CRAIG A. PARTON, State Bar No. 132759
CAMERON GOODMAN, State Bar No. 307679
PRICE, POSTEL & PARMA LLP
200 East Carrillo Street, Fourth Floor
Santa Barbara, California 93101
Telephone: (805) 962-0011
Facsimile: (805) 965-3978

Attorneys for
Antelope Valley Watermaster

Exempt from Filing Fees
Government Code § 6103

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES - CENTRAL DISTRICT

Coordination Proceeding, Special Title (Rule 1550(b)) **ANTELOPE VALLEY GROUNDWATER CASES**	Judicial Council Coordination Proceeding No. 4408 LASC Case No.: BC 325201 Assigned to the Hon. Jack Komar, Judge of the Santa Clara Superior Court Santa Clara Court Case No. 1-05-CV-049053 **ANTELOPE VALLEY WATERMASTER'S ANNUAL REPORT FOR 2019**

Pursuant to the requirements of the Judgement and Physical Solution (Section 18.5.17) as modified by this Court's Order dated April 30, 2018, the Antelope Valley Watermaster hereby submits its 2019 Annual Report (dated July 29, 2020) as required by the terms of the Judgment. The Watermaster Board unanimously approved the filing of this 2019 Annual Report with this Court pursuant to passing Resolution No. R-20-20 on July 22, 2020.

Dated: July 30, 2020

PRICE, POSTEL & PARMA LLP

By: Craig A. Parton
CRAIG A. PARTON
CAMERON GOODMAN
Attorneys for Antelope Valley Watermaster

PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF SANTA BARBARA

I am employed in the County of Santa Barbara, State of California. I am over the age of eighteen (18) and not a party to the within action. My business address is 200 East Carrillo Street, Fourth Floor, Santa Barbara, California 93101.

On July 30, 2020, I served the foregoing document described as **ANTELOPE VALLEY WATERMASTER'S ANNUAL REPORT FOR 2019** on all interested parties in this action by placing the original and/or true copy.

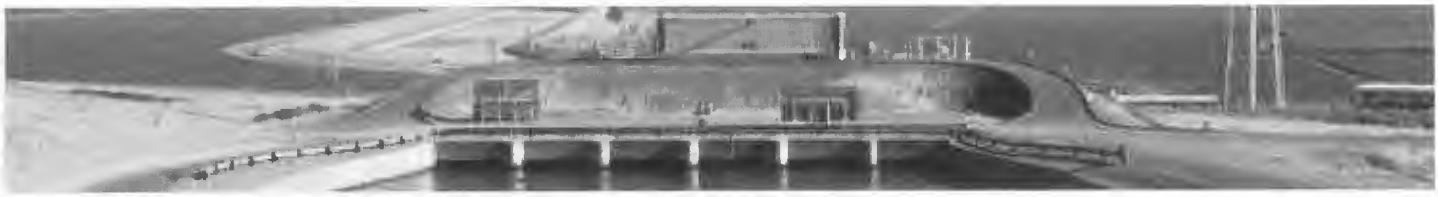
☒ **BY ELECTRONIC SERVICE:** I posted the document(s) listed above to the Santa Clara County Superior Court Website @ www.scefiling.org and Glotrans website in the action of the Antelope Valley Groundwater Cases.

☒ (*STATE*) I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

☐ (*FEDERAL*) I hereby certify that I am employed in the office of a member of the Bar of this Court at whose direction the service was made.

Executed on July 30, 2020, at Santa Barbara, California.

Signature
Elizabeth Wright



ANTELOPE VALLEY
WATERMASTER
EST. 2016

Final
Antelope Valley
Watermaster
2019 Annual Report

July 29, 2020

TODD
GROUNDWATER
Watermaster Engineer

ANTELOPE VALLEY
WATERMASTER
EST. 2016

FINAL

Antelope Valley Watermaster

2019 Annual Report

July 29, 2020

TODD GROUNDWATER

2490 Mariner Square Loop, Suite 215
Alameda, CA 94501
510.747.6920
www.toddgroundwater.com

Fourth Annual Report, Calendar Year 2019

Antelope Valley Groundwater Cases, Judicial Council Coordination Proceeding No. 4408, Santa Clara Case No.: 1-05-CV-049053, Superior Court of the State of California, County of Los Angeles - Central District

Antelope Valley Watermaster Board of Directors

The Antelope Valley Watermaster is charged with administering adjudicated water rights and managing groundwater resources within the Adjudication Area of the Antelope Valley. For 2019, the five-member Board consists of:

Board
Robert Parris, Chairperson
Dennis Atkinson, Vice Chairperson
Adam Ariki
John Calandri
Leo Thibault

Alternates
Dwayne Chisam
Richard Gomez
Kathy MacLaren
Derek Yurosek
Adrienne Reca.

