Appendix I:
Utilities and Service Systems Supporting Information

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I.1 - Water Supply Assessment

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DRAFT Water Supply Assessment for the Giovannoni Logistics Center Project

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EXECUTIVE SUMMARY

Giovannoni Logistics Center ("Project") in the City of American Canyon in Napa County, California, is a proposed light industrial project. The Project is bounded by the Napa Logistics Park and Devlin Road to the north, Green Island Road and warehouses to the south, Green Island Road Business Park to the west, and Union Pacific Railroad/Napa Branch Line to the east. The Project is broken up into two construction phases. Phase 1 is the eastern portion of the project including two warehouses with roughly 1.1 million square feet of warehouse space. Phase 2 is the western portion of the project with conceptually up to 1.3 million square feet of similar uses.

This Water Supply Assessment (WSA) presents the proposed potable and recycled water use for the Project, and assesses the potential impact to citywide supply and demand projections through the year 2040 for the City of American Canyon. The Project would be served by water provided by the City of American Canyon. Phase 1 is estimated to use up to 10.8 acre-feet per year (afy) of potable water to serve the two warehouses at the site, and up to 37.1 afy of recycled water, predominantly for landscape irrigation. Phase 2 is estimated to use up to 13.1 afy of potable water for warehouses and up to 45.0 afy of recycled water for landscape irrigation.

The Project will use less potable water over the long-term than was assumed in the demand analysis in the City's Urban Water Management Plan (UWMP) for the project site (133.3 afy less). In addition, compliance with the City's Zero Water Footprint policy would offset the Project's potable demand through off-site implementation of project-funded water conservation measures of up to 23.9 afy. The citywide supply/demand analysis in this WSA anticipates sufficient supply in all normal years, but shortfalls in water supply during dry-year scenarios in 2035 and 2040, consistent with the analysis in the 2015 UWMP. State Water Project carryover water is anticipated to be available in amounts great enough to accommodate these deficiencies. In addition, the City may choose to make use of other options available, including Advanced Table A Water, drought demand restrictions, or water purchases on the open market. As such, adequate supply is projected to be available under all planning scenarios.

The City produces recycled water to meet demand and, along with recycled water supplied by the Napa Sanitation District, has sufficient long-term supply capacity to meet projected demand both at the project site and throughout the City's service area.

1 INTRODUCTION

This report analyzes the projected water supply and demand for the Giovannoni Logistics Center (Project) in the City of American Canyon in Napa County, California. The Water Supply Assessment (WSA) is intended to support environmental planning documentation for the Project, which includes approximately 2.4 million square feet of warehouse space.

1.1 Regulatory Background

Section 10910 of the California Water Code (as revised by Senate Bill 610, or SB610) requires: "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, "…[to] identify a water system…that may supply water for the project," and to prepare a WSA to address the increased water use over existing conditions. The WSA is intended to:

1. Identify the water system or systems that would (or may) supply water to the project;
2. Compare project water demands with those projections included in the most-recently adopted Urban Water Management Plan or Plans for those service providers; and
3. Assess whether the public water system's total projected water availability for the entire system(s) during normal, single dry, and multiple dry years over a 20-year period 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).

Within this assessment, California Water Code Section 10910(4)(d) requires a discussion of existing water supply entitlements, water rights, or water service contracts relevant to the public water system(s). Also, Section 10910 (2)(f) requires that "If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment: (1) a review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project (2) a description of any groundwater basin or basins from which the proposed project will be supplied."

The proposed Project is a logistics warehouse complex on approximately 208 acres with 2.4 million square feet of warehouse space. Section 10912(a) of the California Water Code outlines the types of projects requiring a Water Supply Assessment, including:

- "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."

As such, the Project requires a WSA. See Section 3.1 for a discussion of estimated water demand for the Project.

Water supply for the proposed project would be served by the City of American Canyon ("City"). Water sources available to the City are discussed in Section 2. The City prepared a 2015 Urban Water Management (UWMP) (Kennedy Jenks, 2016) that projected water supply and demand within the service district through 2040. While the Project was not explicitly named in the 2015 UWMP, the UWMP did generally account for projected increases in demand associated with expected development in the city limits of American Canyon, including the parcel for the Project. Section 3.2 discusses the differences in potable and recycled water demand of the proposed project area compared to the assumed demand. Section 4 compares the system-wide supply and demand for the City to assess whether there is sufficient supply to support existing water uses, the Project, and other planned future uses through 2040.

1.2 Project Location

The Project is located in the northern portion of the City of American Canyon in Napa County, California. The proposed development is bounded by the Napa Logistics Park and Devlin Road to the north, Green Island Road and warehouses to the south, Green Island Road Business Park to the west, and Union Pacific Railroad/Napa Branch Line to the east. The Project is broken up into two construction phases. Phase 1 is the eastern portion of the project including two warehouses, roughly 1.1 million square feet of warehouse floor space. Phase 2 is the western portion of the project with conceptually up to 1.3 million square feet of warehouse space.

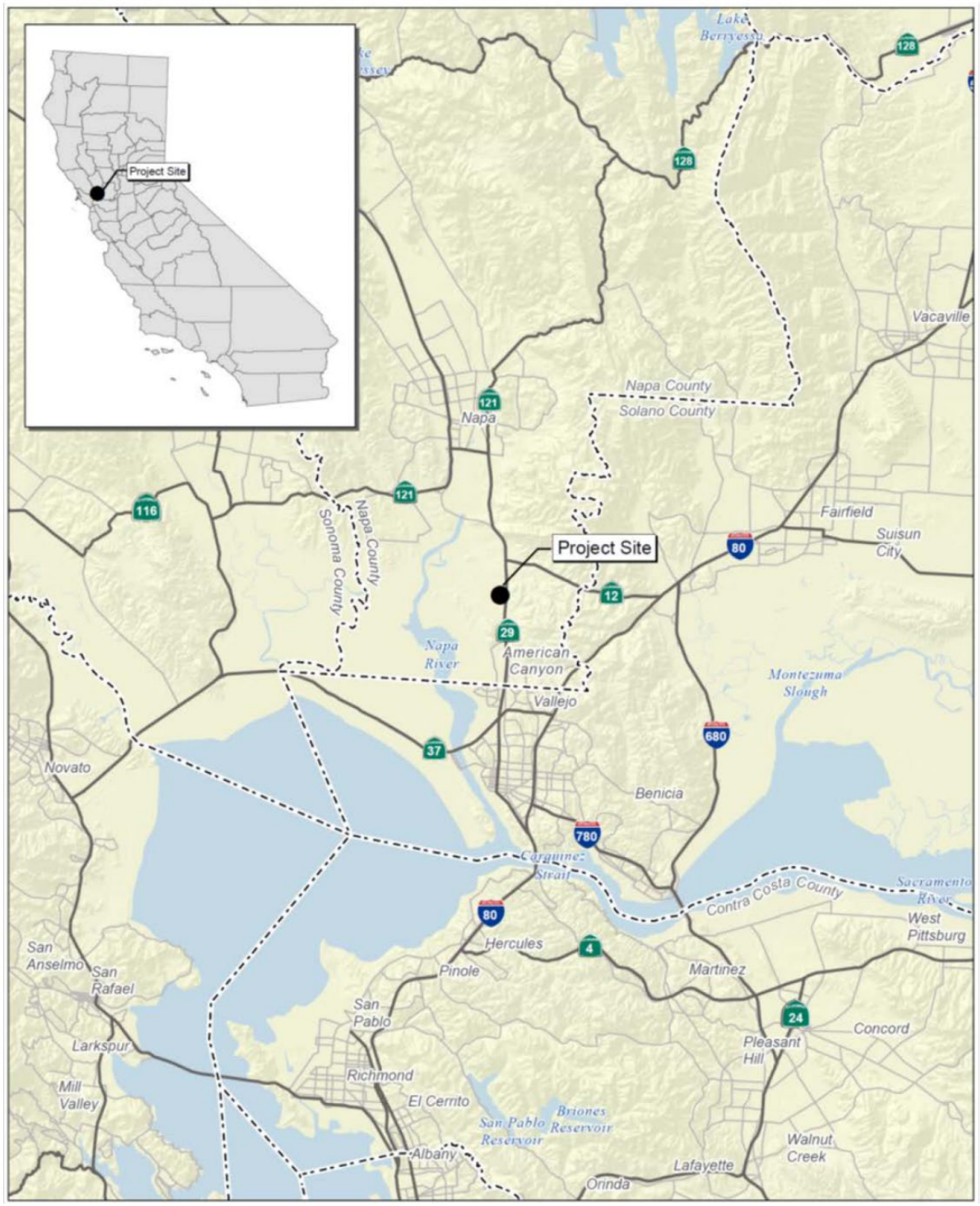

Figure 1-1 Project Location

1.3 Existing Conditions

The project site is currently undeveloped parcels composed generally of mix grasses and several seasonal wetlands. Most of the seasonal wetlands on the proposed project site are located on the northern edges of the parcel and will be left as a wetland/mitigation preserve outside the development footprint of the project.

