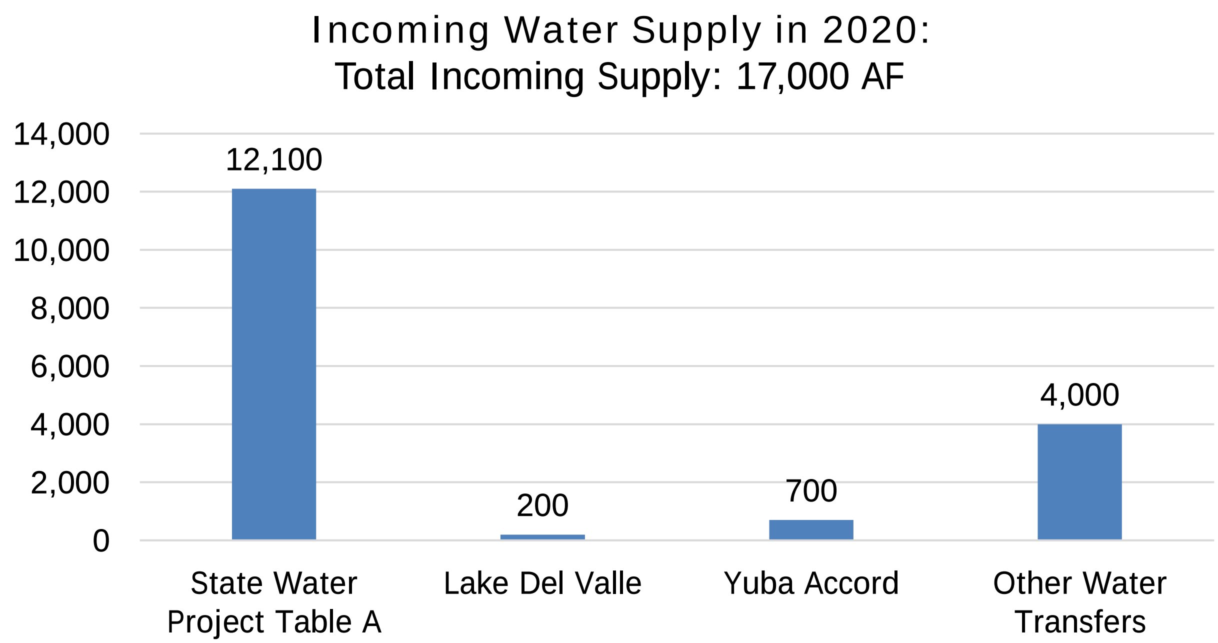


Figure 10: Water Supply Withdrawals from Storage in 2020

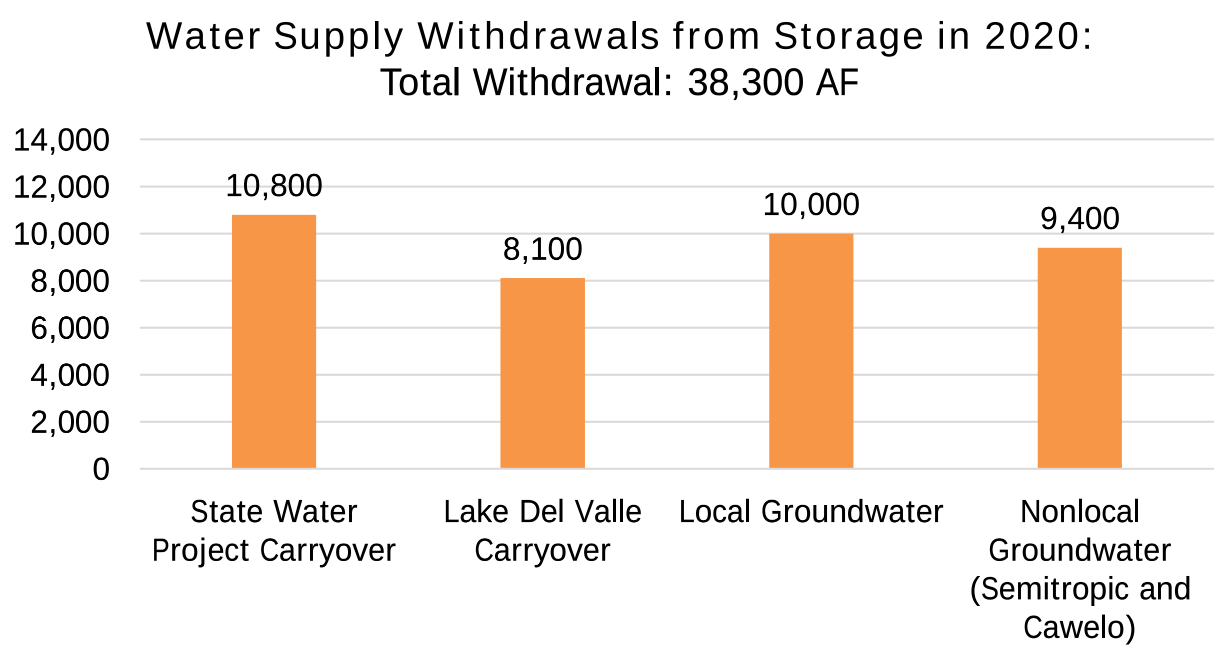
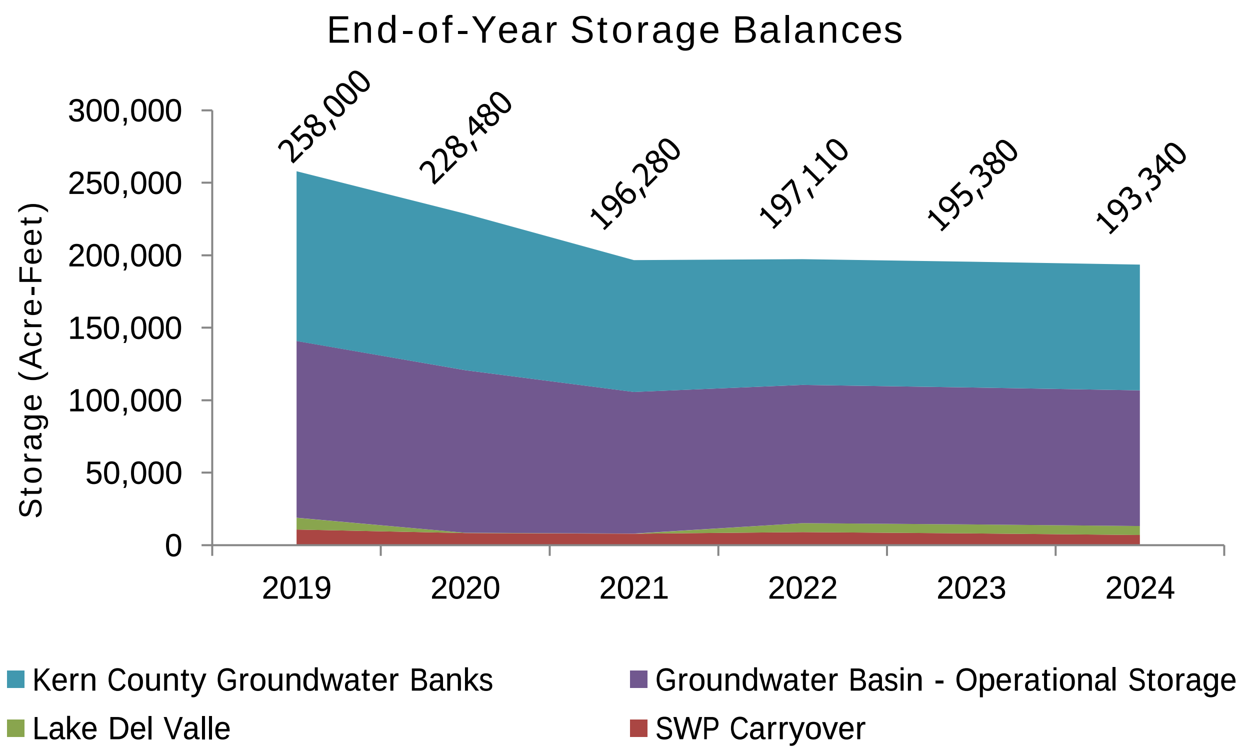


Table 3 and Figure 11 summarize the total water in storage available as of the end of 2019, and projected storage levels over 2020 through 2024. Storage projections show a decrease of about 64,700 AF over the next five years from the end of 2019 through the end of 2024 based on assumed hydrologic conditions and demands. This trend is a preliminary estimate based on projected deposits and withdrawals from the various storage categories. For example, while it accounts for 10% groundwater loss from local storage activities, it does not account for the natural influx to storage that occurs in the local groundwater basin due to rainfall runoff. The declining storage trend could be mitigated through the additional purchase of transfer water. Staff will monitor conditions to determine the appropriate amounts of transfer water in future years.

Table 3: End-of-Year Storage Balances (Actual and Projected)

	ACTUAL	PROJECTIONS				
End of Year Storage Balance (Acre-Feet)	2019	2020	2021	2022	2023	2024
SWP Carryover	10,800	8,400	8,000	9,000	8,200	7,000
Lake Del Valle	8,100	200	0	6,200	6,200	6,200
Groundwater Basin - Operational Storage	122,000	112,180	97,680	95,310	94,380	93,540
Kern County Groundwater Banks	117,100	107,700	90,600	86,600	86,600	86,600