Antelope Valley Watermaster Engineer

TODD GROUNDWATER

2490 Mariner Square Loop, Suite 215
Alameda, CA 94501
510.747.6920
www.toddgroundwater.com

Table of Contents

List of Tables

List of Figures (following text)

Appendices

List of Acronyms

AFY	acre-feet per year
APN	Assessor Parcel Number
AVEK	Antelope Valley-East Kern Water Agency
AVSWC/JPA	Antelope Valley State Water Contractors Joint Powers Authority
Cal Water	California Water Service Company
CIMIS	California Irrigation Management Information System
CSD	Community Services District
DDW	State Water Resources Control Board California Division of Drinking Water
District 40	Los Angeles County Waterworks District No. 40, Antelope Valley
DLCSD	Desert Lake Community Services District
DWR	California Department of Water Resources
DPW	Los Angeles County Department of Public Works
DRI	Desert Research Institute
EAFB	Edwards Air Force Base
ET	Evapotranspiration
FY	Fiscal year
GAMA	SWRCB Groundwater Ambient Monitoring and Assessment
InSAR	Interferometric Synthetic Aperture Radar
IRWMP	Antelope Valley Integrated Regional Water Management Plan
Kc	Crop coefficient
LACSD	County Sanitation Districts of Los Angeles County
LCID	Littlerock Creek Irrigation District
MCL	Maximum Contaminant Level
mg/L	milligram per liter
mgd	million gallons per day
msl	mean sea level
MWC	Mutual Water Company
NEWD	North Edwards Water District
NWIS	National Water Information System of the USGS
NWS	National Weather Service
PRID	Palm Ranch Irrigation District
PWD	Palmdale Water District
QHWD	Quartz Hill Water District
RCSD	Rosamond Community Services District
RWA	Replacement Water Assessment
SWRCB	State Water Resources Control Board
SWRU	Semitropic Water Storage District Stored Water Recover Unit
SGMA	Sustainable Groundwater Management Act
SNMP	Salt and Nutrient Management Plan
SWP	State Water Project

Sy	specific yield
TDS	Total Dissolved Solids
USGS	U.S. Geological Survey
WY	Water Year, October 1 through September 30
WRP	Water Reclamation Plant
WSSP-2	AVEK's Water Supply Stabilization Project No. 2 (also called Westside Water Bank)
WTP	Water Treatment Plant
WWTP	Wastewater Treatment
WSWB	Willow Springs Water Bank (formerly known as the Antelope Valley Water Bank)

MESSAGE FROM THE WATERMASTER BOARD

In this fourth year of administering the Judgment, the Antelope Valley Watermaster benefited from its strong working relationships to accomplish key tasks in 2019. A draft version of a complete set of Rules and Regulations was compiled and provided to a legal Ad Hoc Committee and the Advisory Committee for review and comment – that document was approved in 2020. Templates for a Storage and Recovery Agreement were approved, and the two first applications for a storage agreement for banking and recovery were received. These first two Storage Agreements were approved in 2020, thereby increasing groundwater availability in the Basin. An online Transfer Bulletin Board was established on the Watermaster website that allows Parties to post their interest in transferring or obtaining a transfer of rights to produce groundwater. Administrative Staff, Watermaster Counsel, and the Watermaster Engineer worked with multiple Parties to bring them into compliance with the Judgment.

2019 was also the second year of Rampdown production; groundwater extraction appears to be reduced from previous years bringing the Basin closer to its target safe yield.

The 2019 Annual Report presents improved analyses in monitoring of safe yield components including the distribution of 2019 production, an assessment of water level trends, incorporation of recent satellite imagery data on land subsidence, and a preliminary review of general Basin-wide groundwater quality.

The Watermaster Board is looking forward to working with all Parties in the coming years on the implementation of the Judgment and the associated sustainability of the Basin groundwater resources.

Watermaster Board of Directors, July 24, 2019

From left to right: John Calandri, Dennis Atkinson, Kathy MacLaren (alternate), Dwayne Chisam (alternate), and Adam Ariki

1 INTRODUCTION

The Judgment and Physical Solution for the Antelope Valley Groundwater Adjudication represents more than 15 years of complex proceedings among more than 4,000 parties including public water suppliers, landowners, small pumpers and non-pumping property owners, and the federal and state governments. Through four phases, the adjudication defined the boundaries of the Basin[1], considered hydraulic connection throughout the basin, established the safe yield, and quantified groundwater production. The Judgment documented overdraft conditions, established respective water rights among groundwater producers, and ordered a rampdown of production to the native safe yield.

The adjudication provides a framework to sustainably manage the basin and reduce groundwater level declines and subsidence. The Final Judgment was entered on December 23, 2015 and is posted on the Watermaster website for reference (www.avwatermaster.net). To administer the Judgment, the Court directed appointment of the Watermaster – a five-member board of directors representing the Parties. In 2016, the Watermaster Board and an Advisory Committee (both entities required under the Judgment) were formed. In 2017, the Board awarded Todd Groundwater a three-year contract as Watermaster Engineer to fulfill certain requirements of the Judgment.

Under the Judgment, the Watermaster Engineer has the responsibility of preparing annual reports for the Court; this document is the fourth such report. In 2018, the Watermaster Board requested and was granted a permanent filing date of August 1st for submittal of the Annual Report to the Court covering the previous calendar year. This 2019 Annual Report is being provided to the Court in compliance with the August 1, 2020 deadline.

1.1 BACKGROUND

The Antelope Valley Groundwater Basin is located in the western Mojave Desert, covering 1,580 square miles in portions of Los Angeles, Kern, and San Bernardino counties (**Figure 1**). The groundwater basin boundaries have been defined by the California Department of Water Resources (DWR Basin Number 6-44) and extend beyond the Adjudication Area.

The Antelope Valley Area of Adjudication covers approximately 1,390 square miles of the groundwater basin (**Figure 1).** The Adjudication Area does not include the adjacent alluvial portions of the groundwater basin to the northeast and south and is truncated at the Los Angeles-San Bernardino County Line in the southeast. Subsurface flows between these adjacent alluvial areas and the Adjudication Area are generally considered nominal and the portion of the Antelope Valley Groundwater Basin that extends southeast into San Bernardino County is within the Mojave Basin Area adjudication.