1.4 Proposed Project

The proposed project entails developing 208-acres for light industrial uses constructed in two phases. Phase 1 is the 94.7-acre area east of Devlin Road extension, including two warehouses, totaling roughly 1.1 million square feet, associated impervious surfaces, stormwater facilities, and wetland preservation areas. Phase 2 is the 113.1-acre area west of Devlin Road, and would conceptually include up to 1.3 million square feet of warehouse space and associated infrastructure. In total the Project would develop 161 acres, leaving 47 acres as open space, including the northern portion of the project site adjacent to No Name Creek. **Figure 1-2** shows the proposed project layout, as described in the Project's Stormwater Control Plan (Balance, 2021)[1].

Potable water supply for the Project will be served by the City of American Canyon, and landscape irrigation will be supplied by recycled water, also from the City, via water infrastructure installed within Devlin Road extension. Laterals would extend from Devlin Road water lines to project warehouses (**Figure 1-3**).

[1] Note that only Phase I is shown in the figure. Phase II is being evaluated at a programmatic level, and thus specific site plans for this portion of the site have not yet been completed. It is expected that the site would include warehouses, similar to Phase I, with up to 1.3 million square feet of floor space.

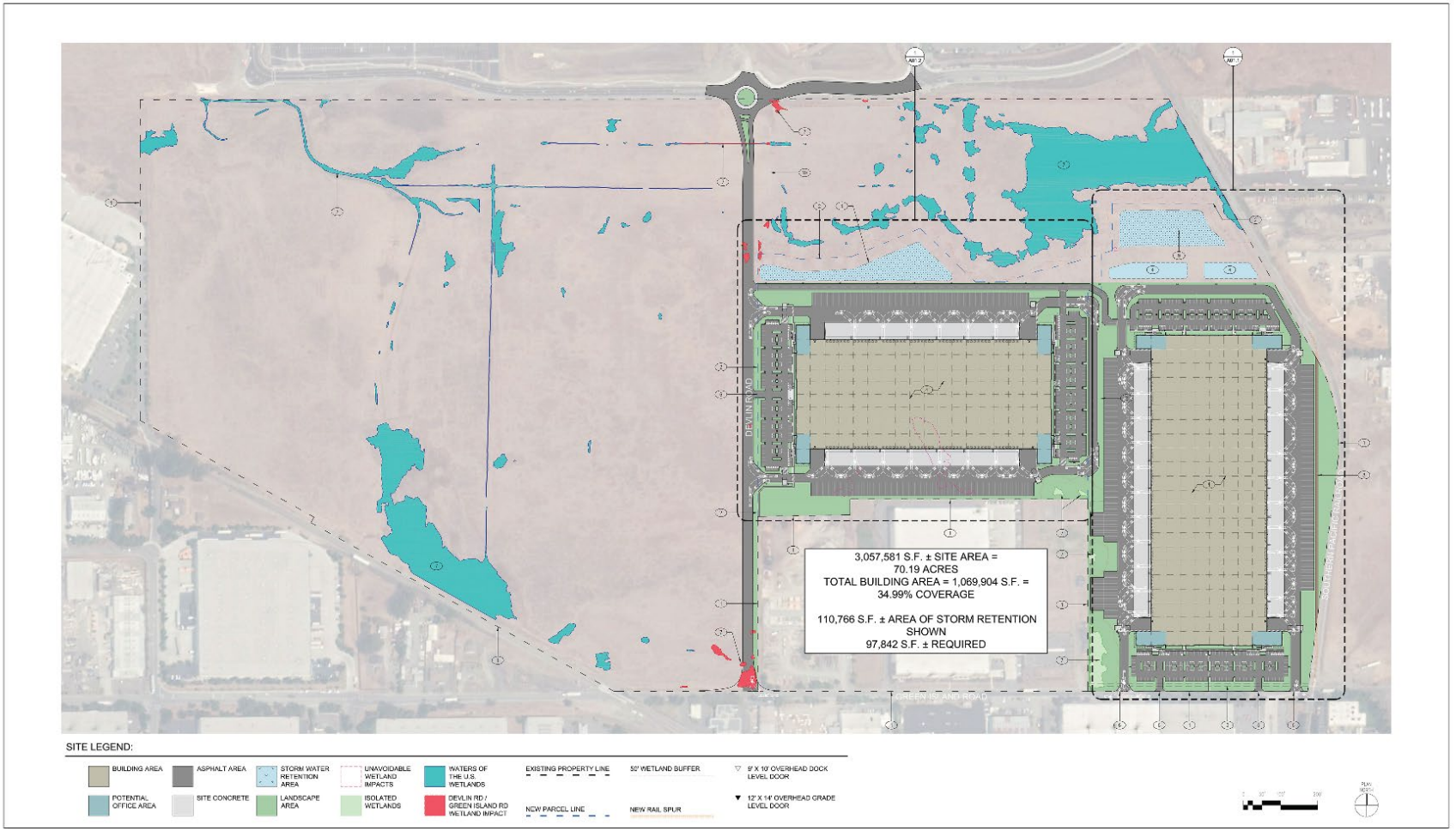

Figure 1-2 Proposed Project

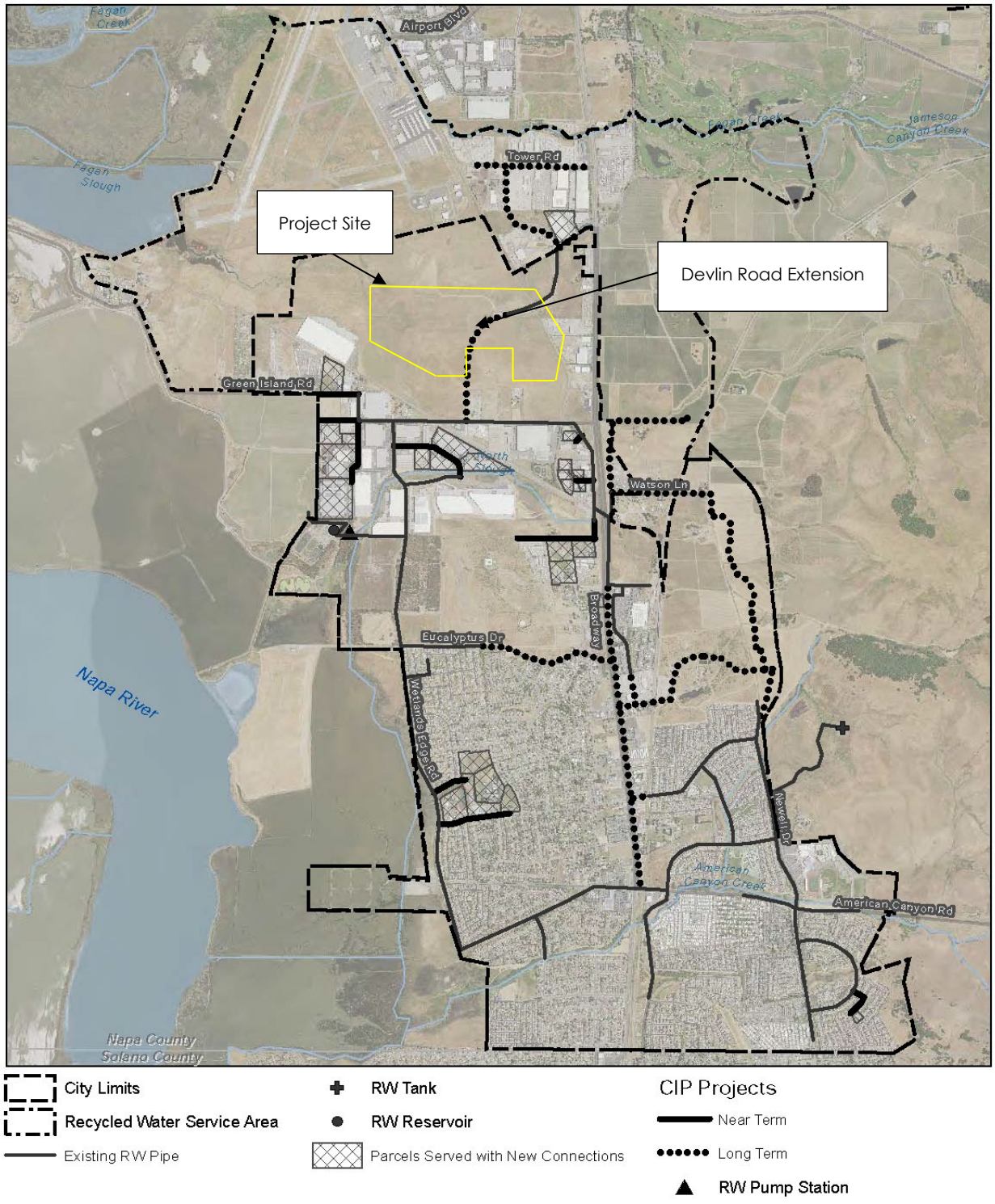

Figure 1-3 **Existing and Planned Recycled Water System for the City of American Canyon, California**. As reported in the City of American Canyon Recycled Water Master Plan, 2016.

2 WATER SUPPLY

American Canyon obtains its water supply from a variety of sources, all of which (except for recycled water) are imported from outside of the City. All of the City's imported water comes through the North Bay Aqueduct (NBA) system. The following sections summarize the various sources of water for American Canyon (see also **Table 1**). These descriptions were summarized from American Canyon 2015 Urban Water Management Plan (2015 UWMP; Kennedy Jenks, 2016).

