Appendix L

FINAL REPORT | JUNE 2023

SMP-38, SMP-39 and SMP-40 Water Supply Assessment

PREPARED FOR

City of Livermore

PREPARED BY

WEST YOST
Water. Engineered.

SMP-38, SMP-39 and SMP-40
Water Supply Assessment

Prepared for

City of Livermore

Project No. 704-60-22-17

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FINAL REPORT | JUNE 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

ACWD	Alameda County Water District
AF	Acre-Feet
af/yr	Acre-Feet Per Year
Basin	Livermore Valley Groundwater Basin
Cal Water Livermore	California Water Service Livermore District
Cawelo	Cawelo Water District
CEQA	California Environmental Quality Act
cfs	Cubic Feet Per Second
City	City of Livermore
DBP	Disinfectant Byproducts
DCP	Delta Conveyance Project
Delta	Sacramento-San Joaquin Delta
DSRSD	Dublin San Ramon Services District
DWR	Department of Water Resources
EIR	Environmental Impact Report
GMP	Groundwater Management Plan
gpad	Gallons Per Acre Per Day
gpd	Gallons Per Day
GPQ	Groundwater Pumping Quota
LII	Low Intensity Industrial

LWRP	Livermore Water Reclamation Plant
M&I	Municipal and Industrial
MAWA	Maximum Applied Water Allowance
MCL	Maximum Contaminant Level
MGD	Million Gallons Per Day
MGDP	Mocho Groundwater Demineralization Plant
MGY	Million Gallons Per Year
MWELO	Model Water Efficient Landscape Ordinance
NMP	Nutrient Management Plan
NRW	Non-Revenue Water
Proposed Project	Proposed Development at SMP-38, SMP-39 and SMP-40
Regional Demand Study	Tri-Valley Municipal and Industrial Water Demand Study
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SBA	South Bay Aqueduct
Semitropic	Semitropic Water Storage District
SMP	Surface Mining Permits
SNMP	Salt and Nutrient Management Plan
SOI	Sphere of Influence
SR	State Route
SWP	State Water Project
T&O	Taste-and-Odor
UGB	Urban Growth Boundary
UWMP	Urban Water Management Plan
Water Code	California Water Code
WMP	Water Master Plan
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant
Yuba Accord	Lower Yuba River Accord
Zone 7	Zone 7 Water Agency

City of Livermore SMP-38, SMP-39 and SMP-40 Water Supply Assessment

EXECUTIVE SUMMARY

Purpose of Water Supply Assessment

The purpose of this Water Supply Assessment (WSA) is to perform the evaluation required by California Water Code (Water Code) sections 10910 through 10915, as established by Senate Bill 610 (SB 610), in connection with the City of Livermore's (City) proposed project at SMP-38, SMP-39, and SMP-40 (Proposed Project). While both the City and California Water Service's Livermore District (Cal Water-Livermore) provide potable water service within the City's limits, the Proposed Project lies solely within the City's water service area.

This WSA evaluates the projected water demands associated with the Proposed Project and the availability of water supplies to meet those projected water demands under various hydrologic conditions (i.e., normal, single dry, and multiple dry years). This WSA is not intended to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code Section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable City policies and procedures, consistent with existing law.

Proposed Project Overview

If approved, the Proposed Project would be constructed near the western limits of the City's Urban Growth Boundary (UGB), as defined in the City's General Plan. The Proposed Project consists of three separate parcels located in the southwestern corner of the City, west of Isabel Avenue/State Route (SR) 84, north of Stanley Boulevard, and south of West Jack London Boulevard. Referred to as SMP-38, SMP-39, and SMP-40 due to their surface mining permits (SMP), these three parcels are located within the City's UGB, but outside City limits. SMP-38 and SMP-39 are within the City of Pleasanton's Sphere of Influence (SOI), while SMP-40 is within the City's SOI.

These three parcels are currently undeveloped, except for two non-residential structures in the northeast corner of SMP-38, and all are zoned Agriculture by Alameda County. The Proposed Project mainly consists of industrial development, but also includes an on-site trail along the western and southern boundaries of SMP-40, as well as a potential off-site crossing connecting to the existing Arroyo Mocho Trail on the east side of Isabel Avenue/SR 84.

Projected Potable and Recycled Water Demands

The projected potable and recycled water demands for buildout of the Proposed Project are approximately 88 and 21 acre-feet per year (af/yr), respectively. Because the Proposed Project is located within the City's recycled water use area, it is assumed that the Proposed Project's landscaped area will be irrigated with recycled water. Potable water demands for the Proposed Project were calculated based on unit water use factors from the City's 2017 Water Master Plan (WMP), while recycled water demands for the Proposed Project were calculated using the Model Water Efficient Landscape Ordinance (MWELO) Maximum Applied Water Allowance (MAWA) for landscaping in non-residential areas. Consistent with the City's 2017 WMP, potable and recycled water demands for the Proposed Project include 11 percent of non-revenue water (NRW).

This WSA uses water demand projections for the City as presented in the City's 2020 Urban Water Management Plan (UWMP). Because the City's 2020 UWMP did not include demands for the Proposed Project, they have been added to the UWMP projections for use in this WSA.

Water Supply Availability

If approved by the City, the Proposed Project would be served from the City's existing and future portfolio of water supplies. These supplies include purchased potable water from Zone 7 Water Agency (Zone 7) and recycled water produced at the Livermore Water Reclamation Plant (LWRP). Zone 7's existing supplies include imported water from the State Water Project, local surface water runoff, and local and non-local storage. Zone 7 is also participating in several future water supply projects that would improve its water supply reliability.

This WSA concludes that the City's projected water supplies are sufficient to meet existing and projected future water demands, including future water demands associated with the Proposed Project, over a 20-year period and under normal, single dry, and multiple dry years. Zone 7's 2020 UWMP shows excess supplies in all hydrologic conditions through 2045, based on the City's projected demands without the Proposed Project. However, since the additional demand from the Proposed Project would represent approximately 1 percent of the City's projected potable water demands (well within the margin of error for water supply planning purposes), this WSA assumes that Zone 7 can reliably meet the City's total projected potable water demands with the Proposed Project.

The recycled water demand associated with the Proposed Project is also relatively small (approximately 1 percent of the City's projected recycled water demands). Given the high reliability of the City's recycled water supply, this WSA assumes that the City can reliably meet its total projected recycled water demands with the Proposed Project.

1.0 INTRODUCTION

The purpose of this WSA is to perform the evaluation required by California Water Code (Water Code) sections 10910 through 10915 in connection with the Proposed Project. Key topics covered in this introduction include:

- Legal Requirements for the WSA
- Need for and Purpose of WSA
- Water Supply Assessment Preparation, Format, and Organization

1.1 Legal Requirements for the Water Supply Assessment

California Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 were companion measures that sought to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require that detailed information regarding water availability be provided to the city and county decision makers prior to approval of large development projects. The purpose of providing such information is to ensure that prudent water supply planning has been conducted and that planned water supplies are adequate to meet existing demands and anticipated demands from approved or proposed projects.