[1] The Final Judgment defines Basin as the Area of Adjudication determined by the Court. Basin is capitalized in this report when referring to the Area of Adjudication. To avoid confusion, the terms *Antelope Valley Groundwater Basin* or *groundwater basin* refer to the DWR-defined groundwater basin.

The Adjudication Area was divided into five subareas for management purposes (**Figure 1**):

- Central Antelope Valley Subarea
- West Antelope Valley Subarea
- South East Subarea
- Willow Springs Subarea
- Rogers Lake Subarea.

A native safe yield of 82,300 acre-feet per year (AFY) was established by the Court for the Antelope Valley Area of Adjudication and the adjudication Parties were divided into various classes to establish respective water rights among groundwater producers. To achieve sustainable groundwater elevations, groundwater production would be reduced (ramped down) over a seven-year period (2016-2022) to a final Production Right. The diagram on the right side of **Figure 2**[2] shows the Judgment's apportionment of native safe yield to the various Judgment classes.

The Physical Solution quantifies the reduction of groundwater production within the Adjudication Area over time to reach the native safe yield. During this Rampdown Period, certain Parties to the Judgment are allowed to produce groundwater in excess of their Production Right (beginning with a Pre-Rampdown Production amount) without incurring a Replacement Obligation. Certain Parties are also allowed credit for Imported Water Return Flows, Carry Over water, and Stored Water under the distinct circumstances defined in the Judgment. Certain Parties without a Production Right can also produce groundwater under certain conditions as provided by the Judgment. Finally, additional production in excess of a Production Right is allowed to certain Parties provided they pay a Replacement Water Assessment. These seven potential production categories are listed on the left side of **Figure 2** and summarized briefly below.

- The Production Right is the portion of the Native Safe Yield assigned to each Party (see diagram on the right of **Figure 2**). Production Rights for specific Parties are defined in the Judgment in Exhibit 3 (Non-Overlying Production Rights), Exhibit 4 (Overlying Production Rights), and in Paragraphs (¶) 5.1.3, 5.1.4, and 5.1.5 of the Judgment for the Small Pumper Class, Federal Reserved Water Rights, and State of California, respectively.
- Rampdown Production is defined in the Judgment as the reasonable and beneficial use of groundwater, excluding Imported Water Return Flows, at a time prior to the Judgment, or the Production Right, whichever is greater. During the seven-year Rampdown Period, production is reduced – or ramped down – from the Pre-Rampdown Production Right to the Production Right for certain Parties with Pre-Rampdown Production rights.
- Imported Water Return Flows represent water brought into the basin from outside of the watershed that provides a net increase in groundwater supply (i.e., does not include consumed or evaporated imported water). Return flows were established in

[2] The sum of the individual production rights is 82,280.63 AFY; this sum was rounded in the Judgment to 82,300 AFY.

the Judgment at 34 percent of imported water used for agriculture and at 39 percent for municipal and industrial uses.

- Carry Over Water is the right to an unused portion of an annual Production Right or a right to Imported Water Return Flows in a year after the year in which the right was originally available.
- Stored Water is water held in storage in the basin as a result of direct spreading or other methods for subsequent withdrawal and use pursuant to an agreement with the Watermaster. It does not include Imported Water Return Flows.
- Other Rights to Produce Groundwater are outlined in Paragraphs 5.1.7 through 5.1.10 and other portions of the Judgment. Such rights include entities that are required to switch to recycled water when available and production rights granted to Non-Stipulating Parties[3]. This category also includes the right of Phelan Piñon Hills Community Services District to produce groundwater from the basin for export to its service area under specific conditions in the Judgment (¶6.4.1.2).
- Additional Production is pumping that does not fall into the other categories and would include Production based on Watermaster approvals for new production, and Production by Parties to the Judgment in excess of other rights. This production would be subject to a Replacement Obligation; for such pumping, the producer would need to pay a Replacement Water Assessment. Replacement Water will be purchased by the Watermaster or otherwise provided to satisfy the Replacement Obligation.

The Judgment limits the amount of groundwater production that can be produced without incurring a Replacement Obligation (i.e., purchase of imported water to offset the production). Types of production that do not incur a Replacement Obligation include Production Rights (up to the Native Safe Yield), recovery of Imported Water Return Flows, or recovery of Stored Water. While this report indicates that reductions in Production will occur as Parties are ramping down production rights to the Native Safe Yield, such reductions may not be required to the extent that the over-production is offset with Replacement Water.

1.2 Purpose and Scope

The Watermaster Engineer is responsible for preparation of annual reports for submittal to the Court. The purpose of the annual report is to document the progress and details regarding implementation of the Judgment including a review of Watermaster activities. Information is provided regarding the operation and management of the groundwater basin and water supplies during the preceding year. A list of the minimum required elements to be compiled in the annual reports is provided in ¶18.5.18 of the Judgment; these elements are reproduced in **Table 1**, with reference to the associated locations in this report. If there are any conflicts or ambiguities related to legal provisions or interpretations between the Judgment and the Annual Report, the Judgment is the controlling document.

[3] Non Stipulating Parties includes the Supporting Landowners identified in the Statement of Decision.

