CENTENNIAL SPECIFIC PLAN

WATER SUPPLY ASSESSMENT

MAY 2011

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CENTENNIAL
WATER SUPPLY ASSESSMENT
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ACRONYMS

AF or af	Acre-feet
AFB	Air Force Base
AFY	Acre-feet per year
ASR	Aquifer Storage and Recovery
AVAA	Antelope Valley Adjudication Area
AVEK	Antelope Valley-East Kern Water Agency
AVGB	Antelope Valley Groundwater Basin
AVIRWMP	Antelope Valley Integrated Regional Water Management Plan
AWWA	American Water Works Association
AWWARF	American Water Works Association Research Foundation
BDCP	Bay Delta Conservation Plan
BiOp	Biological Opinion
BMP	Best Management Practice
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CII	commercial, industrial and institutional
CIMIS	California Irrigation Management Information System
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DEIR	Draft Environmental Impact Report
DFG	California Department of Fish and Game
DHCCP	Delta Habitat Conservation and Conveyance Program
DOF	California Department of Finance
DPH	California Department of Public Health
DRMS	Delta Risk Management Strategy
Dudley Ridge	Dudley Ridge Water District
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ERO	Ecosystem Restoration Program
ET	evapotranspiration
ETo	reference evapotranspiration
FEIR	Final Environmental Impact Report
gpcpd	gallons per capita per day
gpd	gallons per day
gpf	gallons per flush
gpm	gallons per minute
GVMWD	Golden Valley Municipal Water District
IRWD	Irvine Ranch Water District
IUWMP	Integrated Urban Water Management Plan
KCWA	Kern County Water Agency
LACDRP	Los Angeles County Department of Regional Planning
LACSD	Los Angeles County Sanitation Districts
LACWWD	Los Angeles County Waterworks District No. 40
LAFCO	Local Agency Formation Commission
LCID	Littlerock Creek Irrigation District
MCL	maximum contaminant level
mgd	million gallons per day

mg/L	milligrams per liter
M&I	municipal and industrial
MWA	Mojave Water Agency
NEPA	National Environmental Protection Agency
NMFS	National Marine Fishery Service
NOAA	National Oceanic and Atmospheric Administration
OMR	Old River and Middle River
ppb	parts per billion
psi	pounds per square inch
PWD	Palmdale Water District
QHWD	Quartz Hill Water District
RCSD	Rosamond Community Services District
SCAG	Southern California Association of Governments
SF or sf	Square Feet
SVOCs	semi-volatile organic compounds
SWP	State Water Project
SWPCA	State Water Project Contractor's Authority
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
TRC	Tejon Ranch Company
Tulare Lake	Tulare Lake Basin Water Storage District
μg/L	micrograms per liter
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
USBOR	United States Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
VOCs	volatile organic compounds
VTTM	Vesting Tentative Tract Map
VWD	Victorville Water District
WPR	Western Policy Research
WSA	Water Supply Assessment

1.0 INTRODUCTION AND SUMMARY

This Water Supply Assessment (WSA) has been prepared for the proposed Centennial Specific Plan (the "Project") by the Golden Valley Municipal Water District (GVMWD or District) in accordance with California Water Code Sections 10910-10915. As planned, the Project includes approximately 11,680 acres located in the far western portion of the Antelope Valley in northern Los Angeles County (see **Figure 1.1**). The Project proponent is Centennial Founders, LLC. The Project land is owned by Tejon Ranchcorp (Ranchcorp), a subsidiary of Tejon Ranch Company (TRC) that holds title to the company's ranch lands,[1] and by the Project proponent. TRC is a member of Centennial Founders, LLC. Los Angeles County is the California Environmental Quality Act (CEQA) lead agency for the proposed Project.

Section 10910(b) of the Water Code provides that a WSA must be prepared for certain, generally larger projects by a water system that (i) "may supply" water for a project and (ii) is, or may become as a result of supplying water to the project, a "public water system." Section 10912(c) defines a "public water system" as "a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections."

The GVMWD is a California municipal water district formed and operated under Section 71000 of the California Water Code. The District's service area encompasses approximately 12.5 square miles and is adjacent to the Project's western boundary (see **Figure 1.2**). GVMWD currently operates approximately 20 municipal water service connections and a wastewater treatment facility for the unincorporated community of Gorman.

Centennial Founders, LLC has requested that the GVMWD Board of Directors consider annexing the Project area and operating the Project's proposed potable water, water recycling, and wastewater facilities. If the Project is annexed into the GVMWD, the District would become a public water system as defined by Water Code Section 10912(c) as a result of supplying water to the proposed Project. GVMWD therefore qualifies as a WSA preparer for the Project under Water Code Section 10910(b). All water supplies that would be used by the Project and that are analyzed in this WSA will be provided by the Project proponent. None of the GVMWD's existing water supplies, or future supplies that may be developed by GVMWD independent of the Project, will be not be utilized by the proposed Project at any time during or after buildout of the Project.

The Project proponent has applied to Los Angeles County for certain discretionary land use approvals and entitlements that are subject to CEQA review by the County. The County is preparing an environmental impact report (EIR) in accordance with CEQA to evaluate the potential environmental impacts associated with the proposed Project. The potential annexation of the Project by GVMWD would require, among other actions, a decision by the GVMWD Board of Directors to initiate an annexation application with the Los Angeles County Local Agency Formation Commission (LAFCO), and LAFCO approval of the annexation request. These discretionary actions are subject to CEQA and would be evaluated in the Project EIR. A decision by the GVMWD to seek to annex the Project area, and potential LAFCO approval of an annexation request, would only occur after the County completes the Project's CEQA review and certifies the Project EIR.

[1] For ease of reference, this WSA may refer to either TRC or Ranchcorp when describing water-related assets owned by either entity.

Project's Regional Location

Figure 1.1

Centennial WSA

10 5 0 10 Miles

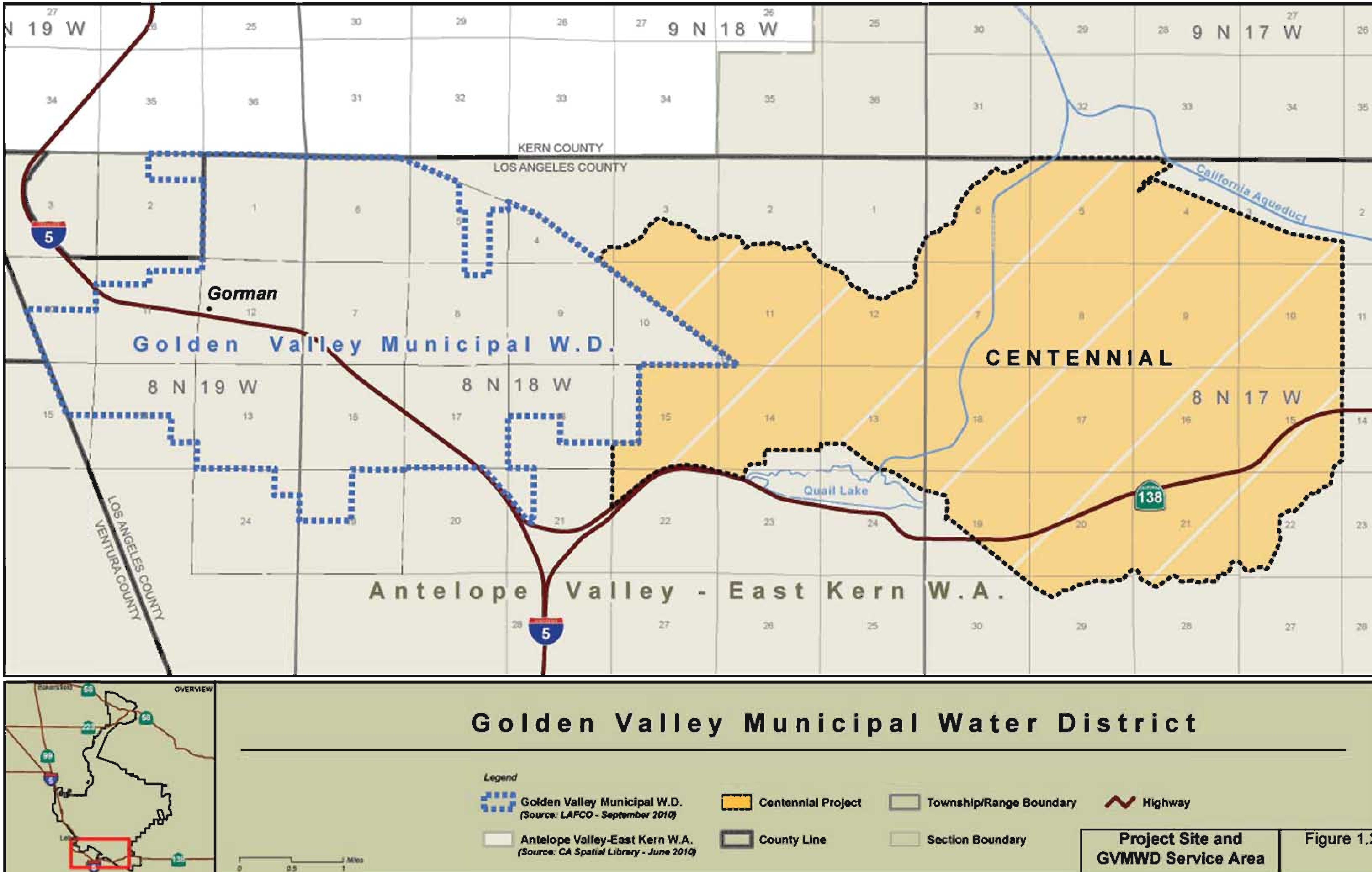


Figure 1.2 Project Site and GVMWD Service Area

1.1 THE WSA AND THE PROJECT'S CEQA REVIEW

The California legislature significantly amended Water Code requirements pertaining to WSA preparation in 2001. These legislative amendments, and subsequent California Court of Appeals decisions (c.f., *California Water Impact Network v. Newhall County Water District, et al.*, (2008) 161 Cal.App.4th 1464) (*CWIN*) have clarified that the purpose of a WSA is limited to providing a CEQA lead agency with an assessment or "discussion" of whether a project's proposed water supplies will meet the projected needs of the project. When a WSA is required, the analysis must consider whether the 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 a proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses (Water Code Section 10910). Under the Water Code, a WSA must be approved by a public water system's governing board at a regular or special meeting and submitted to the CEQA lead agency for inclusion in a project's EIR.

The approval of a WSA does not create any obligation by, or commitment on the part of, the public water system to provide water-related services to a project in the future. Water Code Section 10914(a)-(b) states that a WSA is not "intended to create a right or entitlement to water service or any specific level of water service …[or to] either impose, expand, or limit any duty concerning the obligation of a public water system to provide certain service to its existing customers or to any future potential customers." The CEQA lead agency has the sole authority to consider, assess and examine the quality of the information in the WSA and may disagree with, or not accept, a WSA's analysis. Water Code Section 10911(c) states that, based on the entire record, the CEQA lead agency is required to make the determination of whether a project's water supplies are sufficient. Approval of a WSA and does not constitute any form of project approval, entitlement, or water supply commitment.

Recent WSA case law has also established that the preparation and approval of a WSA by a public water system is only an interim and preliminary step in the EIR process. In 2008, the California Court of Appeals concluded that, since a "WSA's role in the EIR process is akin to that of other informational opinions provided by other entities concerning potential environmental impacts-such as traffic, population density or air quality," a WSA is only an "advisory and informational document" that does not impose "any duty upon the water supplier to provide water services to the project" (*CWIN*, page 1486). Consequently, the approval of a WSA is not subject to judicial review.

In short, because the adoption of a WSA does not create a right or entitlement to water service or impose, expand, or limit any duty concerning the obligation of a public water system to provide certain service and because the lead agency has a separate (from the water provider's WSA) and independent obligation to assess the sufficiency of water supplies for the proposed project, we conclude the WSA is not a final agency decision, determination or action as that term is used in the context of mandamus relief. Under the WSA law framework, the "final" decision for the purposes of writ [judicial] review occurs only after the lead agency acts-completes its obligations under the WSA and CEQA (*CWIN*, pages 1487-1488). GVMWD is eligible to provide water services and prepare a WSA for the Project within the meaning of Water Code Sections 10910-10912. This WSA was approved by the governing board of the GVMWD in May 2011 at a duly-noticed regular meeting and submitted to the County in accordance with Water Code Section 10910(g)(1). This WSA will be included in the Project EIR for consideration by the CEQA lead agency during the preparation of the Draft EIR (DEIR) and Final EIR (FEIR) in accordance with Water Code Section 10911(b). The DEIR, including the WSA and the EIR's analysis of the environmental impacts of obtaining and utilizing the Project's water supply, will be circulated for public review and comment by the County in accordance with CEQA. Following the close of the public review and comment period, the DEIR will be considered for final certification by the Los Angeles County Regional Planning Commission and the Board of Supervisors. The EIR certification must precede any County approval of the Project's entitlement applications and related discretionary agency actions subject to CEQA.

1.2 THE WSA AND SUBDIVISION MAP ACT WATER SUPPLY VERIFICATIONS

The California Subdivision Map Act (Government Code Sections 66410 et seq.) (the "Map Act") requires that tentative maps be submitted to the applicable local land use agency for review and approval before land can be subdivided for development or other purposes. The local land use agency usually includes several conditions in a tentative map that must be satisfied before a final map can be approved and recorded to complete a proposed land subdivision.

Section 66473.7(b)(1) of the California Government Code was added to the Map Act in 2001 and requires that a tentative map approved for a residential subdivision of more than 500 units be conditioned on a "requirement that a sufficient water supply shall be available." A written water verification must be obtained from the project's water supplier to satisfy this tentative map condition before a final map can be approved. Government Code Section 66473.7(a)(2) defines a "sufficient water supply" as "the total water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection that will meet the projected demand associated with the proposed subdivision, in addition to existing and planned future uses, including, but not limited to, agricultural and industrial uses." The information required by a water supply verification is substantially the same as the information included in a WSA. This WSA is intended to provide water supply information that will facilitate the issuance of water supply verifications for the Project in accordance with Government Code Section 66473.7(c)(2).

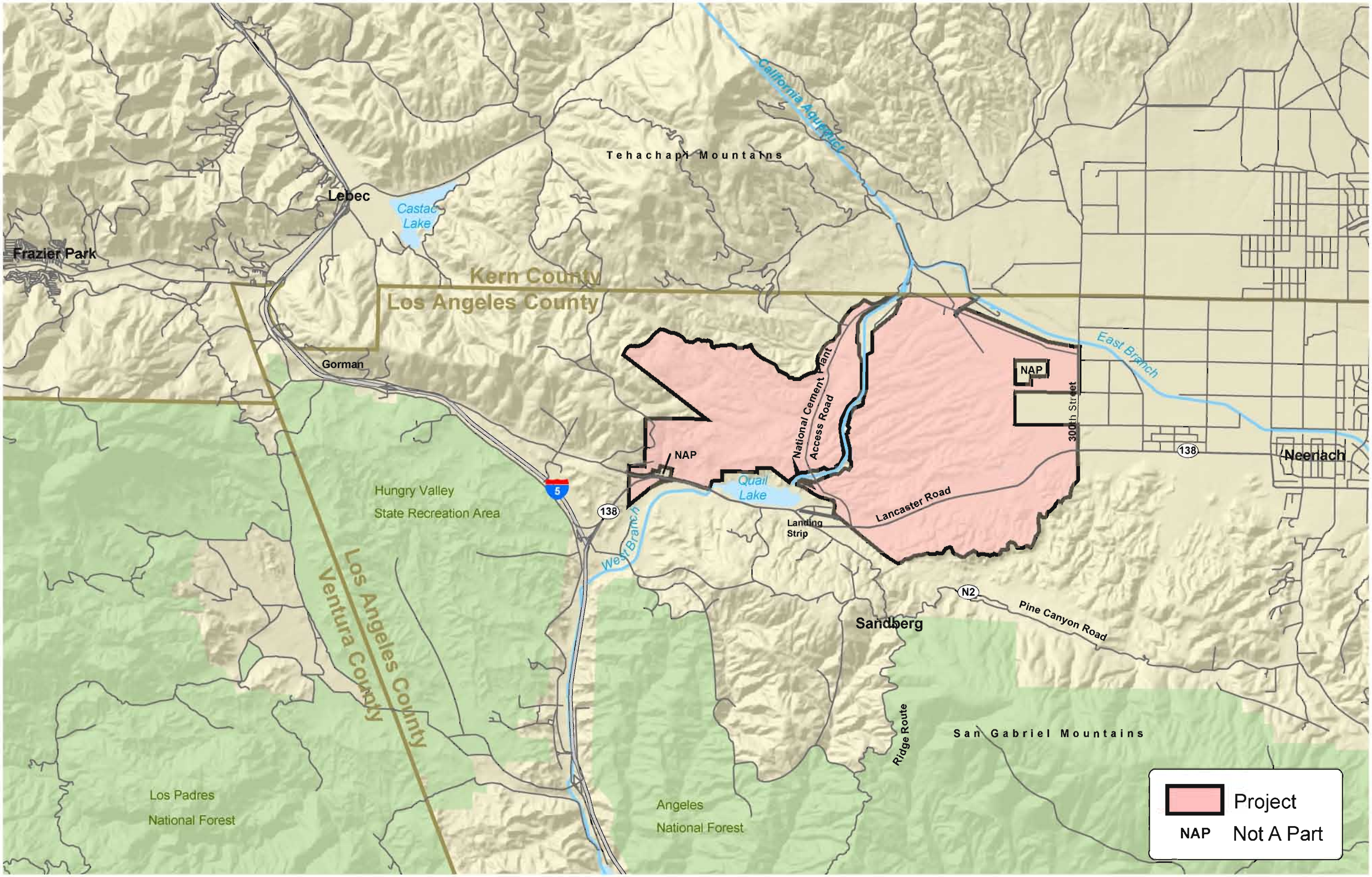
As discussed below, the Project proponent is seeking approval of three vesting tentative tract maps (VTTMs) in conjunction with the County's review of the Project. These maps include proposed subdivisions of more than 500 units and will require written confirmation of sufficient water supplies as a condition of final map approval.

1.3 CENTENNIAL PROJECT DESCRIPTION: PHASE 1 AND BUILDOUT

The Project consists of a new community that includes residential, commercial, business park, civic/institutional uses, open space, parks, and infrastructure to support the proposed land uses and future residents. As planned, at full buildout the Project would include 22,998 dwelling units on approximately 4,190 acres; approximately 12,484,730 square feet (sf) of business park uses on approximately 796 acres; and approximately 2,020,915 sf of commercial uses on approximately 207 acres. Proposed sites for civic and institutional land uses (which could accommodate uses such as a community college, hospital and transit center) encompass approximately 111 acres. Proposed sites for major infrastructure, such as wastewater reclamation facilities and a water treatment facility, encompass approximately 96 acres. The Project would support a permanent onsite employment base of over 32,227 jobs and approximately 64,000 residents. Approximately 5,350 acres (46 percent) of the 11,680-acre Project site are proposed for active and passive recreational use or natural resource protection in the form of parks, commercial recreation, greenways, and open space. The Project also includes a vehicular circulation system, transit and sustainability programs, and a system of trails. The Project EIR will evaluate project-level impacts associated with development within proposed VTTM No. 60020, VTTM No. 60021, and VTTM No. 60023. Collectively, these three VTTMs comprise the planned Phase 1 of the Project. VTTMs or similar tentative maps will be proposed for other portions of the Project, and potential impacts associated with development outside of the planned Phase 1 area will be evaluated at a programmatic level in the Project EIR. Phase 1 would include approximately 5,833 residential dwelling units, 223,000 square feet of commercial uses, and 3,330,000 square feet of business park uses and, when complete, a permanent onsite employment base of approximately 7,966 jobs.

Figure 1.1 (see above) identifies the Project's regional location and **Figure 1.3** depicts the Project site within the surrounding area. **Figure 1.4** shows the locations of VTTM 60020, VTTM 60021, and VTTM 60023 within the Project site.

This WSA separately analyzes the water supplies required for Phase 1 and for the full planned buildout of the Project. The analysis assumes that Phase 1 will be completed by the end of the sixth year of the Project. Full buildout is assumed to occur at the end of the twentieth year of the Project. The Project timing assumptions used in this WSA are conservative because the Project's construction and market absorption are likely to occur over a longer period than 20 years. If the Project's buildout occurs over more than 20 years, Phase 1 and buildout water supplies would be able to meet demand for longer time periods than projected in this WSA.



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Project Site within the Surrounding Area

Figure 1.2

Centennial WSA

N W E S

2 1 0 2 Miles

BonTerra CONSULTING

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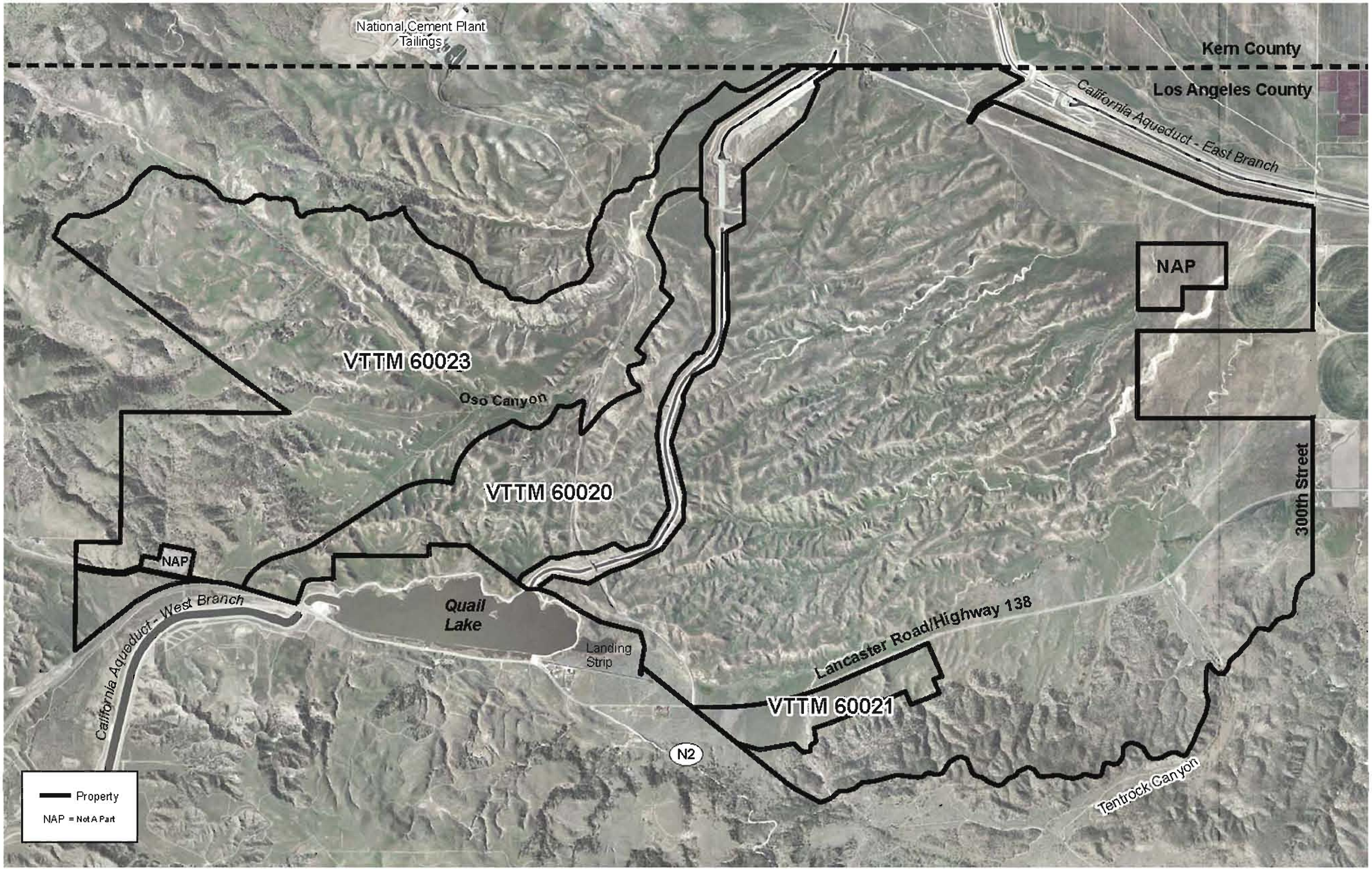

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Aerial Photo of the Three Phase 1 Tract Maps

Figure 1.3

Centennial WSA

N W E S

0.75 0.375 0 0.75 Miles

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1.4 OVERVIEW OF PROJECT WATER SUPPLIES, SYSTEM INFRASTRUCTURE, AND MANAGEMENT

Subject to the factors described in this WSA, Project water demand will be met by utilizing several different supplies, including: (a) previously purchased water supplies loaned to the Antelope Valley-East Kern Water Agency (AVEK); (b) new imported State Water Project (SWP) water from transfers of SWP Table A amounts from SWP contractors located outside of the Antelope Valley and purchases from AVEK; (c) recycled water generated by the collection and tertiary treatment of Project wastewater; (d) return flows generated by Project irrigation that infiltrates into local groundwater; (e) water banked in local aquifers; and (f) groundwater. These supplies are described in detail in Section 4 of this WSA. All of the Project's water supplies will be provided by the Project proponent. None of the GVMWD's existing water supplies, or supplies that may be developed by the District for other activities, will be used for Project purposes. The proposed infrastructure for managing the delivery, treatment and use of the Project's diverse supplies includes the following primary components:

1. *TRC water banking facility (Tejon Water Bank).* The Tejon Water Bank is owned and operated by TRC as an independent water bank on 160 acres located northeast of the Project in Kern County. This water bank was built in 2006 and currently stores water for TRC and AVEK. The Tejon Water Bank would provide water storage and extraction facilities to the Project under contracts with the GVMWD and the Project. The conveyance facilities between the Tejon Water Bank and the Project would be constructed by Centennial and dedicated to the District as part of the annexation process. Appropriate easements for the conveyance facilities will also be provided by Centennial to the District as part of the annexation process. Kern County is a responsible agency for purposes of the Centennial EIR. This water bank consists of several recharge basins or ponds separated by a series of small overflow weirs. During 2006 and 2007, TRC purchased approximately 6,700 acre-feet (AF) of water from AVEK, pumped the water from a turnout on the East Branch of the California Aqueduct (East Branch) to the banking facility, and infiltrated the banked water into the local aquifer. AVEK has also pumped water from the turnout on the East Branch to the banking facility during March and April 2011 to store supplies available under the agency's SWP water supply contract. The turnout serving the banking facility is owned by AVEK and is located at approximately the intersection of 305th Street and the Aqueduct. The turnout will be upgraded and managed for Project use in accordance with turnout operating and maintenance agreements between TRC, AVEK and the California Department of Water Resources (DWR). A pipeline has been installed between the turnout and the offsite bank and can deliver water to separate ponds within the recharge facility. The TRC water bank has the capacity to recharge approximately 11,500 AF per year, or 5,750 AF in a six month wet season. There is at least 161,000 AF of unused aquifer storage within 0.5 miles of the existing TRC banking facility and the proposed onsite water banking facility (described below)(see Appendix A). The location of the TRC water bank relative to the Project is depicted in **Figure 1.5**.

2. *Onsite water banking facility.* A second, approximately 100-acre water banking facility will be constructed along the northern edge of the Project to provide

additional water recharge capacity. The new onsite bank will also facilitate the periodic rotation of infiltration or extraction between the TRC and the onsite banks to avoid potential impacts to the local aquifer. A transmission pipeline will extend from an existing East Branch turnout located at approximately the intersection of 320th Street and the California Aqueduct, and will be routed along the southern edge of the bank to allow for delivery to recharge ponds within the facility. The turnout will be upgraded and managed in accordance with turnout operating and maintenance agreements between AVEK and the DWR. As discussed below, the onsite water bank will also be able to obtain water from a turnout located on the West Branch of the California Aqueduct. A series of contoured infiltration basins separated by a network of berms and overflow weirs will be constructed to receive and infiltrate the water. The onsite water bank's soil and storage characteristics are similar to those of the TRC banking facility and will have the capacity to infiltrate and store approximately 7,200 AF per year (or 3,600 AF during a six-month wet season) (see Appendix A for the Hydrogeologic Investigation Report and Appendix B for the Pilot Recharge Study both prepared by GEI Consultants). There is at least 161,000 AF of unused aquifer storage within 0.5 miles of the proposed onsite and the existing TRC banking facility. The onsite water banking facilities are depicted in **Figure 1.5**. The onsite water bank will be provided to GVMWD for use by the Project as part of the annexation process.

3. *Monitoring and extraction wells*. A series of existing and new onsite and offsite wells will monitor groundwater levels, extract banked water, and recover return flows from onsite irrigation. Subject to the factors discussed in Section 4 of this WSA, the well system would also be used to extract groundwater for Project use. Offsite wells will be located on land owned by TRC to the north and east of the site. The well system will be connected to the onsite water treatment and distribution facilities by a network of pipelines. **Figure 1.5** shows the Project's conceptual monitoring and extraction well field and water transmission system.

4. *Potable water treatment facility.* An onsite water treatment plant will be constructed adjacent to the West Branch of the California Aqueduct (West Branch) to provide potable water for the Project. The planned treatment plant will include required chlorination and other disinfection facilities, and ion exchange or other available, feasible technologies that will maintain potential arsenic levels in potable water serving the Project at a maximum of 2 parts per billion (ppb). As discussed in Section 4.2.7, this level is consistent with typical concentrations in water delivered by the SWP and substantially below the applicable maximum contaminant level of 10 ppb established by the California Department of Public Health. The DWR will construct a new turnout on the West Branch pursuant to an agreement between TRC and DWR to replace a turnout previously demolished by the DWR in conjunction with the enlargement of the Tehachapi Afterbay located to the north of the Project site. The new turnout will be connected to the plant by a short pipeline. After construction, the turnout will be owned by AVEK and managed in accordance with agreements to be completed with AVEK and the DWR. The West Branch turnout can also be used to supply the onsite water bank during periods when the East Branch may lack capacity to convey water to the

facility. The locations of the Project water treatment plant, the West Branch turnout, and the primary connecting pipelines between these facilities are identified in **Figure 1.5**. The potable water treatment facility will be provided to GVMWD for use by the Project as part of the annexation process.

5. *Wastewater reclamation facilities.* All wastewater flows generated by the Project will be collected and treated to tertiary levels. Approximately 90% of the collected and tertiary-treated flows will be used for external irrigation uses such as outdoor irrigation. This recycled water supply will meet approximately 33% of the Project's buildout water demand. As planned, two temporary wastewater reclamation facilities will be built west and east of the aqueduct to serve initial Phase 1 development. As Phase 1 of the Project matures, a permanent wastewater reclamation facility will be constructed west of the aqueduct along the northern border of the site (the "Westside Reclamation Facility") and the temporary western reclamation plant will be removed. As the Project is developed beyond Phase 1, a second permanent wastewater reclamation facility will be constructed at the northeast corner of the Project (the "Eastside Reclamation Facility") and the temporary eastern reclamation plant will be removed. The locations of the temporary and permanent wastewater reclamation facilities are shown in **Figure 1.5.** The wastewater reclamation facilities will be provided to GVMWD for use by the Project as part of the annexation process.

As noted above, after completion of the annexation process, the Project's water system, including the off-site conveyance facilities from the Tejon Water Bank to the Project, Well No. 106 and conveyance facilities from the well to the Project , onsite water bank and on-site Well No. 98 , on-site water conveyance facilities, potable water treatment and distribution systems, and wastewater collection, treatment and recycled water distribution systems, would be owned and operated by the District. Annexation of the Project into the GVMWD service area would require approval by the Los Angeles County LAFCO and would occur after the certification of the Project's FEIR. The GVMWD is a public entity, with noticed, regular public meetings, and is managed by a Board of Directors elected under the provisions of the Water Code. Section 71610 of the Water Code provides that a municipal water district may acquire, control, distribute, store, spread, sink, treat, purify, recycle, recapture, and salvage any water, including sewage and storm waters, for the beneficial use or uses of the district, its inhabitants, or the owners of rights to water in the district. Section 71670 of the Water Code provides that a municipal water district may acquire, construct, and operate facilities for the collection, treatment, and disposal of sewage, waste, and storm water of the district and its inhabitants. Prior to the annexation of the Project into the GVMWD service area, TRC may acquire certain water, water infrastructure or related water rights that are intended to benefit the Project. These rights would be transferred for the benefit of the Project after all required approvals for the annexation process are completed.

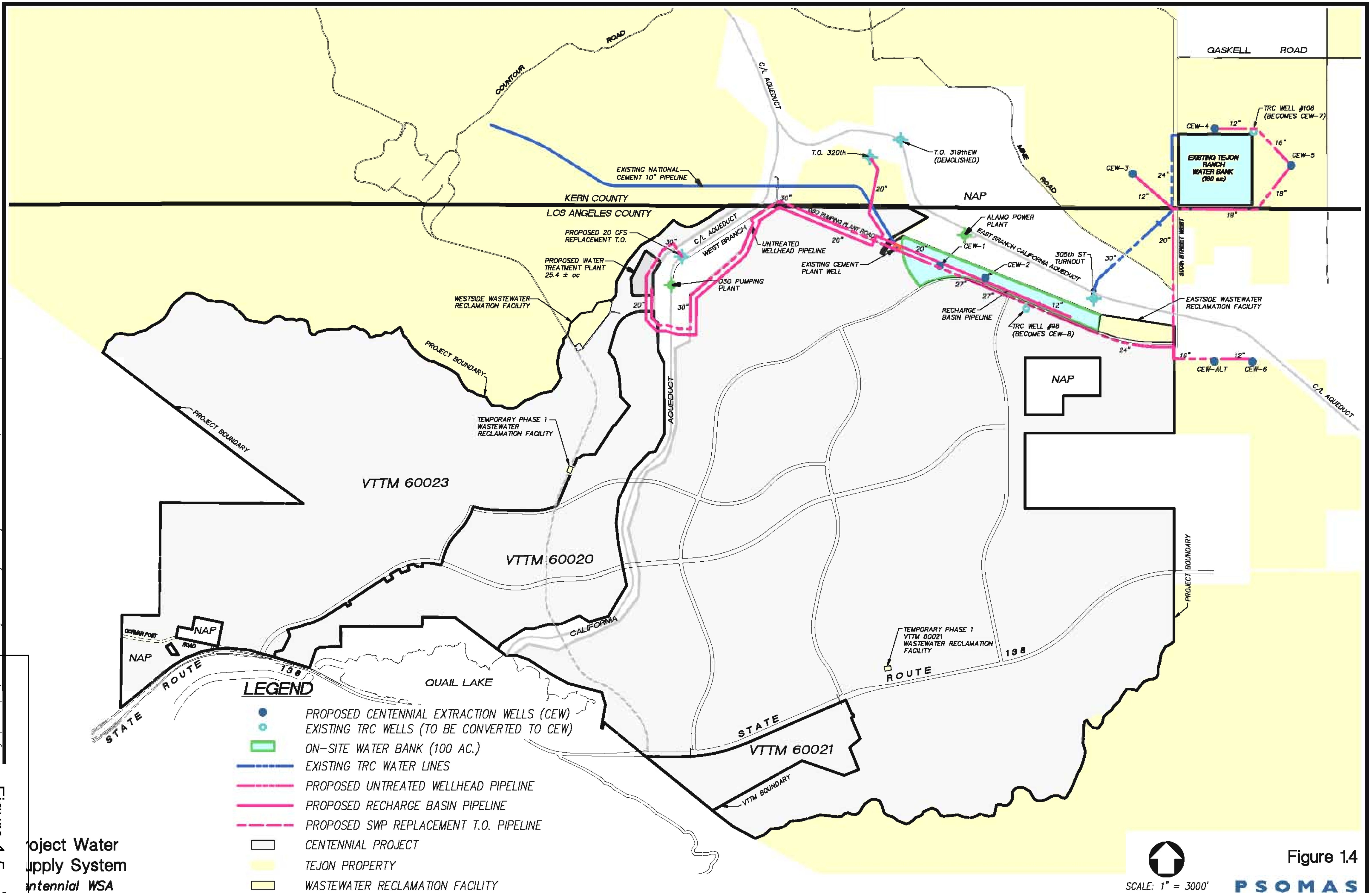

Figure 1.5

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1.5 GVMWD OVERVIEW

Golden Valley Municipal Water District is an independent special district organized in 1971 under the Municipal Water District Act of 1911 (Section 71000 et seq. of the California Water Code). The District's service area encompasses approximately 12.5 square miles in the vicinity of the unincorporated community of Gorman, California. A small portion of the District is located in Kern County as the result of a previous County boundary line change. Almost all of the District land is located within Los Angeles County (see Figure 1.2).