SB 610 amended Water Code sections 10910 through 10915 to require agencies responsible for land use decisions:

- To identify the public water purveyor(s) that may supply water for a proposed development project; and
- To request a WSA from the identified water purveyor(s).

The City is the identified water purveyor for the Proposed Project. The purpose of the WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the Proposed Project, while still meeting the water purveyor's obligations with regard to existing and planned future uses. Water Code sections 10910 through 10915 delineate the specific information that must be included in the WSA.

SB 221 amended State law (California Government Code Section 66473.7) to require that approval by a city or county of certain residential subdivisions[1] requires an affirmative written verification of sufficient water supply. SB 221 was intended as a fail-safe mechanism to ensure that collaboration on finding the needed water supplies to serve a new large residential subdivision occurs before construction begins.

1.2 Need for and Purpose of Water Supply Assessment

The purpose of this WSA is to perform the evaluation required by Water Code sections 10910 through 10915 (SB 610) in connection with the Proposed Project. This WSA is not intended to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code Section 10914), nor is it intended to meet the requirements of SB 221. The provision of water service will continue

[1] Per Government Code Section 66473.7(a)(1), a subdivision means a proposed residential development of more than 500 dwelling units.

to be undertaken in a manner consistent with applicable City policies and procedures, consistent with existing law.

1.3 Water Supply Assessment Preparation, Format, and Organization

The format of this WSA is intended to clearly delineate compliance with the specific requirements for a WSA, per Water Code sections 10910 through 10915. This WSA includes the following sections:

- Section 1: Introduction
- Section 2: Description of Proposed Project
- Section 3: Required SB 610 Determinations
- Section 4: City of Livermore Water Demands
- Section 5: City of Livermore Water Supplies
- Section 6: Water Supply Reliability
- Section 7: Determination of Water Supply Sufficiency Based on the Requirements of SB 610
- Section 8: Water Supply Assessment Approval Process
- Section 9: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this WSA to demonstrate compliance with the specific requirements of SB 610.

2.0 DESCRIPTION OF PROPOSED PROJECT

This section provides a general description of the Proposed Project location, proposed land uses, projected water demand, and proposed water supply.

2.1 Proposed Project Location

If approved, the Proposed Project would be constructed near the western limits of the City's Urban Growth Boundary (UGB), as defined in the City's General Plan. The Proposed Project consists of three separate parcels located in the southwestern corner of the City, west of Isabel Avenue/State Route (SR) 84, north of Stanley Boulevard, and south of West Jack London Boulevard. Referred to as SMP-38, SMP-39, and SMP-40 due to their surface mining permits (SMP), these three parcels are located within the City's UGB but outside City limits. SMP-38 and SMP-39 are within the City of Pleasanton's Sphere of Influence (SOI), while SMP-40 is within the City's SOI.

Two suppliers provide potable water service to the City: the City and California Water Service's Livermore District (Cal Water-Livermore). The City serves the northwestern and northeastern areas, while Cal Water-Livermore serves the central region. As shown on Figure 2-1, the Proposed Project is located within the City's water service area.

2.2 Proposed Land Uses

Land uses for the Proposed Project are based on the following information provided by Raney Planning & Management, Inc., who is proposing to prepare the Proposed Project's Environmental Impact Report (EIR):

- Jack London Blvd. Conceptual Site Plan (08/23/2021)
- Oaks Business Park Master Site Plan (08/23/2021)

Table 2-1 summarizes the land uses for the Proposed Project, which seeks to develop approximately 71.8 acres. Development is currently not proposed for SMP-38, while SMP-39 and SMP-40 are proposed for industrial use. It is assumed that 15 percent of site acreage will be landscaped.

These three parcels are currently undeveloped, except for two non-residential structures in the northeast corner of SMP-38, and all are zoned Agriculture by Alameda County. The Proposed Project mainly consists of industrial development, but also includes an on-site trail along the western and southern boundaries of SMP-40, as well as a potential off-site crossing connecting to the existing Arroyo Mocho Trail on the east side of Isabel Avenue/SR 84.

Table 2-1. Proposed Land Uses

Site	Proposed Land Use	Total Acreage to be Developed[(a)]	Potable Water Use Area,[(b)] acres	Landscaped Area,[(b)] acres
SMP-38	N/A[(c)]	0	0	0
SMP-39	Light Industrial	31.3	26.6	4.7
SMP-40	Industrial	40.5	34.4	6.1
	Total	**71.8**	**61.0**	**10.8**

(a) Source: Site plans dated August 23, 2021.
(b) 15 percent of site acreage is assumed to be landscaped.
(c) Development is not proposed for SMP-38 at this time.

2.3 Water Use Factors and Assumptions

As part of the City's 2017 Water Master Plan (WMP),[2] the City adopted unit water use factors (also referred to as unit water demand factors) to project potable water demand using proposed future land uses within the City's General Plan. This WSA estimates potable and recycled water demands for the Proposed Project based on these factors and the following assumptions:

- Potable water demands assume Low Intensity Industrial (LII) land use, for which the unit water use factor is 1,150 gallons per acre per day (gpad).
- Since the Proposed Project is in the City's Zone 1 Water Service Area, the Proposed Project's landscaped area (assumed to be 15 percent of the total site acreage) will be irrigated with recycled water.
- While the LII unit water use factor from the 2017 WMP assumes no recycled water use, this WSA still uses it to calculate potable water demands for the Proposed Project. With recycled water used for irrigation, the Proposed Project's actual potable water demands would be lower than estimated in this WSA. Therefore, the Proposed Project's estimated potable water demands in this WSA are conservative.
- Recycled water demands are based on the Model Water Efficient Landscape Ordinance (MWELO) Maximum Applied Water Allowance (MAWA) for landscaping. In non-residential areas, MAWA is calculated using the following equation:

  MAWA = (ETo) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]

  Where:

  MAWA = Maximum Applied Water Allowance, gallons per year

  ETo = reference evapotranspiration, inches per year (47.2 for the City)

  0.62 = factor that converts acre-inches per acre to gallons per square foot

  ETAF = evapotranspiration adjustment factor (0.45 for non-residential areas)

  LA = landscape area, square feet

  SLA = special landscape area, square feet

  Using the equation and values above, the MAWA for non-residential landscaping is 1,570 gpad (1.76 acre-feet per acre per year, af/ac/yr). This unit water use factor will determine the recycled water demands for the Proposed Project's landscaped areas.
- Non-revenue water (NRW) is assumed to be 11 percent of water demands (potable water demands and recycled water) for the Proposed Project.