Semitropic	87,200	77,800	68,700	64,700	64,700	64,700
Cawelo	29,900	29,900	21,900	21,900	21,900	21,900
TOTAL STORAGE	258,000	228,480	196,280	197,110	195,380	193,340

Figure 11: End-of-Year Storage Balances (Actual and Projected)



COMPARISON OF SUPPLY AND DEMAND: NEXT FIVE YEARS

As shown in Table 4, Zone 7 can deliver water to supply 100% of delivery requests for 2020 through 2024 based on current projected demands and assumed hydrology for 2020 through 2024. Additional conservation would allow more water not used to meet direct demands to be placed into storage, while higher demands (than currently projected) could be met by using additional storage supplies.

Table 4: Comparison of Supplies and Demands: Next Five Years

SUPPLIES VS DEMANDS	ACTUAL	PROJECTIONS				
Acre-Feet	2019	2020	2021	2022	2023	2024
Hydrologic Year Equivalent	*2002*	*2015*	*1977*	*Average*	*Average*	*Average*
Table A Allocation	*75%*	*15%*	*10%*	*49%*	*49%*	*49%*
Incoming Supply[(a)]	68,600	17,000	14,100	48,700	46,700	46,700
Water Supply from Storage[(b)]	13,500	38,300	40,200	20,400	23,600	22,800
Total Water Supply	82,100	55,300	54,300	69,100	70,300	69,500
Direct Water Demand[(c)]	40,700	45,700	45,700	46,200	46,500	46,800
Deposits into Storage and Losses[(d)]	41,400	9,600	8,600	22,900	23,800	22,700
% of Demand Delivered	100%	100%	100%	100%	100%	100%

Notes:

(a) From Table 2: SWP (Table A), LDV Yield, and transfers.