2.1 State Water Project

A significant portion of the City's supply is obtained through various indirect contracts for water from the State Water Project (SWP). The Napa Flood Control and Water Conservation District (District) is the State Water Contractor with the California Department of Water Resources (DWR), and the City receives its water through subcontracts with the District.

2.1.1 TABLE A ALLOCATION

In January 1967, the American Canyon County Water Agency [2] entered into an agreement with the District for water supply from the North Bay Aqueduct. In 2010, the agreement allowed for the delivery of up to 5,200 acre-feet of water per year[3]. This contract runs through 2035 with provisions for extension. The actual amount of SWP water available to the City under the "Table A" allocation process (the method used by DWR to allocate water in the SWP system) varies from year to year due to hydrologic conditions, water demands of other contractors, SWP facility capacity, and environmental/regulatory requirements. Deliveries have varied between 5% (in 2014) and 100% (last occurring in 2017) of the contracted amount.

2.1.2 ARTICLE 21

Article 21 is a long-term water supply contract with DWR. This contract varies each year depending on excess water in the Delta, excess water not allocated for other purposes

[2] A predecessor agency to the City of American Canyon, which wasn't incorporated until 1992.
[3] 500 AF of this water was obtained through a purchase of water, by the Napa Sanitation District, from Kern County Water Agency in 2000.

or water deliveries, and the capacity within the City's own system to store the Article 21 purchased water.

Table 1 Current Sources of water supply for American Canyon

Source	Contracted Volume/Capacity (afy)
State Water Project ('Table A' allotment)[1]	5,200
Vallejo Permit (Raw) Water[2]	500
Vallejo Treated Water	
(2011-2015)	2,074
(2016-2021)	2,640
(2021-onward)	3,206
Vallejo Emergency (Raw) Water [3]	500
Groundwater [4]	0
American Canyon Recycled Water [5]	1,271
Napa Sanitation District Recycled Water	591

Notes:

[1] *Includes allottment for American Canyon and additional supply from Kern County Water Agency.*

[2] *Non-Table A water.*

[3] *Available only in dry years.*

[4] *No groundwater is used for City-wide supply*

[5] *As reported in 2015 UWMP. Maximum capacity of City's recycled water treatment system by 2035*

2.2 Water from the City of Vallejo

In 1996, the City entered into an agreement with the City of Vallejo to allow the purchase of additional water supply. Vallejo receives its water from a variety of sources, including SWP water and an appropriative water right. Under the Vallejo Agreement, a specific source is identified for Permit Water supply (see Section 2.2.1, below), but not for Treated or Emergency Water (Sections 2.2.2 and 2.2.3).

2.2.1 Vallejo Permit Water (Raw)

Vallejo holds an appropriative right for Sacramento Bay-Delta water from the State Water Resources Control Board that pre-dates the construction of the SWP. The City has an agreement with Vallejo for delivery of up to 500 acre-feet of water under this permit. This source of water is more reliable than the City's Table A supply, but the Vallejo Agreement still allows for reductions. Addendum 2 to the 1996 Vallejo Agreement states that "In the event the State Water Resources Control Board, or any other agency, restricts Vallejo's

diversion of water [under the appropriative pre-SWP contract] for any reason whatsoever, American Canyon's diversions will be reduced in the same proportion". As such, the City may not receive its full allotment during dry years[4].

2.2.2 Vallejo Treated Water (Potable)

In 1996, the City entered into an agreement with Vallejo to purchase up to 629 acre-feet of potable treated water supply. This agreement included the option for additional (cumulative) purchases in 5-year increments through 2021. Ultimately, this results in a total of 3,206 acre-feet of treated water available for purchase each year by the City from Vallejo for 2021-2040.

A specific source for Treated Water is not identified in the Vallejo Agreement; thus, the ultimate source of this water is a blend of all of Vallejo's water sources. Under certain conditions, the maximum delivery of this supply may be "reduced in the same proportions as any reduction to Vallejo customers inside the Vallejo City limits"[5].

2.2.3 Vallejo Emergency Water (Raw)

When the City's Table A water allotment is curtailed, the City has the option to purchase up to 500 acre-feet of emergency raw water supply from Vallejo, under an agreement amended in 1996. The 2015 UWMP assumes that this water would be available under a dry-year and multiple-dry-year scenarios, but not during a normal year.

2.3 Groundwater

The City of American Canyon does not currently rely on groundwater as a source of water, though the 2015 UWMP states that the City remains open to the possibility and will consider potential supply opportunities as they present themselves. The Project will not be using groundwater sources and therefore detailed information on groundwater outlined in Section 10910(f) of the California Water Code is not required for this Water Supply Assessment.

[4] Vallejo Permit Water delivery was curtailed in both 2014 and 2015, for example. However, the City received its full allotment before the curtailment took effect.

[5] Vallejo Water Service Agreement, May 1, 1996 (Appendix E.4 in the 2005 American Canyon UWMP).

2.4 Other Sources of Potable Supply

2.4.1 Dry-Year Water Bank

In 2009, the City (along with other SWP contractors) entered into an agreement with DWR to obtain emergency supplies if rice farmers in the Sacramento Valley are willing to make their supplies available. The year-to-year availability of this supply is not known, and thus supplies are not factored into long-term planning in the 2015 UWMP.

2.4.2 Turn-back Water Pool Program

DWR has a program for interested SWP contractors called the Turn-back Water Pool Program. SWP contractors may choose to sell Table A water or purchase turn-back pool water that is available through the program. Water from this pool program was not included in the reliability assessment in the 2015 UWMP because the program operates on an as-available basis and long-term availability is not reliable. The amount of pool water available to the City is not a significant amount. For example, during 2010 the City purchased 17 acre-feet, and in 2012 it purchased 64 acre-feet. However, between 2015-2020 the City did not purchase any water from the Turn-back Pool Program.

2.4.3 Napa Treated Water

The City has an agreement with the City of Napa for the purchase of treated (potable) water under emergency conditions, or when the NBA system is offline for maintenance or other reasons. This water source is not a water supply and is not included in the reliability assessment in the 2015 UWMP since it is only available during emergencies. Napa treated water, however, does provide operational flexibility (such as providing water to customers even when the City's water treatment plant is off-line for an extended period of time). During 2010, the City purchased 306 acre-feet of treated water when the plant was off-line for maintenance-related issues. Under this informal arrangement, the Napa treated water purchase counts against the City's SWP Table A allotment and is not an additional supply (and is not included in **Table 1**).

2.4.4 Dry Year Transfer Program

During dry years, varying amounts of additional water may be made available to SWP contractors through DWR's Dry Year Transfer Program, which allows for transfers through a combination of crop idling, groundwater substitution and changes in reservoir operation. For example, in 2015 the City of American Canyon purchased 92 af of additional supply (for that year) through this program. While this option is available to the

City on a per-year authorization, the long-term reliability of this supply is not known and included only as potential supplementary supply for the analysis in this WSA.

2.4.5 Yuba Accord

In 2008, DWR adapted the Lower Yuba River Accord, an agreement to settle issues related to in-stream flows in the Yuba River and fisheries habitat. As part of that agreement, DWR is able to purchase water from the Yuba River Water Agency to, in part, offer to participating SWP contractors as a transfer during dry years. The Napa County FCWCD has authorized the execution of Yuba Accord Dry-year Water Purchase Agreement, and the City has the option to purchase water through this agreement in dry years, though at a cost that is considerably higher than under normal conditions. In 2015, the City authorized the purchase of 124 af through this program in response to cover projected water supply shortfalls during the drought. While this option is available to the City in drought conditions, the availability and reliability of such water past 2020 is unknown[6], and therefore has not been included as long-term reliable supply for the analysis in this WSA.

2.5 Recycled Water

2.5.1 American Canyon Recycled Water

In 2010, the City completed the first phase of its Recycled Water Distribution System Project, which included a one-million-gallon reservoir, distribution piping, and associated improvements at the City's water treatment plant. Initially, 13 users were connected to the system and 73 acre-feet of water was delivered in 2010. Ultimately, the Recycled Water Master Plan in 2016 projected over 1,200 acre-feet of water demand at build-out in 2035 for landscaping and agricultural irrigation. However, utilization of this supply is dependent on connection of additional users and completion of additional distribution pipe segments. Currently, the City produces recycled water to meet demand on an as-needed basis.

The City is currently taking steps to increase capacity of their system to meet this demand in the future. The analysis in this WSA uses 1,271afy as the full system capacity by 2035, as reported in the 2015 UWMP.

[6] The original term of the NCFCWCD agreement was through the end of 2015, but an amendment in 2014 authorized an extension until the end of 2020.

2.5.2 Napa Sanitation District Recycled Water

In addition to the City's recycled water supply, Napa Sanitation District (NSD) has an existing recycled water supply pipe that extends to northern portions of the Airport Industrial Area (north of Fagan Creek). In 2015, NSD provided 210 acre-feet of recycled water to the City's users. The 2015 UWMP projected that NSD will provide up to 391 acre-feet of recycled water in 2020, up to 491 acre-feet in 2025, and 591 acre-feet in 2030 and onwards.