GVMWD provides retail water from groundwater sources to residential and commercial users within the Gorman area. The District assumed the responsibility for the operation and maintenance of the community's sewer and treatment and disposal system on October 1, 1987 and acquired the local domestic water system, including a well, treatment facilities and pipelines, in 1995. Directors are elected from five divisions within the District's service area. The District holds regular board meetings on the third Wednesday of each month. Customer contacts are made in person at the board meeting or may be submitted to the District in writing. For water service, the District charges a flat rate for residential customers and a metered rate for non-residential customers (LAFCO 2005b).

According to a 2005 municipal service review by the Los Angeles County LAFCO, GVMWD extracts approximately 100 acre-feet per year (AFY) of groundwater to meet demand within its service area. The LAFCO review utilized population growth estimates provided by the Southern California Association of Governments to project potential water demand within the District over a 20-year period. As shown in **Table 1.5.1**, the LAFCO analysis indicated that potential population growth could increase demand within the GVMWD service area from 100 AFY to approximately 120 AFY by 2020.

TABLE 1.5.1
GVMWD AVERAGE ANNUAL DEMAND INFORMATION (AFY)

	Existing	2005	2010	2015	2020
Residential	5	5	5	5	5
Commercial/Industrial	95	100	105	110	115
Landscape/Irrigation	0	0	0	0	0
Other	0	0	0	0	0
Total	**100**	**105**	**110**	**115**	**120**

Source: LAFCO 2005a

Several development projects have been proposed within or adjacent to the District since GVMWD was formed in 1971. None have been constructed, and no project currently has been approved for development. In approximately 2007, Los Angeles County issued a Notice of Preparation (NOP) for an EIR and a CEQA Initial Study for the proposed Gorman Post Ranch project, a residential development located within approximately 2,700 acres of the GVMWD service area. As described in the NOP, the project included approximately 530 single family residences, a small number of additional large lots, and associated development infrastructure, including onsite water facilities and debris basins and a 16 acre-offsite wastewater treatment plant. After the NOP was released, the County did not circulate or certify an EIR for the project.

In late 2010, the Gorman Post Ranch project land was purchased by a new development company, MDM Gorman Post Ranch LP. In March 2011, the developer informed GVMWD that it would be seeking approval of a new vesting tentative tract map for the property, including approximately 533 residential units. Los Angeles County has not issued any environmental or other approvals for the revised proposal.
All of the Project's water supplies will be provided by the Project proponent. None of the GVMWD's existing water supplies, or supplies that may be developed by the District for other activities, including the revised Gorman Post Ranch project, will be used for Project purposes through the full buildout of the Project. As a result, the provision of water supplies or related services for other potential uses within the District's existing boundaries will not affect or impact the Project's water supplies or services.

1.6 WSA APPROACH AND SUMMARY

This WSA provides a discussion of the sufficiency of the Project's water supplies during normal, single dry, and multiple dry years over a 20-year projection as required by Water Code Sections 10910-10915. The analysis and projections presented in this report have been prepared in accordance with the Water Code and the *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001* (DWR 2003). The projections also incorporate, where applicable, the SWP system information provided in the SWP Delivery Reliability Report 2009 (August 2010) and the CALSIM II water supply model and data developed by the DWR (DWR 2010). A copy of the SWP Delivery Reliability Report 2009 that includes a description of the 2009 CALSIM II data is attached in Appendix C.

Section 2 of this WSA summarizes the Project's water demand for Phase 1 and at full buildout. The Project will use of state-of-the-art water conservation technology and management measures that will reduce per-unit and per-capita demand significantly below current levels within the Antelope Valley. Recycled water use, which will account for approximately 33% of the Project's buildout demand, will significantly exceed the level of tertiary-treated water use currently used in and projected for the Antelope Valley region. Project water consumption will be continuously monitored and further measures will be implemented as necessary to ensure that projected conservation and consumption rates are achieved over time.

Section 3 provides an overview of the Antelope Valley region's current and projected water supplies and demands. Groundwater and SWP imports comprise the two most important water sources within the Antelope Valley. Section 3 summarizes the status of the current adjudication of the Antelope Valley Groundwater Basin, the reliability of SWP imports to the region, and the water supply and demand projections included in the 2007 Antelope Valley Integrated Regional Water Management Plan (AVIRWMP)(see Appendix D) and the AVEK 2008 Urban Water Management Plan (2008 UWMP)(see Appendix E). As discussed in more detail below, the AVIRWMP and 2008 UWMP show that, if current regional per-capita water use rates are not reduced, future growth in combination with existing demands could generate a significant supply and demand "mismatch" or shortfall.

As discussed in Section 2 and Section 3 of this WSA, the water conservation, demand management and recycled water use measures included in the Specific Plan would achieve, on a local basis, most of the long-term water conservation, per-capita consumption reductions and management objectives that have been identified for the Antelope Valley region. If approved, the proposed Project would ensure that the per-capita water consumption associated with a large component of the region's projected future growth would be substantially lower than assumed in the AVIRWMP and the 2008 UWMP. If all of the future growth projected for the region were to achieve the Project's per-capita water consumption rates, the future supply and demand mismatch discussed in the AVIRWMP and the 2008 UWMP would be significantly reduced. As discussed more fully below, the AVIRWMP and the 2008 UWMP provide an important context for describing potential regional water supply outcomes but do not reflect the Project's significantly lower per capita water consumption rates, current SWP reliability data and certain other, more current regional data, such as population growth estimates. Consequently, this WSA considers the AVIRWMP and the 2008 UWMP but provides an independent analysis of Project water supplies in accordance with the Water Code.

Section 4 summarizes the Project's water supplies and water supply management strategy. It first describes the water supplies currently or likely to be available for Project use at the time of Project approval (the "Base Supplies"), including: (a) water supplies loaned to AVEK by TRC in 2008 and 2009 for later return and delivery; (b) the transfer from TRC of certain SWP Table A amounts for Project use; (c) recycled water; (d) return flows generated by Project irrigation; (e) water purchased from AVEK for delivery by 2015 (call water); (f) water currently banked via the TRC water bank; and (g) groundwater. Section 4 then considers the circumstances and potential impacts associated with additional new imported supplies that could become available for Project use to supplement the Base Supplies and meet buildout demand, including the transfer of additional Table A amounts from other SWP contractors located outside of the Antelope Valley, other water imports, and potential purchases from AVEK. As discussed in more detail below, it is reasonably foreseeable that one or a combination of these additional supplies will be available for use after 10 years from the start of the Project to meet buildout demand.

Section 5 presents normal, single dry year and multiple dry year 20-year projections in accordance with the Water Code for Phase 1. It shows that the Base Supplies are sufficient to meet Phase 1 demand on a sustainable basis using multiple, successive iterations of the 82-year 2009 CALSIM II data period of record.

Although TRC currently uses groundwater as part of its ongoing agricultural operations, for the purposes of this WSA no groundwater is assumed to be available for Project use until after Year 6 of the 20-year buildout period, or only after Phase 1 is complete. During Years 1-6 of the buildout process, and throughout the development of Phase 1, TRC is assumed to continue to use groundwater for agricultural purposes. Starting in Year 7 of the Project, for the purposes of this WSA it is assumed that TRC's existing agricultural groundwater use would decline commensurate with Project use of groundwater. As discussed in more detail below, this WSA assumes that Project groundwater use will not occur until at least Year 7 of the 20-year buildout projection for several reasons.

First, as demonstrated in Section 5, no groundwater use is required to achieve a sustainable, long-term water supply for Phase 1. Groundwater is therefore not included or required as a component of the Phase 1 water supply for either Water Code (WSA) or Map Act water supply verification purposes.

Second, as discussed in Section 3.1, the Antelope Valley groundwater basin has been subject to an ongoing adjudication since approximately 2005. Phase 3 of the adjudication trial process was completed in April 2011, and judicial determinations of the basin's sustainable yield and related groundwater conditions is expected by early summer 2011. The ongoing use of groundwater has continued within the Antelope Valley during the adjudication process. The assumption that Project groundwater use will not occur until at least Year 7 of the 20-year buildout projection allows for the achievement of further progress in the adjudication over a multi-year period prior to any groundwater use by the Project.

Third, the Project's environmental review, permitting by lead and responsible agencies, and potential litigation could delay the start of Project construction by approximately four to five years. To provide a conservative analysis, the Project's 20-year buildout projection is also relatively aggressive, including the assumption that approximately 5,833 dwelling units will be constructed and sold and approximately 3.33 million square feet of employment uses will be developed during years 1-6. It is possible that market conditions may not support this rate of absorption and that the Project's use of groundwater would not actually occur until significantly later than year seven of the buildout projections. As a result, the WSA incorporates significantly conservative assumptions regarding the timing of post-Phase 1 groundwater use by the Project.

Section 6 presents normal, single dry year and multiple dry year 20-year projections in accordance with the Water Code for buildout conditions. The 20-year analysis shows that the base supplies are sufficient to meet full buildout demand for the 20-year period required by the Water Code. Section 6 also analyzes the amount of additional imported water, plus the Base Supplies, that would meet full buildout demand in three time frames: (1) over 40 years, or twice the projection period required by the Water Code; (2) over the entire 82-year period of record in the DWR's CALSIM II hydrologic model; and (3) on a sustainable basis using multiple, successive iterations of the 82-year 2009 CALSIM II data period of record. The analysis for each time frame assumes that no new imported water would become available for Project use until Year 11 to allow for the implementation of currently proposed and potential future regional and statewide initiatives that could stabilize and enhance SWP or other potential imported supplies. As discussed below, SWP contractors located outside of the Antelope Valley, or third parties that can supply other water with suitable quality for delivery though the California Aqueduct could sell these supplies for Project use under available legal mechanisms that facilitate water transfers and conveyance transactions. The Project site is also within AVEK's existing service area, and AVEK is the largest SWP contractor in the Antelope Valley (see Figure 4.4). TRC has historically received deliveries of AVEK water under a water supply agreement with the agency and in accordance with AVEK's enabling act and rules and regulations. Considering all of these factors, it is reasonably likely that additional imported water supplies would become available by Year 11 of the Project to meet the demands summarized in Section 6.

Section 7 lists references cited in and used to prepare this WSA.

2.0 PROJECT WATER DEMAND

This section estimates Phase 1 and full buildout water demand based on the planned land uses identified in the Centennial Specific Plan and consumption data from regions that utilize water management measures and technologies similar to those proposed for the Project. As discussed more fully below, the regional consumption data has been adjusted to account for: (a) the more severe climate conditions in the Antelope Valley, which increases Project water requirements; and (b) the use of additional, proven, state-of-the-art water conservation measures that will reduce Project demand, such as the production and use of tertiary-treated reclaimed water for non-potable uses and the more extensive use of water conservation fixtures and appliances.

Per-capita water demand within the Specific Plan area would be approximately 0.125 acre-feet per year (AFY) net of recycled water use compared with 0.273 AFY and 0.343 per-capita use assumed for future growth in the AVIRWMP and the 2008 UWMP, respectively (AVIRWMP 2007; AVEK 2008). As a result, the Project would be consistent with Antelope Valley regional and recently enacted state water use planning objectives to significantly reduce per-capita water demand over time.

2.1 LAND USE

Table 2.1.1 summarizes the land uses and associated water demands for Phase 1. **Table 2.1.2** summarizes the land uses and associated water demand for the Project at full buildout. The tables show that, as planned, Phase 1 demand will be approximately 2,953 AFY and buildout demand will be approximately 11,976 AFY.

At buildout, recycled water will supply approximately 3,979 AFY, or 33% of the Project's total demand (see Table 2.1.2). The Project will require about 7,996 AFY of potable or non-recycled water. Approximately 64,000 residents will live in the Specific Plan area at buildout. As discussed in Section 3, the AVIRWMP and the 2008 UWMP estimate per-capita urban water use by dividing total municipal and industrial (M&I) or non-agricultural consumption by the total number of resident households and persons per household within each planning area. Both plans also assume that almost all M&I demand will be met with potable, non-recycled water. Using the same methodology, the Project's per-capita water consumption will be approximately 0.125 AFY net of recycled use (7,996 AFY total non-recycled water demand divided by 64,000 residents) compared with 0.273 AFY in the AVIRWMP and 0.343 AFY in the 2008 UWMP.

TABLE 2.1.1
CENTENNIAL DEVELOPMENT
LAND USES & ASSOCIATED WATER DEMAND FOR PHASE 1

LAND USE	UNITS	NET AREA (AC)	PERCENT IRRIGATED AREA	IRRIGATED AREA (AC)	DWELLING UNITS	DOMESTIC FACTORS (GPD/DU, AC)	IRRIGATION FACTOR (AF/AC/YR)	AVG ANNUAL DOMESTIC DEMANDS		CENTRALIZED IRRIGATION DEMANDS		TOTAL WATER DEMANDS	
								AFY	MGD	AFY	MGD	AFY	MGD
RESIDENTIAL													
VERY LOW / LOW DENSITY [1]	DU	417			1,396	459		718	0.64			718	0.64
MEDIUM DENSITY [1]	DU	588			3,847	343		1,478	1.32			1,478	1.32
HIGH DENSITY	DU	32	15%	4.8	590	185	3.0	122	0.11	14	0.01	136	0.12
VERY HIGH DENSITY	DU	0	15%	0.0	0	206	3.0	0	0.00	0	0.00	0	0.00
WASHING MACHINE ADJUSTMENT								*-70*	*-0.06*			*-70*	*-0.06*
RESIDENTIAL ET IRRIGATION CONTROLLERS								*-245*	*-0.22*			*-245*	*-0.22*
INDOOR CONSERVATION								*-336*	*-0.30*			*-336*	*-0.30*
TOTAL RESIDENTIAL		**1,037**			**5,833**			**1,666**	**1.49**	**14**	**0.01**	**1,681**	**1.50**
COMMERCIAL	AC	27	20%	5.3		2,188	3.0	65	0.06	16	0.01	81	0.07
EMPLOYMENT	AC	185	20%	37.0		963	3.0	199	0.18	111	0.10	310	0.28
INDOOR COMM/EMPLOY. CONSERVATION								*-36*	*-0.03*			*-36*	*-0.03*
SCHOOLS	AC	117	50%	58.5			3.8			222	0.20	222	0.20
GRADES K-8 - (2,678 STUDENTS)	-	-	-	-		5		15	0.01			15	0.01
GRADES 9-12 - (1,051 STUDENTS)	-	-	-	-		10		12	0.01			12	0.01
UTILITY/ INSTITUTIONAL	AC	93				100		10	0.01			10	0.01
MINOR GREENWAY-PERMANENT	AC	25	100%	25.0			2.5		0.00	63	0.06	63	0.06
MINOR GREENWAY-TEMPORARY [2]	AC	17	100%	17.0			1.5		0.00	26	0.02	26	0.02
PARKS	AC	57	80%	45.4			3.8		0.00	173	0.15	173	0.15
COMMERCIAL RECREATION [3]	AC	288	0%	0.0			3.8		0.00	0	0.00	0	0.00
OPEN SPACE	AC	1,905	0%	0.0			2.0		0.00	0	0.00	0	0.00
TRANSITIONAL SLOPES / BUFFERS-PERMANENT	AC	45	60%	27.0			2.5		0.00	68	0.06	68	0.06
TRANSITIONAL SLOPES / BUFFERS-TEMPORARY [2]	AC	257	40%	102.8			1.5		0.00	154	0.14	154	0.14
INTERNAL SLOPES-PERMANENT	AC	22	60%	13.2			2.5		0.00	33	0.03	33	0.03
INTERNAL SLOPES-TEMPORARY [2]	AC	43	40%	17.2			1.5		0.00	26	0.02	26	0.02
PARKWAY I (8 LANES) [4]	AC	2.6	100%	2.6			3.0		0.00	8	0.01	8	0.01
PARKWAY II (6 LANES) [4]	AC	8.3	100%	8.3			3.0		0.00	25	0.02	25	0.02
SECONDARY (4 LANES) [4]	AC	5.5	100%	5.5			3.0		0.00	16	0.01	16	0.01
MODIFIED COLLECTORS I & II (2 LANES) [4]	AC	2.4	100%	2.4			3.0		0.00	7	0.01	7	0.01
MODIFIED COLLECTORS III (2 LANES) [4]	AC	1.8	100%	1.8			3.0		0.00	5	0.00	5	0.00
RESIDENTIAL COLLECTOR (2 LANES) [4]	AC	8.9	100%	8.9			3.0		0.00	27	0.02	27	0.02
INDUSTRIAL COLLECTOR (2 LANES) [4]	AC	2.8	100%	2.8			3.0		0.00	8	0.01	8	0.01
STATE RTE 138 [4]	AC	6.8	100%	6.8			3.0		0.00	20	0.02	20	0.02
TOTALS					**5,833**			**1,932**	**1.72**	**1,021**	**0.91**	**2,953**	**2.64**

1) 2,276 Phase I dwelling units designated as Low Density Residential were moved to Medium Density Residential land use for the purpose of projecting water demands. These units were moved because the land use densities are similar to IRWD medium density land use on which the water demand factors are based.

2) Temporary slope irrigation is for a 5-year period and assumed to be irrigated at 100% of irrigation rate for permanent slope, then reduced by 20% each year. Therefore, effective irrigation rate at end of Phase I is 60% of full irrigation rate to account for both acreage coming on line and rate being reduced.

3) Assumes total commercial recreational acreage is 50% irrigated for either golf course or other allowable use. Irrigation will come online as recycled water becomes available.

4) Roadway acreages are irrigated acres calculated from roadway lengths and average landscaped width from Specific Plan typical sections

TABLE 2.1.2
CENTENNIAL DEVELOPMENT
LAND USE & ASSOCIATED WATER DEMAND FOR THE PROJECT AT FULL BUILDOUT

LAND USE	UNITS	NET AREA (AC)	PERCENT IRRIGATED AREA	IRRIGATED AREA (AC)	DWELLING UNITS	DOMESTIC FACTORS (GPD/DU, AC)	IRRIGATION FACTOR (AF/AC/YR)	AVG ANNUAL DOMESTIC DEMANDS		CENTRALIZED IRRIGATION DEMANDS		TOTAL WATER DEMANDS	
								AFY	MGD	AFY	MGD	AFY	MGD
RESIDENTIAL													
VERY LOW / LOW DENSITY [1]	DU	2,824			9,330	459		4,796	4.28			4,796	4.28
MEDIUM DENSITY [1]	DU	1,141			8,730	343		3,354	2.99			3,354	2.99
HIGH DENSITY	DU	201	15%	30.2	3,751	185	3.0	775	0.69	90	0.08	866	0.77
VERY HIGH DENSITY	DU	24	15%	3.5	635	206	3.0	147	0.13	11	0.01	157	0.14
MIXED USE [2]	DU	-	-	-	552	180		111	0.10			111	0.10
WASHING MACHINE ADJUSTMENT								*-263*	*-0.24*			*-263*	*-0.24*
RESIDENTIAL ET IRRIGATION CONTROLLERS								*-961*	*-0.86*			*-961*	*-0.86*
INDOOR CONSERVATION								*-1,264*	*-1.13*			*-1,264*	*-1.13*
TOTAL RESIDENTIAL		**4,190**			**22,998**			**6,695**	**5.98**	**101**	**0.09**	**6,796**	**6.07**
COMMERCIAL	AC	207	20%	41.4		2,188	3.0	507	0.45	124	0.11	631	0.56
EMPLOYMENT	AC	796	20%	159.1		963	3.0	859	0.77	477	0.43	1,336	1.19
INDOOR COMM/EMPLOY. CONSERVATION								*-188*	*-0.17*			*-188*	*-0.17*
SCHOOLS	AC	303	50%	151.5			3.8			576	0.51	576	0.51
GRADES K-8 - (10,109 STUDENTS)	AC	-	-	-		5		57	0.05			57	0.05
GRADES 9-12 - (3,983 STUDENTS)	AC	-	-	-		10		45	0.04			45	0.04
UTILITY/ INSTITUTIONAL	AC	207				100		23	0.02			23	0.02
MINOR GREENWAYS-PERMANENT	AC	173	100%	173.0			2.5		0.00	433	0.39	433	0.39
MINOR GREENWAYS-TEMPORARY [3]	AC	120	0%	0.0			0.0		0.00	0	0.00	0	0.00
PARKS	AC	209	80%	167.3			3.8		0.00	637	0.57	637	0.57
COMMERCIAL RECREATION [4]	AC	471	50%	235.6			3.8		0.00	895	0.80	895	0.80
OPEN SPACE	AC	3,677	0%	0.0			0.0		0.00	0	0.00	0	0.00
TRANSITIONAL SLOPES / BUFFERS-PERMANENT	AC	105	60%	63.0			2.5		0.00	158	0.14	158	0.14
TRANSITIONAL SLOPES / BUFFERS-TEMPORARY [3]	AC	595	0%	0.0			0.0		0.00	0	0.00	0	0.00
INTERNAL SLOPES-PERMANENT	AC	98	60%	58.8			2.5		0.00	147	0.13	147	0.13
INTERNAL SLOPES-TEMPORARY [3]	AC	192	0%	0.0			0.0		0.00	0	0.00	0	0.00
PARKWAY I (8 LANES) [5]	AC	2.6	100%	2.6			3.0		0.00	8	0.01	8	0.01
PARKWAY II (6 LANES) [5]	AC	21.8	100%	21.8			3.0		0.00	65	0.06	65	0.06
SECONDARY (4 LANES) [5]	AC	34.0	100%	34.0			3.0		0.00	102	0.09	102	0.09
MODIFIED COLLECTORS I & II (2 LANES) [5]	AC	12.2	100%	12.2			3.0		0.00	37	0.03	37	0.03
MODIFIED COLLECTORS III (2 LANES) [5]	AC	9.0	100%	9.0			3.0		0.00	27	0.02	27	0.02
RESIDENTIAL COLLECTOR (2 LANES) [5]	AC	23.9	100%	23.9			3.0		0.00	72	0.06	72	0.06
INDUSTRIAL COLLECTOR (2 LANES) [5]	AC	6.6	100%	6.6			3.0		0.00	20	0.02	20	0.02
STATE RTE 138 [5]	AC	34.0	100%	34.0			3.0		0.00	102	0.09	102	0.09
TOTALS				**144**	**22,998**			**7,996**	**7.14**	**3,979**	**3.55**	**11,976**	**10.69**

1) 2,276 Phase I dwelling units designated as Low Density Residential were moved to Medium Density Residential land use for the purpose of projecting water demands. These units were moved because the land use densities are similar to IRWD medium density land use on which the water demand factors are based.

2) Overlay district, acreage included in retail commercial.

3) Temporary slope irrigation is for a 5-year period and assumed to be irrigated at 100% of irrigation rate for permanent slope, then reduced by 20% each year.

4) Assumes total commercial recreational acreage is 50% irrigated for either golf course or other allowable use.

5) Roadway acreages are irrigated acres calculated from roadway lengths and average landscaped width from Specific Plan typical sections.

2.2 WATER DEMAND FACTORS

Existing water demand data for the Antelope Valley was determined to not be representative of the proposed Project’s consumption rates for several reasons. Outside of the cities of Lancaster and Palmdale, the area is largely rural with large lots or farm areas and isolated subdivisions that do not possess the centralized services, conservation features, and planned landscaping or water recycling features included in the proposed Specific Plan. The region’s more urban areas generally do not reflect the master-planned character of the Project, which allows for the extensive use of recycled water and native and drought-tolerant landscaping. The water conservation features that would be included in the Project have not been widely used in the Antelope Valley region. As a result, existing regional water utilization rates do not provide a defensible basis for estimating Specific Plan area consumption rates. Accordingly, the Project’s water demand factors are based on documented information from the Irvine Ranch Water District (IRWD), adjusted upward to reflect the local climate, and adjusted downward to account for the Project's use of proven, state-of-the-art water conservation measures.

Reported and published data from other locations were examined to identify an appropriate water use baseline for the Project that could be adapted to reflect the Antelope Valley’s climate and hydrology. The review determined that the IRWD Water Resources Master Plan (March 2002, supplemented in January 2004 with outdoor irrigation use) (the “Master Plan”) provides the most appropriate information for estimating Project water demand factors. IRWD serves a large master-planned community similar to the Project. The IRWD Master Plan is based on actual water consumption documented for detailed categories of land uses that reflect a wide variety of residential, commercial, industrial, and public uses. These categories are similar to the land uses in the proposed Specific Plan. The IRWD Master Plan data can also be easily adapted to reflect climate differences between Orange County and western Antelope Valley. Finally, IRWD data has been used by other projects that have been approved in northern Los Angeles County, such as Newhall Ranch, to estimate demand factors.

The land-use methodology used to estimate Project demand in this WSA has been peer reviewed by and received a favorable assessment from Kennedy-Jenks (see Appendix F), a recognized water resources consulting firm that provided technical support for the AVIRWMP (AVIRWMP 2007). The demand assumptions also incorporate supporting information published in other water consumption research reports and studies.

The exterior residential and commercial demand factors in Table 2.1.1 and Table 2.1.2 are 30% higher than used in the IRWD Master Plan to reflect the warmer, drier climate in the Antelope Valley. A 30% adjustment was estimated by comparing the reference (or potential) evapotranspiration (ETo) rates in Irvine and the Antelope Valley. Evapotranspiration is the loss of water to the atmosphere by the combined processes of evaporation from soil and plant surfaces and transpiration from plant tissues. It indicates how much water crops, lawns gardens, and trees require for healthy growth in a specific climate. The DWR Office of Water Use Efficiency maintains the California Irrigation Management Information System (CIMIS), a network of over 120 automated weather stations that collects and publishes ETo data from throughout the state. According to the CIMIS data, the 2005 average monthly ETo in Palmdale (CIMIS Station #197, located approximately 45 miles to the east of the Project) was approximately 66.19, a level 33% higher than the 49.50 monthly ETo reported for Irvine (CIMIS Station #75). Average annual rainfall in the Antelope Valley is around 10 inches per year on the

Valley floor (USGS 2003) or about 33% less than the average annual rainfall of 15 inches per year in Orange County (NOAA 2005). There are no available data directly comparing IRWD conditions to the western Antelope Valley where the Project site is located. As noted above, the Palmdale data reflects conditions more than 40 miles to the east of the Project where the climate is more arid, temperatures are higher, and annual precipitation is lower. To reflect the more westerly location of the Project, the 33% difference between Palmdale and the Irvine area was further adjusted to 30%.

The proposed Project includes land uses that are similar to those analyzed in the IRWD Master Plan, and the Project demand factors reflect many of the same land use and consumption categories. The Project's water use factors are separated into residential, nonresidential and irrigation demands. Domestic water demands are further subdivided into interior and local exterior demand, which would be met by using potable water supplies for health and safety reasons. Water demands for common area irrigation of greenbelts and other open spaces within residential neighborhoods and commercial areas are characterized as "centralized irrigated" demands in Tables 2.1 and 2.2, and may be met with non-potable water, such as recycled supplies. Demand estimates for schools are based on typical per student use data from both the IRWD and the Los Angeles Bureau of Engineering, and include indoor or potable water use of 5 gallons per day (gpd) per student for K through 8^{th} grade and 10 gpd per student for high schools within the Specific Plan area.

2.2.1 Projected Indoor Water Use

Interior residential water use is primarily affected by the number of people living in a home and the economic condition of the surrounding community. Indoor consumption rates are relatively consistent among different geographic areas that have similar occupancy levels and socio-economic characteristics. The Project's indoor water demand factors were estimated by grouping the Specific Plan area's residential land uses into five density categories and by using the IRWD Master Plan data appropriate for each category. Commercial land uses were also separated into two categories (retail and employment). Commercial indoor demand factors were estimated by using the IRWD Master Plan data for the applicable categories. Indoor demand is not significantly affected by climatic factors and, accordingly, was not adjusted to reflect such factors.

Indoor water demand can be significantly reduced by installing water conservation fixtures and low water consuming devices within a home or business. The Project's Specific Plan encourages the installation of such fixtures and devices. The Specific Plan's Green Development Program, for example, requires the use of "low energy and/or water consuming, Energy Star compliant residential appliances (e.g., refrigerator, clothes washer, dishwasher or room air conditioner)." While several types of water conservation appliances are planned as part of the Project, to provide a conservative analysis water conservation achieved from only one appliance – residential washing machines – has been quantified and included in the water demand analysis. Water conservation achieved from other appliances included in the Specific Plan's Green Development Program, such as dishwashers, could also reduce consumption rates below the IRWD levels.

High efficiency water-conserving clothes washers have been conservatively estimated in published studies to save approximately 5 gallons per capita per day (gpcpd) (CUWCC 2003).

The Project demand projections conservatively assume that, as a result of the Specific Plan's Green Development Program encouraging high-efficiency washing machine use Project buildout residential indoor demand would be reduced by 3.75 gpcpd (5 gpcpd times 0.75, conservatively assuming that only three-quarters of the Project's households use efficient clothes washers) from the levels in the IRWD Master Plan. Comparable high-efficiency clothes washers were not widely deployed in the IRWD Master Plan area during the period when the IRWD's water demand factor analysis was completed.

The proposed Specific Plan also includes the use of other residential water conservation fixtures and devices to further reduce indoor water demand, such as low to ultra-low flow toilets, showerheads, lavatory faucets, and kitchen faucets (see the Specific Plan's Green Development Program, which requires the use of "toilets 1.28 gpf (gallons per flush)," "faucets 2.2 gpm (gallons per minute) or less at 60 psi (pounds per square inch)," and "showerheads 2.5 gpm (gallons per minute) at 80 psi"). Published studies show that these devices can reduce indoor use by up to 24 gpcpd (Vickers 2001). Water conservation fixtures and devices will be used to a greater extent within the Specific Plan area than in the IRWD Master Plan service area, and the Project's indoor water demand factors have been conservatively reduced by 18 gpcpd to reflect this difference.

The proposed Specific Plan also includes the implementation of several commercial, industrial, and institutional (CII) best management practices (BMPs) to reduce water consumption by the proposed commercial and employment land uses. These BMPs include the use of low-flush toilets, urinals and water faucets installed prior to occupancy (see the Specific Plan's Green Development Program, which requires the use of "toilets 1.28 gpf," "sensor operated faucets," and encourages implementation of BMPs such as "sensor operated urinals," and "waterless urinals"). Similar BMPs are not utilized to the same extent within the IRWD Master Plan area. As a result, the demand factors summarized in Tables 2.1 and 2.2 include a 15% reduction in water consumption compared with IRWD commercial and employment water demands (Vickers 2001).

The Project's water use will be monitored and the demand factors identified in Tables 2.1 and 2.2 will be verified over time. As discussed in Section 1.2, the California Government Code requires that water supplies be verified before the final approval and recordation of maps for larger residential subdivisions. Project subdivision maps will be subject to these provisions of the Government Code. As proposed subdivision maps are reviewed over time, the Project's water consumption will be monitored during the verification process to ensure that no residential lots are created unless there are adequate water supplies.

2.2.2 Projected Potable Outdoor Water Use

As summarized above, the Project's exterior irrigation demand factors are 30% higher than comparable exterior rates used in the IRWD Master Plan due to climate differences between the western Antelope Valley and Irvine. The proposed Specific Plan includes the residential use of climate-based irrigation controllers except for higher-density residential areas that have little or no yard space. The irrigation controllers will be linked with an ET measuring station that will automatically adjust watering time to reflect actual, measured ET rates within the Project area. Based on published studies in Irvine and Santa Barbara, climate-based irrigation controllers can reduce outdoor water demand by 25% (WPR 2001; AWWA 2004). Similar equipment has not been widely deployed within the IRWD Master Plan area. As a result, the net exterior water demand factors in Tables 2.1 and 2.2 for very low, low, low-medium and medium density residential land uses are 25% lower than for comparable homes in the IRWD Master Plan. When combined with the 30% higher evapotranspiration rates assumed for the Project area, the lower water use associated with irrigation controllers results in net exterior water use rates that are 5% higher than for comparable homes in the IRWD Master Plan.

2.2.3 Projected Centralized Irrigation (Recycled Water) Use

The Specific Plan proposes to use tertiary-treated recycled water for landscape irrigation, including greenbelts, parkways, commercial recreation, schoolyards, slopes, homeowner association common areas, and parks. Water demands associated with these uses are summarized in the "Centralized Irrigation Demand" columns in Tables 2.1 and 2.2. As discussed in Section 4.1, tertiary treatment is the highest level of treatment for recycled water supplies under California law, and tertiary-treated recycled water may be used on an unrestricted basis for outdoor irrigation.

The Project will use native and drought-tolerant species that are grouped according to water requirements, minimal planting for maximum impact, and drip irrigation where feasible. Landscaping will utilize a plant palette that is tailored to the Specific Plan area's climate and soils, including locally native and adapted species of pines, oaks, sycamores, grasses, and plants that generate spring and fall colors, and a wide range of tree forms. Transitional slopes and greenways will be enhanced with regionally-appropriate species that have historic significance, such as stone fruits. The Project's landscaping approach is designed to achieve several conservation goals, including the following:

- Retaining the look and feel of a regionally-appropriate landscape;
- Minimizing changes in soil types and the energy required to integrate different soils;
- Minimizing irrigated areas; and
- Minimizing water demand in irrigated areas;

Centralized irrigation demand will be met by treating Project wastewater to tertiary treatment levels and distributing the treated water by using dedicated recycled water supply pipelines throughout the site. At full buildout, and assuming approximately 10% of the collected wastewater is lost in the treatment process and due to evaporation, the Project would generate a maximum of approximately 3.90 million gallons per day (mgd) and 4,400 AFY of recycled water. Centralized irrigation system demand will be 3.55 mgd or 3,979 AFY. As a result, the Project's recycled water supply at full buildout will be sufficient to meet all projected centralized irrigation demands. Any excess recycled water supplies will be used to enhance the irrigation of Project greenbelts, parkways, commercial recreation, schoolyards, slopes, homeowner association common areas, and parks. Storage ponds will store recycled water during periods when seasonal irrigation demands are low and to provide sufficient irrigation water in warmer months when demands are higher.