Table 1. Minimum Required Elements for the 2019 Annual Report

Judgment Paragraph	Element	Report Location
18.5.18.1	Replacement Obligations	Section 4.6, Appendix E
18.5.18.2	Hydrologic Data Collection	Section 3
18.5.18.3	Purchase and Recharge of Imported Water	Section 4.4, Section 4.8, Appendices C and E
18.5.18.4	Notice List	Appendix L
18.5.18.5	New Production Applications	Section 4.11, Appendix H
18.5.18.6	Rules and Regulations	Section 1.5.7
18.5.18.7	Measuring Devices	Section 3.9
18.5.18.8	Storage Agreements	Section 4.8, Appendix G
18.5.18.9	Annual Administrative Budget	Section 1.6, Appendix K
18.5.18.10	Transfers	Section 4.7, Appendix F
18.5.18.11	Production Reports	Section 4.3, Appendix B
18.5.18.12	Prior Year Report	Section 2
18.5.18.13	Amount of Stored Water owned by each Party	Section 4.8
18.5.18.14	Amount of Stored Imported Water owned by each Party	Sections 4.3, 4.4 and 4.8, Appendices B, C and D
18.5.18.15	Amount of Unused Imported Water Return Flows owned by each Party	Section 4.4, Appendices B and D
18.5.18.16	Amount of Carry Over Water owned by each Party	Section 4.3 and 4.5, Appendix B
18.5.18.17	All Changes in Use	Section 4.10

1.3 Report Organization

The report provides background and supporting information about Watermaster activities and safe yield monitoring for 2019, and detailed water accounting for 2019 groundwater use by the Parties to the Judgment. These topics are organized into five primary sections and accompanying appendices as described below.

Section 1 of this report provides an introduction and context for the 2019 Annual Report, including purpose and scope. **Section 1.4** summarizes the stakeholder review process including posting and notice of the report including a public hearing. Information on the Watermaster management structure including an organization chart is provided in **Section 1.5**. That section also summarizes the current roles and responsibilities of the Watermaster Board, administrative staff, the Advisory Committee, Watermaster legal counsel, and the Watermaster Engineer. **Section 1.6** provides a summary of Watermaster finances.

Section 2 summarizes activities and actions by the Watermaster in 2019 associated with implementation of the Judgment.

Section 3 presents relevant monitoring data of Safe Yield components in the basin. To provide context for these data, a summary of the safe yield calculation in the Judgment is provided in **Section 3.1**. This summary includes a brief review of the components of natural groundwater recharge relating to the hydrologic system (see Schematic Diagram on **Figure 3**). Components of both the Native Safe Yield and the Total Safe Yield are also discussed, including natural recharge, return flows from urban and agricultural water use, and imported water (including return flows from imported water use). Components of the Total Safe Yield are represented conceptually on **Figure 4**. **Section 3.2** documents the monitoring of safe yield components and provides preliminary analyses on historical and current groundwater levels and change in groundwater volume from 2018 to 2019.

Section 4 provides details on the water accounting for the Parties to the Judgment. Rights to produce groundwater under the Judgment are summarized in **Section 4.1**. Water accounting includes documentation of the Rampdown schedule (**Section 4.2**), 2019 Production and water accounting (**Section 4.3**), imported water use and Imported Water Return Flows (**Sections 4.4**), Carry Over water (**Sections 4.5**), and information on Replacement Obligations (**Section 4.6**), Transfers (**Section 4.7**), Stored water and Storage Agreements (**Section 4.8**). The Drought Program is discussed in **Section 4.9.** Changes in use and well applications for new or replacement production wells are discussed in **Sections 4.10** and **4.11. Section 4.12** provides details on the wastewater and recycled water practices that occurred within the Adjudication Area in 2019. As illustrated in **Table 1** above, much of the water accounting – including reported groundwater production – is provided in appendices to this report. Relevant appendices for each water accounting topic are referenced in each water accounting topic of **Section 4**.

Section 5 lists the technical documents reviewed and referenced in this 2019 Annual Report.

The appendices contain supporting material and details of the water accounting process. The attached appendices are printouts of active water accounting files; on occasion, a cell will contain a notation "#VALUE!" This signifies an incomplete formula in the electronic file; these notations have been retained in water accounting tables in this report to maintain the operational integrity of the electronic file. **Table 2** provides a detailed description of each of the appendices and sub-appendices for reference.

Table 2. Description of Appendices

Appendix		Description
A	**Rampdown Schedules** A-1. Exhibit 3 Non-Overlying and Non-Stipulating Parties Rampdown Schedule A-2. Exhibit 4 Overlying Producers Rampdown Schedule	Appendix A contains the Rampdown schedule for 2016-2022 for each Party. Beginning in 2018, Pre-Rampdown Production is reduced in equal increments each year to reach the Production Right by the end of the Rampdown Period.
B	**Water Accounting Tables** B-1. Exhibit 3 Non-Overlying Producers Water Accounting B-2. Exhibit 4 Overlying Producers Water Accounting B-3. Other Parties (Non-Exhibit 3 or Exhibit 4) Water Accounting B-4. New Production Accounting	Appendix B presents detailed accounting by water source (Production Right, Rampdown, unused Federal Reserved Water Rights, Imported Water Return Flows and Carry Over water) for 2019 for each Party. Note that all Parties may not have rights to all source types. Table B-4 presents water accounting for entities granted New Production.
C	**Imported Water, 2019**	Appendix C-1 provides details on the amounts of water imported into the Antelope Valley watershed, amounts recharged (banked), and amounts sold to customers by AVEK, PWD, and LCID in 2019. Appendices C-2 and C-3 summarize the amount of imported water stored at the beginning of 2019, amounts recharged and recovered in 2019, and the amount of recoverable imported water stored at the end of 2019 at AVEK storage and recovery locations (C-2) and at other storage and recovery locations (C-3).
D	**Imported Water Return Flows**	Appendix D presents annual imported water use for 2011-2019 and Imported Water Return Flows for 2016-2020 by the 37 Parties on Exhibit 8. Return flows from imported water use are set by the Judgment at 34 percent for agricultural use and 39 percent for municipal and industrial imported water use.
E	**Replacement Obligations**	Replacement Obligations and Replacement Assessments for 2016-2019 are listed in Appendix E.
F	**Transfers**	Appendix F-1 provides details on all permanent transfers that have occurred since implementation of the Judgment.