2.4 Water Demand Calculations

Table 2-2 presents the estimated potable and recycled water demands for the Proposed Project in gallons per day (gpd) and acre-feet per year (af/yr). The unit water use factors presented in Section 2.3 were applied to the corresponding use areas (potable water or landscaped) within each site. The potable and

[2] City of Livermore, December 2017. Water Master Plan Final Report.

recycled water demands for the Proposed Project are approximately 78,900 and 19,000 gpd (88 and 21 af/yr), respectively.

Table 2-2. Projected Potable and Recycled Water Use for the Proposed Project

Site	Use Area,[a] acres	Water Use Factor,[b] gpad	Total Water Demand	
			gpd	af/yr
Potable Water				
SMP-38	0	1,150	0	0
SMP-39	26.6	1,150	30,602	34.3
SMP-40	34.4	1,150	39,595	44.4
Potable Water Subtotal	61.0	--	70,196	78.6
		Non-Revenue Water[c]	8,676	9.7
		Total Potable Water Demand	**78,872**	**88.3**
Recycled Water[d]				
SMP-38	0	1,570	0	0
SMP-39	4.7	1,570	7,379	8.3
SMP-40	6.1	1,570	9,546	10.7
Recycled Water Subtotal	10.8	--	16,925	19.0
		Non-Revenue Water[c]	2,092	2.3
		Total Recycled Water Demand	**19,016**	**21.3**

(a) Refer to Table 2-1.

(b) Potable water use factor is based on Low Intensity Industrial land use from Table 3-5 of the City's 2017 Water Master Plan (WMP). Recycled water use factor is based on the Model Water Efficient Landscape Ordinance Maximum Applied Water Allowance for landscaping in non-residential areas.

(c) Per the City's 2017 WMP, non-revenue water is assumed to be 11 percent of the total water demand for the Proposed Project.

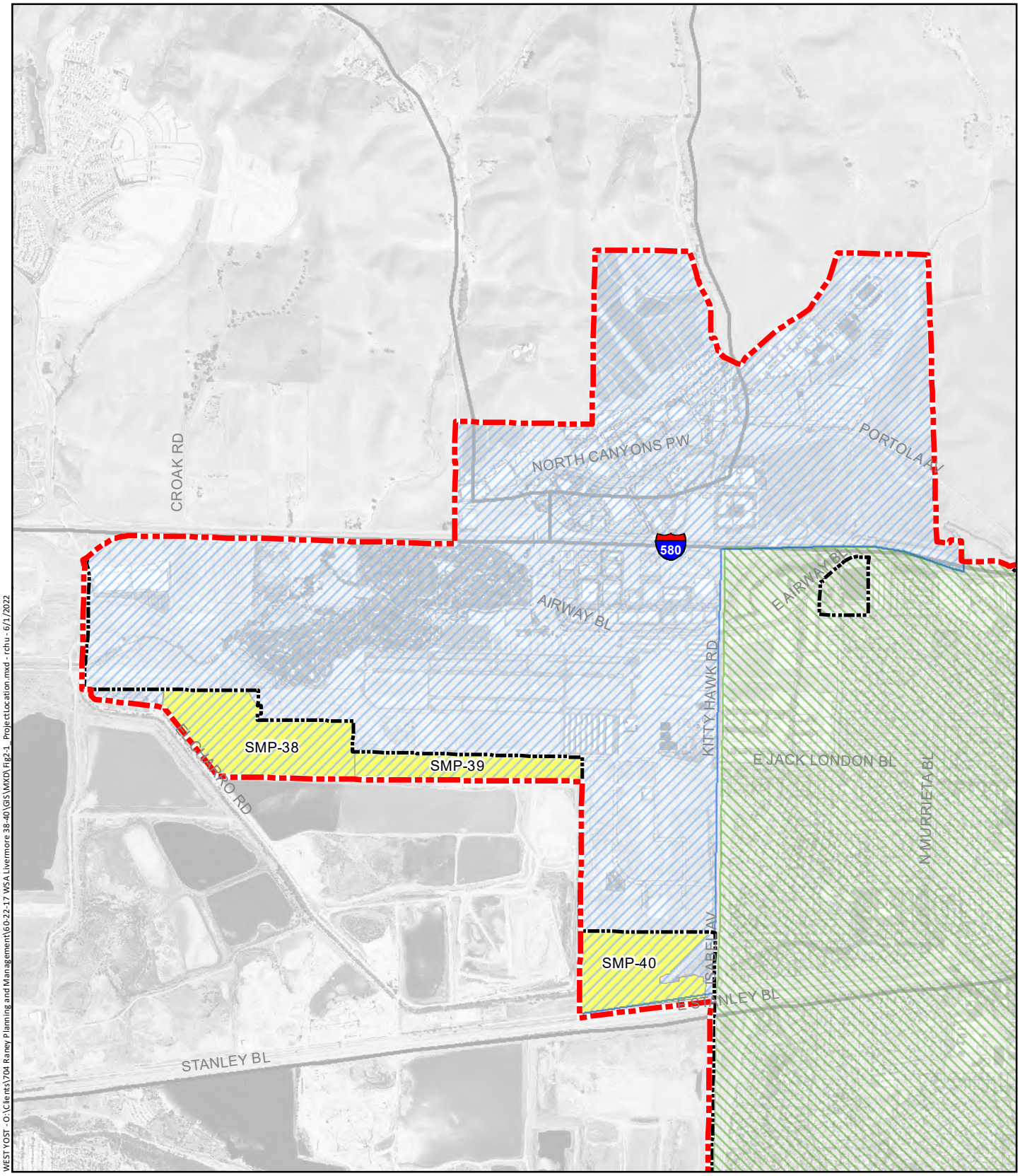
(d) Per the City's 2017 WMP, it is assumed new development in the City's Zone 1 Water Service Area will be supplied with recycled water for irrigation uses.

2.5 Projected Water Supply for the Proposed Project

The City's existing and future portfolio of water supplies will serve the Proposed Project, as allowed by the Water Code:

> *Water Code Section 10631(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).*

Proponents of the Proposed Project will provide their proportionate share of required funding to the City for the acquisition and delivery of treated potable and recycled water supplies to the Proposed Project area (see Figure 2-1).



Proposed Project
Urban Growth Boundary
City Limits
City Water Service Area
Cal Water-Livermore Service Area

N

0 0.25 0.5
Miles

Figure 2-1

Proposed Project Location

City of Livermore
SMP-38, SMP-39 and SMP-40
Water Supply Assessment

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3.0 REQUIRED SB 610 DETERMINATIONS

The following determinations must be made, pursuant to SB 610.