2.3 DEMAND SUMMARY

As shown in Table 2.1.1, Phase 1 will generate total water demands of approximately 2,953 AFY or 2.64 mgd. Approximately 1,021 AFY of recycled water will be available for centralized irrigation system use, and potable water demand will be approximately 1,932 AFY

Table 2.1.2 shows that, as planned, buildout water demand will be approximately 11,976 AFY or 10.69 mgd. This level of demand takes climatic factors into account, and is approximately 24% lower than would be projected for comparable developments using the IRWD Master Plan data due to the implementation of the indoor residential, commercial and employment conservation measures, and external water conservation measures discussed above. Approximately 3,979 AFY, or 33% of buildout demand is associated with centralized irrigation land uses. All of this demand will be met by using recycled water, and any excess recycled supplies will be used to further supplement the irrigation of Project slopes, greenbelts and similar areas. All available recycled water supply will be used for external irrigation within the Project site. Full buildout potable water demand will be approximately 7,996 AFY.

Table 2.3.1 summarizes the proposed Project's water demands, land use development and employment generation over the 20-year buildout period.

TABLE 2.3.1
PROJECT WATER DEMAND, LAND USE AND EMPLOYMENT SUMMARY
OVER A 20-YEAR BUILDOUT PERIOD

Project Year	Total Water Demand (AFY)	Recycled Water Supply (AFY)	Residential Dwelling Units	Commercial Uses (1,000 SF)	Business Park/ Employment Uses (1,000 SF)	Permanent Onsite Jobs
1	168	42	235	86	0	296
2	598	187	1,046	125	0	486
3	1,026	335	1,874	125	832	2,301
4	1,643	558	3,119	223	1,665	4,337
5	2,313	806	4,500	223	2,497	6,151
6	2,953	1,044	5,833	223	3,330	7,966
7	3,684	1,305	7,059	415	3,823	9,514
8	4,396	1,544	8,285	796	4,315	11,488
9	5,092	1,783	9,511	796	4,808	12,604
10	5,772	2,023	10,737	1,265	5,301	14,775
11	6,436	2,262	11,964	1,265	5,794	15,891
12	7,084	2,501	13,190	1,399	6,450	17,644
13	7,741	2,740	14,416	1,399	7,106	19,096
14	8,400	2,979	15,642	1,602	7,762	21,005
15	9,059	3,218	16,868	1,805	8,419	22,914
16	9,567	3,457	18,094	1,805	9,075	24,366
17	10,150	3,696	19,320	1,988	9,927	26,635
18	10,733	3,936	20,546	1,988	10,780	28,492
19	11,342	4,175	21,772	2,021	11,632	30,421
20	11,976	4,414	22,998	2,021	12,485	32,277

3.0 WATER SUPPLY AND DEMAND IN THE ANTELOPE VALLEY

This section discusses water supply and demand in the Antelope Valley region. Water in the Antelope Valley is supplied from two primary sources: (1) naturally occurring water accumulated as surface water or groundwater from rain and snow; and (2) imported surface water collected in northern California and conveyed through the SWP to the region (LACDRP 2010). Section 3.1 discusses groundwater in the Antelope Valley and the potential effects of the Antelope Valley Groundwater Basin adjudication on groundwater supplies. Section 3.2 discusses the reliability of the SWP system with reference to the 2009 SWP Delivery Reliability Report (DWR 2010). Section 3.3 summarizes the regional water supply projections in the 2008 UWMP and the 2007 AVIRWMP.

Water Code Sections 10910(c)(2)-(3) state that if the anticipated water demand associated with a proposed project was accounted for in the most recently adopted urban water management plan (UWMP) adopted by a public water system, a WSA may incorporate the urban water management plan. The GVMWD has not adopted an UWMP. Other UWMPs adopted by public water systems in the Antelope Valley region, and adopted regional integrated water plans, do not reflect or account for the proposed Project's water consumption rates, use of recycled supplies, and aggressive water conservation measures. Under these circumstances, Water Code Section 10910(c)(4) requires that a WSA independently consider whether the total projected water supplies, determined to be available for use by the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the anticipated water demand associated with the proposed project taking into account existing and planned future uses.

The 2008 UWMP and 2007 AVIRWMP are discussed in this WSA to provide regional background information based on the most recently available water planning documents that consider future regional growth, water demands and water supplies. As discussed in Section 3.3, these plans do not reflect the Project's water consumption rates, which are substantially below current and projected regional levels. These plans also utilize certain supply reliability and population data that has since been superseded. None of the adopted UWMPs or other regional water plans constitute an urban water management plan adopted by a public water system that adequately considers the Project. Consequently, this WSA considers the 2008 UWMP and 2007 AVIRWMP but provides an independent assessment of the Project's water supplies as required by the Water Code.

3.1 REGIONAL GROUNDWATER

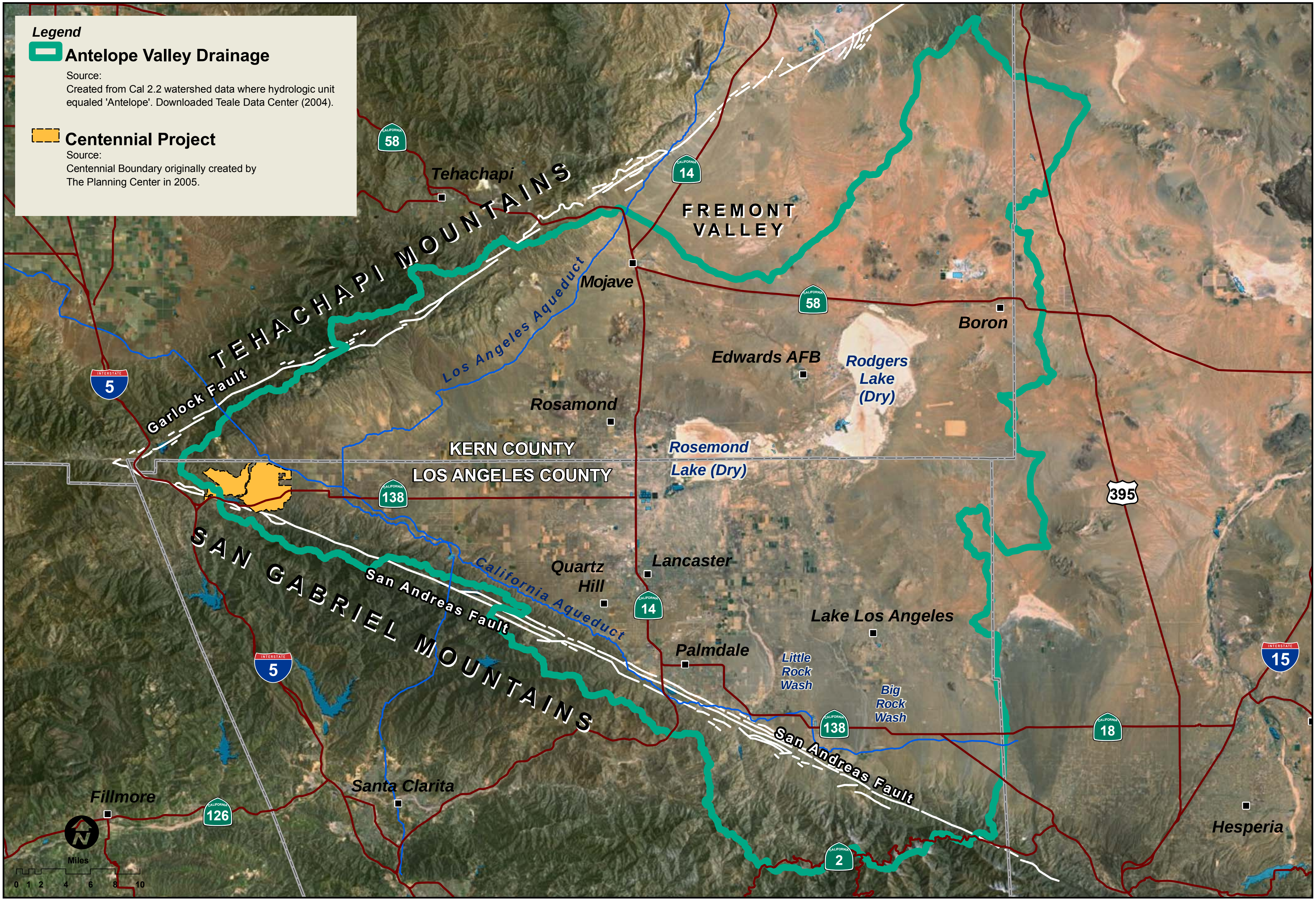
Antelope Valley Groundwater Basin overview. The Antelope Valley is located in the southwest portion of the Mojave Desert in southern California, about 40 miles north of the city of Los Angeles. Approximately two-thirds of the Valley is located in northern Los Angeles County and the remainder is located in southeastern Kern County. The Valley is bounded on the south and west by the San Gabriel and Tehachapi Mountains, on the north by the Rosamond and Bissell Hills, and on the east by the Hi Vista area buttes and alluvial fan. The Fremont Valley is located to the north and the Victor Valley to the east of the Antelope Valley basin (LACDRP 2010). The Antelope Valley is considered to be a closed hydrologic basin because water drains into, but not out of the valley. It extends over approximately 1,390 square miles. The Antelope Valley is comprised of relatively flat valley land and dry lake beds, with coalescing alluvial fans and scattered buttes around the periphery. The basin is topographically closed on the north and northwest by the Garlock Fault at the base of the Tehachapi Mountains, and on the south and southwest by the San Andreas Fault at the base of the Transverse Ranges, including the San Gabriel Mountains. Surface elevations in the Valley range from about 2,300 feet to nearly 3,500 feet above mean sea level. Several creeks, including the perennial Big Rock and Little Rock Creeks, drain the surrounding mountains, cross the alluvial fans, and become dry washes within the Valley. The Los Angeles Aqueduct traverses the western end of the Valley and the California Aqueduct runs along the Valley's southern edge, flanking the San Gabriel Mountains (LACDRP 2010).

Urban centers in the Antelope Valley include the cities of Lancaster, Palmdale, and Rosamond along State Highway 14, as well as a large portion of Edwards Air Force Base (Edwards AFB) in the Valley's northeast corner. The Palmdale and Lancaster urbanized area has grown rapidly since the 1980's and has a current population of approximately 280,000 residents. Agricultural lands occupy various areas near the cities and Edwards AFB, and comprise approximately 25,000 acres (LACDRP 2010). **Figure 3.1** depicts the primary topographic features of the Antelope Valley Groundwater Basin.

The storage capacity of the Antelope Valley Groundwater Basin has been reported to range from 68 million AF (Planert and Williams 1995 as cited in DWR 2004) to 70 million AF (DWR 1975 as cited in DWR 2004). Agricultural and urban uses have been the primary sources of extraction from the groundwater system. According to the U.S. Geological Survey (USGS), groundwater extractions have exceeded the estimated natural recharge of the basin since the 1920s, which has resulted in declining water levels and land subsidence in the eastern portion of the basin (USGS 2003). The Project site overlays the far western portion of the Antelope Valley Groundwater Basin, and is located approximately 20 miles to the east of these subsidence areas.

The Antelope Valley Groundwater Basin is divided by the USGS into 12 subbasins (also called "subunits" or "subareas") that are generally based on ground flow patterns, recharge characteristics, and geographic location, as well as controlling geologic structures such as faults or intruding bedrock features (LACDRP 2010). The Project site is located in the extreme western portion of the Antelope Valley Groundwater Basin, and overlies the Finger Buttes and West Antelope subbasins (see Figure 4.2). The locations of the 12 subbasins in the Antelope Valley Groundwater Basin are shown in **Figure 3.2.**

Substantial groundwater pumping in the Antelope Valley began in the early 1900s, peaked in the 1950s, and decreased in the 1960s and 1970s when agricultural pumping declined. Urban growth in the 1980s resulted in an increase in municipal and industrial water demand and an increase in groundwater extraction for urban uses. SWP imports helped stabilize groundwater levels in some areas of the Valley. Data collected by the USGS indicate that groundwater levels appear to be falling in the southern and eastern areas of the Antelope Valley. In some localized areas, the rate of decline has slowed. Groundwater levels have increased slightly in the rural western and far northeastern areas of the region (LACDRP 2010). The Project site is located in the rural western portion of the basin.



Primary Features in the Antelope Valley Groundwater Basin

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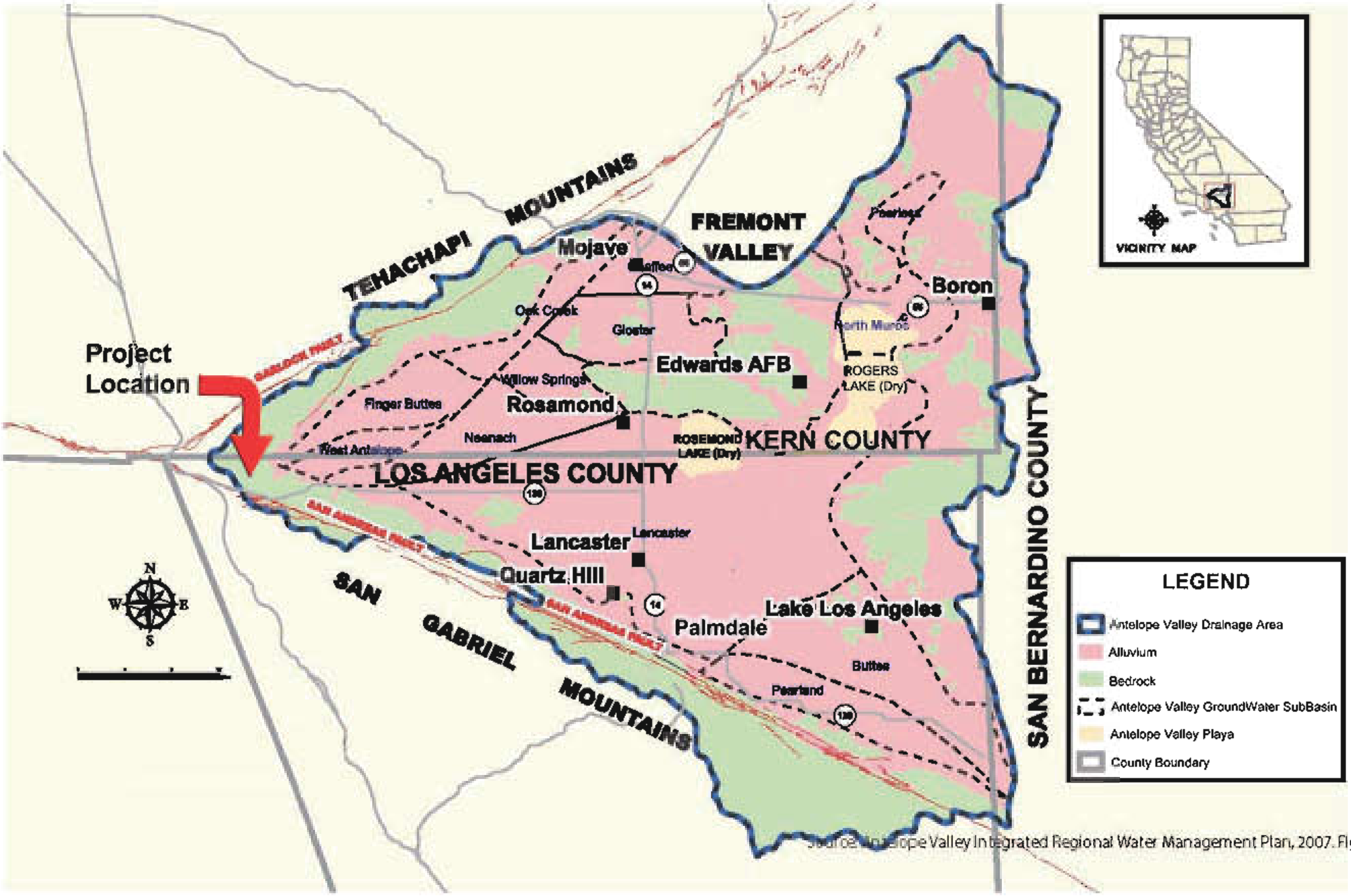
Figure 3.1



Source: Antelope Valley Integrated Regional Water Management Plan, 2007. Figure 2-10, pp. 2-4.

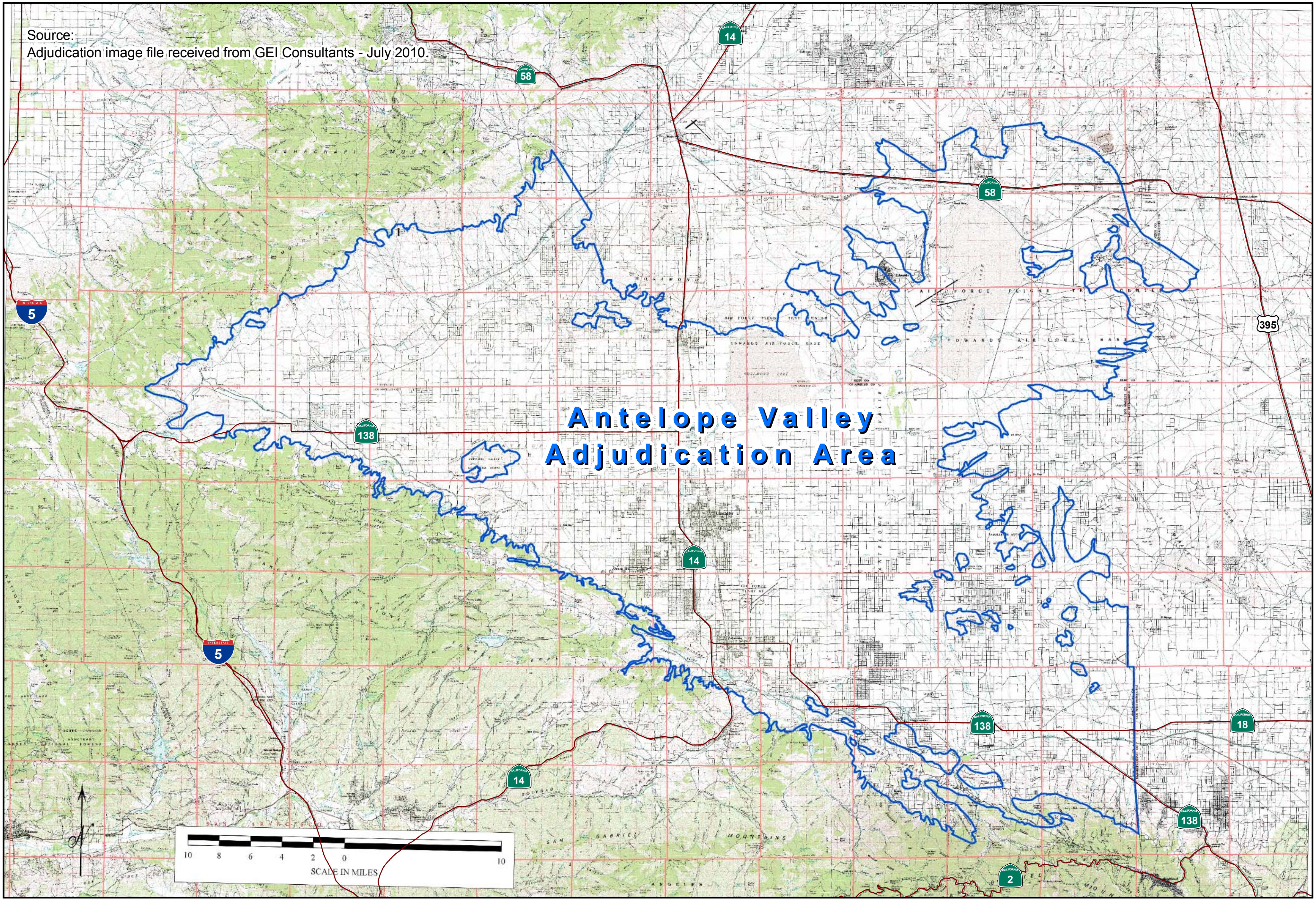
Groundwater Sub-Basins in the Antelope Valley Groundwater Basin — Figure 3.2

Centennial WSA

The primary water-bearing materials in the Antelope Valley Groundwater Basin are Pleistocene and Holocene age alluvial and lacustrine deposits consisting of compact gravels, sand, silt, and clay. Recharge to the basin is primarily from perennial runoff from the surrounding mountains and hills. Most recharge occurs at the foot of the mountains and hills by percolation through the head of the alluvial fan system. An exact groundwater accounting of water input versus output volume, or recharge additions versus extractions and losses for the whole of the Antelope Valley Groundwater Basin, is not available. According to the 2007 AVIRWMP, groundwater is considered a reliable water source in the Antelope Valley region (LACDRP 2010).

Antelope Valley Groundwater Basin adjudication. In approximately 2005, several property owners and public water suppliers initiated legal proceedings asking the Los Angeles County Superior Court to determine the relative rights of users and potential users of the Antelope Valley Groundwater Basin (1-05-CV-049053: Antelope Valley Groundwater Cases, Consolidated Proceeding 4408). Los Angeles County is one of the plaintiffs in the action.

The Antelope Valley adjudication case involves many complex legal issues and hundreds of parties. The underlying dispute among the parties involves the priority of competing rights to pump groundwater and the overall protection of the Basin. At the completion of the Phase 1 Trial (November 2006), the Court concluded that the alluvial basin as described in DWR Bulletin 118-2003 should be the jurisdictional boundary for purposes of the litigation (the "Antelope Valley Adjudication Area" or "AVAA"). The AVAA is shown in **Figure 3.3**. According to the Court's Order After Phase 2 Trial on Hydrologic Nature of Antelope Valley (November 2008), there are multiple claims to be adjudicated, including "declaratory relief, claims of prescription, claims of overlying owners to quiet title to water rights, claims that portions of the Basin should be treated as a separate area for management purposes in the event a physical solution to water use is established, among other issues and claims. The resolution of many of these claims is likely to be affected by the nature and extent of the hydrologic connectivity of water within various portions of the aquifer." In an Order scheduling the Phase 3 Trial (March 2010), the Court stated that it will hear evidence as to whether the Basin is in overdraft. Additional issues in the adjudication include the safe yield for the basin, as well as appointment of a watermaster to manage the groundwater in the basin (LACDRP 2010). The Phase 3 Trial has been concluded, and a final decision is due from the court by early summer 2011. A tentative decision issued on May 9, 2011 concluded that the basin was in overdraft and the sustainable yield from the adjudication area is 110,000 AFY.



Antelope Valley Adjudication Area

Centennial WSA

Figure 3.3

According to a recent certified EIR prepared by Los Angeles County which addressed the adjudication issue, a final judgment in the adjudication would likely determine all groundwater pumping rights in the basin and result in the appointment of a watermaster for the basin. Potential restrictions on groundwater pumping from the Antelope Valley Groundwater Basin will also likely be determined in the adjudication. The County's EIR stated that, given the complexity of the legal issues involved in the adjudication, the quantity of groundwater rights that would be allocated to individual property owners and public water suppliers in the Antelope Valley Groundwater Basin as part of a final judgment is uncertain, but predictable (LACDRP 2010). It is also possible that the parties to the adjudication may settle the dispute, that the Court could refrain from determining pumping rights or appointing a watermaster, or that portions of the AVAA may be subject to separate management after the Phase 3 and subsequent portions of the trial. Section 4.2.7 discusses the potential availability of groundwater for the Project assuming these and other potential adjudication outcomes.

According to the recent County EIR, the amount of groundwater that may be assigned as a result of the adjudication to each basin user is uncertain, but a reasonable and logical outcome can be predicted by considering estimates of the AVAA aquifer's sustainable yield. The sustainable yield of a groundwater basin is the amount of pumping that, for given land use conditions, produces return flows which, in combination with other recharge, results in no long-term depletion of groundwater storage. Based on a combination of estimated natural recharge to the groundwater basin, utilization of supplemental water and its contribution to groundwater recharge, and land use practices that generate various levels of return flows, County's EIR estimates that the "native" sustainable yield of the AVAA is approximately 82,300 AFY, and that the "supplemental" sustainable yield of the AVAA is approximately 110,000 AFY (LACDRP 2010).

The determination of the AVAA's sustainable yield is one of the issues subject to litigation in the adjudication trial. The allocation of groundwater rights and a determination of groundwater basin yield have not yet been determined by the adjudication Court.

3.2 REGIONAL SWP SUPPLIES

SWP system overview. SWP water is imported to the Antelope Valley region by three SWP system contractors: AVEK, the Littlerock Creek Irrigation District (LCID), and the Palmdale Water District (PWD). AVEK is the largest of these three contractors and the agency's service area extends over most of the Antelope Valley and certain adjacent areas, including the Project site and the GVMWD service area (see Figure 4.4).

The SWP is operated by the DWR for the benefit of 29 SWP contractors. The SWP is the nation's largest state-built water and power development and conveyance system, and includes 660 miles of aqueduct and conveyance facilities extending from Lake Oroville in the north to Lake Perris in the south. In addition to these facilities, the system is comprised of pumping and power plants, reservoirs, lakes, storage tanks, canals, tunnels, and pipelines that capture, store, and convey water throughout the state.

SWP water originates in various streams that are tributary to the Sacramento –San Joaquin River Delta ("Delta"). A portion of that water derived from the Feather River is stored in Lake

Oroville, which releases previously stored water back into the Feather River and then to the Sacramento River. These flows and other natural, unstored Sacramento River flows reach the Delta, where water is pumped into the California Aqueduct from SWP facilities located on the southern edge of the Delta. The pumping plant also diverts natural flows from the San Joaquin River and various east-side streams. The aqueduct system, which includes several south-of-the-Delta reservoirs, delivers water to the base of the Tehachapi Mountains, where a pumping system lifts the water through a series of pipelines to the south. Just north of the Project site, the aqueduct branches into the West Branch, which conveys water south through the greater Los Angeles area, and the East Branch, which traverses the northern side of the San Gabriel Mountains.

The Antelope Valley region is served by the East Branch of the SWP aqueduct (AVIRWMP 2007). AVEK also has rights to use a portion of the West Branch extending through the Project. As discussed in Section 1.4, the DWR is constructing a replacement turnout on the West Branch. After construction, the turnout will be owned by AVEK and managed in accordance with agreements to be completed with AVEK and the DWR. **Figure 3.4** depicts the primary facilities of the SWP system.

The SWP has contracted to deliver approximately 4.17 million acre feet of "Table A" water annually and the system has the physical capacity to deliver that amount of water or more when hydrological and regulatory conditions permit. The term "Table A" refers to the amount of water listed in Table A of the SWP contracts, and represents, except for short-term surplus water which may be available in some months of more abundant water years, the maximum amount of water a contractor may request each year. AVEK, which is the third largest SWP contractor, currently has a Table A amount of 141,400 AFY. The LCID and PWD have Table A amounts of 2,300 AFY and 23,000 AFY, respectively. LCID also maintains the only developed surface water supply reservoir in the Antelope Valley, with a storage capacity of 3,500 AF (AVIRWMP 2007). The Project is located outside the service area boundaries of LCID and PWD, and these districts would not supply SWP or other water for Project use.

Names and Locations of Primary Water Delivery Facilities

Source: DWP Bulletin 32-05, December 2006. pp. 4.

Primary Facilities of the SWP System

Figure 3.4

Centennial WSA

The SWP delivers water to each contractor in accordance with the system's supply availability. By October 1 of every year, each contractor provides DWR with a request for water delivery which cannot exceed its full Table A amount. Actual deliveries may be less than a contractor's request due to hydrology, stored water availability, and regulatory or operating constraints. When less than full Table A amounts are available, each contractor receives a percentage of its Table A amount based on available SWP supplies (AVIRWMP 2007). For example, if the DWR can deliver 71% of SWP contract capacity in a certain year, AVEK could receive up to 71% of the agency's Table A amount, or approximately 102,524 AF. AVEK customers utilize approximately 75,000 AFY of the agency's Table A amount, and AVEK is unable to beneficially use its entire Table A amount of SWP water during periods when the agency's full Table A amount could be available (AVIRWMP 2007). The agency's SWP conveyance rights are allocated pro-rata on a monthly basis, although the SWP system allows SWP contractors to exchange conveyance capacity rights under certain conditions.

The timing of water deliveries can affect SWP water supplies. Demand is generally higher in the summer and early fall, and supplies are often more available in late winter or spring. AVEK does not have sufficient "peaking" conveyance rights within the California Aqueduct that would allow for the import of all of the water typically demanded by AVEK customers during high-demand, summer months. The agency has surplus conveyance capacity during the winter, when regional demands are low. The Antelope Valley currently lacks sufficient storage facilities, such as surface reservoirs or aquifer recharge and water banks, that would allow for the storage of SWP water delivered in low demand periods for extraction and use during higher demand periods. As discussed below, several storage facilities have been proposed and are being developed to serve the Antelope Valley region. The AVIRWMP estimates that the maximum Table A amount AVEK can put to beneficial use is approximately 81,750 AFY (AVIRWMP 2007).

AVEK also operates four water treatment plants that are capable of treating approximately 104,260 AFY of imported water. Los Angeles County Waterworks District No. 40 (LACWWD 40), Quartz Hill Water District (QHWD), and Rosamond Community Services District (RCSD), all receive treated water from AVEK and do not independently operate SWP treatment facilities. The PWD operates a treatment plant with an approximate capacity of 31,390 AFY (AVIRWMP 2007). The proposed Project includes onsite water treatment facilities that will meet all Project potable water needs. The Project will not require and will not receive any treated water deliveries from regional treatment plants.

SWP delivery reliability. The amount of SWP water available to AVEK and other SWP contractors each year depends on hydrologic conditions in northern California, the amount of water in SWP storage reservoirs at the beginning of each water year (October 1), regulatory and operational constraints, and the Table A amount requested by all contractors. Since 2003, DWR has prepared biannual estimates of the SWP system's delivery reliability over a 20 year period for average (or "normal" years as described in the Water Code and Map Act), a single dry year and multiple dry years. The most recent reliability report was released in August 2010 and updates previous SWP reliability estimates (DWR 2010) ("2009 SWP Delivery Reliability Report"). The 2009 SWP Delivery Reliability Report, among other factors, considers restrictions on SWP and federal Central Valley Project (CVP) operations imposed by federal Endangered Species Act biological opinions issued by the U.S. Fish and Wildlife Service

(USFWS) and the National Marine Fishery Service (NMFS) on Dec. 15, 2008 and June 4, 2009, respectively, potential changes in California hydrology using climate change projections recommended by the California Climate Action Team, and the potential effects of sea level rise due to climate change (DWR 2010). The report estimates future SWP reliability by adjusting the actual 82-year hydrological record that occurred during 1922-2003 to reflect current operational assumptions based on existing and anticipated regulatory constraints, climate change, and other factors (the "CALSIM II model"). The purposes of the 2009 CALSIM II model and the 2009 SWP Delivery Reliability Report include supporting the development of urban water management plans (Water Code Sections 10610-10656) by local agencies, cities, and counties that use SWP water, and providing information regarding SWP supplies in support of the CEQA analysis for proposed projects (DWR 2010).

The 2009 SWP Delivery Reliability Report indicates that current and reasonably foreseeable system limitations would result deliveries of approximately 60% of a contractor's Table A amount on average over the CALSIM II period of record, including dry and multiple dry years. During single dry years, delivery reliability would vary from 7% to 11% of a contractor's Table A amounts over the 20-year period considered in the report. Multiple year drought period delivery reliability would vary from 34% to 35% of Table A amounts over the 20-year period considered in the report (DWR 2010). The DWR's data indicates that an SWP contractor with a Table A amount of 100,000 AFY would receive 60,000 AFY on average. This average would include 7,000 -11,000 AF during a single dry year, 34,000-35,000 AF during multiple dry year periods, and more than 60,000 AFY in wetter years. The 2009 SWP Delivery Reliability Report lowered the DWR's previous estimates of average or normal year delivery rates, and increased estimates of delivery reliability during dry and drought periods. The 2008 UWMP and the AVIRWMP utilize SWP reliability estimates that predate the 2009 Delivery Reliability Report. The Project water supply projections in this WSA are based on the current 2009 Delivery Reliability Report and the 2009 CALSIM II model.

Factors potentially affecting future SWP delivery reliability. Several legal, regulatory, physical and other factors could affect future SWP deliveries to AVEK and water users in the Antelope Valley, including the following:

Safe, Clean, and Reliable Drinking Water Supply Act of 2010. In November 2009, four legislative bills and a supporting bond bill (collectively the "Safe, Clean, and Reliable Drinking Water Supply Act of 2010" or "Water Act") were approved by the California Legislature. Key provisions of the Water Act include requirements to monitor groundwater basins, develop agricultural water management plans, reduce statewide urban per-capita water consumption by 20 percent by 2020, and report water diversions and uses in the Delta. The Water Act also appropriates $250 million for grants and expenditures for projects to reduce dependence on Delta water. The bond bill was originally to be submitted for voter approval on the November 2010 statewide ballot but was later rescheduled for the 2012 election. If approved by the voters and enacted as drafted, the bond bill would provide $2.25 billion to reduce seismic risks to Delta water supplies, protect drinking water quality, reduce conflicts between water management and environmental protection goals in the Delta, and fund other water programs and policies (DWR 2010). More specifically, the four legislative bills include the following measures:

1. *Delta Governance/Delta Plan (SB-1):* This bill amended and added several sections to the California Public Resources Code and Water Code. The bill establishes a framework for achieving the co-equal goals of (1) providing a more reliable water supply to California and restoring and (2) enhancing the Delta ecosystem in a manner that protects the Delta's unique cultural, recreational, natural resource, and agricultural values of the Delta. The bill creates a Delta Stewardship Council (Council) that will: (a) develop a Delta Plan; (b) develop performance measures for assessing and tracking the Delta ecosystem, fisheries, and water supply reliability; (c) determine if state or local agency projects in the Delta are consistent with the Delta Plan, and review and comment on determinations that certain "covered actions" (generally, state or local funded activity in the Delta region that significantly affect water supply reliability, ecosystem restoration, or flood protection) are consistent with the Delta Plan; (d) assume responsibility for certain prior Delta management programs, including CALFED; and (e) hear appeals from certain of the California Department of Fish and Game ("DFG") determinations that the Bay-Delta Conservation Plan ("BDCP"—see below) meets certain criteria defined in the Act. The Council is required to appoint a Delta Independent Science Board to provide "the best possible, unbiased scientific information about water and environmental conditions in the Delta." The Delta Plan must be prepared by January 1, 2012 and include measures that promote: (a) viable populations of aquatic and terrestrial species; (b) functional corridors for migratory species; (b) diverse habitats; (c) reduced threats; (d) more reliable water supplies; (e) improved water quality; (f) the economic vitality of the State and (g) recommendations promoting statewide water conservation, options for new and improved infrastructure for water conveyance in the Delta, and in-Delta disaster and risk reduction considerations. The Bill requires the State Water Resources Control Board ("SWRCB") to consult with the Council and appoint a Delta Watermaster which will have jurisdiction over water diversions and oversee SWRCB orders and water rights permits in the Delta. Within 12 months of enactment, the DFG must consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service and recommend to the SWRCB flow criteria and quantifiable biological objectives for species of concern in the Delta. The SWRCB must also develop flow criteria, such as water volume, quality, and timing criteria, necessary for the Delta ecosystem under different conditions to protect public trust assets. A Delta watershed diversion data collection and public reporting system must be implemented by December 31, 2010. No new Delta water conveyance facility may be built until the SWRCB approves a change in the point of diversion for the SWP and federal water systems. Water agencies that receive SWP and federal water must pay for the review, planning, design, construction and mitigation costs associated with any new Delta conveyance facility. The bill establishes a new Sacramento-San Joaquin Delta Conservancy to: (a) implement ecosystem restoration activities within the Delta; (b) adopt a strategic plan for implementation of the Conservancy goals; (c) promote economic vitality in the Delta through increased tourism and the promotion of Delta legacy communities; (d) Promote environmental education about, and the public use of, public lands in

the Delta; and (e) assist in the preservation, conservation, and restoration of the region's agricultural, cultural, historic, and living resources. The bill restructures the current Delta Protection Commission (DPC), and requires that the DPC: (a) adopt an economic sustainability plan for the Delta, including flood protection recommendations; and (b) submit the economic sustainability plan to the Council for inclusion in the Delta Plan. The Bill prohibits BDCP funding until the plan is incorporated into the Delta Plan. The criteria for BDCP incorporation include: (1) DFG approval of a Natural Community Conservation Plan (NCCP) in accordance with the California Fish and Game Code; (2) consultation with the Science Board and Council in the development and environmental review of the NCCP; (3) USFWS approval of a Habitat Conservation Plan in accordance with the federal Endangered Species Act; (4) at least one public hearing by the Council and consideration of any appeals regarding the DFG's findings that the criteria for incorporating the BDCP have been met; and (5) certification by DFG that the BDCP has adequately considered the following:

(a) A reasonable range of flow criteria, rates of diversion, and other operational criteria required to satisfy the criteria for approval of an NCCP and other operational requirements and flows necessary for recovering the Delta ecosystem and restoring fisheries under a reasonable range of hydrologic conditions, which will identify the remaining water available for export and other beneficial uses;

(b) A reasonable range of Delta conveyance alternatives, including through-Delta, dual conveyance, and isolated conveyance alternatives and including further capacity and design options of a lined canal, an unlined canal, and pipelines;

(c) The potential effects of climate change, possible sea level rise up to 55 inches, and possible changes in total precipitation and runoff patterns on the conveyance alternatives and habitat restoration activities;

(d) The potential effects on migratory fish and aquatic resources;

(e) The potential effects on Sacramento River and San Joaquin River flood management;

(f) The resilience and recovery of Delta conveyance alternatives in the event of catastrophic loss caused by earthquake or flood or other natural disaster; and

(g) The potential effects of each Delta conveyance alternative on Delta water quality.