(b) From Table 2: SWP Carryover, LDV Carryover, GW Production, and Semitropic/Cawelo.

(c) From Table 1: Treated and Agricultural/Untreated Demands (direct use).

(d) From Table 1: Storage water placed in LDV and SWP as carryover, groundwater recharge, and water stored in Semitropic/Cawelo. A portion of this goes towards operational losses.

PROGRAMS NECESSARY TO MEET WATER DEMANDS GOING FORWARD

The Annual Review indicates that Zone 7 has enough water supplies to meet projected water demands over the next five years based on current delivery requests and assumed hydrology. To achieve long-term water supply reliability through buildout while accounting for hydrologic and other uncertainties (e.g., major system outages), Zone 7 has been evaluating several potential future water supply and storage options. Most recently, the 2019 Water Supply Evaluation Update included the following water supply and storage alternatives:

- Bay Area Regional Desalination Project
- Delta Conveyance (formerly California WaterFix)
- Los Vaqueros Reservoir Expansion
- Potable Reuse
- Short and Long-Term Water Transfers
- Sites Reservoir

Zone 7 also continues to evaluate and optimize the long-term local water yield from the Arroyo Valle currently captured in LDV. A number of planned capital projects (new wells, the Chain of Lakes Pipeline, Chain of Lakes diversion structures, and reliability intertie) will help bolster the reliability of Zone 7's water supply system. The turnover of the lakes in the Chain of Lakes for Zone 7 use also continues to be a key component of Zone 7's long-term reliability.

Zone 7 staff will also continue to monitor local and statewide conditions, adjust operations as necessary to optimize use of available resources, remain prepared for another single or multi-year drought, and continue to coordinate regularly with its local water supply retailers, untreated water customers, and with DWR. To guide Zone 7's efforts in pursuing short- and long-term water transfers, a 'Water Transfers 101 Workshop' will be conducted with the Water Resources Committee in late April/May 2020; transfer options and opportunities will be presented for consideration. In June 2020, staff will provide an updated Operations Plan to the Water Resources Committee; this plan will reflect the latest actual supply and demand conditions and Zone 7's most feasible operational scenario for 2020.

Staff recommends that the Board maintain the ten percent (10%) voluntary conservation target for the Tri-Valley, consistent with the 2016 Board Resolution 16-142, in light of the current dry conditions and the State's long-term conservation goals. This acknowledges and supports the Tri-Valley's continuing conservation efforts—which was nearly 20% in 2019—since the drought ended. Zone 7 will continue to implement rebate and public outreach programs in partnership with the retailers. As previously noted, Zone 7 is undertaking a regional demand study, which will help refine the demand projections as the region looks towards compliance with the State's Long-Term Conservation Framework.

ATTACHMENTS:

A. Water Supply Reliability Policy
B. Latest Hydrologic Conditions

Attachment A
Water Supply Reliability Policy

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO 13-4230

INTRODUCED BY DIRECTOR QUIGLEY
SECONDED BY DIRECTOR STEVENS

Water Supply Reliability Policy

WHEREAS, the Zone 7 Board of Directors desires to maintain a highly reliable Municipal and Industrial (M&I) water supply system so that existing and future M&I water demands can be met during varying hydrologic conditions; and

WHEREAS, the Board has an obligation to communicate to its M&I customers and municipalities within its service area the ability of Zone 7's water supply system to meet projected water demands; and

WHEREAS, the Board on August 18, 2004 adopted Resolution No. 04-2662 setting forth its Reliability Policy for Municipal & Industrial Water Supplies; and

WHEREAS, the Board desires to revise the Reliability Policy to reflect recent data, analysis, and studies.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby rescinds Resolution No. 04-2662 adopting the August 18, 2004 Reliability Policy for Municipal & Industrial Water Supplies; and

BE IT FURTHER RESOLVED that the Board hereby adopts the following level of service goals to guide the management of Zone 7's M&I water supplies as well as its Capital Improvement Program (CIP):

Goal 1.Zone 7 will meet its treated water customers' water supply needs, in accordance with Zone 7's most current Contracts for M&I Water Supply, including existing and projected demands as specified in Zone 7's most recent Urban Water Management Plan (UWMP), during normal, average, and drought conditions, as follows:

- At least 85% of M&I water demands 99% of the time
- 100% of M&I water demands 90% of the time

Goal 2:Provide sufficient treated water production capacity and infrastructure to meet at least 80% of the maximum month M&I contractual demands should any one of Zone 7's major supply, production, or transmission facilities experience an extended unplanned outage of at least one week.

BE IT FURTHER RESOLVED that to ensure that this Board policy is carried out effectively, the Zone 7 General Manager will provide a water supply status report to the Board every five years with the Zone 7 Urban Water Management Plan that specifies how these goals will be, or are being, achieved.