3.1 Does SB 610 Apply to the Proposed Project?

Water Code sections 10910 and 10912 state:

> *10910 (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.*
>
> *10912 (a) "Project" means any of the following:*
>
> *(1) A proposed residential development of more than 500 dwelling units.*
>
> *(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*
>
> *(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*
>
> *(4) A proposed hotel or motel, or both, having more than 500 rooms.*
>
> *(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.*
>
> *(6) A mixed-use project that includes one or more of the projects specified in this subdivision.*
>
> *(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.*

Based on the following assumptions, SB 610 does apply to the Proposed Project.

- The City has determined that the Proposed Project is subject to the California Environmental Quality Act (CEQA) and that an EIR is required.
- In developing approximately 71.8 acres of industrial use, the Proposed Project meets the definition of a "Project" per Water Code Section 10912(a) paragraph (5).

The Proposed Project has not been the subject of a previously adopted WSA and has not been included in an adopted WSA for a larger project. Therefore, according to Water Code Section 10910(a), a WSA is required for the Proposed Project.

3.2 Does SB 221 Apply to the Proposed Project?

In 2001, SB 221 amended State law to require that approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply. Per California Government Code section 66473.7(a)(1), a subdivision means a proposed residential development of more than 500 dwelling units. Since the Proposed Project does not include any residential dwelling units, it is therefore not subject to the requirements of SB 221.

3.3 Who is the Identified Public Water System?

Water Code sections 10910 and 10912 state:

> *10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project.*
>
> *10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…*

The Proposed Project area is within the City's water service area. Therefore, the City is the identified public water system for the Proposed Project.

3.4 Does the Identified Water Supplier have an adopted UWMP, and does the UWMP include the projected water demand for the Proposed Project?

Water Code Section 10910 states:

> *10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).*

The City's 2020 Urban Water Management Plan (UWMP)[3] was adopted by the Livermore City Council in June 2021 and is incorporated by reference into this WSA. Future demand projections in the City's 2020 UWMP extend through 2045 and are based on the Tri-Valley Municipal and Industrial Water Demand Study[4] (Regional Demand Study) developed by Zone 7 Water Agency (Zone 7), the wholesale water supplier for the City and other retailers in the region. The Regional Demand Study forecasts water demand based on land use (i.e., known proposed developments) and other retailer-specific characteristics, such as demographics, historical usage, demand hardening patterns, and population. Buildout in the Regional Demand Study is assumed in 2040, so 2045 demands are the same as 2040 demands.

Demands for the Proposed Project were not included in the Regional Demand Study, so they were also not included in the City's 2020 UWMP. Per Water Code Section 10910(c)(3), if the projected water demand associated with a proposed project is not accounted for in the most recently adopted UWMP, the WSA shall discuss whether water supplies are available to meet the projected water demand for that proposed project during normal, single dry, and multiple dry years. Section 7 of this WSA describes the City's ability to meet the projected water demands for the Proposed Project.

[3] City of Livermore, June 2021. 2020 Urban Water Management Plan.

[4] Zone 7 Water Agency, July 2021. 2020 Tri-Valley Municipal and Industrial Water Demand Study.

4.0 CITY OF LIVERMORE WATER DEMANDS

Water Code Section 10910 states:

> *10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).*
>
> *10910(c)(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.*

As indicated in Section 3.4 of this WSA, the projected water demand associated with the Proposed Project was not accounted for in the City's 2020 UWMP. Nevertheless, existing, and projected water demands from the City's 2020 UWMP are critical for evaluating the City's ability to meet projected water demand associated with the Proposed Project. Therefore, this section summarizes existing and projected water demands in normal and dry years (as presented in the City's 2020 UWMP) and updates demand projections to include demands associated with the Proposed Project.

4.1 Potable and Raw Water Demand – Normal Years

In 2020, the City's potable and raw water demand was approximately 2,134 million gallons per year (MGY), or 6,549 af/yr. The City is expected to be built out by 2040, when potable and raw water demands are projected to reach 2,263 MGY (6,945 af/yr). This modest growth in potable and raw water demands (6 percent) reflects the City's status as being mostly built out already. Table 4-1 summarizes the City's existing and projected potable and raw water demands, as presented in its 2020 UWMP.

Table 4-1. City of Livermore Existing and Projected Potable and Raw Water Demand in Normal Years

Units	2020, Actual	2025	2030	2035	2040	2045
Potable and Raw Water Demand, MGY	2,134	2,100	2,155	2,209	2,263	2,263
Potable and Raw Water Demand, af/yr	6,549	6,445	6,613	6,779	6,945	6,945

Source: City of Livermore 2020 UWMP, Tables 2-3 and 2-4

Because the City's 2020 UWMP does not include demands for the Proposed Project, this WSA recalculates the City's projected potable water demands by adding demands for the Proposed Project to the potable and raw water demand projections from the City's 2020 UWMP. The timing of the Proposed Project is uncertain, so this WSA conservatively includes demands for the Proposed Project beginning in 2025. Table 4-2 summarizes the projected potable and raw water demands used throughout this WSA.

Table 4-2. Normal Year Projected Potable and Raw Water Demand with Proposed Project, af/yr					
Demand Source	2025	2030	2035	2040	2045
2020 UWMP[a]	6,445	6,613	6,779	6,945	6,945
Proposed Project (Potable Water)[b]	88	88	88	88	88
Total Potable and Raw Water Demand with Proposed Project	**6,533**	**6,702**	**6,868**	**7,033**	**7,033**

(a) Refer to Table 4-1.
(b) Refer to Table 2-2.

4.2 Potable and Raw Water Demand – Dry Years

The City's Water Shortage Contingency Plan (WSCP) defines six water shortage stages with associated demand reduction and supply augmentation actions and operational changes. Table 4-3 summarizes the water supply conditions for each water shortage stage.

Table 4-3. City of Livermore Water Shortage Stages	
Stage	Percent Supply Reduction
1	Up to 10 percent
2	Up to 20 percent
3	Up to 30 percent
4	Up to 40 percent
5	Up to 50 percent
6	More than 50 percent
Source: City of Livermore 2020 UWMP, Appendix C, Table 4-1	

In both the City's 2020 UWMP and in this WSA, dry year water demands are assumed to be unconstrained when compared to projected supplies. In other words, when evaluating future water supplies, neither the City's 2020 UWMP nor this WSA assume the City's WSCP would be implemented (which would reduce demands) during dry years. This conservative assumption means that demands in single dry years and the first years of multiple dry year periods are equal to normal year demands presented in Table 4-2. Consistent with Table 7-4 of the City's 2020 UWMP, demands in multiple dry years 2 through 5 are linearly interpolated. Table 4-4 summarizes the City's projected future dry year potable and raw water demands (including potable water demands for the Proposed Project).