Finally, the bill appropriates funding from Proposition 84 to fund the Two-Gates Fish Protection Demonstration Program (see below)(DWR 2010).

(2) *Groundwater Monitoring (SB-6):* This bill requires that local agencies monitor the elevation of groundwater basins to manage groundwater during normal and drought conditions. The DWR must establish a priority schedule for monitoring groundwater basins, reviewing groundwater elevation reports, and making recommendations to improve local monitoring programs. DWR will assist local entities that conduct monitoring, which will be implemented to reflect local circumstances. The bill protects private landowners trespass by state or local entities. If local agencies fail to implement a monitoring program and/or do not provide the required reports, DWR may implement a groundwater monitoring program for the applicable basins. Local entities that do not comply with the bill may lose eligibility for certain state grant funds (DWR 2010).

(3) *Statewide Water Conservation (SB-7):* This bill requires development of agricultural water management plans and requires that urban water agencies reduce per capita water consumption by 20 percent by 2020. To meet this objective, urban suppliers may: (a) set a conservation target of 80 percent of baseline daily per capita water use derived from a 10-year period ending no earlier than 2004 and no later than 2010; (b) utilize performance standards for water use that are specific to indoor, landscape, and commercial, industrial and institutional uses; (c) meet the per capita water use goal for specific hydrologic regions as identified by DWR and other state agencies in the 2020 Water Conservation Plan; or (d) use an alternate method to be developed by DWR. The bill also requires agricultural water suppliers to: (a) measure water deliveries and adopt a pricing structure for water customers based at least in part on quantity delivered, and, where technically and economically feasible, implement additional measures to improve efficiency; (b) adopt and submit to the DWR and other local entities Agricultural Water Management Plans by December 31, 2012 and include in those plans information relating to the water efficiency measures they have undertaken and are planning to undertake. Urban and agricultural suppliers that do not comply with the bill will be ineligible for certain state grant funding. DWR is required to provide a report to the legislature in 2013, 2016 and 2021 summarizing the efficient water management practices that are implemented and described in the agricultural water management plans(DWR 2010).

(4) *Water Diversion and Use/Funding (SB-8):* This bill: (a) requires the filing of water use reports by in-Delta water users that were previously exempt from such reporting obligations and redefines the exempt diversions; (b) assesses civil liability and monetary penalties for failures to submit required diversion reports; (c) appropriates $546 million from Propositions 1E and 84 for integrated regional water management grants, projects that reduce dependence on the Delta, Delta flood protection and levee projects, stormwater management grants, and local agency funding for NCCP development and implementation. The bill also appropriates $3.75 million from the Water Rights Fund for use by the SWRCB to manage the new water diversion reporting, monitoring, and enforcement requirements (DWR 2010).

Delta Vision Process. An independent Blue Ribbon Task Force was established in 2006 to develop a vision for the sustainable management of the Delta. The Delta Vision process concluded at the end of 2008 and made a number of strategic recommendations, many of which were incorporated into the Water Act, including: (a) legally acknowledging the equal goals of restoring the Delta ecosystem and creating a more reliable water supply for California; (b) promoting statewide water conservation, efficiency, and sustainable use; and (c) building facilities to improve the existing water conveyance system and expanding statewide storage (DWR 2010).

Delta Risk Management Strategy (DRMS). The DRMS was initiated to evaluate the potential effects on water supply derived from the Delta based on 50-, 100-, and 200-year projections due to Delta subsidence, earthquakes, floods, and climate change. Most of the Delta, including the waterways that channel supplies to the SWP pumping facilities, is protected from flooding and saltwater intrusion by a system of levees that do not meet modern engineering standards. Many levees are at risk of failure due to floods, seepage, the piping of water through a levee, slippage or sloughing of levee material, or sudden failure due to an earthquake. Since 1900, there have been 158 levee failures. A breach of one or more levees could allow a significant amount of saline water to enter the interior Delta from the west and could curtail Delta exports or adversely affect water quality for a significant period of time. An assessment of these risks was presented in the DRMS Phase 1 Report. In Phase 2 of the DRMS, DWR and the California Department of Fish and Game (DFG) will identify options for reducing the risk of water supply disruptions derived from the Delta, improving the quality of drinking water supplies from the Delta, and maintaining Delta water quality for Delta users (DWR 2010).

CALFED Ecosystem Restoration Program (ERP) Conservation Strategy. The ERP has been developed by the DFG in collaboration with the NMFS and the USFWS to improve aquatic and terrestrial habitats and ecological functions in the Delta, and to support sustainable populations of fish and wildlife species. The ERP Conservation Strategy currently focuses on the Delta and Suisun Marsh areas and will be expanded to include tributaries to the Delta (DWR 2010).

Bay Delta Conservation Plan (BDCP). The BDCP is being prepared with the collaboration of several state, federal, and local water agencies, state and federal wildlife agencies, environmental organizations, SWP and federal Central Valley Project (CVP) system contractors, and other interested parties. The plan will identify water flow and habitat restoration actions that will contribute to the recovery of endangered and sensitive species and their habitats in the Delta, and improve water supply reliability. The BDCP is: (a) identifying conservation strategies to improve the overall ecological health of the Delta; (b) identifying ecologically-friendly ways to move fresh water through and/or around the Delta; (c) addressing toxic pollutants, invasive species, and impairments to water quality; and (d) establishing a framework and funding mechanism to implement the Plan over time. When completed, the BDCP would provide the basis for the issuance of endangered species permits for the operation of the state and federal water projects and would be implemented over 50 years. State and federal agencies are developing a joint Environmental Impact Report/Statement (EIR/EIS) under the Delta Habitat Conservation and Conveyance Program (see below) that will assess the potential environmental impacts of the BDCP (DWR 2010). *Delta Habitat Conservation and Conveyance Program* (DHCCP). The DHCCP is a partnership between DWR and the U.S. Bureau of Reclamation, which operates

Delta pumps near the SWP facilities as part of the CVP system, to evaluate the ecosystem restoration and water conveyance alternative identified by the BDCP and other conveyance options. The evaluation will result in a joint EIR/EIS scheduled to be completed in mid-2012. The U.S. Bureau of Reclamation, the DWR, USFWS and NMFS are NEPA co-lead agencies for the EIR/EIS (DWR 2010).

Climate change and sea level rise. Climate change is identified in the California Water Plan Update 2009 (CWPU) as one of the key considerations in planning for the state's water management. According to the CWPU, rising air temperatures have reduced the early spring snowpack in the Sierra Nevada by about 10%, and sea levels along the California coast have risen by about 7 inches. Higher sea levels could threaten the existing levee system in the Delta. Salinity intrusion into the Delta could also require increased releases of freshwater from upstream reservoirs to maintain compliance with water quality standards. To analyze the potential effects of climate change on SWP reliability, DWR examined 12 future climate scenarios (DWR 2010). The 12 scenarios represent projections from six global climate models and studies assuming varying levels of future greenhouse gas emissions. The studies also took into account Delta salinity intrusion due to sea level rise and resulting changes in reservoir operations to maintain Delta water quality. Shifts in both water supply and water demands were considered. Several factors related to water supply reliability were examined: annual Delta exports, reservoir carryover storage, Sacramento Valley groundwater pumping, and additional water supplies needed to reduce the frequency and extent of system vulnerability due to operational interruption. The studies suggested that, by midcentury, it is possible that climate change could reduce median Delta exports by 7% -10%. Median reservoir carryover storage—the amount of water available in reservoirs at the end of one season for use in subsequent years—could also be reduced by approximately 15%-19%, and median Sacramento Valley groundwater pumping could increase by 5%-9%. Under certain circumstances, the DWR analysis also suggested that water levels in the SWP system's main supply reservoirs (Shasta, Oroville, Folsom, and Trinity) could fall below the lowest release outlets (DWR 2010). The 2009 SWP Delivery Reliability Report incorporated potential climate change factors into the projections of future SWP operations by conducting a separate analysis of the 12 climate change projections to identify a "central" or "median" projection. The metrics used for comparison consisted of projected climate and hydrology variables, and their effects on SWP system exports, including, temperature, precipitation, total inflow to major reservoirs, shifts in the timing of run-off, and Delta exports. Using these metrics, the future climate projection from the MPI-ECHAM5 global climate model run for the higher greenhouse gas emissions scenario was selected to be representative of median effects. This scenario was incorporated into the 2009 SWP Delivery Reliability Report analysis (DWR 2010).

Delta pumping restrictions and federal biological opinions. Recent federal biological opinions issued under the federal Endangered Species Act have imposed more restrictive operating requirements on the SWP pumps in the Delta. In December 2008, USFWS issued a new biological opinion (BiOp) for the Delta smelt (the "Smelt BiOp"). In June 2009, NMFS issued a new BiOp covering winter-run and spring-run Chinook salmon, steelhead, green sturgeon, and killer whales (the "Salmonid BiOp"). The Smelt BiOp imposed additional water management requirements in all but two months of each year. From December to June, an adaptively managed flow restriction is required to maintain average Old River and Middle River (OMR) flows, primarily by reducing Delta water exports. The Smelt BiOp also imposed an additional Delta salinity requirement for September and October in wet and above-normal water years that will be achieved by releasing supplies in upstream reservoirs to flow downstream to augment Delta outflows. The Salmonid BiOp included an OMR requirement similar to the requirements imposed by the Smelt BiOp and expanded from one month to two months the period during which Delta exports in Spring must be reduced to combine with pulse flows on the San Joaquin River. It also required more frequent closure of the Delta Cross Channel gates during October through December 14. The gates must be completely closed between December 15 and January 31. The 2009 SWP Delivery Reliability Report and 2009 CALSIM II models take into account the operational restrictions identified in the BiOps (DWR 2010). The USFWS and NMFS BiOps have been the subject of litigation in two consolidated cases assigned to U.S. District Court Judge Oliver Wanger of the Eastern District of California, and were issued in response to judicial rulings that invalidated prior species-related operating permits for the SWP and federal Central Valley Project (CVP) pumps located near the SWP Delta facilities. Temporary pumping restrictions were imposed by the Court until the agencies could complete the BiOps. After issuance, the BiOps were subsequently challenged in subsequent lawsuits. In May 2010, Judge Wanger ruled that the BiOps were legally flawed because, among other issues, they failed to take into account human considerations in evaluating the impacts that would be caused by additional Delta pumping restrictions and the use of water supplies to protect fish. Judge Wanger also found that, in certain instances, the BiOps failed to use the best available scientific information. On December 14, 2010 Judge Wanger issued a ruling that upheld certain portions of the Delta smelt BiOp and also concluded that several methodologies and conclusions used in the opinion to identify “reasonable and prudent alternative” (RPA) restrictions on the SWP and other Delta water operations were “arbitrary, capricious, and unlawful.” The Smelt BiOp was remanded to the USFWS for further consideration. A decision regarding similar claims that have been asserted against the Salmon BiOp has not yet been issued. The extent to which the Salmonid and the Smelt BiOps will be revised to address the rulings, and the effects of these revisions on future SWP system reliability, are uncertain.

Two-Gates Fish Protection Demonstration Project. The Two-Gates Fish Protection Demonstration Project has been proposed by the U.S. Bureau of Reclamation for five years to test whether a series of flow control gates would protect delta smelt and other sensitive aquatic species by reducing entrainment at the SWP and federal Delta pumping facilities. The project would install and operate removable gate structures in the Old River between Bacon Island and Holland Tract, and in Connection Slough between Mandeville Island and Bacon Island. The structures would be opened and closed in conjunction and coordination with operational criteria established by state and federal water quality and environmental regulators. Water quality and fish monitoring would be conducted to assess the effectiveness of the gates. Public review of the draft environmental assessment and a finding of no significant impact closed on November 30, 2009 (DWR 2010). As discussed above, SB-1 appropriated state funding for the implementation of the Two-Gates Project. State and federal wildlife agencies, as applicable, are continuing to assess whether the project should be implemented.

The Monterey Amendments, EIR certification, and related litigation. In 1994, after a period of droughts generated conflicts between SWP agricultural and urban water contractors, the DWR and agricultural and urban SWP contractor negotiators agreed to a statement of principles called the "Monterey Agreement." These principles were subsequently incorporated as amendments to the SWP system contracts (the "Monterey Amendments") and accepted by 27 of the 29 SWP contractors. The most significant outcomes generated by the Monterey Amendments include the following:

1. The Kern County Water Agency (KCWA), the largest SWP agricultural contractor, agreed to transfer up to 130,000 AF of Table A water to other urban contractors on a permanent basis.

2. SWP contractors with short-term surplus supplies were allowed to sell these supplies to other contractors through a "turnback pool" mechanism.

3. The right of SWP contractors to store water outside their service areas for later use within their service areas was included in the SWP contract.

4. Certain southern California SWP contractors were permitted to utilize flexible storage in Castaic Lake and Lake Perris.

5. SWP supplies were allocated in proportion to each contractor's maximum contractual Table A amount in lieu of reducing agricultural supplies first in the event of a shortage.

6. Interruptible water defined under Article 21 of the SWP contracts was distributed on an equal basis to all SWP contractors rather than on a priority basis to agricultural contractors.

7. Land in the Kern River Fan area was transferred to the Kern County Water Agency (KCWA) to be developed into a local water banking facility.

8. Contract terms related to the conveyance of non-project water were clarified.

In October 1995, a Program EIR was prepared and certified for the Monterey Amendments by the Central Coast Water Agency. The EIR was successfully challenged in a subsequent lawsuit alleging in part that DWR should have been the CEQA lead agency. In 2003, a settlement was reached by the parties to the lawsuit, including DWR, the SWP contractors that accepted the Monterey Amendments, and the Planning and Conservation League, the Plumas County Flood Control and Water Conservation District, and the Citizens Planning Association of Santa Barbara County. The settlement obligated the DWR, among other commitments, to act as the CEQA lead agency and to prepare a new EIR for the Monterey Amendments. A Notice of Preparation for the EIR was circulated in January 2003. A draft EIR was circulated by DWR for public review and comment in late 2007 and early 2008. A final EIR was certified by DWR in February 2010 and a Notice of Decision was issued in May 2010. Several weeks later, the Center for Biological Diversity, the California Water Impact Network, the California Sportfishing Alliance, the Central Delta Water Agency and the South Delta Water Agency filed a lawsuit challenging the certified EIR and the validity of the Monterey Amendment. A second lawsuit challenging the EIR's analysis of impacts potentially associated with operating the Kern County water banking facility was filed by the Rosedale-Rio Bravo Water Storage District and Buena Vista Water Storage District. A third lawsuit was filed by the Center for Biological Diversity and other parties challenging the conveyance of the Kern river fan lands by KCWA to the Kern Water Bank Authority. These lawsuits remain pending.

The SWP has been operated under the auspices of the Monterey Amendments since the mid 1990s. The extent to which the current lawsuits could result in judicially-imposed or negotiated remedies requiring any SWP system changes is uncertain. Many of the SWP operations affected by the Monterey Amendments, such as water transfers, can be accomplished under other SWP contract, statutory, and operational rules (see *Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (2007) 161 Cal.App.4th 149). Due to the disruption that could be caused by a significant departure from the operational principles set forth in the Monterey Agreement, it is reasonably foreseeable that the DWR and the SWP contractors would endeavor to identify other legal means for maintaining the SWP system's current operational structure in the event that the Monterey Amendments EIR or certain of the Monterey Amendments are invalidated.

Assembly Bill 32 (Global Warming Solutions Act). The Global Warming Solutions Act of 2006 committed California to reduce state greenhouse gas emissions to 2000 levels by 2010 and to 1990 levels by 2020. The California Air Resources Board (CARB) is charged with developing appropriate regulations and a reporting system to effectively implement these objectives. AB 32 requires that CARB use the following principles to implement the caps: distribute benefits and costs equitably; ensure that there are no direct, indirect, or cumulative increases in air pollution in local communities; protect entities that have reduced their emissions through actions prior to the Act; and allow coordination with other states and countries to reduce emissions. Counties, cities, water agencies, water purveyors, and water consumers will likely be affected by this legislation and the potential adoption of related measures to reduce carbon footprints, implement carbon trading, use alternative energies, and to reduce emissions through the direct conservation of both water and energy (AVIRWMP 2007). CARB adopted a Scoping Plan in 2008 that allocated required greenhouse reductions among various public and private sectors and included measures to implement these targeted reductions. Water conservation is among the measures included in the 2008 Scoping Plan (CARB 2008).

Water conservation. The AVIRWMP considers several water conservation measures that could minimize the use of regional water supplies and reduce demand for both imported and local supplies. Opportunities to expand water conservation in the Antelope Valley region identified in the plan include the implementation of Best Management Practices (BMPs), establishment of water efficiency ordinances, and development of evapotranspiration controllers for more efficient irrigation (AVIRWMP 2007). As discussed in Section 2, the Project will implement these and other water conservation measures within the Specific Plan area, and Project per-capita water consumption will be less than half of current and projected levels in the Antelope Valley region.

Water recycling. The AVIRWMP includes a number of current and planned management actions to increase recycled water use in the Antelope Valley region. The plan projects 3,400 AFY of tertiary treated water will be used within the region by 2035. Supplies of this magnitude would comprise approximately 1.1% of the 2030 urban water demand projected in the AVIRWMP (AVIRWMP 2007). LACWWD 40 assessed the availability and use of recycled water within the Antelope Valley in 2005 and indicated that as much as 64,620 AFY could become available by 2030 from the Lancaster, Palmdale, and Rosamond water reclamation plants compared with an estimated demand of 17,491 AFY (LACWWD 40 2005). The region currently generates a limited amount of tertiary-treated water. As discussed in Section 2, the Project will use approximately 3,979 AFY of tertiary-treated wastewater at buildout, all of which will be provided by onsite wastewater reclamation facilities. Tertiary-treated wastewater will meet about 33% of total Project demand.

Alternative sources of water. Other water sources potentially available to the region discussed in the AVIRWMP include transfers from the CVP system operated by the US Bureau of Reclamation (USBOR), transfers from other water rights holders in the Sacramento Valley, SWP Article 21 water, treated stormwater captured and recharged into the ground, desalinated water, and Table A transfers from other SWP contractors (AVIRWMP 2007). Key potential supplies identified in the AVIRWMP are briefly discussed below.

> *CVP water*. CVP supplies, if available, would be transported by AVEK via the SWP conveyance facilities on a low-priority basis and would be less reliable than SWP supplies. Like SWP supplies, CVP supplies are constrained by Delta species and pump management issues. The Antelope Valley is not within the CVP system's approved "place of use." Changing the place of use would require the approval of the State Water Resources Control Board, several other agencies including USBOR, and would likely require a joint state and federal EIR/EIS. Finally, CVP water has been fully allocated to other uses, including environmental restoration projects. Due to these considerations, the AVIRWMP concluded that CVP supplies were unlikely to be available for long-term, reliable sales or exchanges that would facilitate use in the Antelope Valley (AVIRWMP 2007).
>
> *SWP Table A transfers.* Certain SWP contractors, or their member agencies or subcontractors, hold contractual right to SWP Table A amounts and are required to make substantial annual payments to maintain these amounts irrespective of whether SWP water is actually requested or delivered. SWP participants may desire to reduce these fixed costs by selling excess Table A amounts to other users (AVIRWMP 2007). As discussed in Section 4.3, over the past year there have been at least two significant transactions that involved Table A transfers, and it is reasonably likely that other potential Table A transfer opportunities will be available in the future
>
> *Article 21 water*. SWP Article 21 water is made available on an unscheduled and interruptible basis under Article 21 of the SWP contracts, and is typically available only in average to wet years for a limited time in winter months. Due to the short duration of Article 21 water availability and capacity constraints at the Edmonston Pumping Plant in the northern Tehachapi Mountain foothills, Article 21 water is generally delivered most readily to agricultural and M&I contractors that have local surface or groundwater storage programs, including San Joaquin Valley banking programs. The utility of Article 21 water for the Antelope Valley Region could be increased if local banking operations were developed to facilitate storage during the winter (AVIRWMP 2007). As discussed

above, SWP contract terms pertaining to Article 21 water were modified in part by the Monterey Amendments and could be affected by the Monterey Amendments EIR litigation.

Drought year program. The SWP Contractors Authority (SWPCA) is a California joint power agency (Government Code Sections 6500 et seq.) whose members are SWP contractors. The SWPCA manages a Dry-year Water Purchase Program that facilitates water purchases from many water users within the California water system on a one-time or short-term basis. The program has historically operated in years when the SWP allocation is below 50%, or when a potentially dry hydrologic season is combined with low SWP carryover storage. Typical water costs include an option payment to hold water, the call or actual purchase price, water losses due to movement through the Delta, and SWP transmission costs (AVIRWMP 2007).

Turnback pools. Turnback pools allow SWP contractors to annually sell excess Table A amounts to other SWP contractors. The program is administered by DWR and requires selling and buying contractors to adhere to a specific schedule during which options to purchase water must be exercised. The total amount of water placed into the pools by selling contractors is allocated to participating buying contractors based on each participant's contractual Table A amount. Each pool is priced in accordance with the date by which water must be purchased. Delivery is subject to system conveyance capacity and priorities for regular SWP water (AVIRWMP 2007). As discussed above, current SWP contract terms pertaining to turnback pools were part of the Monterey Amendments and could be affected by the Monterey Amendments EIR litigation. The turnback pool was active shortly after it began operations in the late 1990s. As demands for water within the SWP contractor service areas increased, contractors completed storage programs, and SWP deliveries decreased, the turnback pool became less active over time. The turnback pool program is unlikely to produce meaningful quantities of water supplies in the future.

Desalinated water. Desalinated water supplies that benefit the Antelope Valley could be generated by exchange transactions with coastal water agencies. A regional water agency or district, for example, could contribute a portion of the funds needed by a coastal water agency to develop a seawater desalination facility along the southern California coast. Water produced by the desalination facility would be used by the coastal agency and in exchange a certain amount of the coastal agency's SWP or other supplies would be delivered to the Antelope Valley (AVIRWMP 2007). At present, the cost, energy use and potential environmental impacts associated with desalination facilities have precluded widespread adoption of this technology.

New groundwater storage facilities. The AVIRWMP identified several potential water banking options for the region, including the TRC water bank discussed in Section 1.4, a commercial water bank that is being developed to the east of the Project, and a potential water bank that could be owned and operated by AVEK, AVEK in collaboration with other regional water agencies, or another public water supplier (AVIRWMP 2007). In 2008, AVEK approved a CEQA mitigated negative declaration and issued a Notice of Determination for a potential recharge and recovery project within a 1,500-acre site located north of West Avenue C, between 130th Street West and 155th Street West in the Antelope Valley (AVEK 2008B). The Antelope Valley Water Bank, which sells water storage services on a commercial basis, was approved in 2006 and is located to the east of the Project site (Kern County 2006). LACWWD 40 currently operates an aquifer storage and recovery (ASR) program that uses new or existing wells to directly inject water into the aquifer. Other banking facilities are in various stages of planning and development in the Antelope Valley. The AVIRWMP assumes that 29,000 AFY of water will be available from the LACWWD 40 ASR facilities to meet regional needs in a single dry year and approximately 31,600 AFY would be available during a multi-year drought (AVIRWMP 2007).

Proposed AVEK water supply development fee program. AVEK has been considering the implementation of a development fee program that would provide the agency with funding to purchase new imported supplies to support future water demand in the region. In general, the program would allow a proposed development to pay a fee that would cover the costs of obtaining and conveying new water for the project. AVEK would use the fee proceeds to purchase and transfer Table A Amounts from other SWP contractors, or to buy water from other entities that are able to convey the supplies through the SWP for delivery to Antelope Valley. The fee program may also include a process for facilitating the acquisition of new imported water by third parties in the AVEK service area. The development fee program has not yet been adopted or implemented by AVEK.

3.3 REGIONAL DEMAND AND SUPPLY ESTIMATES

This section summarizes the regional demand and supply estimates in the 2008 UWMP, which discusses AVEK's SWP supplies, and the 2007 AVIRWMP, which considers groundwater, SWP water and other supplies available to the region. The 2008 UWMP and the AVIRWMP are subject to several considerations that limit their applicability to the analysis of Project water supplies. Both plans use SWP reliability estimates that predate the 2009 SWP Delivery Reliability Report, and do not reflect current estimates of average or normal year, single dry year and multiple-dry year SWP delivery reliability. The plans also use population projections that are likely to be revised due to updated estimates of Kern County, Lancaster and Palmdale growth developed by the California Department of Finance (DOF) and in the Southern California Association Governments (SCAG) 2008 Regional Transportation Plan forecasts (DOF 2010; SCAG 2008). If these updated forecasts are integrated into the 2007 AVIRWMP projections, the region's 2030 population would be approximately 20% lower than projected in the plan (see Appendix G). Future water demand would also be reduced from the projected levels if the region's population growth is lower than assumed in the AVIRWMP.

Finally, the 2008 UWMP and the AVIRWMP supply and demand scenarios assume that the Antelope Valley's per-capita water consumption rate will remain fixed over time. The plans assume that existing demand will not be reduced by retrofitting water conservation equipment in existing structures or through pricing incentives, and that future development will not be required or choose to implement measures that reduce per-capita consumption below current levels. Based on these assumptions, the 2008 UWMP and AVIRWMP projections show that significant regional water supply and demand "mismatches," or shortfalls, could occur.

These plans provide important information regarding the need to ensure that, at a minimum, future growth achieves substantially lower per-capita consumption rates to conserve regional water supplies. As discussed in Section 2, if approved and implemented as planned, the approximately 64,000 population increase projected to occur in the Specific Plan area would be part of the region's projected future growth. The proposed Specific Plan includes water conservation measures that would result in per-capita use rates in the Project area that are less than half of the comparable rates assumed in the 2008 UWMP and the AVIRWMP.

3.3.1 2008 AVEK Urban Water Management Plan

AVEK is the primary SWP contractor for the Antelope Valley, and SWP imports are the agency's sole water supply. The 2008 UWMP analyzes the future availability of SWP water to meet AVEK demands within the agency's service area (see Figure 4.4). The UWMP was adopted in 2009, and included a discussion of a water shortage contingency plan adopted by the agency in 2007 (AVEK 2008). Although the 2008 UWMP discusses various potential demand management measures that could reduce water consumption, the plan's normal or average year, single dry year and multiple dry year analyses all assume that regional water use will remain constant at approximately 1.2 AFY per household, or 0.343 AFY per capita. The 2008 UWMP further states that the projections do not take into account other water sources that may be available for the region, future conservation and water banking efforts, or the use of recycled water (AVEK 2008).

The 2008 UWMP assumes that AVEK's service area population will increase from 303,073 in 2008 to 506,555 in 2027. Total demand, including agriculture, is projected to rise from 105,496 AFY to 196,540 AFY. AVEK supplies are projected to increase to 93,324 AFY over the period. The 2008 UWMP projects that by 2027, AVEK will have a supply shortfall of approximately 103,216 AFY in a "probable" or normal year, approximately 179,572 AFY in a single dry year, and 169,464 AFY in a multiple dry year period (AVEK 2008).

If approved, the Project would significantly reduce the shortfalls projected in the 2008 UWMP relative to projected future population growth. Approximately 30% of the growth predicted in the 2008 UWMP (64,000 of 203,482 new residents) would occur within the Specific Plan area. Per capita potable demand generated by the Project would be 0.125 AFY, or approximately 64% lower than the per-capita rate assumed in the plan. Potable water demand for the increment of growth that would occur within the Project would fall to 7,996 AFY from approximately 21,950 AFY using the 2008 UMWP methodology. If 30% of the projected regional growth occurred in the Specific Plan area, the 2027 shortfalls projected in the 2008 UMWP would be reduced by approximately 13,954 AFY.

In addition, if all of the projected new development in the region achieved the same net potable water consumption rates as the proposed Project, 2027 demand would be 130,931 AFY (2008 existing demand of 105,496 AFY plus new demand of approximately 24,435 AFY), 65,609 AFY below the projected 2027 levels. The projected normal (probable) year 2027 shortfall would be reduced from 103,216 AFY to 37,607 AFY, an amount that could more feasibly be addressed with additional regional conservation measures, water recycling, and supply augmentation.

Project implementation would result in the use of demonstrated, proven conservation measures for a significant portion of the region's future growth. Regional per-capita use rates would be reduced, and future supply shortfalls would be lower than projected in the 2008 UWMP.

3.3.2 2007 Antelope Valley Integrated Regional Water Management Plan

The AVIRWMP was completed in 2007 pursuant to Water Code Sections 79500-79509.6, which codified Proposition 50, a measure approved by the California electorate in 2002. Proposition 50 set aside $380 million for integrated regional water management planning grants, a program jointly administered by the DWR and the State Water Resources Control Board. The AVIRWMP was supported by a regional water management group that included AVEK, the Antelope Valley State Water Contractors Association, the City of Lancaster (Lancaster), the City of Palmdale (Palmdale), the Littlerock Creek Irrigation District (LCID), Los Angeles County Sanitation District Nos. 14 and 20, LACWWD 40, the PWD, the Quartz Hill Water District (QHWD), and the Rosamond Community Services District (RCSD). In accordance with Proposition 50, the plan includes descriptions of the region, the planning participants, regional objectives and priorities, water management strategies, implementation measures, impacts and benefits, data management, financing, stakeholder involvement, the relationship to local planning, and state and federal coordination (AVIRWMP 2007).

The AVIRWMP provides an analysis of normal year, single dry year and multiple dry year regional supply and demand conditions over a 20-year period for the Antelope Valley region. The projections assume that per-capita urban water consumption will remain constant at 0.273 AFY for current and future residents although the plan states that future water use rates could be reduced by the implementation of various demand management and conservation measures (AVIRWMP 2007). These projections were developed prior to the adoption of the statewide per-capita urban water use reductions mandated by SB-7 (see the discussion, "Safe, Clean, and Reliable Drinking Water Supply Act of 2010" above). Recycled water from the Los Angeles County Sanitation Districts (LACSD) 14 (Lancaster) and LACSD 20 (Palmdale) water reclamation plants has been utilized for agricultural irrigation and environmental water use in the AVAA since the early 1990s. These uses currently average about 20,000 AFY (LACDRP 2010). Almost all of the region's recycled water supplies are primary or secondary treated wastewater. The AVIRWMP projects that by 2035, tertiary treated wastewater use within the region will be 3,400 AFY, or approximately 1.1% of total urban demand (AVIRWMP 2007).

The AVIRWMP projections assume that the regional population will increase by about 724,000 new residents, or nearly 300% from 2005 levels, by 2035. As discussed above, updated population estimates for portions of the Antelope Valley indicate that growth over this period could be approximately 20% lower than projected in the AVIRWMP, and the plan states that lower future growth would reduce the region's future water demands (AVIRWMP 2007). **Table 3.3.1** summarizes the population growth estimates used in the AVIRWMP projections.

TABLE 3.3.1
AVIRWMP POPULATION PROJECTIONS

	1970[a]	1980[a]	1985[b]	1990[a]	2000[a]	2005	2015	2035
Boron[d]	3,000	3,000	3,000	3,000	2,000	2,000	3,000	5,000
California City[d]	2,000	3,000	4,000	6,000	8,000	9,000	12,000	20,000
Edwards AFB[d]	10,000	9,000	8,000	7,000	7,000	7,000	10,000	16,000
Mojave[d]	4,000	5,000	5,000	7,000	6,000	7,000	9,000	14,000
Rosamond[e]	4,000	5,000	6,000	9,000	15,000	21,000	39,000	137,000
Unincorporated Kern County[e]	1,000	2,000	3,000	8,000	12,000	16,000	29,000	103,000
Lancaster[c]	41,000	51,000	55,000	98,000	113,000	142,000	192,000	283,000
Palmdale[c]	17,000	22,000	24,000	67,000	96,000	146,000	218,000	380,000
Unincorporated Los Angeles County[d]	20,000	29,000	33,000	69,000	88,000	100,000	129,000	215,000
Antelope Valley Region	103,000	128,000	140,000	275,000	346,000	450,000	641,000	1,174,000

Source: 2007 Antelope Valley Integrated Regional Water Management Plan

Notes: Projections Rounded to the nearest 1,000 people.

(a) Based on Geolytics Normalization of Past U.S. Census Tract Data to 2000 Census Tract Boundaries.
(b) Based on an Interpolation of the 1980 and 1990 U.S. Census Data.
(c) SCAG projections for North Los Angeles County Subregion. 2035 Estimates assume same growth rate as in 2030.
(d) Projections assume the Antelope Valley Region would have a similar annual growth rate as the City of Lancaster, estimated as approximately 2.6 percent from SCAG projections.
(e) Projections based on the Rosamond and Willow Springs Specific Plans.

Tables 3.3.2, 3.3.3 and 3.3.4 summarize the average (normal) year, single dry year and multiple dry year supply and demand projections in the AVIRWMP for 2010-2030. The projections assume that urban demand, or all municipal and industrial (M&I) use, will rise from 147,000 AFY in 2010 to 276,000 AFY in 2030. Agricultural demand is assumed to be 127,000 AFY in an average year, and 136,000 AFY in single dry and multiple dry years. Using these assumptions, the AVIRWMP indicates that by 2030 the region could experience a supply and demand "mismatch" (shortfall) of approximately 192,100 AFY in an average year, 249,500 AFY in a single dry year, and 190,500 AFY in a multiple dry year period.