3 WATER DEMAND

The following section summarizes the anticipated potable- and recycled-water demand for the proposed Project, and compares the anticipated demand of the Project to demand assumptions in the 2015 UWMP for those parcels. Section 3.3 discusses system-wide demand for the City.

3.1 Project Demand

As described in Section 1.4, the proposed Project contains two warehouse buildings for Phase I, and additional warehouse buildings as part of Phase II. In addition, the Project will include associated landscaping areas that will require seasonal irrigation. The wetland preservation area is not expected to require supplemental water after the establishment of mitigation wetlands.

3.1.1 POTABLE WATER

Potable water demand for the Project was estimated by CBG Engineers (see Appendix A) based on demand factors contained in the 2016 City of American Canyon Potable Water Master plan, and is summarized in **Table 2**. These estimates were calculated using an average day demand of 0.015 gpd/sf which is the average water use across all the industrial sector and believed to be an overly high estimate of water use for this project[7]. Therefore, revised potable water use projections for the Project were calculated using averages from other similar commercial warehouse projects with more in-depth water demand estimates and/or metered water usage, as further discussed below.

The Napa Airport Corporate Center (NACC) is an industrial warehouse development just North of the Project in the City of American Canyon. Multiple industrial warehouse buildings are planned in this development (buildings B, D, E, G, and H). Details of the water demand estimates are reported in the NACC Water Supply Assessment report (Balance Hydrologics, 2015), with an estimated average day demand of 0.006 gpd/sf[8] . Similarly, Suisun Logistics Center is a planned industrial warehouse project in Fairfield, California also owned and operated by Buzz Oates. That project used water meter data from similar Buzz Oates developments in Fairfield to project anticipated potable water

[7] Warehouse space typically uses less water than most other industrial uses that often include industrial process water in addition to the water needed to supply employees (sinks, bathrooms, etc.).

[8] Building A of the NACC project is considered mix-used and was left out of the average day demand calculation for the industrial warehouse water demand estimates.

demand. Using actual water use from four industrial developments, Suisun Logistics Center average day demand is estimated at 0.01 gpd/sf (Appendix B). In order to provide a more realistic estimate of potable water demand for the Giovannoni Project, we averaged various demand rates described above (CBG, NACC, and Suisun Logistics Center), resulting in an average day demand of 0.009 gpd/sf. This revised average day demand was used to calculate a revised potable water use for the Project and is summarized in Table 2. We estimate the total potable water demand of the project at build-out to be 23.9 afy (15.9 afy less than the usage originally estimated by CBG Engineers).

For the purposes of this WSA, all indoor water demand is assumed to be from potable water. The applicant has not indicated that recycled water would be used for non-potable indoor uses, though that would remain an option to further reduce potable water demand at the site, should the applicant choose[9]. **Table 2** shows the estimated potable water demand for each building of the Project.

[9] The applicant is required to offset potable demand through implementation of the City's Zero Water Footprint policy (see Chapter 5). Use of recycled water for non-potable indoor uses would reduce the amount of the offset needed. However, because the applicant has not indicated this option, this WSA assumes all indoor water use will be from potable supply in order to provide a conservatively high estimate of potable water use.

Table 2 Estimated water demand for the Giovannoni Logistics Center Project, American Canyon, California

Project feature	Building floor area (sq. ft.)	Potable water use[1] (afy)	Revised potable water (afy)	Recycled water use[3] (afy)	Total water use (afy)
Building A - Phase 1	601,383	10.1	6.1	20.8	30.9
Building B - Phase 1	468,521	7.9	4.7	16.2	24.1
Phase 2	1,300,000	21.8	13.1	45.0	66.9
Total	**2,369,904**	**39.8**	**23.9**	**82.1**	**121.9**

Notes:

[1] cbg project estimate based on average day demand of 0.015 gpd/sf from American Canyon Potable Water Master Plan. See Appendix A for details.

[2] Revised potable water use estimates based on average day demand of 0.009 gpd/sf. This is an average generated from three commerical water demand estimates.

[3] Recycled water will be used for all landscape irrigation. Recycled water should be available to the project. Recycled demand estimated using demand factors from Table 3.13 in the 2010 UWMP.

3.1.2 Recycled Water

The Project is proposing to use recycled water for all irrigation needs. Estimated recycled water use within the project is summarized in **Table 2**. The current project plans do not have estimates for the area of irrigated landscaping. We approximated Project irrigation water demand by applying the average ratio of 0.604 between irrigated area and building footprint from the neighboring NACC project (Balance Hydrologics, 2015), with a demand factor of 2.5 acre-feet/acre (from Table 3.13 in the 2010 UWMP). These irrigation demand estimates may be high if the Project plans to landscape with xeric or native plant species that have lower-than-typical irrigation needs.

The recycled water usage estimates in **Table 2** are intended to be used for environmental planning documentation. Actual use per building may vary based on final site plans, but total use is expected to be consistent with (or less than) these assumptions. As stated above, all non-potable indoor water use is anticipated to be served by potable supply, though the option remains open to serve with recycled water, should the applicant choose.

3.2 Project Demand Comparison to UWMP

The following sections compare the current estimates of water demand for the Project to those assumed for that parcel in the 2015 UWMP.

3.2.1 POTABLE WATER

In order to project future system-wide water demand for the 2015 UWMP, the standard demand factors from the 2010 UWMP were used along with a variety of growth-rate estimates for various land-use sectors. For the commercial/industrial sector, the City analyzed the acreage of vacant land zoned for those uses, and applied a water use factor of 675 gallons/day/acre (gpd/ac) to each parcel. The project's demand has been incorporated into long-term projections under an assumption of a build-out use of 675 gpd/ac (0.76 afy per acre).

Table 3 compares the estimated project demand with the assumptions for the parcel included in the 2015 UWMP. Due to relatively low water-use of warehouse space compared to industrial-sector averages, the incorporation of recycled water for irrigation purposes, and the designation of a portion of the site for wetland preservation that will not require supplemental water supply, the Project is expected to use 133.3 afy less water than expected under the 2015 UWMP growth scenario. Implementation of the City's Zero Water Footprint Policy (see Chapter 5) would result in an additional 23.9-acre-foot reduction in potable water demand relative to the UWMP system-wide demand analysis.

Table 3 Estimated water demand compared to assumptions within the 2015 American Canyon UWMP

	Potable Water				*Recycled Water*	
	UWMP[1]	**Project[2]**	**Difference**	**ZWF offset[3]**	**UWMP[4]**	**Project[5]**
	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)
Phase 1	71.6	10.8	-60.9	-10.8	…	37.1
Phase 2	85.6	13.1	-72.5	-13.1	…	45.0
Total	**157.2**	**23.9**	**-133.3**	**-23.9**		**82.1**

Notes:

[1] Commerical demand factors, 2010 UWMP, Table 3.13.

[2] From Table 2.

[3] Required project compliance with the City's Zero Water Footprint policy. The Project will offset potable water use through implentation of various items from the City's "toolbox".

[4] UWMP did not project irrigation demand on a parcel-by-parcel basis. Because Project irrigation will be supplied by recycled water, comparison against projections in the UWMP is not necessary.

[5] Irrigated landcape; from Table 2.

3.2.2 Recycled Water

The American Canyon UWMP assumes irrigation use to be 2.5 acre-feet of water per acre of landscaping, but (unlike for potable demand) did not project recycled water demand associated with particular parcels anticipated for development. Because recycled water use offsets demand for potable (or raw imported) water and it is in the City's best interest to maximize use of recycled water, the Project's recycled water demand is assessed relative to the recycled-water demand goals outlined in the UWMP.

The 2016 Recycled Water Master Plan showed a delivery of 248 acre-feet for an existing 21 users between August 2013 and July 2014. In 2019, 282 acre-feet[10] of recycled water was delivered to customers which is still below the projected 391 acre-feet of recycled water in 2020. This Project would add an estimated 82.1afy of recycled water demand (see **Table 3**, above).

3.3 System-wide Demand

3.3.1 Recent Actual System Demand

The 2015 UWMP provides a comprehensive assessment of anticipated future water demand that included projections for both potable[11] and recycled water for 2015-2040. However, actual water usage between 2015 and 2020 differed from what was projected in the UWMP, suggesting that demand patterns for 2015-2040 may be different as well.

Table 4 shows the actual water usage within the City's distribution area since the 2015 UWMP was completed, as well as the interpolated yearly demand based on the projections in the UWMP. **Figure 3-1** highlights these recent trends. Since 2015, potable water demand has been much lower than that anticipated in the UWMP.

[10] From the Napa Valley Wine Insider Digest, August 2021. Napa County recycled water was used at record levels amid the recent drought. Balance did not have access to reliable annual data since the 2015 UWMP was released.

[11] Raw water used for agricultural irrigation is included as part of potable demand in the UWMP.