Table 4-4. Projected Future Dry Year Potable and Raw Water Demand, af/yr

Hydrologic Condition	Demand Reduction[a]	2025	2030	2035	2040	2045
Single Dry Year	0	6,533	6,702	6,868	7,033	7,033
Multiple Dry Year 1	0	6,533	6,702	6,868	7,033	7,033
Multiple Dry Year 2[b]	0	6,567	6,735	6,901	7,033	7,033
Multiple Dry Year 3[b]	0	6,601	6,768	6,934	7,033	7,033
Multiple Dry Year 4[b]	0	6,634	6,801	6,967	7,033	7,033
Multiple Dry Year 5[b]	0	6,668	6,834	7,000	7,033	7,033

(a) Conservatively assumes no demand reduction in dry years.
(b) Consistent with Table 7-4 of the City's 2020 UWMP, potable and raw water demand projections in multiple dry years 2 through 5 are linearly interpolated.

4.3 Recycled Water Demand

Table 4-5 summarizes the City's current (2020) and projected recycled water use, as presented in the City's 2020 UWMP. Table 4-6 updates the City's projections with recycled water demands from the Proposed Project. Recycled water demands are assumed to be the same in both normal and dry years.

Future recycled water use is based on current uses plus expected growth and is expected to decrease slightly due to planned upgrades at the Livermore Water Reclamation Plant (LWRP) that will reduce the LWRP's recycled water demand. While some new development within the City's recycled water use area will increase recycled water demands, the City does not currently plan to significantly expand its recycled water use area. Instead, the City is conducting potable reuse studies to guide upcoming recycled water efforts.

Table 4-5. City of Livermore Existing and Projected Recycled Water Demand

Units	2020, Actual	2025	2030	2035	2040	2045
Recycled Water Demand, MGY	710	616	635	653	671	671
Recycled Water Demand, af/yr	2,179	1,890	1,949	2,004	2,059	2,059

Source: City of Livermore 2020 UWMP, Table 2-5

Table 4-6. Recycled Water Demand with Proposed Project, af/yr

Demand Source	2025	2030	2035	2040	2045
2020 UWMP[a]	1,890	1,949	2,004	2,059	2,059
Proposed Project (Recycled Water)[b]	21	21	21	21	21
Total Recycled Water Demand with Proposed Project	**1,912**	**1,970**	**2,025**	**2,081**	**2,081**

(a) Refer to Table 4-5.
(b) Refer to Table 2-2.

5.0 CITY OF LIVERMORE WATER SUPPLIES

Water Code Section 10910 states:

> *10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).*
>
> *10910(c)(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.*
>
> *10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.*
>
> *10910(d)(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:*
>
> *(A) Written contracts or other proof of entitlement to an identified water supply.*
>
> *(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.*
>
> *(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.*
>
> *(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.*
>
> *10910(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract-holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.*

The following descriptions are adapted from Zone 7's 2020 UWMP (adopted in May 2021) and the City's 2020 UWMP (adopted in June 2021).

5.1 Water Supply Overview

The City obtains potable water supplies from Zone 7, a multi-purpose agency that oversees water-related issues in the Livermore-Amador Valley. Zone 7 is a State Water Project (SWP) contractor that wholesales treated water to four retail water agencies: Dublin San Ramon Services District (DSRSD), Cal Water-Livermore, and the cities of Livermore and Pleasanton. In addition, Zone 7 retails potable water to several direct

customers, retails non-potable water for agricultural irrigation, provides and maintains flood control facilities, and manages groundwater and surface water supplies in its service area. Section 5.2 of this WSA details Zone 7's potable water supplies.

The City also has a small groundwater pumping quota (GPQ) of 30 af/yr from the Main Basin of the Livermore Valley Groundwater Basin, but the City currently neither pumps groundwater nor plans to do so in the future. However, Zone 7 delivers groundwater as part of its overall supply to the City. This groundwater supply is detailed in Section 5.3 of this WSA.

Recycled water augments the City's potable water supplies. The City owns and operates the LWRP, which treats wastewater collected within Livermore city limits and produces recycled water. Section 5.4 of this WSA describes the City's recycled water supply.

5.2 Potable Water Supplies from Zone 7

Zone 7's water supply has two major components: (1) incoming water through contracts and water rights each year, and (2) accumulated water stored 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. Zone 7's water supplies include:

- Imported surface water from the SWP
- Local surface water runoff captured in Del Valle Reservoir
- Local groundwater extracted from the Main Basin
- Local storage in the Chain of Lakes
- Non-local groundwater storage in Kern County (Semitropic Water Storage District and Cawelo Water District)

The following sections describe each supply.

5.2.1 State Water Project

Imported water from the SWP, which is owned and operated by the Department of Water Resources (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 and flows through the Sacramento-San Joaquin Delta (Delta) before it is conveyed by the South Bay Aqueduct (SBA) to Zone 7 and others. 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.

For Zone 7, SWP water serves treated water demands from municipal and industrial (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 Main Basin and fill non-local groundwater storage in Kern County.

This section describes Zone 7's contract with DWR for SWP water and the types of water Zone 7 receives under this contract. Also, this section discusses a separate agreement between DWR and Zone 7 for additional SWP water under the Lower Yuba River Accord (Yuba Accord).

5.2.1.1 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. 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** – capital costs associated with the development and maintenance of the SWP are typically financed using revenue bonds. These bonds have historically been sold with 30-year terms. Recently, it has become more challenging to finance capital expenditures for the SWP because bonds used to finance these expenditures are limited to terms that only extend to the year 2035 (the last year of the original contract and only 13 years from 2022). To ensure continued affordability of debt service to SWP contractors and allow DWR to continue to sell bonds with 30-year terms, it was necessary to extend the termination date of the contracts. On January 18, 2019, DWR and Zone 7 agreed to extend the SWP water supply contract to at least December 31, 2085 (Extension Amendment). As of March 2021, DWR and 22 SWP contractors have executed the Extension Amendment.
- **Improved Water Management Tools** – seeking greater flexibility to manage the system to address changes in hydrology and 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 improve water management amongst the SWP contractors by developing concepts to supplement and clarify the existing SWP contracts' water transfer and exchange provisions. The WMT Amendment became effective on February 28, 2021 for the SWP contractors that approved the amendment, including Zone 7. The EIR for the WMT Amendment is being challenged in court, but the enhanced ability to transfer and exchange SWP water will be available during litigation.
- **Delta Conveyance Project** – The Delta Conveyance Project (DCP) is the current DWR project designed to address the need for alternative conveyance in the Delta to reliably deliver SWP supplies. This SWP contract amendment would allocate DCP costs and benefits among the SWP contractors. DWR and the SWP contractors have reached an agreement in principle regarding a contract amendment regarding the DCP, but participating SWP contractors will wait for environmental review of the DCP to be completed before making a final decision.