If the General Manager finds that the goals cannot be met during the first five years of the Urban Water Management Plan, then the Board will hold a public hearing within two months of the General Manager's finding to consider remedial actions that will bring Zone 7 into substantial compliance with the stated level of service goals. Remedial actions may include, but are not limited to, voluntary conservation or mandatory rationing to reduce water demands, acquisition of additional water supplies, and/or a moratorium on new water connections. After reviewing staff analyses and information gathered at the public hearing, the Board shall, as expeditiously as is feasible, take any additional actions that are necessary to meet the level of service goals during the following five-year period; and

BE IT FURTHER RESOLVED that the Zone 7 General Manager shall prepare an Annual Review of the Sustainable Water Supply Report which includes the following information:

(1) An estimate of the current annual average water demand for M&I water as well as a five-year projection based on the same information used to prepare the UWMP and CIP;
(2) A Summary of available water supplies to Zone 7 at the beginning of the calendar year;
(3) A comparison of current water demand with the available water supplies; and
(4) A discussion of water conservation requirements and other long-term supply programs needed to meet Zone 7 M&I water demands for single-dry and multiple-dry year conditions, as specified in the Zone 7's UWMP.

A summary of this review will be provided to M&I customers.

<u>Definitions</u>

Level of Service for Annual Water Supply Needs—the level of service is the percent of existing or projected water demand that Zone 7's water supply system can meet during two key conditions: (1) during various hydrologic conditions and (2) during unplanned outages of major facilities.
Capital Improvement Program (CIP)—the CIP is Zone7's formal program for developing surface and ground water supplies, along with associated infrastructure, including import water conveyance facilities, surface water treatment plants, groundwater wells, and M&I water transmission system to meet projected water demands.

Normal conditions—conditions that most closely represent median runoff or allocation from all normally contracted or available water supplies from the historic record.

Average conditions—conditions that most closely represent the average runoff or allocation from all normally contracted or legally available water supplies from the historic record.

Drought conditions—conditions that most closely represent reduced runoff or allocation level from the historic record from all normally contracted or legally available water supplies, including both single-dry and multiple-dry year conditions.

Single-dry year condition—a condition that most closely represents the lowest yield over a one-year period from the historic record from all normally contracted or legally available supplies.

Multiple-dry year condition—a condition that most closely represents three or more consecutive dry years from the historic record that represent the lowest yields from all normally contracted or legally available supplies.

Available water supplies—consist solely of (1) water supplies that Zone 7 has contracted for (e.g., listed under Schedule A of the State Water Contract, dry-year water options, special contracts with other water districts, etc.) and (2) water actually stored in surface and subsurface reservoirs.

Maximum Month—the largest monthly average water use.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GRECI, MACHAEVICH, PALMER, QUIGLEY, RAMIREZ HOLMES STEVENS

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on October 17, 2012.

By____________________________

President, Board of Directors

Attachment B
Hydrologic Conditions

Figure 12: California Snow Water Content as of April 1, 2020

NORTH	
Data as of April 1, 2020	
Number of Stations Reporting	30
Average snow water equivalent (Inches)	16.5
Percent of April 1 Average (%)	57
Percent of normal for this date (%)	57

CENTRAL	
Data as of April 1, 2020	
Number of Stations Reporting	41
Average snow water equivalent (Inches)	16.7
Percent of April 1 Average (%)	56
Percent of normal for this date (%)	56

SOUTH	
Data as of April 1, 2020	
Number of Stations Reporting	28
Average snow water equivalent (Inches)	11.5
Percent of April 1 Average (%)	45
Percent of normal for this date (%)	45

STATE	
Data as of April 1, 2020	
Number of Stations Reporting	99
Average snow water equivalent (Inches)	15.2
Percent of April 1 Average (%)	53
Percent of normal for this date (%)	53