**TABLE 3.3.2
ANTELOPE VALLEY REGION
WATER SUPPLY AND DEMAND COMPARISON
FOR AN AVERAGE WATER YEAR**

	2010	2015	2020	2025	2030
Groundwater Storage					
Natural Recharge (Low Estimate)	30,300	30,300	30,300	30,300	30,300
Natural Recharge (Increment)	51,100	51,100	51,100	51,100	51,100
Banked ASR Water Extracted	0	0	0	0	0
Return Flows					
Ag RF	23,200	21,500	19,900	18,300	16,600
Urban RF	18,800	20,800	22,400	24,100	25,300
WW RF	2,300	3,100	3,900	4,700	5,500
Subsurface Flow Loss	0	0	0	0	0
Direct Deliveries[(a)]	66,900	70,100	72,200	74,300	74,300
Recycle/Reuse	3,400	3,400	3,400	3,400	3,400
Surface Storage					
Surface Deliveries	4,400	4,400	4,400	4,400	4,400
Total Supply	**200,400**	**204,700**	**207,600**	**210,600**	**210,900**
Demands[(b)]					
Urban Demand	(147,000)	(175,000)	(205,000)	(239,000)	(276,000)
Ag Demand	(127,000)	(127,000)	(127,000)	(127,000)	(127,000)
Total Demand	**(274,000)**	**(302,000)**	**(332,000)**	**(366,000)**	**(403,000)**
Supply and Demand Mismatch	**(73,600)**	**(97,300)**	**(124,400)**	**(155,400)**	**(192,100)**

Notes:
(a) Direct Deliveries consist of the total SWP water available as shown minus the 6,800 AFY of SWP water that is banked to ASR in average water years and is thus not available to meet demand.
(b) Demand includes groundwater extractions.

TABLE 3.3.3
ANTELOPE VALLEY REGION
WATER SUPPLY AND DEMAND COMPARISON
FOR A SINGLE-DRY WATER YEAR

	2010	2015	2020	2025	2030
Groundwater Storage					
Natural Recharge (Low Estimate)	30,300	30,300	30,300	30,300	30,300
Natural Recharge (Increment)	51,100	51,100	51,100	51,100	51,100
Banked ASR Water Extracted	29,000	31,600	31,600	31,600	31,600
Return Flows					
Ag RF	19,100	17,400	15,900	14,700	13,400
Urban RF	14,500	15,700	16,800	18,100	19,100
WW RF	2,300	3,100	3,900	4,700	5,500
Subsurface Flow Loss	0	0	0	0	0
Direct Deliveries	6,400	6,400	6,400	8,000	8,000
Recycle/Reuse	3,400	3,400	3,400	3,400	3,400
Surface Storage					
Surface Deliveries	300	300	300	300	300
Total Supply	**156,400**	**159,300**	**159,700**	**162,200**	**162,700**
Demands[(a)]					
Urban Demand	(147,000)	(175,000)	(205,000)	(239,000)	(276,000)
Ag Demand	(136,000)	(136,000)	(136,000)	(136,000)	(136,000)
Total Demand	**(283,000)**	**(311,000)**	**(341,000)**	**(375,000)**	**(412,000)**
Supply and Demand Mismatch	**(126,600)**	**(151,700)**	**(181,300)**	**(212,800)**	**(249,300)**

Note: (a) Demand includes groundwater extractions.

**TABLE 3.3.4
ANTELOPE VALLEY REGION
WATER SUPPLY AND DEMAND COMPARISON
FOR A MULTIPLE DRY WATER YEAR**

	2010	2015	2020	2025	2030
Groundwater Storage					
Natural Recharge (Low Estimate)	30,300	30,300	30,300	30,300	30,300
Natural Recharge (Increment)	51,100	51,100	51,100	51,100	51,100
Banked ASR Water Extracted	29,000	31,600	31,600	31,600	31,600
Return Flows					
Ag RF	26,200	24,100	22,000	20,000	18,300
Urban RF	19,900	21,700	23,200	24,700	26,000
WW RF	2,300	3,100	3,900	4,700	5,500
Subsurface Flow Loss	0	0	0	0	0
Direct Deliveries	51,400	53,100	53,100	53,100	53,100
Recycle/Reuse	3,400	3,400	3,400	3,400	3,400
Surface Storage					
Surface Deliveries	2,200	2,200	2,200	2,200	2,200
Total Supply	**215,800**	**220,600**	**220,800**	**221,100**	**221,500**
Demands[(a)]					
Urban Demand	(147,000)	(175,000)	(205,000)	(239,000)	(276,000)
Ag Demand	(136,000)	(136,000)	(136,000)	(136,000)	(136,000)
Total Demand	**(283,000)**	**(311,000)**	**(341,000)**	**(375,000)**	**(412,000)**
Supply and Demand Mismatch	**(67,200)**	**(90,400)**	**(120,200)**	**(153,900)**	**(190,500)**

Notes: Values assume 4-year dry period begins in the year shown.
(a) Demand includes groundwater extractions.

The AVIRWMP does not provide specific population estimates for 2010 or 2030, the starting and end points of the plan's water supply and demand analysis (see Table 3.3.1). It includes a graphical representation of the region's population in Figure 2-14. This figure indicates that the region's population is assumed to be about 520,000 in 2010 and about 900,000 in 2030. The net growth during this period is therefore about 380,000 (AVIRWMP 2007).

If approved, the Project would reduce the supply and demand shortfalls projected in the AVIRWMP. Approximately 17% of the growth predicted in the plan (64,000 of 380,000 new residents) would occur within the Specific Plan area. Per-capita demand generated by the Project would be 0.125 AFY net of recycled water use, or approximately 54% lower than the comparable rate assumed in the AVIRWMP. Water demands for the increment of growth that would occur within the Project would fall to 7,996 AFY from approximately 17,472 AFY, a reduction of approximately 9,476 AFY from the demand levels and shortfalls projected for 2030. If all of the projected new development in the region achieved the same net water consumption rates as the proposed Project, 2030 urban demand would be 194,500 AFY (2010 existing demand of 147,000 AFY plus new demand of 47,500 AFY), or 81,500 AFY below the 2030 levels projected in the AVIRWMP. Total urban demand would be 16,490 AFY below the projected 2030 supplies of 210,990 AFY rather than exceed such supplies by 65,100 AFY.

The AVIRWMP recognizes that conservation measures could substantially reduce the supply and demand projections over 2010-2030. The plan states that "aggressive conservation" could reduce urban water demands by 20%, or 54,600 AFY by 2035 (AVIRWMP 2007). The Project would generate urban conservation savings of 54% net of recycled water within the Specific Plan area compared with the AVIRWMP urban consumption rates, or more than double the conservation savings estimated in the AVIRWMP. The plan also indicates that on-farm water use could be reduced substantially without decreasing productivity through improved irrigation technologies and efficient water management practices. The projections in the plan, however, do not assume that agricultural-related conservation will be achieved during 2010-2030 (AVIRWMP 2007).

The AVIRWMP discusses the relationship between the regional economy, land use planning, and water supplies. It indicates that an inability to approve new development due to a lack of water could generate significant economic and social impacts to residential, commercial, industrial, public and governmental users in the Antelope Valley region. Reduced deliveries could cause economic losses because public and private property owners would be unable to maintain lawns, parks, golf courses, landscaping and open space areas. The County and local municipalities would be unable to achieve population, housing, and job projections for which planning and infrastructure funds have previously been expended. Regional retail sales, which grew from $2.5 billion to $3.5 billion over the same time period that the number of new housing units rose by over 300 percent, would likely flatten or even decrease. Businesses that use high volumes of water could be forced to cut back production or close. Businesses considering relocating or expanding in the Antelope Valley region could be reluctant to invest capital because of uncertainties related to water supplies, lack of affordable housing for employees, and stagnant local markets for goods and services (AVIRWMP 2007). The AVIRWMP further indicates that regional land use planning could include long-range planning goals, objectives, general plan policies, ordinances, regulations, education and outreach programs to enhance water efficiency and to provide private development with incentives to reduce water demand (AVIRWMP 2007).

If approved, the proposed Project would be consistent with these AVIRWMP goals and objectives. The Project would generate a significant increment of the future growth assumed for 2010-2030 and assist with meeting the region's economic and social goals related to land development. At the same time, per-capita water use in the Specific Plan area would be substantially lower than the most optimistic potential conservation estimates considered in the AVIRWMP. Future demand shortfalls would be reduced under each of the average year, single dry year and multiple dry year projections summarized in the plan if the Project accounts for a portion of the region's anticipated growth. The Project would implement the long-term strategic vision set forth in the AVIRWMP in the Specific Plan area regarding the need for achieving future growth in a water-efficient manner.

4.0 PROJECT WATER SUPPLIES AND MANAGEMENT STRATEGIES

This section describes the water supplies that the Project currently controls, identifies additional supplies that may become available for Project use, and summarizes the Project's water supply management strategy.

4.1 OVERVIEW

The Project's fundamental water supply strategy is to: (1) utilize stringent demand conservation measures to reduce per-capita and per-unit water use as much as feasible and significantly below existing regional levels (see Section 2 and Section 3.3); and (2) manage a diverse set of supplies in a flexible, adaptive manner to meet demand.

Project water demands will be met by using several different supply sources. As discussed in Section 3, the availability of certain supplies, such as SWP Table A water, may vary in accordance with such factors as rain and snow conditions or regulatory constraints. The Project will be able to meet demand and respond to potential supply variability by banking water during more abundant supply periods for use in periods when other supplies may be unavailable. The water banks will subsequently be replenished when supplies are available, such as during low-demand or seasonal high-flow periods.

This WSA analyzes the water supplies that are available for Project use (the "Base Supplies") and additional supplies that may become available in the future. Base Supplies include: (a) water currently banked at the existing TRC water bank to the north of the Project; (b) water supplies acquired by TRC and loaned to AVEK in 2008 and 2009 for later return and delivery; (c) the transfer of certain SWP Table A amounts from the Tulare Lake Basin Water Storage District and the Dudley Ridge Water District; (d) recycled water; (e) return flows generated by Project irrigation; (f) water purchased from AVEK for delivery by 2015 (call water); and (g) groundwater. Additional supplies include new imported water purchased from other Table A contractors, other imported water, and purchases from AVEK. Each of these supplies is discussed in more detail below.

4.2 BASE SUPPLIES

This section describes the Project's Base Supplies, including the volume of water available for Project use and the Project's rights to use each source of supply.

4.2.1 Banked Water

As discussed in Section 1.4, in late 2005 and early 2006, TRC constructed the approximately 160-acre Tejon Water Bank located to the north of the Project (see Figure 1.5). TRC purchased approximately 2,061 AF during January-October 2006 and approximately 4,638 AF during March-October 2007 from AVEK for banking purposes (see Appendix H). This water was conveyed from the California Aqueduct to the Tejon Water Bank, released into the bank's percolation ponds, and infiltrated into the ground. TRC is storing the banked water for the benefit of the Project in accordance with an agreement between TRC and Centennial Founders LLC (see Appendix I). The Tejon Water Bank is also storing additional water for AVEK delivered in 2011. The Project also includes a proposed onsite water bank that will be able to receive supplies from the California Aqueduct and store water in an approximately 100-acre facility consisting of percolation ponds and related infrastructure (see Figure 1.5).

Both the Tejon Water Bank and onsite water banks will be operated in accordance with well-established management measures for similar facilities in the Antelope Valley and in adjacent regions, such as the San Joaquin Valley. A detailed monitoring and operational constraints plan (Water Bank Management Plan) will be implemented that will include: (1) a monitoring program to ensure that a maximum of 90% of the water stored in the Project water banks would be subsequently extracted from the aquifer to maintain and supplement groundwater supplies and to account for infiltration and extraction losses; (2) regular monitoring of the quality of water infiltrated into and extracted from the Project water banks, and a response plan to ensure that infiltrated and extracted water quality remains appropriate for the designated beneficial uses applicable to local groundwater; (3) monitoring aquifer water levels; (4) adjusting water bank operations by such means as rotating infiltration or extraction locations to avoid potential impacts to the local aquifer; and (5) providing appropriate responses in the event that water levels drop to unacceptable levels in offsite wells or rising groundwater levels reach elevations that, if such increases were to continue, could adversely affect surface crops or land as a direct consequence of water banking operations. These operational criteria are consistent with similar measures that have been established for the commercial Antelope Valley Water Bank, which was approved in 2006 and is located to the east of the Project site (Kern County 2006) and that were considered in the mitigated negative declaration approved by AVEK in 2008 for a 1,500 acre recharge project (AVEK 2008b).

It is possible that Project water supplies may be stored in other water banking facilities that have sufficient connectivity with the East and West Branches of the California Aqueduct and that would provide functionally the same water service as analyzed in this WSA. Any such facility would be fully permitted in accordance with applicable state, local and federal laws and subject to applicable water bank management plans and operational criteria.

As discussed in Section 3, the Antelope Valley groundwater basin is subject to an ongoing adjudication. Access to basin storage can occasionally be regulated in an adjudication when available storage capacity is limited and the input or extraction of imported water could potentially affect natural recharge. The adjudication is not likely to affect the proposed water banking operations for several reasons.

Under California law, the importer of non-native water that is stored in an aquifer retains the rights to the imported supplies. Banked imported water is distinguished from a basin's native supply. The owner of a stored water supply has the right to pump an equivalent amount from storage less losses, and this right is separate from the right to extract native groundwater (*City of Los Angeles v. City of San Fernando* (1975) 14 Cal. 3d 199). As a result, banked water is considered to be separate and distinct from a basin's natural recharge and groundwater. As discussed in Section 3.2, several water banks have been proposed or are being developed in the Antelope Valley, including the Antelope Valley Water Bank and a proposed AVEK storage facility. The adjudication was not identified as a constraint on water banking operations in either of these approved water bank projects. LACWWD 40 has been operating an aquifer storage and recovery program that injects supplies directly into the Antelope Valley groundwater basin for dry year recovery since approximately 2006 (AVIRWMP 2007). The aquifer storage and recovery program was initiated and has been operated during the pendency of the adjudication.

There is a substantial amount of available storage capacity between the top of the existing groundwater level and the upper elevations of the aquifer immediately under the banking facilities that would be used by the Project. The amount of this storage capacity significantly exceeds the Project's maximum potential banking requirements. Substantial additional capacity will continue to exist in the immediate vicinity of, and throughout the local and regional areas surrounding the Project. Groundwater levels currently range from approximately 230 feet to 335 feet below ground surface in the Project area. The U.S. Geological Survey has maintained groundwater hydrograph data from 1948 to 2010 for well number 08N17W4D1 located on the Project site. The USGS well data shows that in response to several years of above-average precipitation and high-rainfall periods since 1948, groundwater levels in the Project area rose by less than approximately 30 to 35 feet, a level that remained substantially below land surface elevations (see Appendix A). The USGS well data is consistent with the existence of significant unused storage capacity in the area. Based on the Project's hydrogeologic investigation, the existing depth to groundwater, aquifer transmissivity, and assuming a conservative storage capacity for the aquifer, there is at least 78,000 AF of available storage capacity in the immediate vicinity of the Project groundwater banks and at least 161,000 AF of storage within one-half mile of the Project site (see Appendix A). As discussed in Section 6.4, the maximum amount of stored water that could be required to meet full-buildout demand on a sustainable basis is less than 50,000 AF (see Tables 6.4.1-6.4.3). This maximum storage level is substantially below the available capacity in the immediate vicinity of the Project groundwater banks (78,000 AF) and approximately 30% of the available storage within one-half mile of the Project site (161,000 AF). The Project's proposed infiltration operations will not significantly affect the storage capacity of local or regional aquifers.

4.2.2 Supplies Loaned to AVEK

In 2008, TRC purchased 8,393 AF of water originally owned by the Nickel Family LLC (Nickel) that was available for export from Kern County in accordance with a water rights exchange between the KCWA and Nickel. In 2009, TRC purchased an additional 6,393 AF, for a total of 14,786 AF (collectively, the "Nickel Water"). The Nickel Water was acquired for storage in the TRC water banking facility to meet the Project's future demand.

As discussed in Section 3.2, AVEK is the primary SWP contractor for the Antelope Valley and sells SWP water to other districts and users throughout its service area. During 2008 and 2009, SWP supplies were severely constrained by drought conditions and regulatory limits affecting the operation of the SWP Delta pumps. To help alleviate the critical water shortage that was emerging within the Antelope Valley, TRC agreed to loan the Nickel Water to AVEK for return in later years. Two agreements were executed in 2008 and 2009 documenting the Nickel Water loan and return terms with AVEK. DWR approved the use of SWP conveyance facilities to deliver the Nickel Water to AVEK in both years.

The agreements provide that TRC may request the return of up to 20% of the loan water in any one year at a rate of 1.5 AF per 1 AF loaned to AVEK. In the event that TRC requests a return from AVEK in a "dry year," which is defined in the agreements as any year in which the SWP system reliability is 51% or lower, AVEK may ask TRC to defer the return until a later period. If a return is deferred, the return rate increases to 2 AF per 1 AF loaned to AVEK. Under the agreements, TRC will receive a minimum of 22,179 AF if all of the Nickel Water return occurs at a 1.5:1 ratio and a maximum of 29,572 AF if all of the Nickel Water return occurs at the deferred 2:1 ratio. Copies of the 2008 and 2009 agreements between TRC and AVEK, AVEK Board approvals, and DWR approvals relating to the Nickel Water are attached in Appendix J.

To provide a conservative assessment, this WSA assumes that TRC will receive only the minimum amount of the Nickel Water return, or 22,179 AF, and that these supplies will be received over the first 10 years of the Project (an average 10% annual return compared with a 20% allowable level in the agreements). The returned Nickel Water will be delivered through the turnouts serving the Project along the East Branch or the West Branch, as applicable. All rights related to the Nickel Water will be transferred by TRC to the District for Project use as part of the annexation process.

4.2.3 Table A Water Transfers from Tulare Lake Basin Water Storage District and the Dudley Ridge Water District

In 2008, TRC acquired to meet general water needs on TRC property the rights to approximately 1,451 AF of SWP Table A amounts held by the Tulare Lake Basin Water Storage District (Tulare Lake) and subcontracted by Tulare Lake to GWF Energy, LLC and the Lurene Mattson Trust. The transfer agreements between TRC and GWF Energy, LLC and the Lurene Mattson Trust are attached in Appendix K. In 2010, TRC also acquired for general water needs on TRC property the rights to approximately 1,993 AF of SWP Table A amounts held by the Dudley Ridge Water District (Dudley Ridge) and subcontracted by Dudley Ridge to the 3-R Land and Development Company, LLC, the Friend Family Trust, the Don Jackson Family LLC, and the Donald Lee Jackson Revocable Trust. The transfer agreements between TRC and Dudley Ridge, and between TRC and the 3-R Land and Development Company, LLC, the Friend Family Trust, the Don Jackson Family LLC, and the Donald Lee Jackson Revocable Trust, are attached as Appendix L.

Tulare Lake, Dudley Ridge, AVEK and the DWR will continue to complete the required authorizations, including applicable CEQA review, for the permanent transfer of the Table A amount to AVEK in accordance with SWP contract terms and applicable rules and regulations. The water would be used to meet TRC's general water needs, including agricultural operations and banking for future TRC general use in the existing TRC bank or other authorized water banking facilities. Following approval of the Project and certification of the Project's FEIR, AVEK, and TRC on behalf of the Project, will complete an agreement under which AVEK will convey the water for the benefit of the Project. The conveyance agreement will ensure that AVEK is compensated for any costs related to the transfer and delivery of the Tulare Lake and Dudley Ridge water for Project use. All rights related to the Tulare Lake and Dudley Ridge water will be transferred by TRC to the District for Project use as part of the annexation process.

As discussed in Section 3.2, SWP Table A water is subject to delivery variability due to weather, regulatory constraints, seasonal demand, and other factors. The availability of the Tulare Lake and Dudley Ridge transfer water for Project use is evaluated in this WSA using the normal (average) year, dry year and multiple dry year delivery projections in the 2009 SWP Delivery Reliability Report and the 2009 CALSIM II model. The total SWP Table A amount acquired by TRC is 3,444 AFY. The 2009 SWP Delivery Reliability Report indicates that the Project would receive approximately 2,067 AF on average (60% delivery reliability), including approximately 241-379 AF in a single dry year (7%-11% delivery reliability), and approximately 1,171-1,205 AFY (34% -35% delivery reliability) during multiple year droughts.

Table A water is subject to the terms of the SWP contracts between the DWR and the SWP contractors. Article 2 of the contract provides for a minimum term of at least 75 years, which generally extends through 2035 unless construction financing bonds or project repayment terms require a longer period. Article 4 of the contract provides for renewal at the election of the contractor at the same amount, cost, conveyance and quality as the prior contract. Article 4 also provides for similar renewal rights at the end of each succeeding term. The intent of these provisions is to provide SWP system participants with a stable, reasonably-priced, reliable long-term source of water. The consolidated and amended AVEK SWP contract, including Articles 2 and 4, is attached as Appendix M.

4.2.4 Recycled Water

As discussed in Section 2, the proposed Specific Plan will require the maximum feasible use of recycled water for external irrigation requirements in designated categories of centralized irrigation uses, including common and open space areas. All wastewater will be collected and treated to tertiary water quality standards in accordance with Title 22 of the California Code of Regulations. The tertiary treatment standard is the most stringent under California law, and allows for the unrestricted outdoor irrigation use of recycled water supplies. The onsite distribution system will provide recycled water for use within the proposed Project's parks, landscaped slopes, greenbelts, medians, parkways, schools and commercial recreation areas.

Two temporary and two permanent wastewater reclamation facilities will be constructed and operated to treat wastewater as required to meet the recycled water distribution and use rules and regulations promulgated by the California Department of Public Health (DPH) and the Regional Water Quality Control Board (see Figure 1.5). Recycled water infrastructure will be constructed throughout the Project, including a separate, non-domestic water distribution network, and dedicated pumps, pipelines and reservoirs. The storage facilities will be sized to balance seasonal irrigation demands and to store recycled water during low irrigation periods.

As part of the annexation process, the District would own and operate the water reclamation facilities. Water Code Section 1210 provides that the owner of a wastewater treatment plant holds the exclusive right to the treated wastewater produced by the plant. The Project's proposed recycled water use is consistent with the Recycled Water Policy adopted in 2009 by the State Water Resources Control Board (Resolution No. 2009-0011, February 3, 2009). The Recycled Water Policy goals include: (1) increasing statewide use of recycled water over 2002 levels by at least one million AFY by 2020 and by at least two million AFY in 2030; and (2) substituting as much recycled water for potable water as possible by 2030. To facilitate these goals, the Recycled Water Policy provides direction to each Regional Water Quality Control Board regarding the appropriate criteria for issuing recycled water use permits and to streamline the recycled project permitting process. A copy of the Recycled Water Policy is attached as Appendix N.

As discussed in Section 2, Phase 1 will generate approximately 1,021 AFY of recycled water. At full buildout, the Project will generate recycled water supplies of approximately 3,979 AFY. Approximately 33% of the Project's total annual water demand at buildout will be met by using recycled water.

4.2.5 External Irrigation Return Flow

Most of the proposed Project, excluding small areas within the Quail Lake and Gorman watersheds, is within the Antelope Valley watershed. A portion of the external irrigation applied to Project land within the watershed will infiltrate into the ground and become available for extraction by the Project's well system as return flows to the basin. Published studies indicate that approximately 20% to 30% of the surface water used in locations with similar characteristics as the Project site will generate return flows that can be captured for beneficial uses (Law Environmental 1991; USGS 2003). These return flows would not exist but for the proposed Project, and would be provided to the District as part of the annexation process.

To provide a conservative assessment, this WSA assumes that only 15% of the return flows produced by the Project's external irrigation in the Antelope Valley watershed will become available for Project use. The analysis further assumes a five-year lag between the time that water is used for irrigation and the time that related return flows can be used. As a result, no return flows will be used by the Project in Years 1-5. By Year 20, approximately 788 AFY of return flows will be available, and by Year 25, five years after full buildout, the volume of Project-generated return flows will be approximately 1,029 AFY.

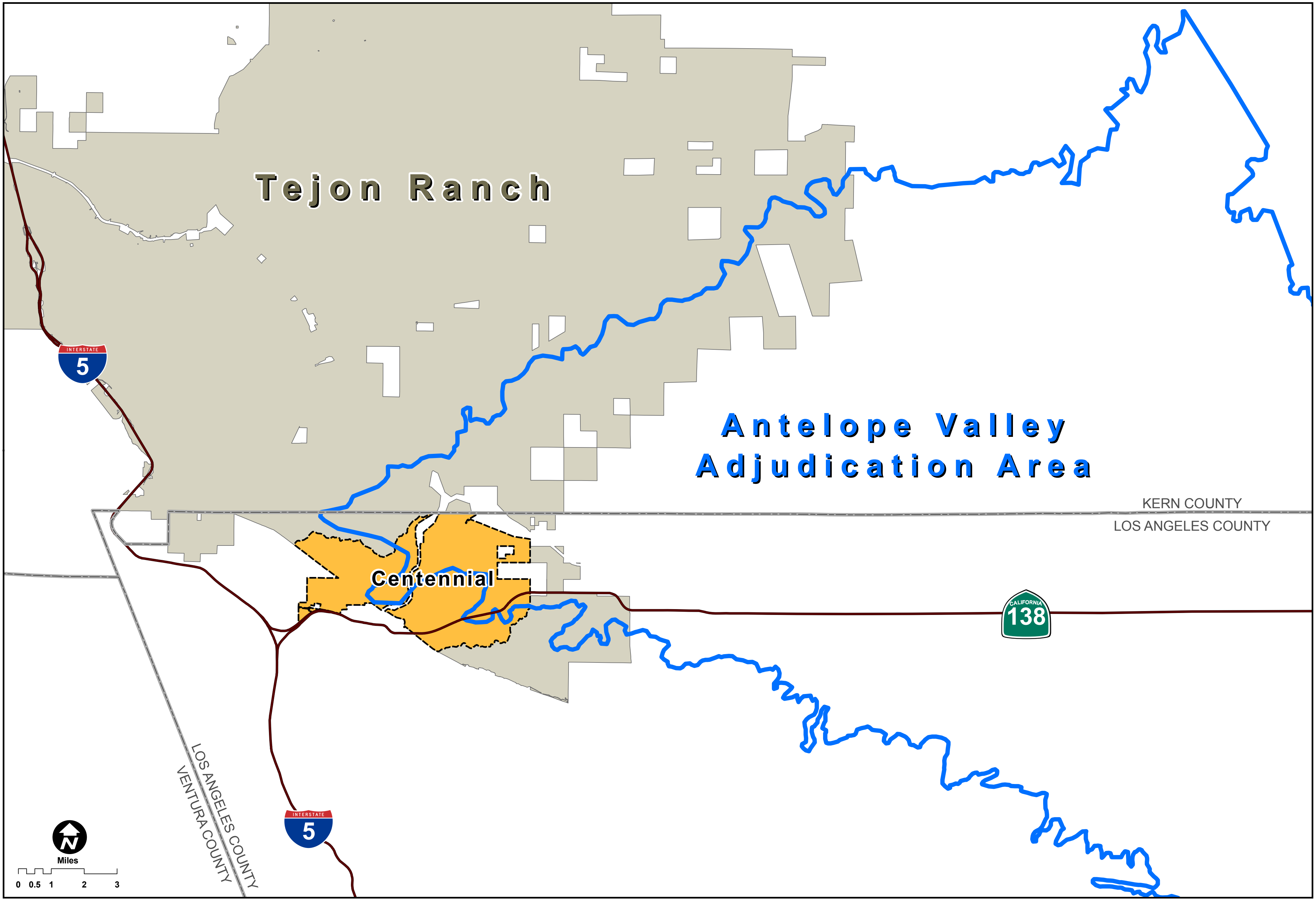
4.2.6 Call Water

In 2008, TRC purchased the right to receive 2,362 AF from AVEK by 2015 (see Appendix O; see also Appendix H). This water supply is characterized as "call water" by AVEK. Upon delivery, the call water would be used meet existing Project demand and any excess supplies would be stored in the onsite or offsite water bank. All rights related to the call water will be transferred by TRC to the District for Project use as part of the annexation process.

4.2.7 Groundwater

Overview. As discussed in Section 3, the Antelope Valley Groundwater Basin is subject to an ongoing adjudication. Approximately 33,530 acres of TRC, and approximately 4,920 acres of the Project area, overlie the AVAA. **Figure 4.1** shows the locations of TRC property, the Project and the AVAA boundaries.

As discussed in Section 3.1, pending the resolution of the adjudication, the amount of groundwater available to each user in the AVAA is not certain. To address this uncertainty, the WSA analysis assumes that no groundwater will be used during Years 1-6 of the Project, which corresponds to the buildout of Phase 1. Section 5 of this WSA demonstrates that groundwater is not required to provide a sustainable water supply for Phase 1. Groundwater use in the Project's



Project Site and TRC Land Ownership within Antelope Valley Adjudication Area

Centennial WSA

Figure 4.1

full-buildout scenarios (see Section 6, below) would only occur after the finalization of all state, federal and local permits required to initiate construction in Year 1 and after Phase 1 was completed. The required permit process would extend over an additional period of time after WSA approval, and Phase 1 completion could take longer than the six years assumed in this WSA. As a result, the “Year 7” start time for Project groundwater use that is assumed in the full-buildout projections would actually occur after more than seven years following WSA approval. The adjudication was initiated in approximately 2005 and has been continuously litigated since that time. Under these circumstances, it is reasonable to assume that, by the time Project permitting is actually finalized and Phase 1 is completed, the adjudication process will have matured to the point that the Project would be able to access up to 1,530 AFY of groundwater annually. As discussed in more detail below, this level of groundwater use is substantially below the sustainable yield of the local aquifer that would serve the Project and substantially below the historical amount of TRC’s groundwater extractions in the western Antelope Valley.

The amount of groundwater available to the Project in this WSA reflects two highly conservative adjustments to TRC’s historical groundwater use in the Antelope Valley:

1. TRC’s historical pumping levels are reduced by 15% to conservatively reflect the terms of adjudication mediation and settlement discussions that have been publicly disclosed between certain public water suppliers, including Los Angeles County, and landowners in the AVAA litigation. TRC is a litigant in the adjudication, and is asserting, among other defenses, that the western portion of the AVAA where the Project is located is not in overdraft, and that this area should be managed separately from the eastern portion of the basin where land subsidence and groundwater level reductions have occurred. If TRC prevails in the litigation, or if the Court finds that a “physical solution” is not required for the AVAA or the western portion of the basin (see below), it is possible that the groundwater supplies available to the Project could be substantially larger or available at an earlier point in time than assumed in this WSA.

2. On February 10, 2010 an individual and a related limited liability company (collectively “Burrows”) filed a lawsuit in Los Angeles County regarding the allocation of certain water, land and entitlement processing rights as between Burrows, Ranchcorp, and the Project. The lawsuit arises from and relates to a 2006 settlement agreement involving a land swap, water rights and entitlement processing requirements relating to the Project and certain properties owned by Burrows in the immediate vicinity of the Project site. Since 2002, Ranchcorp extracted groundwater from two wells on property owned by Ranchcorp to irrigate crops on six quarter-section (160-acre) parcels located to the east and south of the wells. A center-pivot, or circular irrigation system, was installed on each of the six quarter-section parcels irrigating approximately 120 acres of each quarter-section parcel. On or about February 15, 2007, Ranchcorp conveyed a quarter-section (160-acre parcel) containing one of the six pivots (Pivot 3) to Burrows. Following the conveyance, Ranchcorp leased back the Pivot 3 parcel for agricultural purposes. After the conveyance of the 160-acre parcel, Burrows filed a lawsuit asserting, among other claims, that it had acquired a specific amount of groundwater from Ranchcorp attributable to the parcel. In early 2010, in a response to a motion filed by Burrows in the lawsuit, Ranchcorp voluntarily

prepared the following written insert for inclusion in the WSA to clarify that the groundwater supply considered for Project use does not include groundwater applied to irrigate Pivot 3:

> During the period 2002-2008, the Tejon Ranchcorp (Ranchcorp) extracted groundwater from two wells on property owned by Ranchcorp to irrigate crops on six quarter-section (160-acre) parcels located to the east and south of the wells. A pivot, or circular irrigation system, was installed on each of the six quarter-section parcels irrigating approximately 120 acres of each quarter-section parcel. The amount of groundwater piped from the two extraction wells and used to operate the six pivots ranged over a six-year period from a low of approximately 1,593 acre-feet in 2002 (partial year of operation) to a high of approximately 2,792 acre-feet in 2004. Extractions averaged approximately 2,187 acre-feet per year from 2002 to 2008. In addition to irrigating crops, the extractions facilitated additional groundwater analysis by the Project's technical consultants. Each of the extraction wells was operated at a level that was representative of the anticipated well operational parameters required to supply the Project. Aquifer response to pumping in the vicinity of each well was also monitored. The observed well yields and aquifer responses were consistent with the Project's analytical assessments. On or about February 15, 2007, Ranchcorp conveyed a quarter-section (160-acre parcel) containing one of the six pivots (Pivot 3) to a third party. Following the conveyance, Ranchcorp leased back the Pivot 3 parcel for agricultural production purposes. The analysis of groundwater supplies available for Project use in the WSA and EIR does not rely on groundwater used on the Pivot 3 quarter-section (160-acre) parcel.

As shown in **Table 4.2.1** (see below), the agricultural pivots have been in full operation since 2003 and have been used for irrigation approximately six months each year. Based on historical pumping records, approximately 17% of the total amount of water used on the six pivots was used on Pivot 3 during the 2003-2010 period. No groundwater has been used on Pivot 3 since 2009. Ranchcorp, TRC and the Project proponent have secured outside counsel and are vigorously contesting the Burrows lawsuit, including any claim that the 2006 conveyance transferred a quantified water right. Nevertheless, to provide a highly conservative analysis, and consistent with the insert that Ranchcorp voluntarily agreed to include in this WSA, the amount of groundwater assumed to be available to the Project does not include 17% of TRC's average groundwater extraction after a 15% adjustment is made to conservatively account for the adjudication.