5.2.1.2 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." Zone 7's Table A amount has increased along with its demands and following a series of permanent transfers. Currently, Zone 7's Table A allocation is 80,619 af/yr.

The Table A allocation is typically less than 100 percent of the Table A amount. In practice, the actual amount of SWP water available to Zone 7 under the Table A allocation process 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.

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),[5] 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 (2040) conditions.

For Zone 7's Table A supply, the 2019 DCR's existing condition was assumed to represent 2020 (59 percent Table A reliability, or 47,600 af/yr), and the future condition (54 percent Table A reliability, or 43,500 af/yr) was applied to 2040; the years in between were interpolated between these two bookends. Note that the effect of the proposed DCP 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 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. In its 2020 UWMP, Zone 7 assumes it will carry over 10,000 AF of water each year on average.

5.2.1.3 Article 21 Water (Interruptible or Surplus Water)

Under Article 21 of Zone 7's SWP contract, Zone 7 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 has assumed no water supply yield from Article 21. As Zone 7 develops the Chain of Lakes project, which will increase Zone 7's local storage and ability to capture Article 21 water, Zone 7 will re-evaluate the potential increase in Article 21 yield.

5.2.1.4 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.

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 in Section 5.2.1.1 of this WSA, it is expected that there will not be much water available under Article 56d in the future. Zone 7 has therefore assumed no supplies are available from this source under normal conditions.

[5] Department of Water Resources, August 2020. State Water Project Delivery Capability Report 2019.

5.2.1.5 Yuba Accord

In 2008, Zone 7 entered into a contract with DWR to purchase additional water under the 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 acre-feet (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 from the Yuba Accord.

5.2.2 Local Surface Water Runoff

Zone 7, along with the Alameda County Water District (ACWD), has a water right (Permit 11319 [Application 17002]) to divert flows from Arroyo Valle. Runoff from the Arroyo Valle watershed is stored in Lake Del Valle, 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 recreational and flood control functions. In late fall, DWR typically lowers lake levels in anticipation of runoff from winter storms. 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.

Using historical hydrology adjusted for climate change impacts, Zone 7's latest modeling forecasts future average yields from Arroyo Valle to Zone 7 at approximately 5,500 af/yr. Previous planning documents, including Zone 7's 2015 UWMP, assumed an average yield of 7,300 af/yr, and the 2011-2020 average was 3,500 af/yr. Construction of the Chain of Lakes Arroyo Valle diversion structure and pipeline will allow Zone 7 to capture more of the storm releases from Lake Del Valle and will likely increase the local surface water yield in the future. The conservative average yield estimate of 5,500 af/yr will be re-evaluated as climate change impacts become clearer and as the Chain of Lakes projects progress.

5.2.3 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, with runoff collected in any given year 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. Section 5.3 of this WSA further describes the Main Basin and Zone 7's groundwater supply.

5.2.4 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 located in Kern County. 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.

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 of Directors (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.

5.2.4.1 Semitropic Water Storage District

In 1998, Zone 7 acquired a storage capacity of 65,000 AF in the Semitropic groundwater banking program. 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. As a result, Zone 7 currently has a total groundwater banking storage capacity of 78,000 AF available to augment water supplies during drought and emergency conditions and as needed. Zone 7 can store up to 5,883 af/yr 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.

5.2.4.2 Cawelo Water District

Per a 2006 agreement, Zone 7 has 120,000 AF of groundwater banking storage capacity available with Cawelo. Zone 7 can store up to 5,000 af/yr in the bank and can request up to 10,000 af/yr of pumpback (or SWP exchange water) from Cawelo. 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.

5.3 Groundwater Supply

Water Code Section 10910 states:

> *10910(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment.*
>
> *10910(f)(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.*
>
> *10910(f)(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which 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 public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as over drafted or has projected that the basin will become over drafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the*

groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long term overdraft condition.

10910(f)(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

10910(f)(4) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.

A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

The City does not currently pump groundwater (nor plans to in the future) but receives groundwater as part of its supply from Zone 7. This section describes the Main Basin and how Zone 7 manages it to maintain groundwater supplies and quality.

5.3.1 Groundwater Basin

Zone 7 overlies the Livermore Valley Groundwater Basin (Basin); the Main Basin is the portion of the Basin that contains high-yielding aquifers and generally the best-quality groundwater. 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, in overdraft, or expected to be in overdraft, and DWR has identified it as medium priority.

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 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.

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.

5.3.2 Groundwater Quantity

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. 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.

5.3.2.1 Historical and Projected Future Pumpage

Tables 5-1 and 5-2 present Zone 7's historical and projected future groundwater pumpage, respectively. Zone 7's artificial recharge program uses surface water supplies to recharge the Main Basin. Since Zone 7 only pumps what it artificially recharges, future groundwater pumpage is expected to have zero net impact on groundwater storage. Zone 7 plans to recharge about 9,200 af/yr in the future, meaning Zone 7 can pump an equivalent 9,200 af/yr from the Main Basin on average.

Table 5-1. Historical Groundwater Pumped by Zone 7

Basin Name	Volume, AF				
	2016	2017	2018	2019	2020
Livermore Valley Groundwater Basin	1,871	4,859	5,691	10,433	12,400

Source: Zone 7 2020 UWMP, Table 6-2

Table 5-2. 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**

Source: Zone 7 2020 UWMP, Table 6-3

(a) Zone 7 does not use the Main Basin's natural sustainable yield, so it only pumps what it artificially recharges.
(b) Includes 600 AF of demineralization losses.

5.3.2.2 Artificial Recharge

Before the construction of the SWP in the early 1960s, groundwater was the sole water source for the Livermore-Amador Valley. Groundwater 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, but was allowed to recover from 1962 to 1983. It was during this recovery 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.

Zone 7's operational policy is to balance natural and artificial recharge with withdrawal or pumping to maintain groundwater levels above the emergency reserve storage. 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 and spatial distribution in the Main Basin.

Between 1974 and 2020, Zone 7 artificially recharged over 67,000 AF more water than it pumped, helping to offset demands and keep the Main Basin's groundwater levels above the historical lows. More recently, Zone 7 has artificially recharged less than it has pumped, primarily due to construction work on the SBA, recent drought conditions, and lower-than-average SWP allocations. Overall groundwater storage remains significantly above historic lows, and Zone 7 plans to augment its current groundwater in-stream recharge capacity with off-stream recharge using the future Chain of Lakes project.

5.3.2.3 Current Sustainable Yield

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, irrigation waters, and inflow of subsurface waters—that 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 it has artificially recharged.

The natural sustainable yield of the Main Basin has been determined to be about 13,400 af/yr, 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 and is allocated to Zone 7's retailers as a GPQ. If a retailer uses less than their GPQ in one year, they are allowed to carry over up to 20 percent of their GPQ to the next year. Retailers exceeding their GPQ must pay a recharge fee.