Appendix		Description
		Appendix F-2 lists the one-time transfers. Appendix F-3 lists transfers associated with a split of Production Rights.
G	**Storage Agreements**	Approved Storage Agreements are listed in Appendix G.
H	**Approved Well Applications and Small Pumper Qualifying Documentation**	Appendix H contains a table of the well applications and Small Pumper Qualifying Documentation that have been approved through 2019.
I	**AVEK Facilities Map and Water Use Flowcharts**	Appendix I contains the following information provided by AVEK: • AVEK storage and recovery facilities location map • Flowchart depicting the distribution of AVEK's imported water, groundwater, and recovered water supply in 2019 • Flowchart depicting water AVEK distributed for other agencies in 2019
J	**Wastewater and Recycled Water, 2019**	Antelope Valley area wastewater is treated at LACSD's Palmdale and Lancaster WRPs, EAFB Air Force Research Laboratory Treatment Plant and the Main Base WWTP, and the RCSD WWTP. Quantities of effluent and reuse for 2019 are tabulated in Appendix J.
K	**Watermaster Financial Budgets** K-1. Approved Financial Budget, 2020 K-2. Financial Audit, 2019	Appendix K contains an approved budget for 2020 and an audit of all revenue and expenditures for 2019.
L	**Notice List**	Appendix L contains a list of parties to receive notices from the Watermaster.
M	**Delinquent Administrative Assessments and Delinquent Production Reports**	Appendix M contains current lists of delinquent assessments and delinquent production reporting.
N	**List of Forms**	Appendix N contains a list of forms available on the Watermaster website.
O	**Financial Analysis Study for Replacement Water Assessment**	Appendix O contains a financial analysis of the imported water costs associated with Antelope Valley State Water Contractors Association's groundwater basin recharge and Replacement Water Assessment fees to be assessed on property owners or agencies outside of the AVSWCA service area.

1.4 Stakeholder and Public Review and Comment

This fourth annual report will be submitted to the Court on or by August 1 in compliance with the filing deadline approved by the Court[4]. A Draft Annual Report was posted on the Watermaster website on June 3, 2020 and reviewed by the Watermaster at its regular board meeting on June 24, 2020. After incorporating comments from various Parties and the Advisory Committee, the Watermaster Engineer produced a Revised Draft version on July 1, 2020.

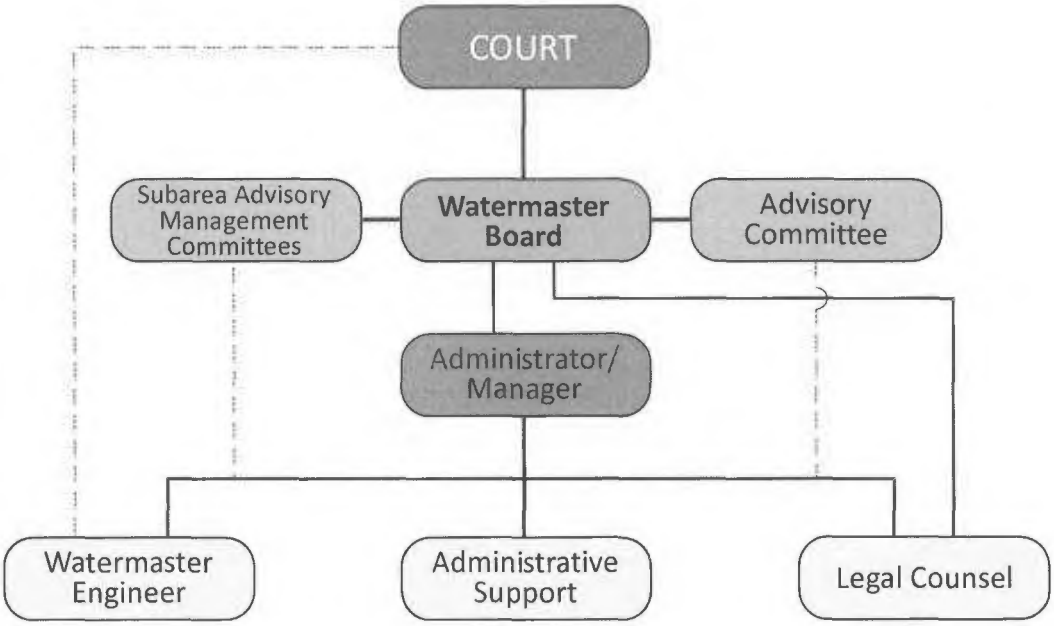
The Watermaster Board held a noticed public hearing on July 22, 2020 to consider public comments on the Revised Draft 2019 Annual Report. On July 22, 2020, the Watermaster unanimously voted to consider and incorporate additional comments received prior to and at the July 22 public hearing. The Watermaster also unanimously approved the filing of the Final 2019 Annual Report, which incorporates the Board-recommended comments, to the Court by August 1, 2020 (Resolution No. R-20-20).