Table 4 Recent potable and recycled water usage for American Canyon

	2015	2016	2017	2018	2019	2020
	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)
Total potable water use[1]	2,968	2,572	2,558	2,667	2,418	2,665
Total projected potable water demand (2015 UWMP)[2]	2,976	3,062	3,148	3,233	3,319	3,405
Total City recycled water use[3]	**180**	**na**	**na**	**na**	**282**	**na**
Total projected recycled water demand (2015 UWMP)	385	509	634	758	883	1,007
Total water usage (actual)	**3,148**	**2,572**	**2,558**	**2,667**	**2,700**	**2,665**
Total projected water demand (2015 UWMP)	3,361	3,571	3,781	3,992	4,202	4,412

Notes:

[1] *Actual water usage from Napa County Flood Control and Water Conservation District SWP delivery accounting tables (provided by the City) plus agricultural raw water. Agricultural raw water use estimated to remain at 2015 level (56 AFY) through 2020, then be reduced to zero thereafter.*

[2] *Linear interpolation of 2015 usage and UWMP projected potable water demand for 2020.*

[3] *Actual recycled water usage, 2015 value obtained from the 2015 UWMP, 2019 value obtained from Napa Valley Wine Insider Digest, all other values not readily available.*

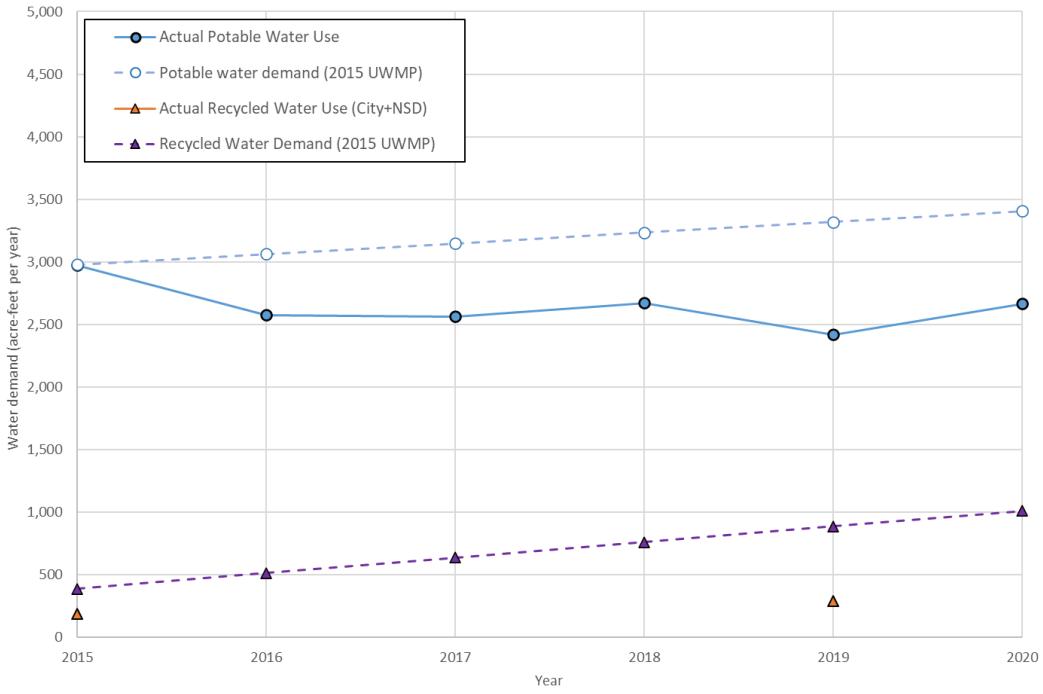

Figure 3-1 Potable and Recycled Water Demand vs. Actual Water Use

3.3.2 Projected System Demand

Projected Demand (2015 UWMP)

The 2015 UWMP projected future demand on a parcel-by-parcel basis relative to expected growth under the City's general plan. The analysis assumed that recycled water would be available to meet a portion of the total demand, with the remainder supplied by potable water. **Table 5** shows the water demand as presented in the 2015 UWMP.

Table 5 Projected potable, recycled, and total water demand for American Canyon through 2040, as presented in the 2015 UWMP

	2015 [5] (afy)	2020 (afy)	2025 (afy)	2030 (afy)	2035 (afy)	2040 (afy)
Projected potable water demand (UWMP) [1]	*2345*	*3,150*	*3,350*	*3,606*	*3,862*	*4,131*
Projected potable system losses (UWMP) [2]	*631*	*255*	*272*	*292*	*313*	*335*
Recycled water demand (UWMP) [3]	*385*	*1,007*	*1,146*	*1,351*	*1,862*	*1,862*
Total water demand (UWMP) [4]	**3,361**	**4,412**	**4,768**	**5,249**	**6,037**	**6,328**

Notes:

[1] *From 2015 American Canyon UWMP, Tables 4-3, excluding system losses.*

[2] *From 2015 American Canyon UWMP, Tables 4-3, system losses only*

[3] *From 2015 American Canyon UWMP, Tables 4-10*

[4] *Sum of potable demand, system losses, and recycled water demand, consistent with Table 4-10 in the 2015*

[5] *Actual values for 2015 presented in 2015 American Canyon UWMP, Tables 4-2. All other values are projected values.*

Unbilled Water Losses

The UWMP assumed that unbilled water losses[12] would be 7.5 percent for each year between 2020-2040. This is consistent with standards adopted by the California Urban Water Conservation Council (CUWCC), which provides that systems that experience greater than 10-percent losses annually undergo a water audit. In 2015, water delivery and water-use records indicate that system losses were 22 percent. The City is currently undertaking an aggressive response to the situation by replacing leaky services and water mains to reduce system loss. The City assumed it would reduce system losses to 7.5 percent of the total potable and raw water deliveries by 2020. In 2015, the City replaced more than 120 segments of residential services lines as part of its program to reduce distribution system losses.

[12] Referred to as "Unaccounted-for System Losses" in the UWMP, and "system losses" elsewhere in this WSA.

4 SUPPLY AND DEMAND COMPARISON

This section compares future City-wide water demand, to anticipated available supply under 'normal year,' 'single dry year,' and 'multiple dry year' scenarios. The scenarios presented herein have been summarized from the 2015 UWMP analysis for City-wide system planning.

The following analysis addresses potable and recycled water separately, as recycled water supply is considered reliable (and available at 100 percent of capacity) under all year-types. Reliability of potable water varies by year type as a percentage of contracted amount, as shown in **Table 6** and further described below.

Table 6 **Supply reliability for various American Canyon water sources**. Assumed percent of contracted amount for various year-type scenarios.

	2021-2040	Year Type				
Source	**Contracted or Available Volume**	**Normal Year**	**Single Dry Year**	**Dry year 1**	**Dry year 2**	**Dry year 3**
SWP (Table A allotment)	5,200	62%	5%	22%	22%	22%
Vallejo Permit Water [1]	500	100%	100%	100%	100%	100%
Vallejo Treated Water [1]	Varies [2]	100%	80%	80%	80%	80%
Vallejo Emergency Water [1]	500	0%	100%	100%	100%	80%
Groundwater [3]	n/a	--	--	--	--	--
American Canyon Recycled Water	n/a [4]	100%	100%	100%	100%	100%

Notes:

[1] *Percentages from 2015 UWMP, Table 7-4, 7-5, 7-6*

[2] *Contracted amount is 2,074 in 2015, 2,640 in 2020, and 3,206 2021-onward.*

[3] *Groundwater is not a source for City-wide supply.*

[4] *Recycled water is produced to meet demand; ultimately, maximum production capacity of City's recycled water system is expected to be 1,000 afy.*

4.1 Potable Water

Table 7 summarizes available potable water supply under 'normal year', 'single dry year', and 'multiple dry year' scenarios. As outlined in Section 2, the City's potable water supply relies exclusively on imported water, both from the SWP and through the City of Vallejo. A percentage of the full contracted amount is assumed for each source type under each scenario (**Table 6**, above). These percentages are based on guidance by DWR, analysis in the City's UWMP and the Vallejo UWMP. Resulting supply volumes for each source

under the various scenarios through 2040 are shown in **Table 7**. The supply and demand for potable water for each of the year-types is discussed below[13].

4.1.1 Normal Year

In a 'normal year', the City's 2015 UWMP assumes 'Table A' SWP deliveries would be 62 percent of the total contracted amount. Treated water from Vallejo water and raw Vallejo Permit water are assumed to be 100 percent available in normal years, consistent with the 2015 UWMP.

The UWMP concluded that future supply is available to meet anticipated demand in normal years through build-out in 2035, as does the analysis in this WSA (**Table 8**). Excess supply in normal years ranges from a low of 2,653 in 2040 to a high of 3,497 afy in 2025.

4.1.2 Single Dry Year

Under the "single-dry-year" scenario, the 2015 UWMP assumed SWP Table A deliveries to be curtailed to 5 percent of the contracted amount (see **Table 7 and Table 8**).

As discussed in Section 2.2, all water from Vallejo is considered a more reliable source than the City's SWP supply. The 2015 UWMP assumes that raw Vallejo Permit Water is available at 100 percent and Treated Vallejo Water are available at 80 percent of the contracted amount during single dry years. In addition, the full allotment of raw Vallejo Emergency Water (500 acre-feet) would be available under dry-year conditions. The analysis herein uses these same assumptions.