5.3.3 Groundwater Quality

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 are 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 Mocho Groundwater Demineralization Plant (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 total dissolved solids (TDS) and hardness levels. To address this problem, Zone 7 developed a Salt Management Plan,[6] which was approved by the Regional Water Quality Control Board (RWQCB) in 2004, satisfying a condition of the Master Water Recycling Permit. The Salt Management Plan was incorporated into Zone 7's Groundwater Management Plan (GMP) in 2005. Salinity levels are being addressed primarily through groundwater pumping and demineralization. Zone 7 completed construction of the MGDP, which has a capacity of 6.1 million gallons per day (MGD) in 2009. 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 5-3 lists the average TDS and hardness for each year from 2016 through 2020.

Table 5-3. 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

Source: Zone 7 2020 UWMP, Table 6-4

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, onsite domestic wastewater systems (septic systems), and 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 LWRP—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 Salt Management Plan, as discussed above. In 2015, Zone 7 completed a Nutrient Management Plan (NMP),[7] which assesses 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

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

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

of septic systems is the predominant method for sewage disposal. The NMP was prepared as a supplement to the Salt Management Plan; together, they are a Salt and Nutrient Management Plan (SNMP), which has been incorporated into the GMP and Alternative Groundwater Sustainability Plan.

Under the Toxic Sites Surveillance Program, Zone 7 documents and tracks polluted sites across the Main 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 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.[8]

5.4 Recycled Water

The LWRP provides disinfected tertiary treated recycled water to the northwest portion of the City. The recycled water distribution system includes two aboveground reservoirs (each with a capacity of 1.88 million gallons), approximately 20 miles of recycled water distribution pipeline (ranging in diameter from 4 to 18 inches), and 100 recycled water fire hydrants for construction, fire protection, and system maintenance. Across the City's 168 metered connections, recycled water is used for landscape and agricultural irrigation, fire protection, construction, street sweeping, and toilet and urinal flushing.

5.5 Summary of Current and Projected Future Water Supplies

Table 5-4 summarizes the City's current (2020) and projected future water supplies under normal weather conditions. As presented in the City's 2020 UWMP, projected potable water supplies from Zone 7 are assumed to equal projected potable water demands, while projected recycled water supplies are assumed to equal projected recycled water demands. An increase in the City's projected potable water demands (e.g., from the Proposed Project) does not necessarily mean Zone 7's supplies would be insufficient. Section 7 of this WSA evaluates water supply sufficiency.

Table 5-4. City of Livermore Existing and Projected Future Water Supplies, af/yr

Water Source	2020, Actual	2025	2030	2035	2040	2045
Potable Water from Zone 7[(a)]	6,549	6,445	6,613	6,779	6,945	6,945
Recycled Water[(b)]	2,179	1,890	1,949	2,004	2,059	2,059
Total	**8,728**	**8,335**	**8,562**	**8,783**	**9,004**	**9,004**

(a) Source: City of Livermore 2020 UWMP, Tables 4-3 and 4-4; converted to af/yr.
(b) From Table 4-5 of this WSA.

[8] Zone 7 Water Agency, March 2021. Annual Report for the Sustainable Groundwater Management Program 2020 Water Year.

6.0 WATER SUPPLY RELIABILITY

This section descries the reliability of Zone 7's potable water supply and the City's recycled water supply under various hydrologic conditions, as presented in their respective 2020 UWMPs.

6.1 Potable Water Supply Reliability

The reliability of the City's potable water supply depends on Zone 7's water supply reliability policy and the reliability of Zone 7's supplies. This section details each of these factors.

6.1.1 Zone 7 Reliability Policy for Municipal & Industrial Water Supplies

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

- 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.

Zone 7's water supply reliability analysis is based on future water supply options developed to meet this policy over the long term.

6.1.2 Zone 7 Water Supply Reliability

The quantity of water available from Zone 7's supply sources varies annually 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. 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 supply source, Table 6-1 lists the years representing the normal, single driest, and five consecutive dry years. Table 6-2 presents the estimated available water supply from each source based on these reference years.

Table 6-1. Basis of Water Year Data for Zone 7's Water Supply Sources

Water Source	Normal Year	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
SWP – Table A	1965	2014	1987	1988	1989	1990	1991
SWP – Carryover	1965	2014	1987	1988	1989	1990	1991
Water Transfers	1965	2014	1987	1988	1989	1990	1991
Arroyo Valle	1919	1977	1987	1988	1989	1990	1991
Sites Reservoir	1965	2014	1987	1988	1989	1990	1991
BARDP[(a)] and/or Potable Reuse	1965	2014	1987	1988	1989	1990	1991
From Storage							
Main Basin	1965	2014	1987	1988	1989	1990	1991
Semitropic	1965	2014	1987	1988	1989	1990	1991
Cawelo	1965	2014	1987	1988	1989	1990	1991
Chain of Lakes	1965	2014	1987	1988	1989	1990	1991

Source: Zone 7 2020 UWMP, Tables 7-1 through 7-10

(a) BARDP = Bay Area Regional Desalination Project

Table 6-2. Summary of Estimated Available Water Supply from Zone 7's Sources

Water Source	Yield, af/yr		
	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

Source: Zone 7 2020 UWMP, Table 7-11

(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. Annual amounts may vary, 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.

The following sections discuss the reliability of Zone 7's water supply sources and its strategies for managing the risks associated with each supply, as presented in Zone 7's 2020 UWMP. This analysis is based on 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.

6.1.2.1 Imported Water: State Water Project

Major constraints on SWP supplies include Delta conveyance, water quality, and SBA conveyance. This section describes each constraint.

6.1.2.1.1 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 a 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.

DWR has prioritized, funded, and implemented Delta levee improvements and developed a plan for responding to levee failures. These efforts, along with pre-positioned emergency flood fighting materials, help ensure reasonable seismic performance of levees and timely pathway restoration after a severe earthquake.

Zone 7 is also participating in alternative conveyance projects, specifically the DCP and the Los Vaqueros Expansion Project. The Transfer-Bethany Pipeline is part of the Los Vaqueros Expansion Project and would provide an alternate means of conveying water to Zone 7 when the Delta is inaccessible.

6.1.2.1.2 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 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, 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 Del Valle Water Treatment Plant and scheduled for completion at the Patterson Pass Water Treatment Plant 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 WTP 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. Climate change-induced sea level rise is also expected to increase salinity in Delta. Finally, levee breaks—due to earthquakes and other factors—would result in significant saltwater intrusion 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 WTP production capacities and could require supplemental groundwater use.

As noted above, Zone 7 has state-of-the-art ozonation facilities at the Del Valle WTP, and ozonation facilities will be operational at the Patterson Pass WTP 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, Valley Water, 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.