1.5 Antelope Valley Adjudication Management

The Judgment identified the powers and duties of specific entities charged with carrying out the Physical Solution. The Watermaster Board functions as the arm of the Court and is assisted by the Watermaster Engineer, the Watermaster Legal Counsel, and Watermaster Administrative Staff to implement the Physical Solution. The Advisory Committee acts in an advisory role and makes recommendations on discretionary determinations by the Watermaster Board. The Subarea Advisory Management Committees, while not yet formed, will also act in an advisory capacity regarding recommendations on discretionary determinations made by the Watermaster Engineer that may affect that subarea. A general organization chart that illustrates current working relationships is provided as follows. Roles and responsibilities of these entities are summarized in the following sections.

[4] Paragraph 18.5.17 of the Final Judgment requires that the Annual Report be filed no later than April 1 of each year. Recognizing the time needed for data reporting and compilation, along with the required public review process, the Watermaster Board requested and received approval from the Court to permanently move the filing deadline to August 1 of each year.

Antelope Valley Watermaster Organization Chart



1.5.1 Watermaster Board

The Court-appointed Watermaster Board is made up of five members including:

- One representative from the Antelope Valley-East Kern Water Agency (AVEK)
- One representative from the Los Angeles County Waterworks District No. 40 (District 40)
- One public water supplier selected by District 40, Palmdale Water District (PWD), Quartz Hill Water District (QHWD), Littlerock Creek Irrigation District (LCID), California Water Service Company (Cal Water), Desert Lake Community Services District (DLCSD), North Edwards Water District (NEWD), City of Palmdale, City of Lancaster, Palm Ranch Irrigation District (PRID), and Rosamond Community Services District (RCSD), and
  Two landowner representatives (exclusive of public agencies and members of the Non-Pumper and Small Pumper Classes) who are selected by majority vote of the landowners identified on Exhibit 4 of the Physical Solution (or their successors in interest) based on their proportionate share of the total Production Rights identified on Exhibit 4.

The current Board members and their alternates are:

- AVEK: *Robert Parris,* alternate: *Dwayne Chisam*
- District 40: *Adam Ariki,* alternate: *Richard Gomez*
- Public Water Suppliers: *Kathy MacLaren,* alternate: *Barbara Hogan*
- Landowners: *John Calandri and Dennis Atkinson*, alternates: *Derek Yurosek and Adrienne Reca.*

The Watermaster Board has certain responsibilities and powers including:

- A responsibility to implement and enforce the Judgment through actions, motions, and service of notices, determinations, requests, demands, reports and other methods pursuant to the Judgment and the Rules and Regulations
- An obligation to carry out its duties in an impartial manner and to rely on best available information to support Judgment implementation
- Selection of Watermaster Engineer
- Preparation of Annual Administrative budgets and associated accounting and billing
- Documentation of groundwater use and transfers and other pertinent information
- Review of new production applications
- Maintenance of a notice list
- Conduct of regular meetings at least quarterly and in accordance with the Ralph M. Brown Act
- Oversight of the preparation of annual reports and a Rules and Regulations document
- Powers and duties as provided in Paragraph 18.4 of the Judgment.

The Board typically meets on the fourth Wednesday of each month, with all meetings conducted in compliance with the Ralph M. Brown Act. The Watermaster Board has conducted its affairs transparently, including holding interviews and deliberations in open session. All Watermaster decisions to date have been achieved through unanimous vote of the Board, although the Watermaster provided for meeting minutes to be approved using a simple majority vote.

1.5.2 Watermaster Engineer

Todd Groundwater was selected unanimously by the Watermaster Board as the Watermaster Engineer for the April 2017 to December 2019 period and its contract was extended two years to December 2021. The Watermaster Engineer is to "perform engineering and technical analysis and water administration functions as provided for in this Judgment" (¶3.5.53 of the Judgment). Duties include:

- Monitor safe yield components and collect hydrologic data
- Require Producers (other than unmetered Small Pumper Class members) to submit Production Reports
- Ensure reduction in groundwater production to the Native Safe Yield during the 2016 to 2022 Rampdown Period
- Propose measuring devices to monitor Production

- Determine if Material Injury to the Basin is occurring, including but not limited to conditions specified in the Judgment
- Determine Replacement Obligations
- Purchase and recharge Replacement Water
- Establish a new production application procedure, review applications and recommend approval or denial of such applications
- Maintain accounting of water stored under Storage Agreements
- Ensure that no person reduces the amount of storm flows that would otherwise enter the Basin
- Encourage appropriate regulatory agencies to enforce reasonable water quality regulations affecting the basin
- Establish memoranda of understanding with Kern and Los Angeles counties regarding well drilling ordinances and reporting
- Beginning in 2034, consider and potentially recommend change to Native Safe Yield
- Beginning in 2034, consider and potentially recommend changes to the calculation of Imported Water Return Flow percentages
- Rely on best available information to support Judgment implementation.
- Prepare an Annual Report for filing with the Court by August 1. The Watermaster requested and was granted a permanent extension to August 1 from the April 1 date in the Judgment
- Prepare Rules and Regulations for Watermaster proposal to the Court (¶18.4.2 of the Judgment).