The 2015 UWMP shows that single-dry-year supply is not significantly currently constrained and the City will be able to reliably meet potable demand until the year 2030[14]. Single-dry-year deficiencies are anticipated starting in 2035 (**Table 8**). The City has several options available to resolve dry-year supply deficiencies, as described in Section 4.2.

[13] The analysis does not include adjustments for reduced demand of the Project relative to the assumptions in the UWMP for that parcel. As discussed in 3.2, the Project is expected to use 133.3 afy less than anticipated for those parcels in the UWMP, and will fund ZWF demand offsets of approximately 23.9 afy. Other recently completed projects or projects currently in the planning process may also affect projected demand, but have not been included in this analysis.

[14] Slight deficiencies are shown for dry-year supply in 2020 and 2030, but only by less than 2% of the total supply.

4.1.3 MULTIPLE DRY YEARS

The multiple-dry-year scenario, as described in the UWMP, consists of three consecutive years of reduced water deliveries, though none are reduced to the same degree as the single-dry-year scenario[15]. The UWMP assumed that SWP Table A water would be reduced to 22 percent of the contracted amount for each of three years (see **Table 7 and Table 8**).

Raw Permit water are assumed to be available at 100 percent, and Treated water from Vallejo are assumed to be available at 80 percent of the contracted amount for years 1, 2, and 3 of the multi-year drought following the assumptions in the 2015 UWMP. Vallejo Emergency water is assumed to be available at the full contracted amount (500 acre-feet) for each of the three years of a multi-year drought, consistent with the 2015 UWMP.

The 2015 UWMP projects that water supply will exceed demand during a three-year drought through the full 2040 planning period (**Table 8**).

[15] The reference period used for the multi-dry-year scenario in the UWMP is the drought from 1990-1992. From a planning perspective, the UWMP assumed that a three-year drought is unlikely to include the "single dry-year" scenario.

Table 7 Projected water supply for American Canyon for various year types

	2021-2040	2015	2020					2025					2030					2035					2040				
Source	**Contracted or Available Volume**	**Actual**	**Normal Year**	**Single Dry Year**	**Dry year 1**	**Dry year 2**	**Dry year 3**	**Normal Year**	**Single Dry Year**	**Dry year 1**	**Dry year 2**	**Dry year 3**	**Normal Year**	**Single Dry Year**	**Dry year 1**	**Dry year 2**	**Dry year 3**	**Normal Year**	**Single Dry Year**	**Dry year 1**	**Dry year 2**	**Dry year 3**	**Normal Year**	**Single Dry Year**	**Dry year 1**	**Dry year 2**	**Dry year 3**
SWP (Table A allotment)	5,200	1,953	3,224	260	1,144	1,144	1,144	3,224	260	1,144	1,144	1,144	3,224	260	1,144	1,144	1,144	3,224	260	1,144	1,144	1,144	3,224	260	1,144	1,144	1,144
SWP (Article 21)	Varies	72	189	0	124	124	124	189	0	124	124	124	189	0	124	124	124	189	0	124	124	124	189	0	124	124	124
Vallejo Permit Water	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Vallejo Treated Water	Varies	102	2,640	2,112	2,112	2,112	2,112	3,206	2,565	2,565	2,565	2,565	3,206	2,565	2,565	2,565	2,565	3,206	2,565	2,565	2,565	2,565	3,206	2,565	2,565	2,565	2,565
Vallejo Emergency Water	500	387	0	500	500	500	400	0	500	500	500	400	0	500	500	500	400	0	500	500	500	400	0	500	500	500	400
Total Potable	**6,200**	**3,014**	**6,553**	**3,372**	**4,380**	**4,380**	**4,280**	**7,119**	**3,825**	**4,833**	**4,833**	**4,733**	**7,119**	**3,825**	**4,833**	**4,833**	**4,733**	**7,119**	**3,825**	**4,833**	**4,833**	**4,733**	**7,119**	**3,825**	**4,833**	**4,833**	**4,733**
American Canyon Recycled Water	n/a[2]	180	616	616	616	616	616	655	655	655	655	655	760	760	760	760	760	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271	1,271
NSD Recycled Water	Varies[3]	210	391	391	391	391	391	491	491	491	491	491	591	591	591	591	591	591	591	591	591	591	591	591	591	591	591
Total Recycled	**-**	**390**	**1,007**	**1,007**	**1,007**	**1,007**	**1,007**	**1,146**	**1,146**	**1,146**	**1,146**	**1,146**	**1,351**	**1,351**	**1,351**	**1,351**	**1,351**	**1,862**	**1,862**	**1,862**	**1,862**	**1,862**	**1,862**	**1,862**	**1,862**	**1,862**	**1,862**
Total Supply	**-**	**3,404**	**7,560**	**4,379**	**5,387**	**5,387**	**5,287**	**8,265**	**4,971**	**5,979**	**5,979**	**5,879**	**8,470**	**5,176**	**6,184**	**6,184**	**6,084**	**8,981**	**5,687**	**6,695**	**6,695**	**6,595**	**8,981**	**5,687**	**6,695**	**6,695**	**6,595**

Notes:

[1] *Contracted amount is 2,074 in 2015, 2,640 in 2020, and 3,206 2021-onward.*

[2] *Recycled water is produced to meet demand; ultimately, maximum production capacity of City's recycled water system is expected to be 1,000 afy.*

[3] *Projected deliveries from NSD to the northern Airport Industrial Area. Does not include demand for the Montalcino Resort, as that amount will not affect City-wide demand.*

Table 8 **Comparison of potable and recycled water supply and demand under various year-type scenarios.**

See Table 15 for resolution of potable supply-demand deficiencies.

Source	2015	2020					2025					2030					2035					2040				
	Acutal	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3
	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)
Total potable supply[1]	3,014	6,553	3,372	4,380	4,380	4,280	7,119	3,825	4,833	4,833	4,733	7,119	3,825	4,833	4,833	4,733	7,119	3,825	4,833	4,833	4,733	7,119	3,825	4,833	4,833	4,733
Potable demand[2]	2,345	3,405	3,405	3,405	3,405	3,405	3,622	3,622	3,622	3,622	3,622	3,898	3,898	3,898	3,898	3,898	4,175	4,175	4,175	4,175	4,175	4,466	4,466	4,466	4,466	4,466
Potable supply minus demand	*669*	*3,148*	*-33*	*975*	*975*	*875*	*3,497*	*203*	*1,211*	*1,211*	*1,111*	*3,221*	*-73*	*935*	*935*	*835*	*2,944*	*-350*	*658*	*658*	*558*	*2,653*	*-641*	*367*	*367*	*267*
Recycled water supply[3]	390	1,007	1,007	1,007	1,007	1,007	1,146	1,146	1,146	1,146	1,146	1,351	1,351	1,351	1,351	1,351	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862
Recycled water demand[4]	385	1,007	1,007	1,007	1,007	1,007	1,146	1,146	1,146	1,146	1,146	1,351	1,351	1,351	1,351	1,351	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862	1,862
Recycled supply minus demand	***5***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***

Notes:

[1] *From Table 7.*

[2] *Projected potable normal-year demand, from Table 5.*

[3] *From Table 7*

[4] *From Table 5*

4.2 Potable Water Deficiency Resolution

The above analysis compares potable water supply and normal-year demand, and projects supply shortages in several of the 'dry-year' and 'multi-dry-year' planning scenarios. This section describes a series of options available to the City to eliminate those shortfalls in order to provide reliable supply. Estimated SWP carryover water (see Section 4.2.1) would be sufficient to eliminate dry-year supply shortfalls, and could also be used in combination with drought demand reductions to further improve supply reliability.

4.2.1 SWP Carryover Water

If the City does not use its entire allotment of Table A water in a given year, the remaining water will carry-over to the following year, assuming there is adequate storage in SWP reservoirs to contain the excess supply[16]. Between 2015 and 2020, the City has stored between 35 and 2,600 acre-feet of carry-over water in a given year (**Table 9**), which has helped to meet demand during recent dry years. Because of the variability of carryover supply and the periodic "re-set" of the accounting when reservoirs are full, it is not considered a consistent yearly supply for planning purposes, but it does allow the City extra flexibility during droughts. As such, we have incorporated carry-over water into the analysis in this WSA.

We assume that 1,156 acre-feet of carryover water, the average over the last six years (**Table 9**), would be available at the beginning of a dry year and the first year of a multi-year drought. Projected excess normal-year supply ranges from 2,653 to 3,497 acre-feet for 2020-2040 (see **Table 8**), suggesting that the 1,156 acre-feet is a reasonable and somewhat conservative estimate for planning purposes[17]. In the second and third year of a multi-year drought, we assume that the remaining carry-over supply (assuming there is any) would continue to carry over to subsequent years to supplement supplies.

[16] In years when SWP reservoirs spill, the carry-over water is released, effectively re-setting carryover accounting to zero. Typically, however, ample storage is available in dry years.

[17] By definition, a single-dry-year would follow a normal or wet year, as would the first year of a three-year drought.

Table 9 **Recent SWP carryover water supply for the City of American Canyon.** Values from Napa County Flood Control and Water Conservation District SWP delivery accounting tables (provided by the City).