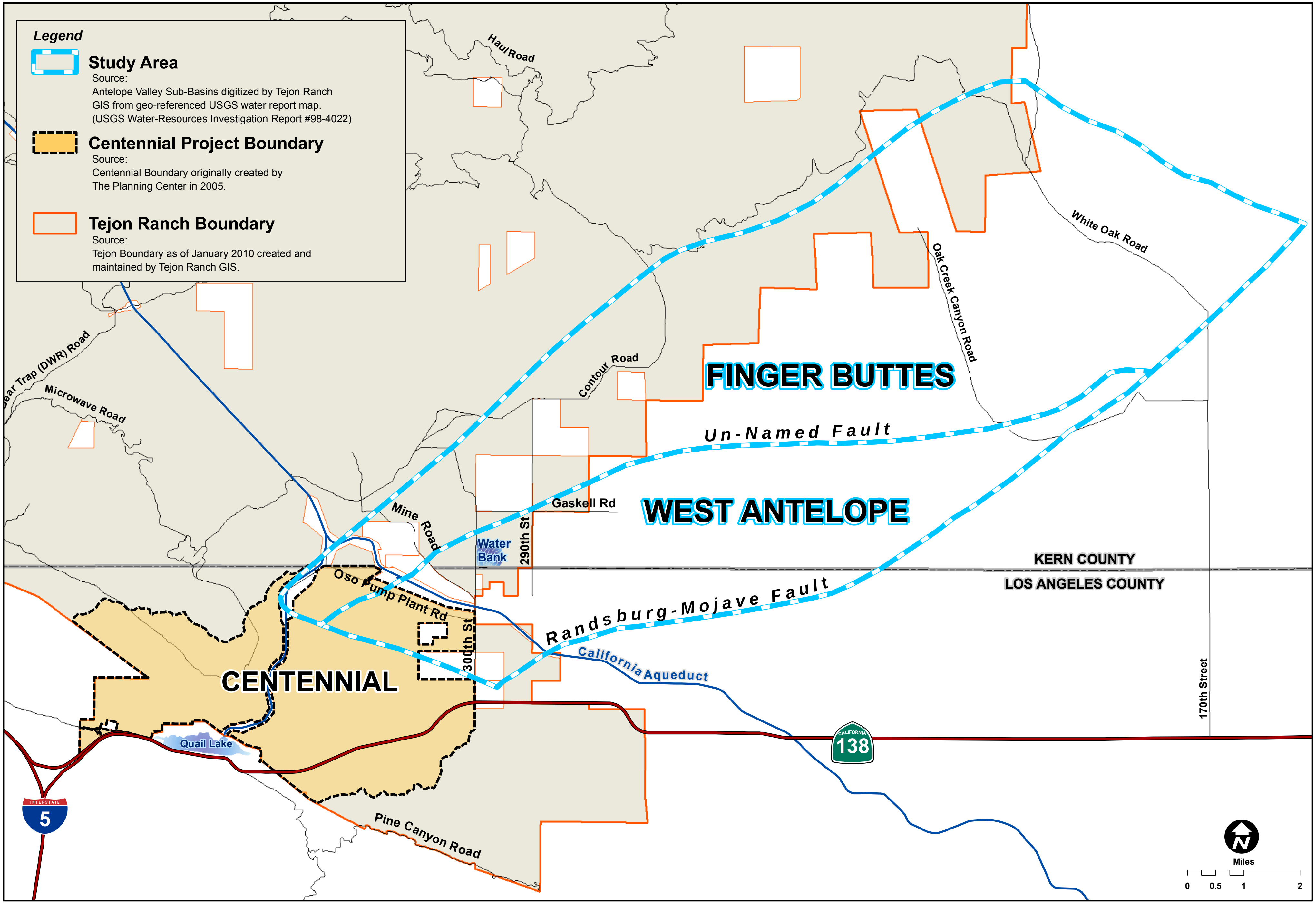
TRC's historical groundwater use in the Antelope Valley, and the derivation of the 1,530 AFY of groundwater available for Project use after Year 7, are discussed in more detail below, including a description of the groundwater study area used in the analysis, estimates of available recharge and sustainable yield, and applicable aquifer storage capacity and water quality characteristics.

Groundwater study area. This section describes aquifer conditions within a local groundwater study area that includes the locations where wells would be installed and operated to serve the Project. Under California law, a WSA may analyze a portion of a larger basin and is not required to assess groundwater pumping by all users in an entire basin. The Water Code also provides substantial discretion in determining how to measure groundwater sufficiency for WSA purposes (see *O.W.L. Foundation et al., v. City of Rohnert Park* (2008) 168 Cal.App.4th 568, 574).

This WSA focuses on two of the 12 subbasins that have been designated in several published studies of the Antelope Valley Groundwater Basin: (1) the Finger Buttes subbasin; and (2) the West Antelope subbasin (collectively the "Study Area"). The Study Area location within the Antelope Valley and relative to the Project and TRC's land ownership is shown in **Figure 4.2**. The subbasins have been utilized in the description of the Antelope Valley since at least the 1940s, and were systematically defined by the USGS in an influential 1967 study (USGS-Bloyd 1967) (see also Figure 3.2 for the locations of the 12 subbasins within the Antelope Valley Groundwater Basin). The subbasins have been routinely and regularly used to analyze local groundwater conditions in several published studies, reports and planning documents, including a USGS study of the region's hydrology (USGS 2003), the Antelope Valley Water Bank EIR (Kern County 2006), the AVIRWMP (AVIRWMP 2007), and in the recently-approved County EIR (LACDRP 2010).

Study Area sustainable recharge and yield. As discussed in Section 1.4, a series of wells for water banking, monitoring and potential groundwater extraction would be installed and maintained within the Project and on adjacent land owned by TRC (see Figure 1.5). A hydrogeologic study of the Project area shows that the aquifer underlying the Study Area is divided into discrete western, southern, and eastern components (see Appendix A). The Finger Buttes subbasin overlies the western portion of the aquifer and is composed of younger alluvium.

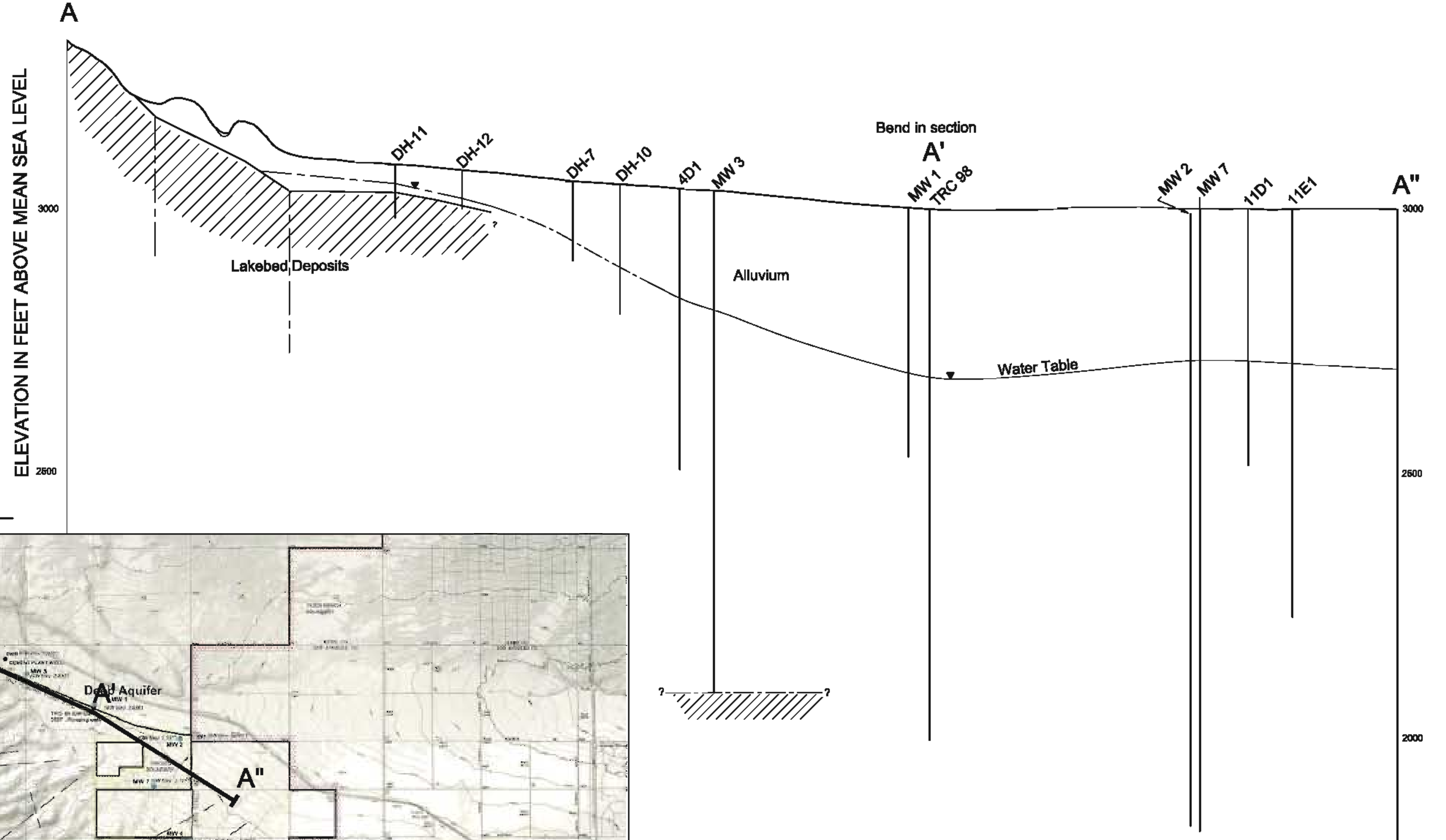
The West Antelope sub-basin is composed of 200 to 300 feet of younger alluvium underlain by 700 to 900 feet of older alluvium. The older alluvium corresponds with the deeper portion of the aquifer and is the principal water-bearing unit within the Study Area. The Study Area's groundwater and aquifer characteristics are depicted in **Figure 4.3.** Groundwater production from the deeper portion of the Study Area aquifer has been documented to be 1,100 gallons per minute (gpm) per well (see Appendix A). All of the Project's wells will be located within the Study Area and will be situated to access the deeper, most productive portions of the local aquifer.

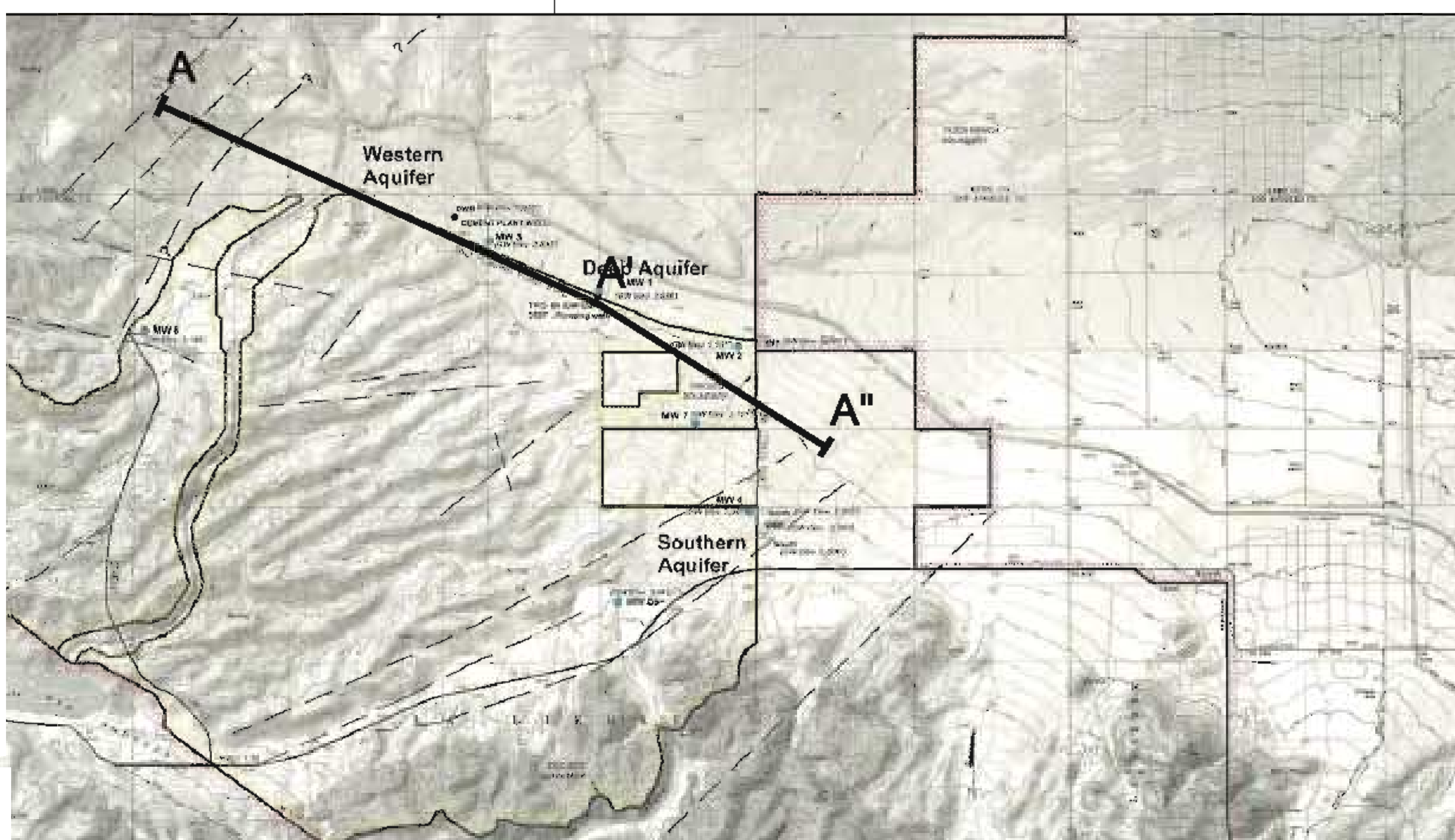


Location of Study Area, TRC Land and Project Site

Centennial WSA

Figure 4.2





Study Area Groundwater and Aquifier Characteristics

Figure 4.3

CENTENNIAL HYDROGEOLOGIC EVALUATION
GEOLOGIC CROSS SECTION A–A"

FIGURE 4.3

TRC (Ranchcorp) maintains two primary extraction wells within the Study Area that are used for current agricultural irrigation (see Figure 1.5) Substitute or additional wells drawing from the same aquifer may be considered for the Project in the future. Irrigation occurs approximately six months each year, mainly during the summer and warmer months. The two primary extraction wells and certain other TRC wells in the Antelope Valley were constructed in the late 1960s and have been used to extract groundwater since that time. During the 1991-1992 drought, TRC extracted approximately 6,464 AF (approximately 6,044 AF in 1991) and delivered this supply to AVEK (see Appendix P). In 2002, the Project contracted with TRC to manage agricultural operations within and adjacent to the Project site. Groundwater has been continuously extracted from two wells and used for agricultural irrigation since approximately the middle of 2002. **Table 4.2.1** summarizes the annual extractions from within the Study Area during 2002-2010 and the average annual extraction during 2003-2010, the period when the wells were in full operation.

TABLE 4.2.1
STUDY AREA GROUNDWATER PUMPED BY RANCHCORP
FOR AGRICULTURAL USES (AF)

Year	Total
2002 (partial year)	1,593
2003	2,632
2004	2,792
2005	1,912
2006	2,038
2007	2,347
2008	1,999
2009	1,653
2010	1,942
2003-2010 Average	2,164

Source: Ranchcorp

The conveyance facilities between Well No. 106 and the Project would be constructed by Centennial and, along with Well No. 106 would be dedicated to the District as part of the annexation process. Appropriate water system easements will also be provided to the District as part of the annexation process

Hydrogeologic investigations of the Study Area were conducted in 2006 and in 2010. Based on annual rainfall rates, inflows from the surrounding watershed, and estimated return flows from existing agricultural extractions, the 2010 investigation conservatively estimated the Study Area’s recharge at approximately 5,612 AFY and the sustainable yield, including return flows, at 6,219 AFY (see Appendix A). To provide a conservative assessment, this WSA uses the lower of these two estimates, 5,612 AFY, as the applicable sustainable supply of the Study Area. This estimate is consistent with the unitized (per acre) allocation of the AVAA safe yield to the Study Area following the County’s approach in a recently certified EIR (LACDRP2010). The total size of the Study Area is approximately 57,480 acres (18,475 acres in the West Antelope subbasin, and 39,005 acres in the Finger Buttes subbasin). The most conservative unitized sustainable yield estimate in the County’s EIR is approximately 0.1 AFY per acre (LACDRP 2010). Using this estimate, approximately 5,748 AFY of the AVAA’s safe yield would be allocated to the Study

Area. This amount is approximately the same as the conservative estimate of the Study Area's sustainable recharge of 5,612 AFY derived from the 2010 hydrogeologic investigation (see Appendix A).

Groundwater conditions have been monitored since 2004 to verify empirically that the Study Area aquifer can sustainably support significant extraction rates. As shown in Table 4.2.1, extractions by TRC for agricultural uses exceeded 2,600 AFY in 2003, were nearly 2,800 AFY in 2004 and averaged about 2,164 AFY in 2003-2010. Documented extractions by other Study Area aquifer users include approximately 353 AFY by National Cement for mining uses and approximately 75 AFY for domestic uses. During 2004-2009, based on analyses of annual crop reports and satellite data from the Study Area, total agricultural, domestic and industrial groundwater production in the Study Area averaged approximately 3,940 AFY (see Appendix A). During this period, local groundwater levels declined slightly (approximately 10 feet in the deep aquifer located near the extraction wells) in 2004-2006 and remained stable since that time. No subsidence or damage to onsite and offsite wells was observed or reported in or near the Project site (see Appendix A).

The Study Area recharge yield estimates and monitoring data indicate that, when groundwater becomes available for Project use, the Study Area aquifer could support Project extraction rates at least within the range of TRC's peak historical agricultural groundwater production and also maintain a significant additional sustainable supply for other users in the Study Area. As discussed above, this WSA assumes that the Project's groundwater use would be substantially below TRC's peak and average historical use levels. This reduced level of groundwater use would further ensure that sustainable supplies are available for other potential groundwater users in the Study Area. Subject to the results of the adjudication, existing agricultural operations would continue to occur pending Project approval. If the Project is approved and able to use groundwater after the adjudication is resolved, and the Project is annexed into the GVMWD, the District could allocate any temporarily unused groundwater supplies for interim agricultural uses until residential, commercial, employment and other demands increase within the Specific Plan area.

Study area water quality. Water quality samples from the deeper aquifer that would serve the Project, and from shallower wells in the region that would not generally be used for Project water supplies, indicate that Study Area groundwater is suitable for potable use. Total dissolved solids (TDS) concentrations in several shallow and deep wells analyzed by Geosyntec in 2007 were approximately 318 milligrams per liter (mg/L) and pH levels were neutral at 7.5. Iron and manganese were not detected in the samples. Nitrate concentrations were measured at 12.6 mg/L (as nitrate), below the applicable maximum contaminant level (MCL) drinking water standard of 45 mg/L. Boron concentration was 0.26 mg/L compared with the California Department of Public Health Action Level of 1 mg/L. Arsenic was detected in the deep aquifer at approximately 11.9 micrograms per liter (µg/L), above the state and federal MCL of 10 µg/L. As discussed in more detail below, an integrated arsenic treatment approach will be implemented to maintain arsenic levels at a maximum of 2 ppb (2µg/L) in Project potable water, substantially below the applicable MCL and consistent with the range of arsenic concentration in SWP and other public water supplies (see Appendix Q). No other metals were detected above applicable MCL standards. None of the deep aquifer groundwater samples contained detectable concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), asbestos, total and fecal coliform bacteria, e. coli bacteria, 1,2,3-trichloropropane, or 1,2-dibromoethane (Geosyntec 2007) (see Appendix R).

Water quality tests performed by GEI in 2010 at TRC-98 and TRC-106 focused on the deeper aquifer that would serve the Project and were consistent with the 2007 sampling results. Total dissolved solid levels ranged from 310 to 320 mg/L, well below applicable standards. The results also indicated the presence of coliform bacteria and odor at the applicable MCL of 3.0 threshold odor number (TON). These results are typical for wells that are used for agriculture and well water that is not disinfected or treated for potable use. Standard chorine disinfection, ultra-violet (UV) light disinfection or, if needed, physical cleaning by either scrubbing or brushing, followed by disinfection would meet applicable potable water standards for these characteristics (see Appendix A).

Arsenic was observed in TRC-106 at 13 ug/L, above the applicable MCL of 10 ug/L, and at 8.9 ug/L in TRC 98. Further aquifer sampling will be conducted prior to Project residential, commercial or employment-related groundwater use to verify these results. The analysis data will be reviewed by the DPH Drinking Water Program to confirm that constituent levels comply with federal and state drinking water standards. The Project will implement an integrated treatment approach to ensure that arsenic concentrations in potable water are maintained at no more than 2 ppb (2 µg/L) at any time. This level is consistent with the range of arsenic occurrence (approximately 1-4 ppb) reported in the SWP system (see Appendix Q). Arsenic treatment approaches sufficient to achieve this objective include the following:

- *Well screening to exclude arsenic-containing sediments.* Public water suppliers in the Antelope Valley, including LACWWD 40, have demonstrated that arsenic concentrations in well water can be significantly reduced by installing screens that isolate soils or well zones where arsenic occurs. An isolation strategy will be evaluated and deployed to reduce potential arsenic concentrations in well water serving the Project to the extent feasible (see Appendix Q).

- *Blending.* As discussed in Section 1.4, potable water will be conveyed to and treated in a central water treatment facility, including well extractions and SWP supplies (see Figure 1.5). Depending on the annual and seasonal availability of SWP supplies, which typically contain arsenic concentrations that range from 1-4 ppb, well and SWP water can be blended in the facility to meet the arsenic requirements for the Project (see Appendix Q).
- *Ion exchange process.* Ion exchange is an EPA-approved technology for the removal of arsenic from potable water supplies. An application of the technology developed by Envirogen, a commercial treatment system supplier, has been documented to be effective in reducing arsenic to non-detect levels in a plant operated by the Victorville Water District (VWD) under conditions similar to Antelope Valley and the Project area. The ion exchange process uses an adsorptive media such as iron oxide that bonds arsenic to the surface of the media in a staggered bed design. Water is passed through the media, where the arsenic is bonded and captured, and the purified water is then conveyed for further use. In 2002, VWD treated approximately 127 million gallons of well water using a mobile, 1,000 gallon per minute Envirogen facility to non-detect levels. Approximately 99.94% of the treated water was recovered for potable use. Based

on these results, VWD contracted with Envirogen to install a full-scale, centralized 6,000 gpm arsenic removal facility that will treat groundwater extracted from five wells. The VWD results show that ion exchange technology does not generate a significant wastewater stream and effectively removes arsenic from potable water supplies. The primary disposal requirements associated with the technology include the filtration media and solids suspended in the media. Assuming arsenic occurs in Project-serving groundwater at the highest tested level of approximately 13 µg/L, normal year Phase 1 operations could generate approximately 19 pounds of arsenic, and treatment to meet buildout demand could generate approximately 78 pounds of arsenic in a normal year and approximately 182 pounds of arsenic in a single dry year. Disposal options include: (a) disposal at dedicated regeneration locations, including a facility in Memphis, Tennessee operated by Envirogen; (b) cleaning in a dedicated onsite facility that would remove the arsenic and other solids from the adsorptive media and transporting the solids for disposal at EPA-approved regional facilities, such as the Harbors Environmental Services in Wilmington, California; or (c) transporting the adsorptive media and solids for cleaning and disposal at the Wilmington or a similar, EPA-approved facility (see Appendix Q).

Additional treatment technologies currently exist, such as reverse osmosis that can supplement the treatment approach if required to meet the arsenic concentration objective. Future techniques may be also be developed that could treat arsenic in a more cost-effective manner and reduce treatment wastes. The water treatment facility will be managed to allow for the systematic consideration and evaluation of available arsenic filtration technologies over time to ensure that applicable arsenic concentration levels are maintained and to reduce treatment wastes to the maximum extent feasible.

Potential availability of groundwater. The availability of groundwater for Project use is primarily related to the resolution of the adjudication. Potential adjudication outcomes include the following:

1. *Physical solution.* As discussed in Section 3.1, the adjudication may result in an allocation of water supplies to AVAA users and the appointment of a watermaster by the Court. As described above, and for illustrative purposes only, a recently-approved County EIR states that a logical outcome of this process would be the allocation of water in manner consistent with a basin-wide sustainable safe yield of approximately 0.125 to 0.1 AFY per acre (LACDRP 2010). Water use that results in a per acre consumption rate lower than these estimates would be consistent with this estimate of the basin's sustainable yield allocation.

2. *Separate basin management.* The adjudication could result in the creation of one or more separate management areas that reflect different groundwater conditions in certain parts of the AVAA. If the Project was included in a separate management area, groundwater use would be governed by criteria defined and managed by a watermaster or similar authority appointed by the Court. As discussed above, groundwater levels in the far western portion of the AVAA that includes the Project well field (see Figure 1.5) have generally been stable over time. TRC is a litigant in the adjudication and is asserting that the western portion

of the AVAA that includes the Project is not in overdraft and should be managed separately from the eastern parts of the basin. It is likely that the extent of the Project's access to groundwater in a separate management area would be at least comparable with, and could potentially be greater than, the amount of groundwater that could become available through a basin-wide physical solution.

3. *Settlement.* It is possible that the parties to the adjudication may, subject to Court approval and entry of a stipulated judgment, agree to a settlement. A settlement could potentially implement a number of pumping, monitoring, adaptive management or other measures under the auspices of a watermaster or similar authority. TRC is a party to and one of the largest landowners in the adjudication and has beneficially used AVAA groundwater for many years. It is likely that the extent of the Project's access to groundwater as the result of a settlement would be at least comparable with, and could potentially be greater than, the amount of groundwater that could become available through a basin-wide physical solution.

4. *No overdraft finding.* It is possible that the adjudication proceeding may result in a judicial determination that the basin, or a portion of the basin, is not in overdraft and that the Court lacks the legal authority to impose a physical solution. In this event, groundwater use within the Antelope Valley would be governed by California's system of overlying and appropriative groundwater use rights. As discussed above, there is enough recharge in the Study Area to allow for groundwater extraction in at least the levels assumed in the Phase 1 and Buildout projections (see Sections 5 and 6), other existing extractions, and potential additional use by other Study Area landowners.

Groundwater would be available to the Project in each of these scenarios. Certain of the public water suppliers that are parties to the adjudication have also asserted prescriptive rights claims to basin groundwater. It is likely that these claims would not be pursued if the adjudication is resolved through a physical solution, imposition of separate management areas or similar measures ordered by the Court, or by a settlement among the parties. TRC has asserted defenses against prescriptive claims, as the Study Area is located in the far western portion of the AVAA, is approximately 20 miles from any well that is currently or has historically been utilized by a prescriptive rights claimant, and overlies an area where groundwater levels have generally been stable over time. Even if the claims were pursued, and the claimants secured a favorable judgment against every groundwater user in the basin, it is unlikely that all of the available groundwater would be subject to prescription. Consequently, under each of the adjudication scenarios described above, and considering the possibility that prescriptive claims in the basin were successfully pursued, it is likely that groundwater will be available for Project use.

Potential amount of available groundwater. A recent County-approved EIR determined that the quantity of groundwater rights that will be allocated to individual property owners and public water suppliers in the Antelope Valley groundwater basin as part of the adjudication process is uncertain, but predictable (LACDRP 2010). The Study Area is currently unadjudicated. Groundwater supplies in the Study Area have sustainably supported extractions by TRC, in addition to extractions by other users, of over 6,000 AF in 1991, from 2,600-2,800 AF in 2003-2004, and an average extraction of approximately 2,164 AFY during 2003-2010. During 2004-2009, total agricultural, domestic and industrial groundwater production in the Study Area averaged approximately 3,940 AFY, and the Study Area has an annual sustainable recharge of at least 5,612 AFY (see Appendix A). Based on these estimates, the Study Area has a sustainable recharge that is greater than average annual extraction levels in recent years. According to the AVIRWMP, groundwater is considered a reliable water source in the Antelope Valley Groundwater Basin (AVIRWMP 2007).

To provide a conservative assessment of the potential effects of the adjudication, this WSA assumes that the groundwater available for Project use would not exceed TRC's average annual historical pumping of approximately 2,164 AFY, less 15% of this amount in a manner consistent with recent AVAA settlements involving the County and other public water suppliers, and approximately 17% to reflect the amount of water historically used on Pivot 3. As discussed above, TRC is vigorously defending its groundwater rights. As a result of these assumptions, this WSA assumes that only 1,530 AFY of groundwater would become available for Project use, and that such supplies would only be available in Year 7 after Phase 1 is complete. Substantially more groundwater could be available over time and in years prior to Year 7 depending on the results of the adjudication.

Groundwater use of 1,530 AFY is nearly 75% below the most conservative estimate of the Study Area's sustainable recharge of 5,612 AFY (see Appendix A). The Study Area aquifer has historically supported significantly higher rates of extraction by TRC in addition to pumping by other users. Consequently, it is reasonably likely that at least 1,530 AFY will be available for Project use by Year 7.

An adjudication can also result in the implementation of a groundwater rights sale and transfer system among basin users. Under such a system, parties that desire to increase groundwater production could buy additional pumping rights from other users or pay a fee to the watermaster or similar authority that would be used to obtain replacement water from other sources. If implemented, either of these mechanisms would allow the Project to augment available groundwater supplies without affecting the basin's sustainable yield. It is reasonably likely that the adjudication will result in a groundwater rights sale and transfer system that could be utilized to secure additional groundwater supplies for the Project. To provide a conservative analysis, this WSA does not include any supplemental groundwater supplies that may be obtained by groundwater rights sales or transfers in the Phase 1 and buildout projections.

4.3 ADDITIONAL SUPPLIES

This section describes additional imported water supplies that may become available over time to supplement the Base Supplies. The discussion considers certain factors that could affect the future availability of these supplies, the amount of additional supplies that could potentially become available, and impacts potentially associated with Project acquisition and use of additional supplies.
The Project could acquire rights to use new imported water under several scenarios, including additional transfers of SWP Table A amounts from SWP contractors located outside of the Antelope Valley, other water transfers, and SWP purchases from or fee payments to AVEK. These potential supplies are discussed in more detail below.

Table A or other imported water transfers. The Project could acquire additional Table A or other imported water supplies, including the following:

1. *Additional Table A transfers.* As discussed in Section 4.2.3, TRC acquired rights to 3,444 AFY of Table A amounts from Tulare Lake and Dudley Ridge. Additional Table A transfer opportunities may become available in the future. Additional Table A water secured by the Project would eventually be transferred to AVEK's SWP account in accordance with applicable SWP contracts and rules, subject to payment of all conveyance and other costs associated with the transfer. Transfers of Table A amounts would require the approval of the transferring SWP contractor, AVEK and DWR after appropriate environmental review.

2. *Potential private or public water sales.* Public or private entities may acquire rights to non-SWP water that can be transferred to the Project by means of the California Aqueduct. As discussed in Section 4.2.2, Nickel Water became available to the Project after a water rights exchange between Nickel and KCWA. It is possible that other groundwater or other surface water rights holders located in areas that can access the California Aqueduct, or that can facilitate exchanges that result in the delivery of water to the Project, may be able to sell or transfer other non-SWP supplies water for Project use. The acquisition of sale and delivery rights by a seller, as well as the sale and transfer to the Project, would require appropriate agency approvals and environmental review. Water delivered to the Project would also be required to meet applicable California Aqueduct water quality standards. Approvals from AVEK, DWR and potentially other conveyance facility rights holders would be necessary to deliver third-party water through the California Aqueduct to the turnouts that serve the Project. In general, the conveyance of non-SWP water would occur on a lower priority than the conveyance of SWP supplies in the aqueduct system, and transfers that rely on variable conveyance rights are more difficult to complete. A transfer relying on variable conveyance in the California Aqueduct would generally occur when there is surplus capacity and would be stored until needed within the onsite and TRC water banks.

3. *Central Valley Project water.* The CVP is a federal water system primarily located in California's central valley that is managed by the USBOR. It is possible that certain CVP water may become available for third party purchase and conveyance, potentially through a series of exchanges, for Project use. As discussed in Section 3.2, the acquisition and delivery of CVP water to the Antelope Valley would likely require a more complex permitting process than would be associated with transfers of Table A amounts, including State Water Resources Control Board approval of a change in the place of use of CVP water, federal and state environmental review, and federal and state conveyance and conveyance system water quality approvals. As a result, it is relatively unlikely that significant amounts of CVP water would become available for Project use.

4. *In-basin transfers and acquisitions and development fee programs.* As discussed above, the Antelope Valley adjudication or ongoing regional efforts to provide stable, reliable water supplies could result in a system of groundwater or surface water transfers, fee payments or other mechanisms by which the Project could acquire rights to additional water supplies. Potential Antelope Valley basin

groundwater transfer mechanisms are discussed in Section 4.2.7. Potential fee payment and purchase mechanisms for SWP water are discussed below.

5. *AVEK development fee program.* As discussed in Section 3.2, AVEK may implement a development fee program that would provide the agency with funding to purchase new imported supplies. If adopted, this program could facilitate additional imported water supplies for Project use.

To provide a conservative assessment, the Phase 1 and buildout supply projections in Section 5 and Section 6 assume that all new imported water will be subject to the SWP reliability levels identified in the 2009 SWP Delivery Reliability Report. Certain non-SWP water transfers may be available at a higher level of reliability, particularly if they do not require movement through or originate from locations that are north of the Delta. The projections also conservatively assume that no new imported water supplies, other than as included in the Base Supplies, will be available for Project use before Year 10. This assumption allows for the implementation of currently proposed and potential future regional and statewide initiatives that could stabilize or enhance SWP or other potential imported supplies (see the discussion of "Factors potentially affecting future SWP delivery reliability" in Section 3.2 of this WSA). If these initiatives are implemented more rapidly than assumed, it is possible new imported water supplies could become available for Project use prior to Year 10.

California public policy explicitly favors water transfers as means of achieving the most efficient allocation and use of state water resources. Water Code Section 475 states:

> The Legislature hereby finds and declares that voluntary water transfers between water users can result in a more efficient use of water, benefiting both the buyer and the seller. The Legislature further finds and declares that transfers of surplus water on an intermittent basis can help alleviate water shortages, save capital outlay development costs, and conserve water and energy. The Legislature further finds and declares that it is in the public interest to conserve all available water resources, and that this interest requires the coordinated assistance of state agencies for voluntary water transfers to allow more intensive use of developed water resources in a manner that fully protects the interests of other entities which have rights to, or rely on, the water covered by a proposed transfer.

Sales of surplus and nonsurplus water are authorized by Water Code Sections 382, 383, and 1745 et seq. SWP Table A transfers can be accomplished through a variety of means, including Article 41 of the SWP contracts.

As discussed in Section 3.2, numerous state, regional and local water supply stakeholders and state and federal wildlife agencies have initiated efforts that could increase the reliability of the SWP system. If these efforts are successful, the availability of SWP supplies in normal, dry and multiple dry years could increase and SWP contractors may receive a larger share of their Table A amounts over time. Under these circumstances, the amount of Table A water potentially available to the Project through existing transfers (Tulare Lake and Dudley Ridge), potential future transfers, and by deliveries from AVEK could be higher than considered in this WSA. In addition, other SWP contractors may be more willing to engage in transfer transactions to reduce the fixed costs associated with holding surplus Table A amounts.