Although not specified in the Judgment, the Watermaster also has reporting requirements under the Sustainable Groundwater Management Act (SGMA) for adjudicated basins (Cal. Water Code §10720.8). Required data on water use, groundwater monitoring, and other information are due to the California Department of Water Resources (DWR) by April 1 of each year (California Water Code Section 10720.8). Adjudicated basins that have Court filing dates for their Annual Reports after April 1 (such as the Antelope Valley Adjudication) are allowed to complete reporting later than April 1.

DWR requires an initial filing on the SGMA website by April 1 of each year to notify DWR that requested data are not yet available; SGMA reporting can be completed when data become available. Todd Groundwater completed the initial notification to DWR on January 27, 2020, prior to the April 1 deadline. For the Antelope Valley Watermaster, the completion of the SGMA reporting will occur concurrently with the Court filing of the Annual Report on August 1. Todd Groundwater will fulfill 2019 SGMA compliance reporting for the Watermaster following Watermaster approval of the Final 2019 Annual Report.

1.5.3 Watermaster Legal Counsel

Watermaster Legal Counsel advises the Board on legal matters and takes direction directly from the Board. In November 2017, the Watermaster unanimously selected Craig Parton of Price Postel & Parma LLP to provide legal services to the Board, including provision of legal opinions on implementation of the Judgment.

1.5.4 Administrative Staff and Functions

Since 2016, administrative functions of the Watermaster are shared between selected staff members of AVEK and Palmdale Water District (PWD). The Watermaster has agreed to reimburse AVEK and PWD for the costs of providing administrative services to the Watermaster. The Advisory Committee and Watermaster will continue to review the roles and responsibilities of the administrative staff to improve the level of service provided to the Watermaster. Currently, administrative staff perform the followings tasks for the Watermaster:

- Provide general oversight of all Watermaster activities and provide direction to consultants
- Work with the Watermaster Board to establish priorities and policy
- Provide accounting services (accounts receivables and bill payables)
- Administer assessment billings and collection process
- Serve as primary point of contact for producers and the public
- Prepare and manage Watermaster budgets
- Administer Watermaster contracts (Engineer, Legal, Audit, etc.)
- Prepare Watermaster staff reports
- Prepare, distribute, and post Watermaster meeting agendas and public notices
- Maintain contact lists and notice list
- Maintain Watermaster website
- Coordinate attorney input
- Coordinate Advisory Committee input
- Coordinate Subarea Advisory Management Committees input
- Assist Watermaster Landowner Board member elections
- Staff Watermaster meetings
- Prepare meeting minutes
- Administer meeting services and equipment (Audio/Visual, Teleconference, and Video-Conference)
- Maintain liability insurance
- Manage work tasks as directed by Board
- Recommend timelines for tasks
- Process applications for Replacement Wells, Monitoring Wells, and unknown Small Pumper qualifications.

1.5.5 Advisory Committee

The Judgment directed Producers to form an Advisory Committee to act in an advisory capacity and make recommendations on discretionary determinations by the Watermaster Board. The Watermaster Board facilitated the formation of the Advisory Committee, which is formed and functioning, and has provided input into various Watermaster Board decisions. The Advisory Committee consists of 16 members representing a broad range of interests:

- Four from agricultural interests
- One industrial landowner
- One public landowner (County Sanitation Districts Nos. 14 and 20 of Los Angeles County or the City of Los Angeles)
- Two Los Angeles County public water purveyors (PWD, QHWD)
- One Kern County public agency (RCSD)
- Two mutual water companies (ideally one each in Los Angeles and Kern counties)
- Two small pumpers
- Two ex-officio members per Judgment (Federal and State), and
- One ex-officio member to provide technical advice.

Advisory Committee meetings are open to the public, noticed on the same webpage as the Watermaster meetings, and held on a regular basis (typically monthly in the week before the Board meeting).

1.5.6 Subarea Advisory Management Committees

The Judgment requires the creation of Subarea Management Advisory Committees. Since the Advisory Committee is actively providing all Parties with a platform for direct participation in Watermaster decision-making, formation of the Subarea Management Advisory Committees has been deferred until a specified interest is identified. All subarea concerns and requests may still be raised before the Watermaster Advisory Committee or to the Watermaster Board in accordance with the Judgment and Rules and Regulations. Any Party may request formation of the Subarea Management Advisory Committees at any time in the future and without Watermaster approval.

1.5.7 Rules and Regulations Development

The Watermaster Engineer is required by the Judgment to prepare Rules and Regulations for Watermaster approval and proposal to the Court (¶18.4.2). The Rules and Regulations provide procedures and processes for implementation of the Judgment. Development of the Antelope Valley Watermaster Rules and Regulations document was initiated in 2017 and approved at a public hearing on June 24, 2020 pending modifications to one section (Resolution No. R-20-12). Modifications to Section 9 of the Rules and Regulations were approved at a public hearing on July 22, 2020 (Resolution No. R-20-25). The complete Rules and Regulations document will be submitted to the Court for approval. A copy of the Rules and Regulations is posted on the Watermaster website.

1.6 Watermaster Finances

1.6.1 Watermaster Administrative Budgets

The Watermaster Board approved an administrative budget for 2019, which resulted in a $5.00 per acre-foot administrative assessment. The Watermaster 2019 Budget information is summarized as follows.