6.1.2.1.3 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, Valley Water, 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 other stakeholders 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 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 the East Bay Municipal Utility District 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 Del Valle WTP via one of the SBA turnouts.

6.1.2.2 Local Storage

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 Del Valle WTP have significantly reduced the impact.

The future Chain of Lakes 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 Chain of Lakes 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.

6.1.2.3 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). To facilitate these exchanges, there must be sufficient water flowing through the Delta and California Aqueduct system, 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 6.1.2.1 of this WSA.

During the 2012-2016 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.

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.

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.

6.1.3 Groundwater Supply Reliability

Zone 7 is actively implementing its SNMP. Salinity levels are being addressed primarily through groundwater pumping and demineralization using the MGDP, which 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 groundwater extraction possible under various conditions while maintaining levels above historical lows. Zone 7 also plans to augment its ability to recharge the Main Basin (e.g., through the Chain of Lakes) 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 improve 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.

6.2 Recycled Water Supply Reliability

The City's recycled water supply is considered reliable under all hydrologic conditions (i.e., normal, single dry, and multiple dry years). Since the City anticipates no significant changes to the land uses in its wastewater service area, it does not expect any changes to the wastewater effluent quality that would impact recycled water production. Therefore, the City does not expect recycled water quality issues to impact its ability to reliably deliver recycled water to its customers.

7.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

Water Code Section 10910 states:

> *10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*

This section separately evaluates potable/raw and recycled water supply sufficiency. Since potable water demands for the Proposed Project were not included in the City's 2020 UWMP, the following analysis relies on Zone 7's 2020 UWMP. Recycled water supply sufficiency is based on the City's conclusion in its 2020 UWMP that recycled water is highly reliable.

7.1 Potable and Raw Water Supply Sufficiency

Pursuant to Water Code Section 10910(c)(4) and based on the technical analyses described in this WSA, the total projected water supplies determined to be available for the Proposed Project during normal, single dry, and multiple dry years during a 20-year projection will meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses.

Zone 7's 2020 UWMP indicates that it will have a supply surplus in all hydrologic conditions through 2045. Further, the additional demand from the Proposed Project, if approved by the Livermore City Council, represents approximately 1 percent of the City's potable water demands. This small percentage is not considered significant enough to warrant interim analysis, as it is well within the margin of error for water supply planning purposes. Therefore, this WSA assumes that Zone 7 supplies can meet the City's projected potable and raw water demands (including potable water demands for the Proposed Project) in all hydrologic conditions through 2045.

Table 7-1 compares the City's projected potable and raw water supplies and demands for normal, single dry, and multiple dry years through 2045. As shown in Table 7-1, demand within the City's service area is not expected to exceed the City's supplies in any year or hydrologic condition. For the purposes of this WSA, no demand reductions are assumed during dry years.

7.2 Recycled Water Supply Sufficiency

As presented in Section 2.4 of this WSA, the recycled water demand for the Proposed Project is approximately 21 af/yr, or about 1 percent of the City's annual projected recycled water demand through 2045. Given the high reliability of the City's recycled water supply and the relatively small, recycled water demand associated with the Proposed Project, this WSA assumes the City can meet the recycled water demand associated with the Proposed Project under all hydrologic conditions.

Therefore, pursuant to Water Code Section 10910(c)(4) and based on the technical analyses described in this WSA, the City can meet the projected recycled water demands for the Proposed Project, in addition to existing and planned future uses, in normal, single dry, and multiple dry water years during a 20-year projection.

Table 7-1. Summary of Potable and Raw Water Demand Versus Supply During Hydrologic Normal, Single Dry, and Multiple Dry Years, af/yr

Hydrologic Condition		2025	2030	2035	2040	2045
Normal Year						
Available Potable and Raw Water Supply[a]		6,533	6,702	6,868	7,033	7,033
Total Water Demand[b]		6,533	6,702	6,868	7,033	7,033
	Potential Surplus (Deficit)	0	0	0	0	0
	Supply Shortfall, Percent of Demand	-	-	-	-	-
Single Dry Year						
Available Potable and Raw Water Supply[a]		6,533	6,702	6,868	7,033	7,033
Total Water Demand[b]		6,533	6,702	6,868	7,033	7,033
	Potential Surplus (Deficit)	0	0	0	0	0
	Supply Shortfall, Percent of Demand	-	-	-	-	-
Multiple Dry Years						
Multiple Dry Year 1	Available Potable and Raw Water Supply[a]	6,533	6,702	6,868	7,033	7,033
	Total Water Demand[b]	6,533	6,702	6,868	7,033	7,033
	Potential Surplus (Deficit)	0	0	0	0	0
	Supply Shortfall, Percent of Demand	-	-	-	-	-
Multiple Dry Year 2	Available Potable and Raw Water Supply[a]	6,567	6,735	6,901	7,033	7,033
	Total Water Demand[b]	6,567	6,735	6,901	7,033	7,033
	Potential Surplus (Deficit)	0	0	0	0	0
	Supply Shortfall, Percent of Demand	-	-	-	-	-
Multiple Dry Year 3	Available Potable and Raw Water Supply[a]	6,601	6,768	6,934	7,033	7,033
	Total Water Demand[b]	6,601	6,768	6,934	7,033	7,033
	Potential Surplus (Deficit)	0	0	0	0	0
	Supply Shortfall, Percent of Demand	-	-	-	-	-
Multiple Dry Year 4	Available Potable and Raw Water Supply[a]	6,634	6,801	6,967	7,033	7,033
	Total Water Demand[b]	6,634	6,801	6,967	7,033	7,033
	Potential Surplus (Deficit)	0	0	0	0	0
	Supply Shortfall, Percent of Demand	-	-	-	-	-
Multiple Dry Year 5	Available Potable and Raw Water Supply[a]	6,668	6,834	7,000	7,033	7,033
	Total Water Demand[b]	6,668	6,834	7,000	7,033	7,033
	Potential Surplus (Deficit)	0	0	0	0	0
	Supply Shortfall, Percent of Demand	-	-	-	-	-

(a) Based on excess supplies presented in Zone 7's 2020 UWMP and the relatively small demand from the Proposed Project, Zone 7's supplies are assumed to equal projected demands.

(b) Equals the City's total projected potable and raw water demand with the Proposed Project (from Table 4-2 and Table 4-4).

8.0 WATER SUPPLY ASSESSMENT APPROVAL PROCESS

Water Code sections 10910 and 10911 state:

> *10910 (g)(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.*
>
> *10911 (b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.*

This WSA must be approved by the Livermore City Council and included in the Draft EIR being prepared for the Proposed Project.

9.0 REFERENCES

California Department of Water Resources, August 2020. State Water Project Delivery Capability Report 2019.

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