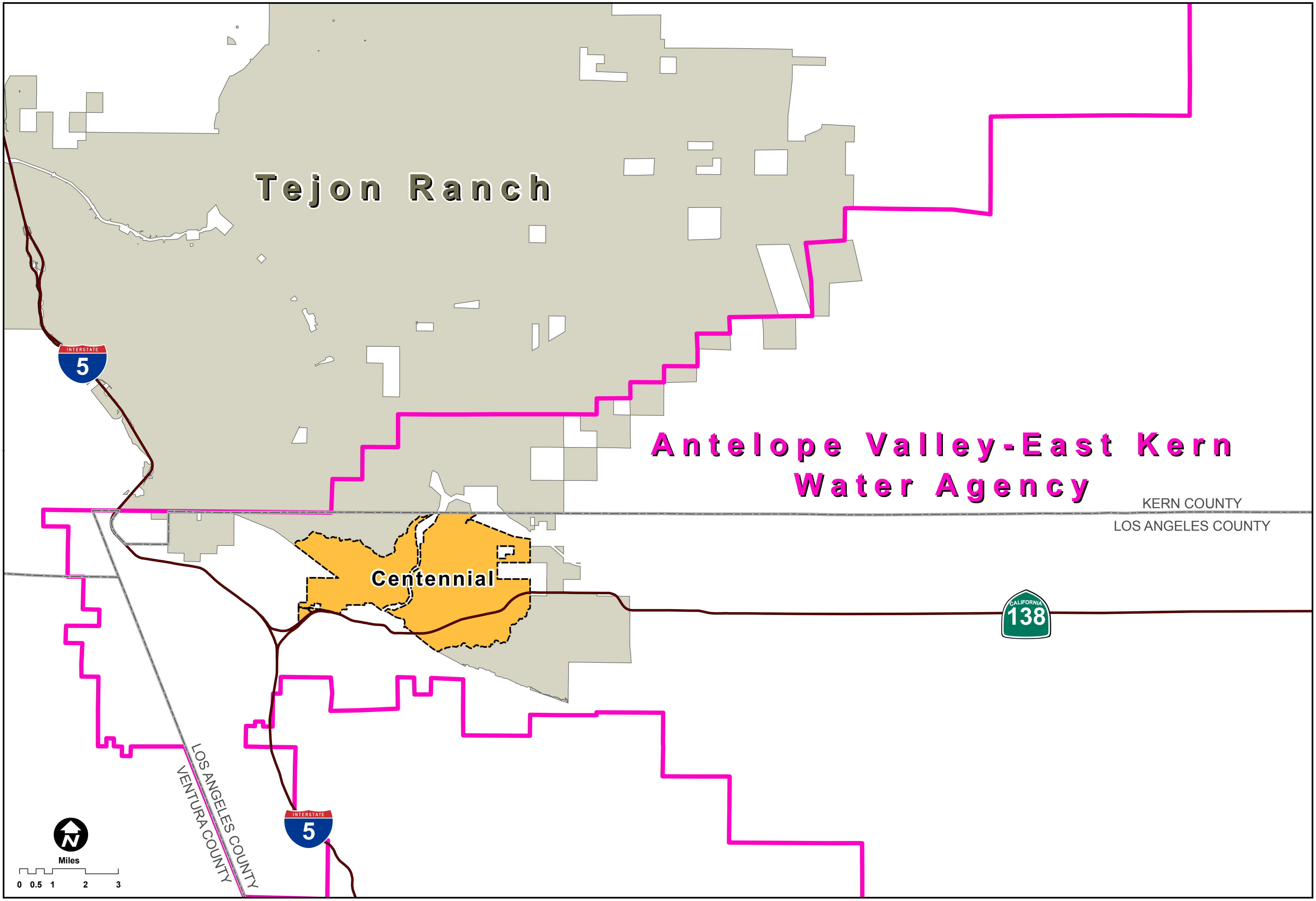
Water transfers also regularly occur within local watersheds and among contractors and subcontractors operating within the same state, federal or local water systems. As discussed above, it is likely that one or more regional water supply management initiatives or the AVAA adjudication will facilitate a system of in-basin transfers that the Project could utilize to augment available supplies. Third-party transfers of non-SWP water that result in permanent exports from one region to another, such as the Nickel Water, are relatively rare. As a result, it is relatively less likely that third party transfer opportunities involving the permanent movement of non-SWP water from one watershed to another will become common in the future.

The potential impacts associated with Project acquisition of additional Table A amounts or other imported supplies primarily depend on the source of the affected water. Table A transfers between SWP contractors typically do not require new infrastructure and do not significantly modify SWP system operations. For example, the 2009 Table A transfer from the Dudley Ridge Water District to the MWA and the 2010 Jackson Ranch acquisition by IRWD were both completed with CEQA negative declarations (MWA 2009; IRWD 2010). It is possible that future transfers will require the preparation of additional CEQA documentation, such as a mitigated negative declaration or an EIR.

AVEK deliveries. Approximately 38,611 acres of TRC land including all of the Project area is within the AVEK service area. **Figure 4.4** shows TRC's land ownership and the Project site within AVEK's service area. Section 61.1 of the AVEK Agency Law (California Uncodified Acts 9095, Sections 49-96) states that AVEK shall:

> …whenever practicable, distribute and apportion the water purchased from the State of California or water obtained from any other source as equitably as possible on the basis of total payment by a district or geographical area within the agency regardless of its present status, of taxes, in relation that such payment bears to the total taxes and assessments collected from all other areas. It is the intent of this section to assure each area or district its fair share of water based on the amounts paid into the agency as they bear relation to the total amount collected by the agency.

TRC and AVEK executed a water services agreement in 1976 that provides for deliveries from AVEK to TRC in accordance with the agency's rules and regulations. Since 1976, TRC has received approximately 79,000 AF of water from AVEK, or an average of approximately 2,325 AFY (see Appendix P). These deliveries include approximately 6,700 AF received by TRC in 2006 and 2007. In 2008, TRC also purchased 2,362 AF from AVEK for delivery by 2015 (see Appendix O). TRC has the right to request water deliveries from AVEK in the future in



Project Site and TRC Land Ownership within AVEK Service Area

Centennial WSA

Figure 4.4

accordance with principles set forth in Section 61.1 of the AVEK Agency Law and under the water services agreement. It is reasonably likely that AVEK supplies would become available for Project use in the future.

As discussed in Section 3, under current conditions, and assuming per-capita water use rates in the Antelope Valley are not reduced over time, the 2008 UWMP projects that AVEK's SWP supplies will be insufficient to meet regional needs. The Project would avoid impacts to AVEK's water supplies and regional supplies in several ways. First, as discussed in Section 2, proven, state-of-the-art water conservation measures will be implemented to reduce Project per-capita water demands substantially below the levels assumed for new growth in the 2008 UWMP. If the Project is approved, about 30% of the future regional growth projected in the 2008 UWMP would occur within the Specific Plan area. Per-capita water demands associated with Project growth would be significantly lower than in other locations in the 2008 UWMP analysis.

The projections in Section 5 and Section 6 also assume that no AVEK or other new imported supplies would be used by the Project before Year 10. This time frame would allow for the implementation of several regional measures currently under consideration that, if implemented, would increase the reliability and availability of AVEK supplies. These measures include: (a) regional groundwater banking to store water during low demand periods when AVEK has excess supplies and conveyance capacity; (b) a development fee or similar program under which users would pay for the right to a specific amount of water imported by AVEK and which would generate revenues that AVEK would use to secure new supplies; or (c) regional water conservation measures that would reduce Antelope Valley per-capita water use significantly below current levels and extend the use of existing supplies. If one or a combination of these or similar measures are implemented during the initial decade of the Project, AVEK supplies could be obtained after Year 10 without significantly affecting other users.

The Project could also schedule AVEK deliveries to avoid impacts to other AVEK customers, such as during years when the SWP system is able to deliver a relatively high percentage of each contractor's Table A amounts. The Project can store water delivered during these periods in the onsite and TRC water banks or in other approved facilities that can access the California Aqueduct. The 2009 CALSIM II model, for example, indicates that the SWP system will be able to deliver at least 71% of each contractor's Table A amount in 21 years of the 82 years in the model, or once every four years on average (DWR 2010). During these years, AVEK could receive at least 71% of its Table A amount, or approximately 102,524 AF. As discussed in Section 3.2, AVEK customers utilize about 75,000 AFY and the agency generally cannot beneficially use more than about 81,000 AFY due to storage and capacity limitations (AVIRWMP 2007).

Under these conditions, the Project or other users could receive up to about 25,000 AF in only 21 of 82 years when SWP reliability is at least 71% without affecting other AVEK users. In 61 of 82 years, including average, dry and multiple dry years, the Project or other users would receive no water from AVEK.

It is probable that AVEK or other regional water suppliers will develop banking or similar storage facilities that could store water available to AVEK during relatively abundant SWP delivery years. As such facilities become operational over time, most or potentially all AVEK Table A water delivered in relatively abundant years could be put to beneficial use by the agency and the potential availability of water for Project use in high-delivery years could decline. An extensive regional banking capability, however, would also increase AVEK's ability to make deliveries to customers within its service area in all years. The Project can flexibly adapt its potential use of AVEK water to allow for: (a) abundant-year only deliveries in the event that AVEK has water supplies and conveyance capacity that cannot otherwise be put to beneficial use; or (b) annual or other regular deliveries after regional banking and other supply enhancement measures have been implemented that increase the availability of AVEK supplies for all local users.

Finally, the Project could cap its use of AVEK water at a level that would avoid significant impacts to regional supplies and be consistent with regional and state efforts to reduce per-capita water use. For example, the project could contract with AVEK for no more than 2,000 AF per year, a level below the 2,372 AFY average delivery by AVEK to TRC since the mid-1970s. If capped at approximately 2,000 AFY, the project's per-capita use of AVEK water would be approximately 0.031 AFY (2,000 AFY divided by 64,000 residents at buildout), substantially lower than the 0.343 AFY per-capita use assumed in the 2008 UWMP.

The projections in Section 6 assume that the Project would not use additional imported water from AVEK for 10 years from the start of development to allow for the development of new regional water storage and fee payment programs or similar regional supply enhancement measures. The Project can also time the delivery of AVEK water to coincide with periods in which AVEK has surplus supplies and delivery capacity. Under these circumstances, it is reasonably likely that the Project will be able to obtain AVEK water by Year 10 under conditions that would avoid or mitigate for potentially significant impacts.

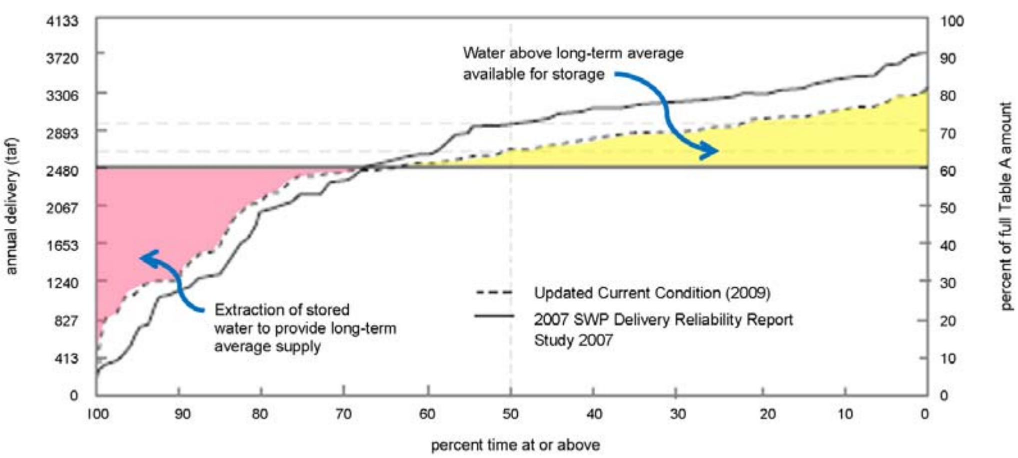
5.0 PHASE 1 WATER SUPPLY PROJECTIONS

This Section discusses Phase 1 supply and demand during normal, dry and multiple dry years over a 20-year projection as required by Water Code Section 10910(c)(3). The final row in each projection identifies the ending water bank balance, or water stored in the water banks and available for future Project use, for each year. The water bank balance for each year is equal to: (a) the previous year's ending balance; plus (b) the net transfers to or from the water banks during the year, less 10% to reflect banking losses.

For informational purposes, 1,530 AFY of groundwater is included in the total "Base Available Supplies" shown on the tables after Year 7, when Phase 1 is projected to be complete. As discussed below, the Phase 1 projections show that groundwater is not needed to meet Phase 1 demand and to maintain a significant water banking reserve supply on a sustainable basis. As a result, while available groundwater supplies are used to meet demand in the buildout scenarios presented in Section 6, they are not included in the net amount of surplus water transferred into the water banks in the Phase 1 projections. This approach is conservative. If groundwater was used after Year 7 in the Phase 1 projections, a greater amount of imported water could be stored in the water banks over time than is depicted in the projections.

The projections incorporate the 2009 SWP Delivery Reliability Report and the 2009 CALSIM II data. The base supplies for normal years, shown in Table 5.1.1, are assumed to reflect the long-term average availability of SWP water acquired from Tulare Lake Basin Water Storage District and Dudley Ridge Water District. While the SWP Table A amounts actually delivered will vary each year, they will be managed to ensure that the average availability is achieved in all years. This will be done by banking SWP water in wetter years when the actual deliveries are greater than the long term average and by extracting that stored SWP water for use in drier years when the actual SWP deliveries are less than the long-term average. Based on the 2009 SWP Delivery Reliability Report, the sustainable long-term average availability of SWP water to the Project would be about 60% of the full Table A amount, or 2,067 acre feet. As shown in **Figure 5.1**, which is derived from the DWR 2009 Water Reliability Report, the amount of SWP water available in above average years offsets the amount available in below average years enabling 2,067 acre feet to be available each year as long as it is properly managed.

FIGURE 5.1
SWP TABLE A DELIVERY PROBABILITY
UNDER CURRENT CONDITIONS



Single dry year projections are presented in five year increments. Multiple dry year projections are presented separately for each of the five-year periods in the projection with the first year of each five-year period a normal year and the last four years a dry period. These single and multiple dry year projections are assumed to follow years of long-term average water availability. This results in a conservative assessment of the SWP water available to the Project, as it does not consider that the long-term average of 60% includes the single and multiple dry years and that, therefore, the average deliveries in the normal years should be greater than 60%. By properly managing the SWP supplies through storage and withdrawal actions, the 60% long-term average deliveries of SWP water should be available to the Project even in a single dry year and multiple dry years.

5.1 BASE SUPPLIES

Tables 5.1.1, 5.1.2 and 5.1.3 provide Phase 1 demand and supply projections using the Base Supplies during normal, single dry and multiple dry years. The projections show that the Base Supplies significantly exceed the amount of water required to meet Phase 1 demand throughout the 20-year analysis period required by the Water Code. The projections also show that, after the 20 year projection period, and utilizing the 82-year CALSIM II data over several iterations (i.e., 164 years, 246 years and successive 82-year periods), the Base Supplies are sufficient to meet Phase 1 demand on a sustainable basis. No imported water in addition to the Base Supplies will be required to meet Phase 1 demand over the 20 year projection period and on a sustainable basis.

As discussed above, Tables 5.1.1, 5.1.2 and 5.1.3 show that significant banking operations are not required to meet Phase 1 demand on a sustainable basis using the Base Supplies. If available groundwater starting in Year 7 was used to meet Phase 1 demand, additional water could be banked and would continue to accumulate over time because the Base Supplies exceed the long-term water demands generated by Phase 1. Section 6 provides normal, single dry and multiple dry year projections for the full buildout of the Project. Water demand under buildout conditions will be greater than for Phase 1, and water that is not required to meet demand in earlier years will be banked for subsequent use. As a result, the Phase 1 tables understate the amount of water that would be banked for future Project use under buildout conditions. The tables presented in Section 6 include projections of banking operations related to full buildout conditions.

TABLE 5.1.1
BASE SUPPLY – NORMAL YEAR

Annual Sources and Uses of Base Water Supplies	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021	1,021
Return Flows	0	0	0	0	0	7	48	88	115	167	225	225	225	225	225	225	225	225	225	225
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Base Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**6,884**	**6,924**	**6,951**	**7,003**	**4,843**	**4,843**	**4,843**	**4,843**	**4,843**	**4,843**	**4,843**	**4,843**	**4,843**	**4,843**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**
Net Amount Available for Transfer to (from) Water Bank[(1)]	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,931**	**3,971**	**3,998**	**4,050**	**1,890**	**1,890**	**1,890**	**1,890**	**1,890**	**1,890**	**1,890**	**1,890**	**1,890**	**1,890**

(1) See Section 5 text regarding Phase 1 banking assumptions. For Years 7 through 20, available groundwater not used by the Project is not transferred to a water bank.

Water Bank Activity and Balances	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance [(2)]	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**28,286**	**30,483**	**32,704**	**34,972**	**35,296**	**35,620**	**35,944**	**36,268**	**36,592**	**36,916**	**37,240**	**37,564**	**37,888**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	2,401	2,441	2,468	2,520	360	360	360	360	360	360	360	360	360	360
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(240)	(244)	(247)	(252)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**28,286**	**30,483**	**32,704**	**34,972**	**35,296**	**35,620**	**35,944**	**36,268**	**36,592**	**36,916**	**37,240**	**37,564**	**37,888**	**38,212**

(2) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 5.1.2
BASE SUPPLY – SINGLE DRY YEAR

Annual Sources and Uses of Base Water Supplies				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	1,021	1,021	1,021
Return Flows	0	167	225	225
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Total Base Supplies Available	**1,088**	**3,034**	**3,127**	**3,155**
Total Demand	**2,313**	**2,953**	**2,953**	**2,953**
Net Amount Available for Transfer to (from) Water Bank(1)	**(1,225)**	**81**	**174**	**202**

(1) See Section 5 text regarding Phase 1 banking assumptions.

Water Bank Activity and Balances				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Beginning Water Bank Balance	**19,375**	**32,704**	**36,268**	**37,888**
Net Transfers to (from) Water Bank	(1,225)	0	0	0
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,704**	**36,268**	**37,888**

For Years 7 through 20, groundwater not used by the Project is not transferred to a water bank.
For Years 10, 15, and 20, the net surplus represents groundwater not used by the Project and that is not transferred to a water bank.

TABLE 5.1.3
BASE SUPPLY – MULTI DRY YEARS

Base Supply - Multi-Dry Years 1-5

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank[1]	**4,159**	**766**	**487**	**95**	**(325)**

(1) See Section 5 text regarding Phase 1 banking assumptions.

Water Bank Activity and Balances					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

For Years 7 through 20, groundwater not used by the Project is not transferred to a water bank

Table 5.1.3 (Continued)
Base Supply – Multi-Dry Years 6-10

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,021	1,021	1,021	1,021
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**5,313**	**3,784**	**3,826**	**3,855**	**3,908**
Total Demand	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**
Net Amount Available for Transfer to (from) Water Bank[(1)]	**2,360**	**831**	**873**	**902**	**955**

(1) See Section 5 text regarding Phase 1 banking assumptions.

Water Bank Activity and Balances					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Water Bank Balance	**24,001**	**26,125**	**26,125**	**26,125**	**26,125**
Net Transfers to (from) Water Bank	2,360	0	0	0	0
10% Loss for Current Year Additions	(236)	0	0	0	0
Ending Water Bank Balance	**26,125**	**26,125**	**26,125**	**26,125**	**26,125**

For Years 7 through 20, groundwater not used by the Project is not transferred to a water bank.
For Years 8, 9, and 10, the net surplus represents groundwater not used by the Project and that is not transferred to a water bank.

Table 5.1.3 (Continued)
Base Supply - Multi-Dry Years 11-15

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	1,021	1,021	1,021	1,021	1,021
Return Flows	225	225	225	225	225
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**4,843**	**3,970**	**3,971**	**3,973**	**3,975**
Total Demand	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**
Net Amount Available for Transfer to (from) Water Bank[(1)]	**1,890**	**1,017**	**1,018**	**1,020**	**1,022**

(1) See Section 5 text regarding Phase 1 banking assumptions.

Water Bank Activity and Balances					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Beginning Water Bank Balance	**34,972**	**35,296**	**35,296**	**35,296**	**35,296**
Net Transfers to (from) Water Bank	360	0	0	0	0
10% Loss for Current Year Additions	(36)	0	0	0	0
Ending Water Bank Balance	**35,296**	**35,296**	**35,296**	**35,296**	**35,296**

For Years 7 through 20, groundwater not used by the Project is not transferred to a water bank.
For Years 11-15, the net surplus represents groundwater not used by the Project and that is not transferred to a water bank.

Table 5.1.3 (Continued)
Base Supply – Multi-Dry Years 16-20

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	1,021	1,021	1,021	1,021	1,021
Return Flows	225	225	225	225	225
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**4,842**	**3,978**	**3,980**	**3,981**	**3,981**
Total Demand	**2,953**	**2,953**	**2,953**	**2,953**	**2,953**
Net Amount Available for Transfer to (from) Water Bank[(1)]	**1,889**	**1,025**	**1,027**	**1,028**	**1,028**

(1) See Section 5 text regarding Phase 1 banking assumptions.

Water Bank Activity and Balances					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance	**36,592**	**36,915**	**36,915**	**36,915**	**36,915**
Net Transfers to (from) Water Bank	359	0	0	0	0
10% Loss for Current Year Additions	(36)	0	0	0	0
Ending Water Bank Balance	**36,915**	**36,915**	**36,915**	**36,915**	**36,915**

For Years 7 through 20, groundwater not used by the Project is not transferred to a water bank.
For Years 16-20, the net surplus represents groundwater not used by the Project and that is not transferred to a water bank.

6.0 PROJECT BUILDOUT WATER SUPPLY PROJECTIONS

This section discusses buildout supply and demand during normal, dry and multiple dry years over a 20-year projection as required by Water Code Section 10910(c)(3). The final row in each projection identifies the ending water bank balance, or water stored in the water banks and available for future Project use, for each year. The water bank balance for each year is equal to: (a) the previous year's ending balance; plus (b) the net transfers to or from the water banks during the year, less 10% to reflect banking losses.

The projections incorporate the 2009 SWP Delivery Reliability Report and the 2009 CALSIM II data. The base supplies for normal years, shown in Tables 6.1.1, 6.2.1, 6.2.4, 6.3.1, 6.3.4, 6.4.1 and 6.4.4 are assumed to reflect the long-term average availability of SWP water. While the SWP Table A amounts actually delivered will vary each year, they will be managed to ensure that the average availability is achieved in all years. Based on the 2009 SWP Delivery Reliability Report, the sustainable long-term average availability of SWP water to the Project would be about 60% of the full Table A amount. As shown in Figure 5-1, the amount of SWP water available in above average years offsets the amount available in below average years.

Single dry year projections are presented in five year increments. Multiple dry year projections are presented separately for each of the five-year periods with the first year of each five-year period a normal year and the last four years a dry period. These single and multiple dry year projections are assumed to follow years of long-term average water availability. This results in a conservative assessment of the SWP water available to the Project, as it does not consider that the long-term average of 60% includes the single and multiple dry years and that, therefore, the average deliveries in the normal years should be greater than 60%. By properly managing the SWP supplies through storage and withdrawal actions, the 60% long-term average deliveries of SWP water should be available to the Project even in a single dry year and multiple dry years.

Section 6.1 provides buildout supply and demand projections using the Base Supplies.

Section 6.2 provides buildout supply and demand projections using the Base Supplies and additional imported water in amounts sufficient to meet buildout demand over 40 years, or twice the 20-year projection period required by the Water Code. The analysis considers the delivery of the additional imported supplies on an annual basis, and by staggering additional imported water deliveries to occur only during high-rainfall years (SWP delivery reliability of 71% or higher) as indicated in the 2009 CALSIM II data.

Section 6.3 provides buildout supply and demand projections using the Base Supplies and additional imported water in amounts sufficient to meet buildout demand over the entire 82-year period of record in the 2009 CALSIM II data. The analysis considers the delivery of additional imported supplies on an annual basis and by staggering a portion of the additional imported deliveries to occur only during high-rainfall years (SWP delivery reliability of 71% or higher) as indicated in the 2009 CALSIM II data.

Section 6.4 provides buildout supply and demand projections using the Base Supplies and additional imported water in amounts sufficient to meet buildout demand on a sustainable basis over several successive iterations of the 82-year CALSIM II data. The analysis considers the delivery of additional imported supplies on an annual basis and by staggering a portion of the additional imported deliveries to occur only during high-rainfall years (SWP delivery reliability of 71% or higher) as indicated in the 2009 CALSIM II data.

6.1 BASE SUPPLIES

Tables 6.1.1, 6.1.2 and 6.1.3 provide buildout demand and supply projections using the Base Supplies during normal, single dry and multiple dry years. The projections show that the Base Supplies are sufficient to meet buildout demand for the 20-year analysis period and for approximately four years thereafter.

TABLE 6.1.1
BASE SUPPLY – NORMAL YEAR

Annual Sources and Uses of Base Water Supplies																				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,305	1,544	1,783	2,023	2,262	2,501	2,740	2,979	3,218	3,303	3,453	3,603	3,779	3,979
Return Flows	0	0	0	0	0	7	48	88	115	167	225	293	361	427	491	552	610	669	729	788
Groundwater (1,530 AFY after Yr 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Base Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**7,168**	**7,447**	**7,713**	**8,005**	**6,084**	**6,391**	**6,698**	**7,003**	**7,306**	**7,452**	**7,660**	**7,869**	**8,105**	**8,364**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,484**	**3,051**	**2,621**	**2,233**	**(352)**	**(693)**	**(1,043)**	**(1,397)**	**(1,753)**	**(2,115)**	**(2,490)**	**(2,864)**	**(3,237)**	**(3,612)**

Water Bank Activity and Balances																				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance (1)	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**36,024**	**35,331**	**34,288**	**32,891**	**31,138**	**29,023**	**26,533**	**23,669**	**20,432**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	3,484	3,051	2,621	2,233	(352)	(693)	(1,043)	(1,397)	(1,753)	(2,115)	(2,490)	(2,864)	(3,237)	(3,612)
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(348)	(305)	(262)	(223)	0	0	0	0	0	0	0	0	0	0
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**36,024**	**35,331**	**34,288**	**32,891**	**31,138**	**29,023**	**26,533**	**23,669**	**20,432**	**16,820**

(1) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 6.1.2
BASE SUPPLY – SINGLE DRY YEAR

Annual Sources and Uses of Base Water Supplies				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	2,023	3,218	3,979
Return Flows	0	167	491	788
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Total Base Supplies Available	**1,088**	**4,036**	**5,590**	**6,676**
Total Demand	**2,313**	**5,772**	**9,059**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,225)**	**(1,736)**	**(3,469)**	**(5,300)**

Water Bank Activity and Balances				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Beginning Water Bank Balance	**19,375**	**34,366**	**32,891**	**20,432**
Net Transfers to (from) Water Bank	(1,225)	(1,736)	(3,469)	(5,300)
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,630**	**29,422**	**15,132**

TABLE 6.1.3
BASE SUPPLY – MULTI-DRY YEARS

Base Supply – Multi-Dry Years 1-5

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**766**	**487**	**95**	**(325)**

Water Bank Activity and Balances					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

Table 6.1.3 (Continued)
Base Supply – Multi-Dry Years 6-10

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,305	1,544	1,783	2,023
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**5,313**	**4,068**	**4,349**	**4,617**	**4,910**
Total Demand	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**
Net Amount Available for Transfer to (from) Water Bank	**2,360**	**384**	**(47)**	**(475)**	**(862)**

Water Bank Activity and Balances					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Water Bank Balance	**24,001**	**26,125**	**26,471**	**26,424**	**25,949**
Net Transfers to (from) Water Bank	2,360	384	(47)	(475)	(862)
10% Loss for Current Year Additions	(236)	(38)	0	0	0
Ending Water Bank Balance	**26,125**	**26,471**	**26,424**	**25,949**	**25,087**

Table 6.1.3 (Continued)
Base Supply – Multi-Dry Years 11-15

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	2,262	2,501	2,740	2,979	3,218
Return Flows	225	293	361	427	491
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**6,084**	**5,518**	**5,826**	**6,133**	**6,438**
Total Demand	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**
Net Amount Available for Transfer to (from) Water Bank	**(352)**	**(1,566)**	**(1,915)**	**(2,267)**	**(2,621)**

Water Bank Activity and Balances					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Beginning Water Bank Balance	**36,376**	**36,024**	**34,458**	**32,543**	**30,276**
Net Transfers to (from) Water Bank	(352)	(1,566)	(1,915)	(2,267)	(2,621)
10% Loss for Current Year Additions	0	0	0	0	0
Ending Water Bank Balance	**36,024**	**34,458**	**32,543**	**30,276**	**27,655**

Table 6.1.3 (Continued)
Base Supply – Multi-Dry Years 16-20

Annual Sources and Uses of Base Water Supplies					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	3,303	3,453	3,603	3,779	3,979
Return Flows	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Total Base Supplies Available	**7,452**	**6,795**	**7,006**	**7,244**	**7,503**
Total Demand	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(2,115)**	**(3,355)**	**(3,727)**	**(4,098)**	**(4,473)**

Water Bank Activity and Balances					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance	**31,138**	**29,023**	**25,668**	**21,941**	**17,843**
Net Transfers to (from) Water Bank	(2,115)	(3,355)	(3,727)	(4,098)	(4,473)
10% Loss for Current Year Additions	0	0	0	0	0
Ending Water Bank Balance	**29,023**	**25,668**	**21,941**	**17,843**	**13,370**

6.2 BASE SUPPLIES PLUS NEW IMPORTED WATER: 40 YEAR SUPPLY

Tables 6.2.1, 6.2.2 and 6.2.3 provide buildout demand and supply projections using the Base Supplies plus 1,740 AFY of new imported water starting in Year 11. The projections assume that all new imported water will be subject to the reliability rates in the 2009 SWP Delivery Reliability Report. An annual delivery of 1,740 AFY corresponds with a Table A amount of approximately 2,900 AFY using the 2009 SWP Delivery Reliability Report long-term average reliability factor of 60%. As discussed in Section 4.3, the additional imported water could consist of Table A transfers from SWP contractors located outside of the Antelope Valley, other imported supplies from sources outside of the region, or AVEK deliveries assuming that regional programs were implemented by Year 11 that could facilitate Project use. The projections show that the Base Supplies, plus new imported water deliveries of 1,740 AFY starting after Year 10, would meet buildout demand over a 40 year period, or twice as long as the 20-year period required by the Water Code.

Tables 6.2.4, 6.2.5 and 6.2.6 provide buildout supply and demand projections assuming that approximately 7,000 AF of new imported water would be delivered once every 4 years, or at the approximate frequency projected for relatively abundant SWP supply years (SWP Table A amount delivery rates of 71% or higher) in the 2009 CALSIM II data. The purpose of these projections is to demonstrate the potential feasibility of obtaining water for Project use only when regional imported water is relatively abundant. The Project can use the onsite and TRC water banks to obtain water on a relatively infrequent schedule and bank supplies for use during periods when limited or no imported deliveries occur. As discussed in Section 1.4, the onsite and TRC water banks have sufficient capacity to bank a single annual delivery of 7,000 AF during at least a six month and within a potentially shorter period of time. A single delivery during a relatively abundant period once every four years would still be sufficient to meet Project demand even if no deliveries of additional imported water occurred in three out of every four years. The projections show that approximately 7,000 AF of new imported water delivered at the rate of once every 4 years would meet buildout demand over a 40 year period.

TABLE 6.2.1
ANNUAL IMPORTED WATER, 40 YEAR SUPPLY - NORMAL YEAR

Annual Sources and Uses of Water Supplies																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,305	1,544	1,783	2,023	2,262	2,501	2,740	2,979	3,218	3,303	3,453	3,603	3,779	3,979
Return Flows	0	0	0	0	0	7	48	88	115	167	225	293	361	427	491	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Supplies																				
New Imported Water (2,900 AFY Table A after Year 10)	0	0	0	0	0	0	0	0	0	0	1,740	1,740	1,740	1,740	1,740	1,740	1,740	1,740	1,740	1,740
Total Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**7,168**	**7,447**	**7,713**	**8,005**	**7,824**	**8,131**	**8,438**	**8,743**	**9,046**	**9,192**	**9,400**	**9,609**	**9,845**	**10,104**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,484**	**3,051**	**2,621**	**2,233**	**1,388**	**1,047**	**697**	**343**	**(13)**	**(375)**	**(750)**	**(1,124)**	**(1,497)**	**(1,872)**

Water Bank Activity and Balances																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Beginning Water Bank Balance (1)	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**37,625**	**38,567**	**39,194**	**39,503**	**39,490**	**39,115**	**38,365**	**37,241**	**35,744**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	3,484	3,051	2,621	2,233	1,388	1,047	697	343	(13)	(375)	(750)	(1,124)	(1,497)	(1,872)
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(348)	(305)	(262)	(223)	(139)	(105)	(70)	(34)	0	0	0	0	0	0
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**37,625**	**38,567**	**39,194**	**39,503**	**39,490**	**39,115**	**38,365**	**37,241**	**35,744**	**33,872**

(1) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 6.2.2
ANNUAL IMPORTED WATER, 40 YEAR SUPPLY – SINGLE DRY YEAR

Annual Sources and Uses of Water Supplies				
	Year 5	Year 10	Year 15	Year 20
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	2,023	3,218	3,979
Return Flows	0	167	491	788
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Additional Supplies				
New Imported Water (2,900 AFY Table A after Year 10)	0	0	296	319
Total Supplies Available	**1,088**	**4,036**	**5,886**	**6,995**
Total Demand	**2,313**	**5,772**	**9,059**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,225)**	**(1,736)**	**(3,173)**	**(4,981)**

Water Bank Activity and Balances				
	Year 5	Year 10	Year 15	Year 20
Beginning Water Bank Balance	**19,375**	**34,366**	**39,503**	**35,744**
Net Transfers to (from) Water Bank	(1,225)	(1,736)	(3,173)	(4,981)
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,630**	**36,330**	**30,763**

TABLE 6.2.3
ANNUAL IMPORTED WATER, 40 YEAR SUPPLY –
MULTI-DRY YEARS

Annual Imported Water, 40 Year Supply – Multi-Dry Years 1-5

		Dry Years			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,900 AFY Table A after Year 10)	0	0	0	0	0
Total Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**766**	**487**	**95**	**(325)**

Water Bank Activity and Balances					
		Dry Years			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

Table 6.2.3 (Continued)
Annual Imported Water, 40 Year Supply – Multi-Dry Years 6-10

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,305	1,544	1,783	2,023
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,900 AFY Table A after Year 10)	0	0	0	0	0
Total Supplies Available	**5,313**	**4,068**	**4,349**	**4,617**	**4,910**
Total Demand	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**
Net Amount Available for Transfer to (from) Water Bank	**2,360**	**384**	**(47)**	**(475)**	**(862)**

Water Bank Activity and Balances					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Water Bank Balance	**24,001**	**26,125**	**26,471**	**26,424**	**25,949**
Net Transfers to (from) Water Bank	2,360	384	(47)	(475)	(862)
10% Loss for Current Year Additions	(236)	(38)	0	0	0
Ending Water Bank Balance	**26,125**	**26,471**	**26,424**	**25,949**	**25,087**

Table 6.2.3 (Continued)
Annual Imported Water, 40 Year Supply – Multi-Dry Years 11-15

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	2,262	2,501	2,740	2,979	3,218
Return Flows	225	293	361	427	491
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,900 AFY Table A after Year 10)	1,740	1,005	1,006	1,008	1,009
Total Supplies Available	**7,824**	**6,523**	**6,832**	**7,141**	**7,447**
Total Demand	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**
Net Amount Available for Transfer to (from) Water Bank	**1,388**	**(561)**	**(909)**	**(1,259)**	**(1,612)**

Water Bank Activity and Balances					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Beginning Water Bank Balance	**36,376**	**37,625**	**37,064**	**36,155**	**34,896**
Net Transfers to (from) Water Bank	1,388	(561)	(909)	(1,259)	(1,612)
10% Loss for Current Year Additions	(139)	0	0	0	0
Ending Water Bank Balance	**37,625**	**37,064**	**36,155**	**34,896**	**33,284**

Table 6.2.3 (Continued)
Annual Imported Water, 40 Year Supply – Multi-Dry Years 16-20

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	3,303	3,453	3,603	3,779	3,979
Return Flows	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,900 AFY Table A after Year 10)	1,740	1,012	1,014	1,015	1,015
Total Supplies Available	**9,192**	**7,807**	**8,020**	**8,259**	**8,518**
Total Demand	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(375)**	**(2,343)**	**(2,713)**	**(3,083)**	**(3,458)**

Water Bank Activity and Balances					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance	**39,490**	**39,115**	**36,772**	**34,059**	**30,976**
Net Transfers to (from) Water Bank	(375)	(2,343)	(2,713)	(3,083)	(3,458)
10% Loss for Current Year Additions	0	0	0	0	0
Ending Water Bank Balance	**39,115**	**36,772**	**34,059**	**30,976**	**27,518**