Figure 13: Northern Sierra Precipitation as of March 31, 2020

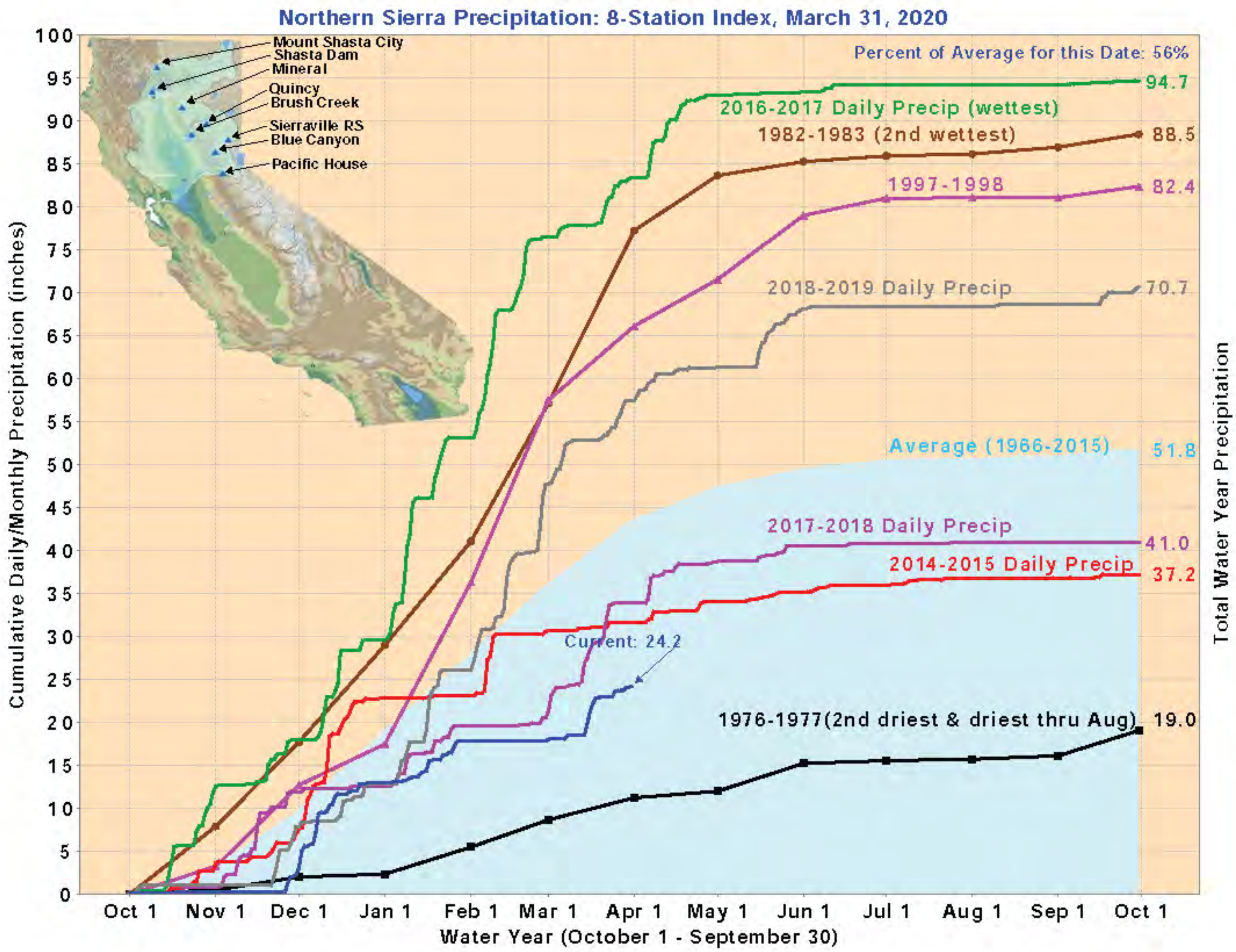


Figure 14: California Reservoir Conditions as of March 31, 2020

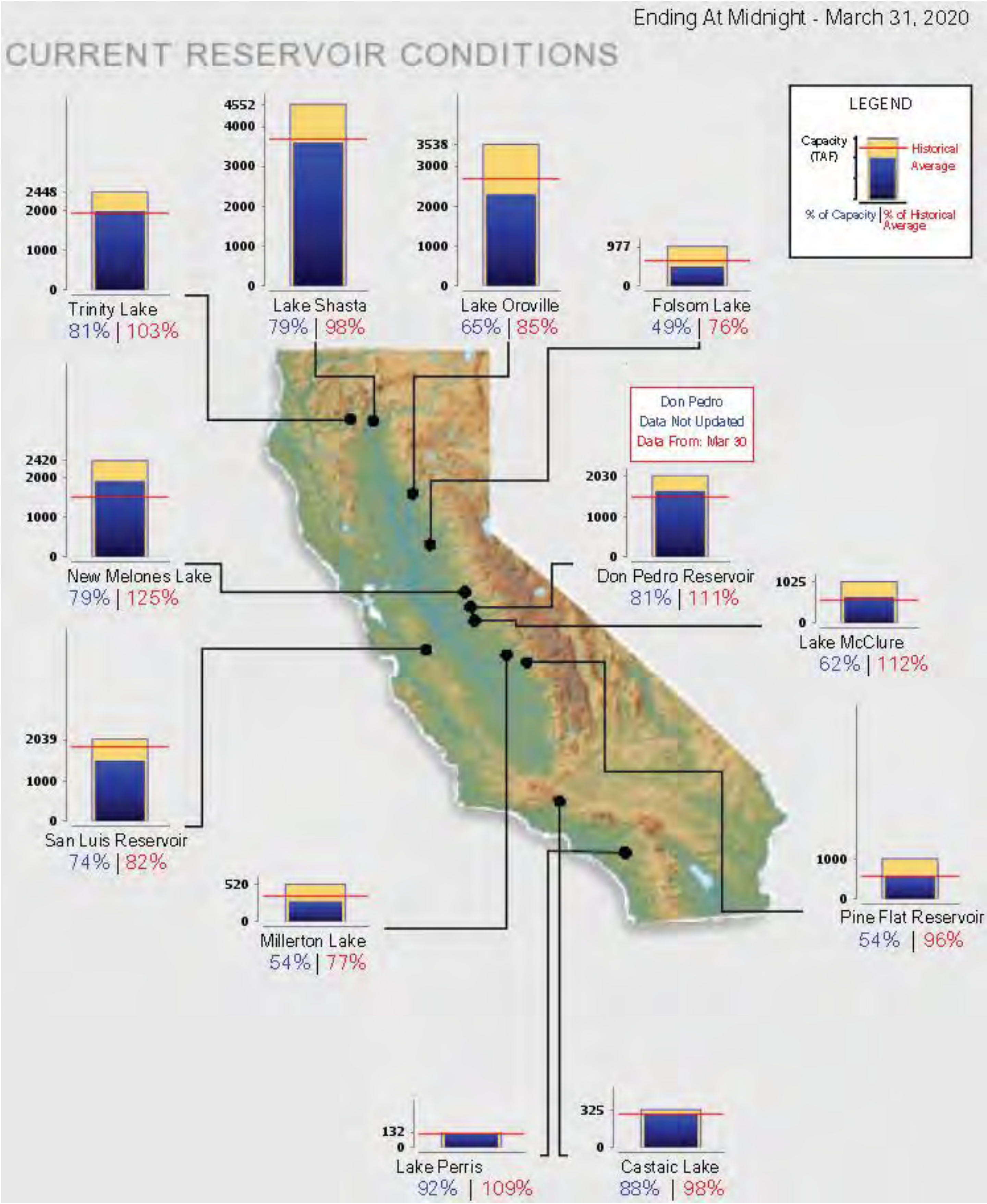
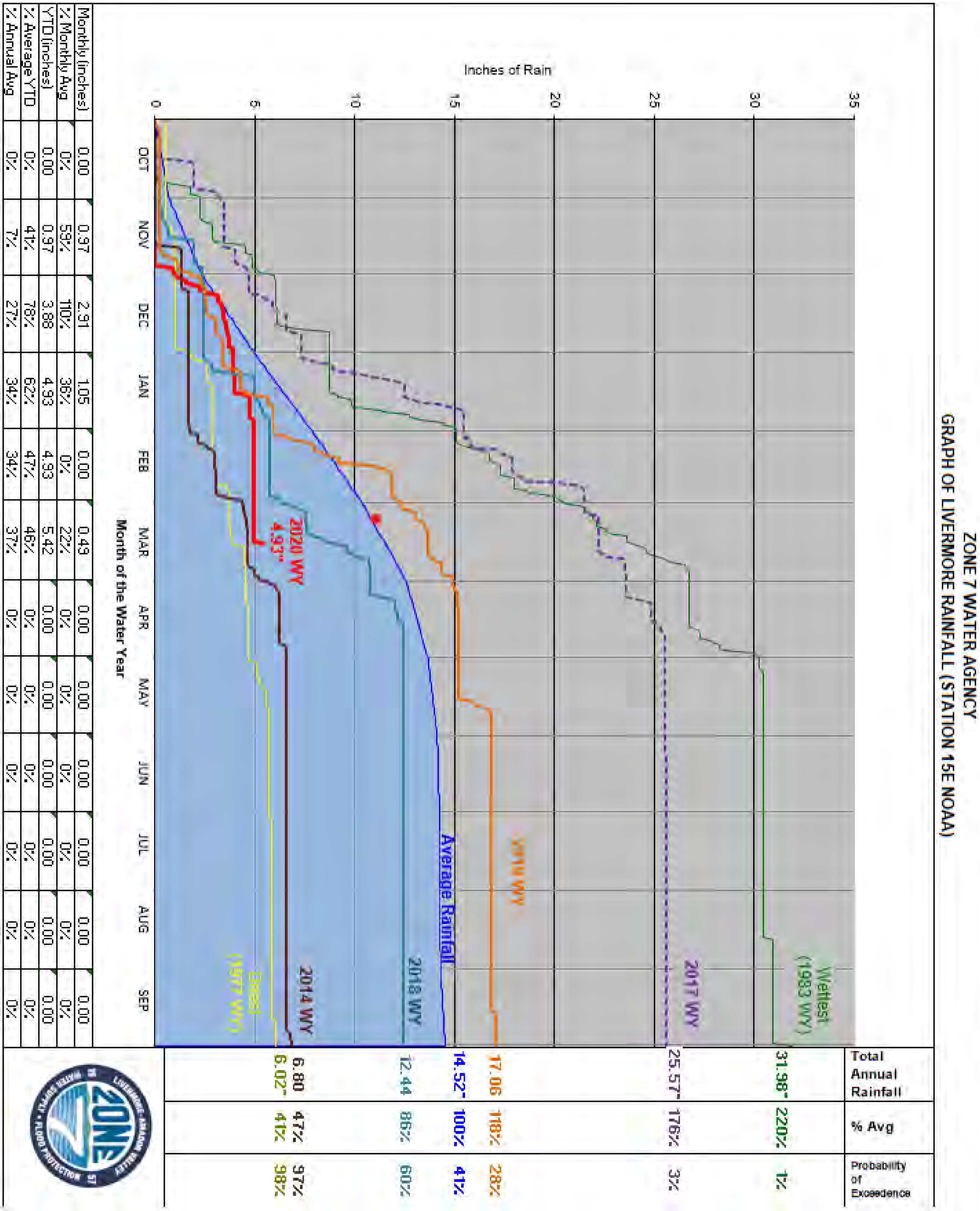


Figure 15 Local Rainfall (Livermore Station 15E NOAA) as of April 1, 2020



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Monthly (inches)	0.00	0.97	2.91	1.05	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00
% Monthly Avg	0%	59%	110%	36%	0%	22%	0%	0%	0%	0%	0%	0%
YTD (inches)	0.00	0.97	3.88	4.93	4.93	5.42	0.00	0.00	0.00	0.00	0.00	0.00
% Average YTD	0%	41%	78%	62%	47%	46%	0%	0%	0%	0%	0%	0%
% Annual Avg	0%	7%	27%	34%	34%	37%	0%	0%	0%	0%	0%	0%

Total Annual Rainfall	% Avg	Probability of Exceedence
31.98"	220%	1%
25.57"	176%	3%
17.06	118%	28%
14.52"	100%	41%
12.44	86%	60%
6.80	47%	97%
6.02"	41%	98%

Note: due to station reporting delays, data from most recent March rainfall events were unavailable at the time of writing.