	2015	2016	2017	2018	2019	2020	Mean
Table A deliveries (% of total contract amount)[1]	25%	75%	100%	50%	85%	20%	59%
Available carryover water (remaining from previous year, in afy)[1]	876	1,087	127	2,210	35	2,600	1,156

Notes:

[1] From Napa County Flood Control and Water Conservation District SWP delivery accounting tables (provided by the City).

For example, in Single Dry Year scenario for 2035, 1,156 acre-feet would be available to meet the supply deficit of -350 acre-feet (from **Table 8**). The difference (806 af) would be available if there was another drought year. Under the above assumptions, the City would be able to meet projected supply deficiencies under all dry- and multi-dry-year scenarios within the planning period (2015-2040) through the use of available carry-over water.

4.2.2 Advanced Table A Program

A recent court settlement (Area of Origin Settlement[18], 2014), clarifies another potential mechanism for the Napa County FCWCD, the Solano County Water Agency, and Yuba City (along with subcontractors to those agencies, which includes American Canyon) to obtain water during dry periods. The Advanced Table A Program allows these agencies to 'borrow' against future SWP deliveries during times when annual deliveries are not sufficient to meet demand. The agreement requires that all Table A and Table A Carryover water be used prior to utilizing the Advanced Table A Program, but under those circumstances the City could request an advance of up to 949 af from future years' Table A allotments.

The projections in **Table 10** do not rely on the use of the Advanced Table A Program water to meet dry-year demand, as estimated Table A Carryover is enough to cover supply deficiencies for all scenarios. However, this Program provides an important tool available

[18] Superior Court of the State of California, County of Sacramento, Case No. 34-2008-00001 6338-CU BC GDS.

to the City should unforeseen circumstances result in significantly lower-than-expected carryover.

Table 10 Potable water deficiency resolution for dry- and multi-dry-year scenarios.

The table shows that all dry-year deficiencies can be met through carry-over water. In addition, the City has several other options available to help meet supply shortages during droughts.

Source	2015	2020					2025					2030					2035					2040				
	Actual	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3	Normal Year	Single Dry Year	Dry year 1	Dry year 2	Dry year 3
	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)	(afy)
Potable supply minus demand[1]	669	3,403	222	1,230	1,230	1,130	3,769	475	1,483	1,483	1,383	3,513	219	1,227	1,227	1,127	3,257	-37	971	971	871	2,988	-306	702	702	602
Estimated Table A carryover water[2]	--	--	1,156	1,156	2,386	3,616	--	1,156	1,156	2,639	4,122	--	1,156	1,156	2,383	3,610	--	1,156	1,156	2,127	3,098	--	1,156	1,156	1,858	2,560
"Advanced Table A" water[3]	--	--	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--	0	0	0	0
Demand savings through drought restrictions[4]	--	--	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--	0	0	0	0	0	0	0	0	0
Open market water purchases[5]	--	--	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--	0	0	0	0	0	0	0	0	0
Adjusted supply minus demand[6]	669	3,403	1,378	2,386	3,616	4,746	3,769	1,631	2,639	4,122	5,505	3,513	1,375	2,383	3,610	4,737	3,257	1,119	2,127	3,098	3,969	2,988	850	1,858	2,560	3,162

Notes:

[1] *From Table 8*

[2] *Table A water not used in the prior year may be used in the following year, assuming storage is available; estimated from previous six years of carryover availability (see Table 9). Assume 1,156 af of available in a dry year and the first year of a multi-year drought. Remaining carryover after the first year of a drought is available in the second year, and remaining water after the second year is available in the third year of a drought.*

[3] *When the City exhausts its supply of carryover water, the City can "borrow" against future SWP deliveries, up to 949 af. Projected water shortages can be met solely through carryover supply, so no Advanced water is projected to be needed to meet demand.*

[4] *The City may chose to offset supply deficiency through demand reduction (drought restrictions) during dry periods. All supply deficiencies are projected to be satisfied through carryover water; restrictions are not likely to be required, but remain an option for the City, if needed; see Table 11 for projected estimated volume for drought conservation savings.*

[5] *The City also has the option to purchase additional water on the open market. While not required to meet long-term supply deficiencies the City may chose to use this option during droughts,*

[6] *Supply minus demand from above, plus additional supply available through carryover, "Advanced Table A", demand savings, and open market purchases.*

4.2.3 Drought-year Demand Reductions

It is important to note that the demand projections in the 2015 UWMP (as well as for the analysis in this WSA) were not explicitly adjusted for voluntary or mandatory water-use reduction measures that may be implemented in response to drought conditions[19]. The City has a Water Shortage Contingency Plan that outlines four stages of water demand reduction measures that could be utilized when water supply is constrained due to environmental or other conditions. The City projects demand reductions of 10/20/30/50 percent corresponding to each of the tiers, beginning with voluntary actions at Tier 1, and moving to increasingly restrictive mandatory measures for Tiers 2-4.

On June 1, 2021, in response to on-going statewide drought conditions, the City declared a Stage 1 drought emergency that called for a voluntary reduction from residential and commercial customers compared to the previous year. On July 20, 2021, the City declared a Stage 2 drought emergency, enacting mandatory water-use restrictions, requiring all water customers to reduce their water use by 20%. As of the end of August, 2021, water conservation measures have resulted in an 18 percent decrease from residential customers and 13 percent decrease from commercial customers.

Because estimated carryover water was sufficient to satisfy projected shortages, the supply and demand analysis in **Table 10** does not account for drought-year demand reduction. However, the City may choose to use these measures to provide additional flexibility during droughts. Assuming drought reductions of 13 percent, similar to what was achieved in 2014, the City could be expected to reduce demand in future years ranging between 305 af in 2015 and 537 af in 2040 (**Table 11**). While these volumes would not solely eliminate projected dry-year shortages, these measures could be used in conjunction with the above measures to provide additional buffer, as needed, if other supplies are unexpectedly curtailed. Stronger restrictions (level 3 or 4), could be used to achieve greater reductions if necessary, but are not likely to be needed.

[19] For the purposes of the UWMP and this WSA, demand is assumed to be the same in normal- and dry-year scenarios for a given planning period.

Table 11 **Projected drought-year demand savings.** Estimated drought conservation volume (potable demand reduction) that could be used during future droughts to help the City manage supply shortages. Volumes based on 13% savings achieved between 2013 and 2014.

	2015 (afy)	2020 (afy)	2025 (afy)	2030 (afy)	2035 (afy)	2040 (afy)
Projected normal-year potable demand[1]	2,345	3,150	3,350	3,606	3,862	4,131
Estimated drought conservation volume[2]	305	410	436	469	502	537

Notes:
[1] *From Table 5*
[2] *13% of potable demand.*

4.2.4 Open Market Purchases

As discussed in Section 2.4 the City has the option to purchase additional water from a variety of other sources on an as-needed and as-available basis. These potential purchases were not considered as a reliable long-term supply for the purposes of this WSA, though the City could choose to purchase additional supply in dry years when normal supplies are constrained. In fact, the City chose to utilize this option in 2015, and purchased 216 af of additional supply through the Dry Year Transfer and Yuba Accord Programs. As with the above options, Open Market Purchases can provide additional operational flexibility for the City during dry periods when other supplies are reduced.

4.3 Recycled Water

As discussed in Section 2.5, the City's recycled water system has a supply capacity of up to 1,271 acre-feet per year by 2035, and NSD has agreed to provide up to 591 acre-feet to supply the northern portion of the Airport Industrial Area (which is located within the City's water service area). Practically, however, the City produces recycled water to meet demand, as shown in **Table 8** (above). Because recycled water is derived from wastewater that is: 1) less susceptible to fluctuation due to climatic conditions, and 2) available in excess of the capacity of the recycled water system, recycled water is assumed to be 100 percent available during single- and multi-year-drought scenarios.

Table 8 presents recycled water supply versus demand for the 2015-2040 planning period under various year-type scenarios. Because recycled water use offsets water that would otherwise be delivered from limited potable or imported-water supply, it is in the City's

best interest to maximize recycled water use by way of increasing the number of recycled water users tied into the system.

The projections for recycled water use in the 2015 UWMP were, in effect, operational goals to maximize recycled water use. The UWMP projected 1,862 acre-feet of recycled water use by 2035. Recent recycled water use has been much lower than projected in the UWMP. For example, in 2019 water demand was projected to be about 883 AF, but the City only used 282 AF of recycled water. The City expects a significant expansion in the recycled water delivery system by 2035, allowing full use of the system by that time. Recycled water demand by sector is shown in **Table 12.**

Table 12 Summary of potential recycled water demand, by sector

Utility land-use classification	Potable offset demand[1] (afy)	Buildout demand[2] (afy)
Single-family residential	--	22.8
Multi-family residential	--	41.8
Commercial	3.4	49.7
Industrial	4.7	209.9
Institutional/Governmental	101.9	127.4
Landscape	69.4	119.5
Open Space	--	--
Watson Ranch	--	253.2
Recreation	--	204.3
Agricultural	68.1	173.2
Total	**247.5**	**1,201.9**

Notes:

[1] Adapted from GHD, 2016, Table 14. Projected demand used in the WSA analysis (Table 6) are lower than the numbers shown here in order to provide a conservative estimate of future demand.