TABLE 6.2.4
STAGGERED DELIVERY, 40 YEAR SUPPLY – NORMAL YEAR

Annual Sources and Uses of Water Supplies	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,305	1,544	1,783	2,023	2,262	2,501	2,740	2,979	3,218	3,303	3,453	3,603	3,779	3,979
Return Flows	0	0	0	0	0	7	48	88	115	167	225	293	361	427	491	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Supplies																				
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0	0	0	0	0	0	7,000	0	0	0	7,000	0	0	0	7,000	0
Total Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**7,168**	**7,447**	**7,713**	**8,005**	**13,084**	**6,391**	**6,698**	**7,003**	**14,306**	**7,452**	**7,660**	**7,869**	**15,105**	**8,364**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,484**	**3,051**	**2,621**	**2,233**	**6,648**	**(693)**	**(1,043)**	**(1,397)**	**5,247**	**(2,115)**	**(2,490)**	**(2,864)**	**3,763**	**(3,612)**

Water Bank Activity and Balances	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance (1)	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**42,359**	**41,666**	**40,623**	**39,226**	**43,948**	**41,833**	**39,343**	**36,479**	**39,866**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	3,484	3,051	2,621	2,233	6,648	(693)	(1,043)	(1,397)	5,247	(2,115)	(2,490)	(2,864)	3,763	(3,612)
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(348)	(305)	(262)	(223)	(665)	0	0	0	(525)	0	0	0	(376)	0
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**42,359**	**41,666**	**40,623**	**39,226**	**43,948**	**41,833**	**39,343**	**36,479**	**39,866**	**36,254**

(1) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 6.2.5
STAGGERED DELIVERY, 40 YEAR SUPPLY – SINGLE DRY YEAR

Annual Sources and Uses of Water Supplies				
	Year 5	Year 10	Year 15	Year 20
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	2,023	3,218	3,979
Return Flows	0	167	491	788
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Additional Supplies				
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0
Total Supplies Available	**1,088**	**4,036**	**5,590**	**6,676**
Total Demand	**2,313**	**5,772**	**9,059**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,225)**	**(1,736)**	**(3,469)**	**(5,300)**

Water Bank Activity and Balances				
	Year 5	Year 10	Year 15	Year 20
Beginning Water Bank Balance	**19,375**	**34,366**	**39,226**	**39,866**
Net Transfers to (from) Water Bank	(1,225)	(1,736)	(3,469)	(5,300)
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,630**	**35,757**	**34,566**

TABLE 6.2.6
STAGGERED DELIVERY, 40 YEAR SUPPLY – MULTI-DRY YEARS

Staggered Delivery, 40 Year Supply – Multi-Dry Years 1-5

		Dry Years			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**766**	**487**	**95**	**(325)**

Water Bank Activity and Balances					
		Dry Years			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

Table 6.2.6 (continued)
Staggered Delivery, 40 Year Supply – Multi-Dry Years 6-10

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,305	1,544	1,783	2,023
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**5,313**	**4,068**	**4,349**	**4,617**	**4,910**
Total Demand	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**
Net Amount Available for Transfer to (from) Water Bank	**2,360**	**384**	**(47)**	**(475)**	**(862)**

Water Bank Activity and Balances					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Water Bank Balance	**24,001**	**26,125**	**26,471**	**26,424**	**25,949**
Net Transfers to (from) Water Bank	2,360	384	(47)	(475)	(862)
10% Loss for Current Year Additions	(236)	(38)	0	0	0
Ending Water Bank Balance	**26,125**	**26,471**	**26,424**	**25,949**	**25,087**

Table 6.2.6 (continued)
Staggered Delivery, 40 Year Supply – Multi-Dry Years 11-15

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	2,262	2,501	2,740	2,979	3,218
Return Flows	225	293	361	427	491
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
AVEK (7,000 AFY Wet Year Delivery)	7,000	0	0	0	0
Total Supplies Available	**13,084**	**5,518**	**5,826**	**6,133**	**6,438**
Total Demand	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**
Net Amount Available for Transfer to (from) Water Bank	**6,648**	**(1,566)**	**(1,915)**	**(2,267)**	**(2,621)**

Water Bank Activity and Balances					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Beginning Water Bank Balance	**36,376**	**42,359**	**40,793**	**38,878**	**36,611**
Net Transfers to (from) Water Bank	6,648	(1,566)	(1,915)	(2,267)	(2,621)
10% Loss for Current Year Additions	(665)	0	0	0	0
Ending Water Bank Balance	**42,359**	**40,793**	**38,878**	**36,611**	**33,990**

Table 6.2.6 (continued)
Staggered Delivery, 40 Year Supply – Multi-Dry Years 16-20

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	3,303	3,453	3,603	3,779	3,979
Return Flows	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**7,452**	**6,795**	**7,006**	**7,244**	**7,503**
Total Demand	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(2,115)**	**(3,355)**	**(3,727)**	**(4,098)**	**(4,473)**

Water Bank Activity and Balances					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance	**43,948**	**41,833**	**38,478**	**34,751**	**30,653**
Net Transfers to (from) Water Bank	(2,115)	(3,355)	(3,727)	(4,098)	(4,473)
10% Loss for Current Year Additions	0	0	0	0	0
Ending Water Bank Balance	**41,833**	**38,478**	**34,751**	**30,653**	**26,180**

6.3 BASE SUPPLIES PLUS NEW IMPORTED WATER: 82 YEAR SUPPLY (CALSIM II PERIOD OF RECORD)

Tables 6.3.1, 6.3.2 and 6.3.3 provide buildout demand and supply projections using the Base Supplies plus 2,700 AFY of new imported water starting in Year 11. The projections assume that all new imported water will be subject to the reliability rates in the 2009 SWP Delivery Reliability Report. An annual delivery of 2,700 AFY corresponds with a Table A amount of approximately 4,500 AFY using the 2009 SWP Delivery Reliability Report long-term average reliability factor of 60%. As discussed in Section 4.3, the new imported water could consist of additional Table A transfers from SWP contractors located outside of the Antelope Valley, other imported supplies from sources outside of the region, or AVEK deliveries assuming that regional programs were implemented by Year 11 that would facilitate Project use. The projections show that the Base Supplies, plus new imported water deliveries of 2,700 AFY starting in Year 11, would meet buildout demand over the entire 82 year period of record in the 2009 CALSIM II data.

Tables 6.3.4, 6.3.5 and 6.3.6 also provide buildout supply and demand projections assuming (i) deliveries of approximately 900 AFY of imported water (a Table A amount of 1,500 AF using the 2009 SWP Delivery Reliability Report long-term average reliability factor of 60%) and (ii) 7,000 AF of new imported water would be delivered once every 4 years, or at the approximate frequency projected for relatively abundant SWP supply years (SWP Table A amount delivery reliability of 71% or higher) in the 2009 CALSIM II data. The purpose of these projections is to demonstrate the potential feasibility of obtaining a substantial portion of water for Project use only when regional imported water is relatively abundant. The Project can use the onsite and TRC water banks to obtain water on a relatively infrequent schedule and bank supplies for use during periods when limited or no imported deliveries occur. As discussed in Section 1.4, the onsite and TRC water banks have sufficient capacity to bank a single annual delivery of 7,000 AF during at least a six month and within a potentially shorter period of time. A single delivery of a substantial portion of new imported water during a relatively abundant period once every four years would still be sufficient to meet Project demand even if much lower levels of additional imported water were delivered in three out of every four years. The projections show that approximately 7,000 AF of new imported water delivered at the rate of once every 4 years and new imported water in the amount of 900 AFY starting in Year 11 would meet buildout demand over the entire 82 year period of record in the 2009 CALSIM II data.

TABLE 6.3.1
ANNUAL IMPORTED WATER, 82 YEAR SUPPLY - NORMAL YEAR

Annual Sources and Uses of Water Supplies	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,305	1,544	1,783	2,023	2,262	2,501	2,740	2,979	3,218	3,303	3,453	3,603	3,779	3,979
Return Flows	0	0	0	0	0	7	48	88	115	167	225	293	361	427	491	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Supplies																				
New Imported Water (4,500 AFY Table A after Year 10)	0	0	0	0	0	0	0	0	0	0	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700
Total Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**7,168**	**7,447**	**7,713**	**8,005**	**8,784**	**9,091**	**9,398**	**9,703**	**10,006**	**10,152**	**10,360**	**10,569**	**10,805**	**11,064**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,484**	**3,051**	**2,621**	**2,233**	**2,348**	**2,007**	**1,657**	**1,303**	**947**	**585**	**210**	**(164)**	**(537)**	**(912)**

Water Bank Activity and Balances	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance (1)	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**38,489**	**40,295**	**41,786**	**42,959**	**43,811**	**44,337**	**44,526**	**44,362**	**43,825**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	3,484	3,051	2,621	2,233	2,348	2,007	1,657	1,303	947	585	210	(164)	(537)	(912)
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(348)	(305)	(262)	(223)	(235)	(201)	(166)	(130)	(95)	(59)	(21)	0	0	0
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**38,489**	**40,295**	**41,786**	**42,959**	**43,811**	**44,337**	**44,526**	**44,362**	**43,825**	**42,913**

(1) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 6.3.2
ANNUAL IMPORTED WATER, 82 YEAR SUPPLY – SINGLE DRY YEAR

Annual Sources and Uses of Water Supplies				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	2,023	3,218	3,979
Return Flows	0	167	491	788
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Additional Supplies				
New Imported Water (4,500 AFY Table A after Year 10)	0	0	459	495
Total Supplies Available	**1,088**	**4,036**	**6,049**	**7,171**
Total Demand	**2,313**	**5,772**	**9,059**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,225)**	**(1,736)**	**(3,010)**	**(4,805)**

Water Bank Activity and Balances				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Beginning Water Bank Balance	**19,375**	**34,366**	**42,959**	**43,825**
Net Transfers to (from) Water Bank	(1,225)	(1,736)	(3,010)	(4,805)
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,630**	**39,949**	**39,020**

TABLE 6.3.3
ANNUAL IMPORTED WATER, 82 YEAR SUPPLY – MULTI-DRY YEARS

Annual Imported Water, 82 Year Supply – Multi-Dry Years 1-5

		Dry Years			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (4,500 AFY Table A after Year 10)	0	0	0	0	0
Total Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**766**	**487**	**95**	**(325)**

Water Bank Activity and Balances					
		Dry Years			
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

Table 6.3.3 (Continued)
Annual Imported Water, 82 Year Supply – Multi-Dry Years 6-10

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,305	1,544	1,783	2,023
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (4,500 AFY Table A after Year 10)	0	0	0	0	0
Total Supplies Available	**5,313**	**4,068**	**4,349**	**4,617**	**4,910**
Total Demand	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**
Net Amount Available for Transfer to (from) Water Bank	**2,360**	**384**	**(47)**	**(475)**	**(862)**

Water Bank Activity and Balances					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Water Bank Balance	**24,001**	**26,125**	**26,471**	**26,424**	**25,949**
Net Transfers to (from) Water Bank	2,360	384	(47)	(475)	(862)
10% Loss for Current Year Additions	(236)	(38)	0	0	0
Ending Water Bank Balance	**26,125**	**26,471**	**26,424**	**25,949**	**25,087**

Table 6.3.3 (Continued)
Annual Imported Water, 82 Year Supply – Multi-Dry Years 11-15

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	2,262	2,501	2,740	2,979	3,218
Return Flows	225	293	361	427	491
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (4,500 AFY Table A after Year 10)	2,700	1,559	1,562	1,564	1,566
Total Supplies Available	**8,784**	**7,077**	**7,388**	**7,697**	**8,004**
Total Demand	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**
Net Amount Available for Transfer to (from) Water Bank	**2,348**	**(7)**	**(353)**	**(703)**	**(1,055)**

Water Bank Activity and Balances					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Beginning Water Bank Balance	**36,376**	**38,489**	**38,482**	**38,129**	**37,426**
Net Transfers to (from) Water Bank	2,348	(7)	(353)	(703)	(1,055)
10% Loss for Current Year Additions	(235)	0	0	0	0
Ending Water Bank Balance	**38,489**	**38,482**	**38,129**	**37,426**	**36,371**

Table 6.3.3 (Continued)
Annual Imported Water, 82 Year Supply – Multi-Dry Years 16-20

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	3,303	3,453	3,603	3,779	3,979
Return Flows	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (4,500 AFY Table A after Year 10)	2,700	1,571	1,573	1,575	1,575
Total Supplies Available	**10,152**	**8,366**	**8,579**	**8,819**	**9,078**
Total Demand	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**585**	**(1,784)**	**(2,154)**	**(2,523)**	**(2,898)**

Water Bank Activity and Balances					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance	**43,811**	**44,337**	**42,553**	**40,399**	**37,876**
Net Transfers to (from) Water Bank	585	(1,784)	(2,154)	(2,523)	(2,898)
10% Loss for Current Year Additions	(59)	0	0	0	0
Ending Water Bank Balance	**44,337**	**42,553**	**40,399**	**37,876**	**34,978**

TABLE 6.3.4
STAGGERED DELIVERY, 82 YEAR SUPPLY – NORMAL YEAR

Annual Sources and Uses of Water Supplies																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,305	1,544	1,783	2,023	2,262	2,501	2,740	2,979	3,218	3,303	3,453	3,603	3,779	3,979
Return Flows	0	0	0	0	0	7	48	88	115	167	225	293	361	427	491	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Supplies																				
New Imported Water (1,500 AFY Table A after Year 10)	0	0	0	0	0	0	0	0	0	0	900	900	900	900	900	900	900	900	900	900
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0	0	0	0	0	0	7,000	0	0	0	7,000	0	0	0	7,000	0
Total Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**7,168**	**7,447**	**7,713**	**8,005**	**13,984**	**7,291**	**7,598**	**7,903**	**15,206**	**8,352**	**8,560**	**8,769**	**16,005**	**9,264**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,484**	**3,051**	**2,621**	**2,233**	**7,548**	**207**	**(143)**	**(497)**	**6,147**	**(1,215)**	**(1,590)**	**(1,964)**	**4,663**	**(2,712)**

Water Bank Activity and Balances																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Beginning Water Bank Balance (1)	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**43,169**	**43,355**	**43,212**	**42,715**	**48,247**	**47,032**	**45,442**	**43,478**	**47,675**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	3,484	3,051	2,621	2,233	7,548	207	(143)	(497)	6,147	(1,215)	(1,590)	(1,964)	4,663	(2,712)
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(348)	(305)	(262)	(223)	(755)	(21)	0	0	(615)	0	0	0	(466)	0
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**43,169**	**43,355**	**43,212**	**42,715**	**48,247**	**47,032**	**45,442**	**43,478**	**47,675**	**44,963**

(1) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 6.3.5
STAGGERED DELIVERY, 82 YEAR SUPPLY – SINGLE DRY YEAR

Annual Sources and Uses of Water Supplies				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	2,023	3,218	3,979
Return Flows	0	167	491	788
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Additional Supplies				
New Imported Water (1,500 AFY Table A after Year 10)	0	0	153	165
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0
Total Supplies Available	**1,088**	**4,036**	**5,743**	**6,841**
Total Demand	**2,313**	**5,772**	**9,059**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,225)**	**(1,736)**	**(3,316)**	**(5,135)**

Water Bank Activity and Balances				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Beginning Water Bank Balance	**19,375**	**34,366**	**42,715**	**47,675**
Net Transfers to (from) Water Bank	(1,225)	(1,736)	(3,316)	(5,135)
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,630**	**39,399**	**42,540**

**TABLE 6.3.6
STAGGERED DELIVERY, 82 YEAR SUPPLY – MULTI-DRY YEARS**

Staggered Delivery, 82 Year Supply – Multi-Dry Years 1-5

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (1,500 AFY Table A after Year 10)	0	0	0	0	0
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**766**	**487**	**95**	**(325)**

Water Bank Activity and Balances					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

Table 6.3.6 (Continued)
Staggered Delivery, 82 Year Supply – Multi-Dry Years 6-10

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,305	1,544	1,783	2,023
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (1,500 AFY Table A after Year 10)	0	0	0	0	0
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**5,313**	**4,068**	**4,349**	**4,617**	**4,910**
Total Demand	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**
Net Amount Available for Transfer to (from) Water Bank	**2,360**	**384**	**(47)**	**(475)**	**(862)**

Water Bank Activity and Balances					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Water Bank Balance	**24,001**	**26,125**	**26,471**	**26,424**	**25,949**
Net Transfers to (from) Water Bank	2,360	384	(47)	(475)	(862)
10% Loss for Current Year Additions	(236)	(38)	0	0	0
Ending Water Bank Balance	**26,125**	**26,471**	**26,424**	**25,949**	**25,087**

Table 6.3.6 (Continued)
Staggered Delivery, 82 Year Supply – Multi-Dry Years 11-15

Annual Sources and Uses of Water Supplies		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	2,262	2,501	2,740	2,979	3,218
Return Flows	225	293	361	427	491
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (1,500 AFY Table A after Year 10)	900	520	521	521	522
AVEK (7,000 AFY Wet Year Delivery)	7,000	0	0	0	0
Total Supplies Available	**13,984**	**6,038**	**6,347**	**6,654**	**6,960**
Total Demand	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**
Net Amount Available for Transfer to (from) Water Bank	**7,548**	**(1,046)**	**(1,394)**	**(1,746)**	**(2,099)**

Water Bank Activity and Balances		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Beginning Water Bank Balance	**36,376**	**43,169**	**42,123**	**40,729**	**38,983**
Net Transfers to (from) Water Bank	7,548	(1,046)	(1,394)	(1,746)	(2,099)
10% Loss for Current Year Additions	(755)	0	0	0	0
Ending Water Bank Balance	**43,169**	**42,123**	**40,729**	**38,983**	**36,884**

Table 6.3.6 (Continued)
Staggered Delivery, 82 Year Supply – Multi-Dry Years 16-20

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	3,303	3,453	3,603	3,779	3,979
Return Flows	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (1,500 AFY Table A after Year 10)	900	524	524	525	525
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**8,352**	**7,319**	**7,530**	**7,769**	**8,028**
Total Demand	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,215)**	**(2,831)**	**(3,203)**	**(3,573)**	**(3,948)**

Water Bank Activity and Balances					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance	**48,247**	**47,032**	**44,201**	**40,998**	**37,425**
Net Transfers to (from) Water Bank	(1,215)	(2,831)	(3,203)	(3,573)	(3,948)
10% Loss for Current Year Additions	0	0	0	0	0
Ending Water Bank Balance	**47,032**	**44,201**	**40,998**	**37,425**	**33,477**

6.4 BASE SUPPLIES PLUS NEW IMPORTED WATER: SUSTAINABLE SUPPLY

Tables 6.4.1, 6.4.2 and 6.4.3 provide buildout demand and supply projections using the Base Supplies plus 3,372 AFY of new imported water starting in Year 11. The projections assume that all new imported water will be subject to the reliability rates discussed in the 2009 SWP Delivery Reliability Report. An annual delivery of 3,372 AFY corresponds with a Table A amount of approximately 5,620 AFY using the long-term average 2009 SWP Delivery Reliability Report factor of 60%. As discussed in Section 4.3 the new imported water could consist of additional Table A transfers from SWP contractors located outside of the Antelope Valley, other imported supplies from sources outside of the region, or AVEK deliveries assuming that regional programs were implemented by Year 11 that would facilitate Project use. The projections show that the Base Supplies, plus new imported water deliveries of 3,372 AFY starting after Year 11, would meet buildout demand on a sustainable basis over multiple, successive iterations of the 82-year 2009 CALSIM II period of record.

Tables 6.4.4, 6.4.5 and 6.4.6 also provide buildout supply and demand projections assuming (i) deliveries of approximately 1,620 AFY of imported water (a Table A amount of 2,700 AF using the 2009 SWP Delivery Reliability Report long-term average reliability factor of 60%) and (ii) 7,000 AF of new imported water would be delivered once every 4 years, or at the approximate frequency projected for relatively abundant SWP supply years (SWP Table A amount delivery reliability of 71% or higher) in the 2009 CALSIM II data. The purpose of these projections is to demonstrate the potential feasibility of obtaining a substantial portion of water for Project use only when regional imported water is relatively abundant. The Project can use the onsite and TRC water banks to obtain water on a relatively infrequent schedule and bank supplies for use during periods when limited or no imported deliveries occur. As discussed in Section 1.4, the onsite and TRC water banks have sufficient capacity to bank a single annual delivery of 7,000 AF during at least a six month and within a potentially shorter period of time. A single delivery of a substantial portion of new imported water during a relatively abundant period once every four years would still be sufficient to meet Project demand even if much lower levels of additional imported water were delivered in three out of every four years. The projections show that approximately 7,000 AF of new imported water delivered at the rate of once every 4 years and new imported water in the amount of 1,620 AFY starting in Year 11 would meet buildout demand on a sustainable basis over multiple, successive iterations of the 82-year 2009 CALSIM II period of record.

TABLE 6.4.1
ANNUAL IMPORTED WATER, SUSTAINABLE - NORMAL YEAR

Annual Sources and Uses of Water Supplies																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,305	1,544	1,783	2,023	2,262	2,501	2,740	2,979	3,218	3,303	3,453	3,603	3,779	3,979
Return Flows	0	0	0	0	0	7	48	88	115	167	225	293	361	427	491	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Supplies																				
New Imported Water (5,620 AFY Table A after Year 10)	0	0	0	0	0	0	0	0	0	0	3,372	3,372	3,372	3,372	3,372	3,372	3,372	3,372	3,372	3,372
Total Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**7,168**	**7,447**	**7,713**	**8,005**	**9,456**	**9,763**	**10,070**	**10,375**	**10,678**	**10,824**	**11,032**	**11,241**	**11,477**	**11,736**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,484**	**3,051**	**2,621**	**2,233**	**3,020**	**2,679**	**2,329**	**1,975**	**1,619**	**1,257**	**882**	**508**	**135**	**(240)**

Water Bank Activity and Balances																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Beginning Water Bank Balance (1)	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**39,094**	**41,505**	**43,601**	**45,378**	**46,835**	**47,966**	**48,760**	**49,217**	**49,338**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	3,484	3,051	2,621	2,233	3,020	2,679	2,329	1,975	1,619	1,257	882	508	135	(240)
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(348)	(305)	(262)	(223)	(302)	(268)	(233)	(198)	(162)	(126)	(88)	(51)	(14)	0
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**39,094**	**41,505**	**43,601**	**45,378**	**46,835**	**47,966**	**48,760**	**49,217**	**49,338**	**49,098**

(1) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 6.4.2
ANNUAL IMPORTED WATER, SUSTAINABLE – SINGLE DRY YEAR

Annual Sources and Uses of Water Supplies				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	2,023	3,218	3,979
Return Flows	0	167	491	788
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Additional Supplies				
New Imported Water (5,620 AFY Table A after Year 10)	0	0	573	618
Total Supplies Available	**1,088**	**4,036**	**6,163**	**7,294**
Total Demand	**2,313**	**5,772**	**9,059**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,225)**	**(1,736)**	**(2,896)**	**(4,682)**

Water Bank Activity and Balances				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Beginning Water Bank Balance	**19,375**	**34,366**	**45,378**	**49,338**
Net Transfers to (from) Water Bank	(1,225)	(1,736)	(2,896)	(4,682)
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,630**	**42,482**	**44,656**

TABLE 6.4.3
ANNUAL IMPORTED WATER, SUSTAINABLE – MULTI-DRY YEARS

Annual Imported Water, Sustainable – Multi-Dry Years 1-5

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (5,620 AFY Table A after Year 10)	0	0	0	0	0
Total Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**766**	**487**	**95**	**(325)**

Water Bank Activity and Balances					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

Table 6.4.3 (Continued)
Annual Imported Water, 82 Sustainable – Multi-Dry Years 6-10

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,305	1,544	1,783	2,023
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (5,620 AFY Table A after Year 10)	0	0	0	0	0
Total Supplies Available	**5,313**	**4,068**	**4,349**	**4,617**	**4,910**
Total Demand	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**
Net Amount Available for Transfer to (from) Water Bank	**2,360**	**384**	**(47)**	**(475)**	**(862)**

Water Bank Activity and Balances					
		Dry Years			
	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Water Bank Balance	**24,001**	**26,125**	**26,471**	**26,424**	**25,949**
Net Transfers to (from) Water Bank	2,360	384	(47)	(475)	(862)
10% Loss for Current Year Additions	(236)	(38)	0	0	0
Ending Water Bank Balance	**26,125**	**26,471**	**26,424**	**25,949**	**25,087**

Table 6.4.3 (Continued)
Annual Imported Water, Sustainable – Multi-Dry Years 11-15

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	2,262	2,501	2,740	2,979	3,218
Return Flows	225	293	361	427	491
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (5,620 AFY Table A after Year 10)	3,372	1,947	1,950	1,953	1,956
Total Supplies Available	**9,456**	**7,465**	**7,776**	**8,086**	**8,394**
Total Demand	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**
Net Amount Available for Transfer to (from) Water Bank	**3,020**	**381**	**35**	**(314)**	**(665)**

Water Bank Activity and Balances					
		Dry Years			
	Year 11	Year 12	Year 13	Year 14	Year 15
Beginning Water Bank Balance	**36,376**	**39,094**	**39,437**	**39,468**	**39,154**
Net Transfers to (from) Water Bank	3,020	381	35	(314)	(665)
10% Loss for Current Year Additions	(302)	(38)	(4)	0	0
Ending Water Bank Balance	**39,094**	**39,437**	**39,468**	**39,154**	**38,489**

Table 6.4.3 (Continued)
Annual Imported Water, Sustainable – Multi-Dry Years 16-20

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	3,303	3,453	3,603	3,779	3,979
Return Flows	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (5,620 AFY Table A after Year 10)	3,372	1,961	1,964	1,967	1,967
Total Supplies Available	**10,824**	**8,756**	**8,970**	**9,211**	**9,470**
Total Demand	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**1,257**	**(1,394)**	**(1,763)**	**(2,131)**	**(2,506)**

Water Bank Activity and Balances					
		Dry Years			
	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Water Bank Balance	**46,835**	**47,966**	**46,572**	**44,809**	**42,678**
Net Transfers to (from) Water Bank	1,257	(1,394)	(1,763)	(2,131)	(2,506)
10% Loss for Current Year Additions	(126)	0	0	0	0
Ending Water Bank Balance	**47,966**	**46,572**	**44,809**	**42,678**	**40,172**

TABLE 6.4.4
STAGGERED DELIVERY, SUSTAINABLE – NORMAL YEAR

Annual Sources and Uses of Water Supplies																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Base Supplies Available																				
Tulare Lake (1,451 AFY Table A)	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871	871
Dudley Ridge (1,993 AFY Table A)	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196	1,196
Recycled Water	42	187	335	558	806	1,021	1,305	1,544	1,783	2,023	2,262	2,501	2,740	2,979	3,218	3,303	3,453	3,603	3,779	3,979
Return Flows	0	0	0	0	0	7	48	88	115	167	225	293	361	427	491	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0	0	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	2,218	0	0	0	0	0	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	2,362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Supplies																				
New Imported Water (2,700 AFY Table A after Year 10)	0	0	0	0	0	0	0	0	0	0	1,620	1,620	1,620	1,620	1,620	1,620	1,620	1,620	1,620	1,620
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0	0	0	0	0	0	7,000	0	0	0	7,000	0	0	0	7,000	0
Total Supplies Available	**4,327**	**4,472**	**4,620**	**4,843**	**7,453**	**5,313**	**7,168**	**7,447**	**7,713**	**8,005**	**14,704**	**8,011**	**8,318**	**8,623**	**15,926**	**9,072**	**9,280**	**9,489**	**16,725**	**9,984**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**3,874**	**3,594**	**3,200**	**5,140**	**2,360**	**3,484**	**3,051**	**2,621**	**2,233**	**8,268**	**927**	**577**	**223**	**6,867**	**(495)**	**(870)**	**(1,244)**	**5,383**	**(1,992)**

Water Bank Activity and Balances																				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year 16**	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Beginning Water Bank Balance (1)	**6,030**	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**43,817**	**44,651**	**45,170**	**45,371**	**51,551**	**51,056**	**50,186**	**48,942**	**53,787**
Net Transfers to (from) Water Bank	4,159	3,874	3,594	3,200	5,140	2,360	3,484	3,051	2,621	2,233	8,268	927	577	223	6,867	(495)	(870)	(1,244)	5,383	(1,992)
10% Loss for Current Year Additions	(416)	(387)	(359)	(320)	(514)	(236)	(348)	(305)	(262)	(223)	(827)	(93)	(58)	(22)	(687)	0	0	0	(538)	0
Ending Water Bank Balance	**9,773**	**13,260**	**16,495**	**19,375**	**24,001**	**26,125**	**29,261**	**32,007**	**34,366**	**36,376**	**43,817**	**44,651**	**45,170**	**45,371**	**51,551**	**51,056**	**50,186**	**48,942**	**53,787**	**51,795**

(1) Beginning Water Bank Balance for Year 1 is the amount deposited (6,700 AF) less the 10% loss factor.

TABLE 6.4.5
STAGGERED DELIVERY, SUSTAINABLE – SINGLE DRY YEAR

Annual Sources and Uses of Water Supplies				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Base Supplies Available				
Tulare Lake (1,451 AFY Table A)	119	133	148	160
Dudley Ridge (1,993 AFY Table A)	163	183	203	219
Recycled Water	806	2,023	3,218	3,979
Return Flows	0	167	491	788
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0
AVEK Return of Call Water	0	0	0	0
Additional Supplies				
New Imported Water (2,700 AFY Table A after Year 10)	0	0	275	297
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0
Total Supplies Available	**1,088**	**4,036**	**5,865**	**6,973**
Total Demand	**2,313**	**5,772**	**9,059**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(1,225)**	**(1,736)**	**(3,194)**	**(5,003)**

Water Bank Activity and Balances				
	Year 5	**Year 10**	**Year 15**	**Year 20**
Beginning Water Bank Balance	**19,375**	**34,366**	**45,371**	**53,787**
Net Transfers to (from) Water Bank	(1,225)	(1,736)	(3,194)	(5,003)
10% Loss for Current Year Additions	0	0	0	0
Ending Water Bank Balance	**18,150**	**32,630**	**42,177**	**48,784**

TABLE 6.4.6
STAGGERED DELIVERY, SUSTAINABLE – MULTI DRY YEARS

Staggered Delivery, Sustainable – Multi-Dry Years 1-5

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	496	496	497	498
Dudley Ridge (1,993 AFY Table A)	1,196	681	682	683	684
Recycled Water	42	187	335	558	806
Return Flows	0	0	0	0	0
Groundwater (1,530 AFY after Year 6)	0	0	0	0	0
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,700 AFY Table A after Year 10)	0	0	0	0	0
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**4,327**	**1,364**	**1,513**	**1,738**	**1,988**
Total Demand	**168**	**598**	**1,026**	**1,643**	**2,313**
Net Amount Available for Transfer to (from) Water Bank	**4,159**	**766**	**487**	**95**	**(325)**

Water Bank Activity and Balances					
		Dry Years			
	Year 1	Year 2	Year 3	Year 4	Year 5
Beginning Water Bank Balance	**6,030**	**9,773**	**10,462**	**10,900**	**10,985**
Net Transfers to (from) Water Bank	4,159	766	487	95	(325)
10% Loss for Current Year Additions	(416)	(77)	(49)	(10)	0
Ending Water Bank Balance	**9,773**	**10,462**	**10,900**	**10,985**	**10,660**

Table 6.4.6 (Continued)
Staggered Delivery, Sustainable – Multi-Dry Years 6-10

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 6	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	499	500	501	501
Dudley Ridge (1,993 AFY Table A)	1,196	686	687	688	689
Recycled Water	1,021	1,305	1,544	1,783	2,023
Return Flows	7	48	88	115	167
Groundwater (1,530 AFY after Year 6)	0	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	2,218	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,700 AFY Table A after Year 10)	0	0	0	0	0
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**5,313**	**4,068**	**4,349**	**4,617**	**4,910**
Total Demand	**2,953**	**3,684**	**4,396**	**5,092**	**5,772**
Net Amount Available for Transfer to (from) Water Bank	**2,360**	**384**	**(47)**	**(475)**	**(862)**

Water Bank Activity and Balances					
		Dry Years			
	Year 6	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Beginning Water Bank Balance	**24,001**	**26,125**	**26,471**	**26,424**	**25,949**
Net Transfers to (from) Water Bank	2,360	384	(47)	(475)	(862)
10% Loss for Current Year Additions	(236)	(38)	0	0	0
Ending Water Bank Balance	**26,125**	**26,471**	**26,424**	**25,949**	**25,087**

Table 6.4.6 (Continued)
Staggered Delivery, Sustainable – Multi-Dry Years 11-15

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 11	**Year 12**	**Year 13**	**Year 14**	**Year 15**
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	503	503	504	505
Dudley Ridge (1,993 AFY Table A)	1,196	691	692	693	694
Recycled Water	2,262	2,501	2,740	2,979	3,218
Return Flows	225	293	361	427	491
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,700 AFY Table A after Year 10)	1,620	936	937	938	940
AVEK (7,000 AFY Wet Year Delivery)	7,000	0	0	0	0
Total Supplies Available	**14,704**	**6,454**	**6,763**	**7,071**	**7,378**
Total Demand	**6,436**	**7,084**	**7,741**	**8,400**	**9,059**
Net Amount Available for Transfer to (from) Water Bank	**8,268**	**(630)**	**(978)**	**(1,329)**	**(1,681)**

Water Bank Activity and Balances					
		Dry Years			
	Year 11	**Year 12**	**Year 13**	**Year 14**	**Year 15**
Beginning Water Bank Balance	**36,376**	**43,817**	**43,187**	**42,209**	**40,880**
Net Transfers to (from) Water Bank	8,268	(630)	(978)	(1,329)	(1,681)
10% Loss for Current Year Additions	(827)	0	0	0	0
Ending Water Bank Balance	**43,817**	**43,187**	**42,209**	**40,880**	**39,199**

Table 6.4.6 (Continued)
Staggered Delivery, Sustainable – Multi-Dry Years 16-20

Annual Sources and Uses of Water Supplies					
		Dry Years			
	Year 16	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Base Supplies Available					
Tulare Lake (1,451 AFY Table A)	871	506	507	508	508
Dudley Ridge (1,993 AFY Table A)	1,196	696	697	698	698
Recycled Water	3,303	3,453	3,603	3,779	3,979
Return Flows	552	610	669	729	788
Groundwater (1,530 AFY after Year 6)	1,530	1,530	1,530	1,530	1,530
AVEK Return of Nickel Water	0	0	0	0	0
AVEK Return of Call Water	0	0	0	0	0
Additional Supplies					
New Imported Water (2,700 AFY Table A after Year 10)	1,620	942	944	945	945
AVEK (7,000 AFY Wet Year Delivery)	0	0	0	0	0
Total Supplies Available	**9,072**	**7,737**	**7,950**	**8,189**	**8,448**
Total Demand	**9,567**	**10,150**	**10,733**	**11,342**	**11,976**
Net Amount Available for Transfer to (from) Water Bank	**(495)**	**(2,413)**	**(2,783)**	**(3,153)**	**(3,528)**

Water Bank Activity and Balances					
		Dry Years			
	Year 16	**Year 17**	**Year 18**	**Year 19**	**Year 20**
Beginning Water Bank Balance	**51,551**	**51,056**	**48,643**	**45,860**	**42,707**
Net Transfers to (from) Water Bank	(495)	(2,413)	(2,783)	(3,153)	(3,528)
10% Loss for Current Year Additions	0	0	0	0	0
Ending Water Bank Balance	**51,056**	**48,643**	**45,860**	**42,707**	**39,179**

7.0 SOURCES

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