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
BOARD OF DIRECTORS

RESOLUTION NO

INTRODUCED BY
SECONDED BY

Declaration of a Water Shortage Emergency

WHEREAS, the California Urban Water Management Planning Act ("Act") requires urban water suppliers to adopt an Urban Water Management Plan every five years; and

WHEREAS, Zone 7 adopted its 2020 Urban Water Management Plan in accordance with the provisions of the Act on May/June XX, 2021; and

WHEREAS, a required component of the Urban Water Management Plan is a Water Shortage Contingency Plan, which establishes criteria and guidelines for operations, water conservation, and response actions during a water shortage; and

WHEREAS, on April X, 202X the Zone 7 Board was presented with the Annual Review of Sustainable Water Supply ("Annual Sustainability Report"); and

WHEREAS, the Annual Sustainability Report determined that Zone 7 can only deliver XX% of expected water demands in 202X due to [cite conditions: e.g., critically dry conditions]. ***And/Or***

WHEREAS, on X/XX/20XX, the Governor of the State of California declared a drought state of emergency [asking/requiring] residents to reduce water use by XX%. ***And/Or***

WHEREAS, on X/XX/20XX, the Department of Water Resources announced a X% allocation from the State Water Project. ***And/Or***

WHEREAS, the Board has determined that water shortage emergency conditions exist within the Zone 7 service area due to [cite event: e.g., supply disruption from the Delta due to an earthquake]; and

WHEREAS, the Water Shortage Contingency Plan in the 2020 Urban Water Management Plan adopted by the Board on May/June XX, 2021 identifies stages of water shortage levels and actions associated with each stage.

WHEREAS, current conditions warrant declaration of a Stage Y water shortage with XX% [voluntary/mandatory] reduction in water use.

NOW, THEREFORE BE IT RESOLVED, the Board hereby declares a Stage Y water shortage level;

BE IT FURTHER RESOLVED that the Board directs staff to implement the following actions from the Water Shortage Contingency Plan as soon as feasible:

- [Action 1]
- [Action 2]
- Etc.

ADOPTED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT:

ABSTAIN:

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on _______________.

By: ____________________________________
President, Board of Directors

Appendix C

Zone 7 Board Sample Resolutions

ZONE 7
ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO.

INTRODUCED BY
SECONDED BY

Implementation of Water Shortage Surcharge

WHEREAS, the Zone 7 Board has declared a Stage Y water shortage which requires a XX% [voluntary/mandatory] reduction in water use;

WHEREAS, the Water Shortage Contingency Plan in the 2020 Urban Water Management Plan adopted by the Board on XX/XX/2021 identifies stages of water shortage levels and planned and potential response actions associated with each stage;

WHEREAS, response actions include use of reserves, deferral/acceleration of capital projects, grants and other cost cutting measures; and

WHEREAS, the Water Shortage Contingency Plan identifies both water shortage surcharges and use of reserves to ensure full revenue recovery for each water shortage stage.

NOW, THEREFORE BE IT RESOLVED, that Stage Y water shortage surcharge in accordance with the table below shall take effect on the first day of the month following thirty days after the adoption of this resolution.

Stage	**Demand Reduction Targets**	**Water Shortage Surcharges [per Hundred cubic feet (ccf)]**
1	< 10%	N/A
2	10-20%	$0.26
3	20-30%	$0.59
4	30-40%	$1.04
5	40-50%	$1.67
6	>50%	$2.60

BE IT FURTHER RESOLVED, that the Stage Y water shortage surcharge will sunset after six months unless extended or modified by action of the Board.

ADOPTED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT:

ABSTAIN:

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on ______________.

By: ________________________________
President, Board of Directors

Appendix H

UWMP and WSCP Adoption Resolutions

ZONE 7

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO. 21-42

INTRODUCED BY DIRECTOR PALMER
SECONDED BY DIRECTOR RAMIREZ HOLMES

Adoption of the 2020 Urban Water Management Plan
and Addendum to the 2015 Urban Water Management Plan

WHEREAS, the Urban Water Management Planning Act (Water Code Division 6, Part 2.6, Sections 10610 through 10657), requires all urban water suppliers serving more than 3,000 customers either directly or indirectly, or more than 3,000 acre-feet of water annually, to prepare and submit an Urban Water Management Plan (UWMP), or plan update, once every five years; and

WHEREAS, said plan is for the purpose of evaluating and developing water management policies to achieve conservation and efficient use of urban water supplies; and

WHEREAS, the Urban Water Management Planning Act was updated between 2015 and 2020 to incorporate 2018 Water Conservation Legislation (AB 1668 (Friedman) and SB 606 (Hertzberg)); and

WHEREAS, Zone 7 Water Agency is required to prepare an addendum to its 2015 UWMP to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) (Draft 2015 UWMP Addendum), to support a certification of consistency for a future covered action; and

WHEREAS, Zone 7 Water Agency is the wholesale water management agency for the Livermore-Amador Valley, including the Cities of Dublin, Livermore, and Pleasanton in Alameda County, and a portion of San Ramon in Contra Costa County; and

WHEREAS, Zone 7 Water Agency issued notices of preparation at least 60 days in advance of the public hearing to the cities and counties that it serves; and coordinated with the Livermore-Amador Valley water suppliers, including Cal Water-Livermore District, the Cities of Livermore and Pleasanton, and Dublin San Ramon Services District, and other agencies and the community, on the preparation of the Draft 2020 UWMP, Draft Water Shortage Contingency Plan, and Draft 2015 UWMP Addendum; and

WHEREAS, Zone 7 Water Agency has circulated for public review for a minimum of 14 days the Draft 2020 UWMP, Draft Water Shortage Contingency Plan, and Draft 2015 UWMP Addendum; and

WHEREAS, a public hearing regarding the Draft 2020 UWMP, Draft Water Shortage Contingency Plan, and Draft 2015 UWMP Addendum was properly noticed and held to receive comments.