[2] Buildout demand for Institutional/Gonvernmental assumes the American Canyon High School will halve existing demand by fixing suspected leaks in the irrigation system.

4.4 Summary

In summary, the analysis in this WSA shows that the City's water supply is sufficient to meet projected demand, in all years and under all normal-, dry, and multi-dry-year scenarios. The analysis shows that demand will exceed supply during some dry years, but the City will still be able to meet demand through the use of carryover SWP water, or through some combination of carryover SWP water, Advanced Table A Water, demand

reductions, and/or additional purchases on the open market. In addition, recycled water supply in the City is available to meet existing and projected demand, and available in sufficient volume to support non-potable uses at the Project site. Use of recycled water at the site will increase the City's utilization of this supply.

5 ZERO WATER FOOTPRINT POLICY

In October 2007, the City adopted a policy to regulate water use for new development. Under this Zero Water Footprint (ZWF) policy, new accounts are required to offset the proposed project's potable water use through off-site water conservation measures, conversion of off-site potable irrigation to recycled water, on-site demand reduction (relative to existing use), or by acquiring additional supply. The City has provided a list of potential conservation, repair, and other projects within the service area that could be used as offsets for new service accounts. In 2011, the City adopted an additional policy that further refined the offset options available to meet the ZWF requirements.

5.1 Project ZWF Compliance

The proposed Project is required to comply with the City's ZWF policy, and will offset all of its potable water demand. The Project will offset its potable water demand by implementing several items off of the City's offset "toolbox", likely to include a combination of off-site landscape irrigation water conversion and conversion of existing potable water customers.

Anticipated potable water use for the Project, once completed, would be 23.9 afy. ZWF offset totals will be required to be at least that amount.

5.2 City-wide Compliance

On the whole, compliance with the City's ZWF policy should essentially result in no net increase in potable water demand[20] as new projects are built within the City's water distribution area. The effect of this policy was not explicitly accounted for in the long-term potable demand projections in the 2015 UWMP or for this WSA. However, two of the main ways that projects can reach compliance with the ZWF policy would be through funding conversion of irrigated landscape areas to recycled water, and improving the efficiency of the City's water distribution system (reducing system losses). The analysis in this WSA has included projections of both recycled water system expansion and reduced potable water losses that would, at least in part, be funded through implementation of the ZWF policy.

[20] Or alternatively, offset increases in demand with increased volume of reliable supply.

6 LIMITATIONS

This technical report was prepared in general accordance with the accepted standard-of-practice existing in Northern California at the time the analyses were performed. No other warranty is made or implied. Readers are asked to contact us if they have additional relevant information, or wish to propose revisions or modified descriptions of conditions, such that the best data can be applied at the earliest possible date.

7 REFERENCES

Balance Hydrologics, 2015, Water Supply Assessment for the Napa Airport Corporate Center Project, American Canyon, California. Report prepared for First Carbon Solutions.

Balance Hydrologics, 2021, Draft Stormwater Control Plan for the Giovannoni Logistics Center Project – East. Report prepared for Carlson, Barbee & Gibson, Inc.

Brown, S., and Shaw, D., 2015, Water Supply Assessment for the Napa Airport Corporate Center Project, American Canyon, California. Prepared by Balance Hydrologics, Inc. for First Carbon Solutions, 87p.

GHD, 2016, City of American Canyon Recycled Water Master Plan. Report prepared for the City of American Canyon, dated May 2016, 96p.

Kennedy Jenks Consultants, 2016, Final 2015 Urban Water Management Plan. Report prepared for the City of American Canyon, 153p.

APPENDICES

APPENDIX A

Potable water demand estimates by CBG Engineers

CIVIL ENGINEERS ▪ SURVEYORS ▪ PLANNERS

February 23, 2021
Job No.: 2637-030

PRELIMINARY WATER DEMAND ESTIMATE
GIOVANNONI LOGISTICS CENTER - EAST
AMERICAN CANYON, CALIFORNIA

				Proposed Flow				
Description	**Land Use**	**Building Square Footage**	**Average Day Demand (gpd/sf)**	**Average Day Demand (gpd)**	**Max Day Factor**	**Max Day Demand (gpd)**	**Peak Hour Factor**	**Peak Hour Demand (gpm)**
Building A	Industrial	601,383	0.015	9,021	2.0	18,041	1.75	22
Building B	Industrial	468,521	0.015	7,028	2.0	14,056	1.75	17

Notes:

1. *Design Criteria is based on the: City of American Canyon Potable Water Master plan dated, May 2016, and the City of American Canyon Engineering Standard Plans and Specifications for Public Improvements dated, May 1, 1995.*
2. *Average Day Demand of 0.015 gpd/sf equates to 650 gpd/acre per the American Canyon Potable Water Master plan.*

APPENDIX B

Suisun Logistics Center Potable Water Demand Estimates by RAK Engineers

RAK CIVIL ENGINEERS
ROBERT A. KARN & ASSOCIATES, INC.
707 Beck Avenue, Fairfield, California 94533 Phone: (707) 435-9999 Fax: (707) 435-9988

April 12, 2021

Mr. Paul Fuchslin
Director of Engineering
Solano Irrigation District
810 Vaca Valley Pkwy Suite 201
Vacaville, CA 95688

SUBJECT: Proposed Water Usage for the Suisun Logistics Center and Highway 12 Logistics Center Projects – Suisun City – CA.

The intent of this memo is to provide clarity as to the yearly anticipated water usage demand for both proposed Buzz Oates City of Suisun City projects (Suisun Logistics Center & Highway 12 Logistics Center).

High-Cube Warehouse and Distribution buildings are not a water-intensive use, especially when compared to other heavy industrial uses. Most of the water demand for High-Cube Warehouse and Distribution comes from landscape irrigation. Buzz Oates intends to minimize landscape irrigation, further reducing anticipated water demand.

We requested water meter data for similar buildings developed, constructed, owned, and operated by Buzz Oates from the City of Fairfield Water Department to provide accurate water usage loads.

Michael Hether, Assistant Public Works Director provided the attached usage data that spans approximately 5 years, 7 months. The annual acre-foot usage was calculated as an aggregate spanning the entire duration of building operation by utilizing the average daily usage data for domestic, irrigation, and fire suppression demands. Broken down, this equates to 0.29228 acre feet per year per developable acre of water demand.

Total water demand equals approximately +/-62 acre-feet when applied to the proposed City of Suisun City projects. See below breakdown. I have also attached the usage data provided by the City of Fairfield for reference.

ADRESS	Sq. Ft.	Acres	Yearly Acre Feet	Acre Feet Per Developable Acre
2975 Cordelia Rd.	473,136	24.25	0.840132626	
2925 Cordelia Rd.	318,402	18.73	10.05492075	
2875 Cordelia Rd.	176,760	9.32	3.022470217	
2825 Cordelia Rd.	36,950	3.99	2.534983094	
		56.29	16.45	**0.29228**

Suisun Logistics Center 120 developable acres (x 0.29228) = 35.0736

Highway 12 Logistics Center 93 developable (x0.29228) = 27.182

TOTAL **62.255 ANTICIPATED YEARLY ACRE-FOOT USAGE**

RAK CIVIL ENGINEERS
ROBERT A. KARN & ASSOCIATES, INC.
707 Beck Avenue, Fairfield, California 94533 Phone (707) 435-9999 Fax (707) 435-9998

I have attached the water usage data provided by the City of Fairfield for your records. Please let me know if you have any questions or require additional data related to the proposed water usage.

Thank you,

Tony Perfetto
Project Manager
Robert A. Karn & Associates, Inc.

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I.2 - Hydrology Report

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November 12, 2020
Job No.: 2637-030

PRELIMINARY SANITARY SEWER SIZING CALCULATIONS
GIOVANNONI LOGISTICS CENTER - EAST
AMERICAN CANYON, CALIFORNIA

				Proposed Flow				
Description	**Acreage**	**Q (gal/day)**	**I/I (gal/day)**	**Q (gal/day)**	**Q (gpm)**	**Q (cfs)**	**d/D**	**Downstream Pipe Slope**
Building A	34.7	86,750	14,100	152,900	106.2	0.237	0.36	0.5%
Buildings B	26.6	66,500	17,500	123,900	86.0	0.192	0.33	0.5%

Notes:

1. *Design Criteria is based on the: City of American Canyon Sanitary Sewer Master plan dated, May 2016, and the City of American Canyon Engineering Standard Plans and Specifications for Public Improvements dated, May 1, 1995.*
2. *The minimum pipe size for a public sanitary sewer main is 6".*
3. *Sewers shall be sized to carry no greater than the design flow capacities of 75% for pipes 10" and smaller.*
4. *The n-value for new sewer pipe is 0.013.*
5. *All gravity sewers shall maintain a minimum velocity of 2.5 feet per second flowing full.*
6. *The minimum slope for 8" sewer pipe is 0.5%.*
7. *The maximum slope for gravity mains is 15%*
8. *The average acreage flow estimate for light industrial areas is 2500 Gal/Acre/Day*
9. *The peak acreage flow estimate for light industrial areas is 4000 Gal/Acre/Day*
10. *I/I is 4000 Gallons per inch diameter - mile per day*

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