NOW, THEREFORE, BE IT RESOLVED that the General Manager is authorized to make non-substantive changes to and finalize the Draft 2020 UWMP and Draft 2015 UWMP Addendum to produce the 2020 UWMP and 2015 UWMP Addendum; and

BE IT FURTHER RESOLVED that the 2020 UWMP be approved and adopted for the Zone 7 Water Agency; and

BE IT FURTHER RESOLVED that the 2015 UWMP Addendum is adopted as an addendum to the 2015 UWMP to incorporate demonstration of consistency with Delta Plan Policy WR P1; and

BE IT FURTHER RESOLVED that Zone 7 reaffirms its commitment to maintain the long-term reliability of its water supply; and

BE IT FURTHER RESOLVED that the 2020 UWMP and 2015 UWMP Addendum be filed with the California Department of Water Resources.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GAMBS, GREEN, PALMER, RAMIREZ HOLMES, SANWONG, SMITH MCDONALD

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on May 19, 2021.

DocuSigned by:
Olivia Sanwong
8A3F19465A6B4C0...

By: ______________________
President, Board of Directors

ZONE 7

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

BOARD OF DIRECTORS

RESOLUTION NO. 21-43

INTRODUCED BY DIRECTOR PALMER
SECONDED BY DIRECTOR RAMIREZ HOLMES

Adoption of 2020 Water Shortage Contingency Plan

WHEREAS, the Urban Water Management Planning Act (Water Code Division 6, Part 2.6, Sections 10610 through 10657), requires all urban water suppliers serving more than 3,000 customers either directly or indirectly, or more than 3,000 acre-feet of water annually, to prepare and submit an Urban Water Management Plan (UWMP), or plan update, once every five years; and

WHEREAS, said plan is for the purpose of evaluating and developing water management policies to achieve conservation and efficient use of urban water supplies; and

WHEREAS, the Urban Water Management Planning Act was updated between 2015 and 2020 to incorporate 2018 Water Conservation Legislation (AB 1668 (Friedman) and SB 606 (Hertzberg)); and

WHEREAS, Zone 7 Water Agency is required to update its Water Shortage Contingency Plan for consistency with the updated Urban Water Management Planning Act; and

WHEREAS, Zone 7 Water Agency is the wholesale water management agency for the Livermore-Amador Valley, including the Cities of Dublin, Livermore, and Pleasanton in Alameda County, and a portion of San Ramon in Contra Costa County; and

WHEREAS, Zone 7 Water Agency issued notices of preparation at least 60 days in advance of the public hearing to the cities and counties that it serves; and coordinated with the Livermore-Amador Valley water suppliers, including Cal Water-Livermore District, the Cities of Livermore and Pleasanton, and Dublin San Ramon Services District, and other agencies and the community, on the preparation of its Draft 2020 UWMP, Draft Water Shortage Contingency Plan, and its Draft 2015 UWMP Addendum; and

WHEREAS, Zone 7 Water Agency has circulated for public review for a minimum of 14 days the Draft 2020 UWMP, Draft Water Shortage Contingency Plan, and Draft 2015 UWMP Addendum; and

WHEREAS, a public hearing regarding the Draft 2020 UWMP, Draft Water Shortage Contingency Plan, and Draft 2015 UWMP Addendum was properly noticed and held to receive comments.

NOW, THEREFORE, BE IT RESOLVED that the General Manager is authorized to make non-substantive changes to and finalize the Draft Water Shortage Contingency to produce the 2020 Water Shortage Contingency Plan; and

BE IT FURTHER RESOLVED that the 2020 Water Shortage Contingency Plan be approved and adopted for the Zone 7 Water Agency; and

BE IT FURTHER RESOLVED that Zone 7 reaffirms its commitment to maintain the long-term reliability of its water supply; and

BE IT FURTHER RESOLVED that the 2020 Water Shortage Contingency Plan be filed with the California Department of Water Resources.

ADOPTED BY THE FOLLOWING VOTE:

AYES: DIRECTORS FIGUERS, GAMBS, GREEN, PALMER, RAMIREZ HOLMES, SANWONG, SMITH MCDONALD

NOES: NONE

ABSENT: NONE

ABSTAIN: NONE

I certify that the foregoing is a correct copy of a Resolution adopted by the Board of Directors of Zone 7 of the Alameda County Flood Control and Water Conservation District on May 19, 2021.

DocuSigned by:
Olivia Sanwong
8A3F19465A6B4C0...

By: ______________________
President, Board of Directors

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Lake Oswego
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Lake Oswego OR 97035
503-451-4500

Oceanside
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Oceanside CA 92054
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Olympia WA 98501
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