2019 Administrative Budget Summary

Operating Revenues	$2,603,806
Non-Operating Revenues	$ 575
Operating Expenses	($ 556,481)
Change	$2,047,900
Beginning of year	$ 23,252
End of year	$2,071,152*

*Includes 1,927,253 of Replacement Water Assessments

The 2019 Operating Revenue Budget listed above includes 2019 Fixed Assessments and 2018 Variable Assessments. The complete audit is in **Appendix K-2**.

- **Fixed Administrative Assessments** are based on each acre foot of a Party's Production Right and are levied at the beginning of the year in which the Production Right occurs.
- **Variable Administrative Assessments** are based on either (1) production by a Party in excess of the Production Right or (2) the right to produce Imported Water Return Flows. Administrative assessments on production under (1) above are levied each Spring after total Production is reported for the preceding year; administrative assessments on the right to produce Imported Water Return Flows under (2) above are determined for the current year based on an average of the amounts of imported water used in the five preceding years (¶5.2.2). Variable Administrative Assessments are collected on:
    - each acre foot (AF) of a Party's right to produce Imported Water Return Flows (¶5.2)
    - each acre foot of a Party's production for which a Replacement Water Assessment has been imposed (¶9.2)
    - each acre foot used of a Non-Overlying Production Right holders' allocation of the unused Federal Reserved Water Right (¶9.1)
    - each acre foot during Rampdown of a Party's production in excess of the sum of its Production Right, Imported Water Return Flows, and Production subject to a Replacement Water Assessment.

Appendix K contains detailed Watermaster financial budgets as follows:

- **Appendix K-1** contains an approved budget for 2020.

  The 2020 Administrative Assessment was set at $5.00 per acre-foot, the same as the Administrative Assessment for 2019.

- **Appendix K-2** contains an audit of all revenue and expenditures for 2019.

1.6.2 Replacement Water Assessments

Replacement Water Assessments are charged by the Watermaster to pay for costs incurred to buy and recharge Replacement Water. The purpose of Replacement Water is to ensure that each Party may fully exercise its Production Right by keeping the Basin in hydrologic balance. The Watermaster shall impose a Replacement Water Assessment on any Producer whose production of groundwater is more than the sum of such Producer's rights to pump groundwater including Production Rights, Carry Over water, Imported Water Return Flows, in-lieu production, and Stored water. **Appendix E** lists the Replacement Obligations for 2019.

During the first two years of the Rampdown Period (2016 and 2017), Producers were generally not subject to Replacement Water Assessment fees. An exception to this was Phelan Pinon Hills Community Services District (PPHCSD). It does not have Production Rights, but according to the Judgment is allowed to pump up to 1,200 AFY from its Well #14 provided such use does not cause Material Injury and PPHCSD pays a Replacement Water Assessment and any other costs deemed necessary to protect Production Rights defined in the Judgment, on all water produced and exported.

The amount of the Replacement Water Assessment due is the sum of excess Production multiplied by the cost to the Watermaster of replacement water, including any Watermaster spreading costs. All Replacement Water Assessments collected by the Watermaster are used to acquire imported water from AVEK, LCID, PWD, or other entities. If the Watermaster encounters issues in acquiring imported water, as much water as possible will be purchased. The Watermaster will allocate the imported water for delivery to areas on an equitable and practicable basis pursuant to the Watermaster Rules and Regulations, including when the available amount of imported water is insufficient to fully meet the Replacement Obligations.

The State Water contractors in the Antelope Valley area (AVEK, PWD, and LCID) hired an independent contractor to determine the Replacement Water Assessment fee in areas inside and outside of the State Water Contractor service areas (copy included in **Appendix O**). The Replacement Water Assessment fee for 2019 was set at $451 per acre-foot for Producers within the State Water Contractor service areas and at $948 per acre-foot for Producers outside the State Water Contractor service areas, with the differences reflecting capital costs paid through property taxes by Parties inside the State Water Contractor service areas. Imported water can be purchased from AVEK, PWD, LCID, or other entities and recharged to make up any Replacement Obligations.

2 WATERMASTER ACTIVITIES IN 2019

In this fourth year of implementation, the Watermaster Board continues to actively administer the Judgment and Physical Solution. The Board held ten regular Board meetings and one special Board meeting (combined November and December meeting) in 2019. Board meetings were generally preceded by an Advisory Committee meeting the previous week; the Advisory Committee typically produced a memorandum to the Board advising it on items identified for each upcoming Board meeting. In 2019, the Board considered and unanimously approved 33 resolutions (available on Watermaster website) as listed below:

- R-19-01 Adopting Watermaster Fee Schedule for Year 2019
- R-19-02 Approving Small Pumper or New and Replacement Well Applications
- R-19-03 Small Pumper Qualifying and Monitoring Well Applications
- R-19-04 Approving Small Pumper Qualifying Applications
- R-19-05 Approving New Production and New Point of Extraction Applications
- R-19-06 Approving Applications for Water Transfer
- R-19-07 Approving Applications for Small Pumpers Documentation
- R-19-08 Approving Applications for New Production
- R-19-09 Approving Water Transfer Application
- R-19-10 Adopting Replacement Water Assessments for Year 2018-PWD and LCID
- R-19-11 Adopting Replacement Water Assessments for Year 2019
- R-19-12 Adopting Forms – Storage and Recovery Agreement and Annual Water Storage and Recovery Report
- R-19-13 Adopting March 15, 2019 Memorandum from General Counsel Concerning Small Pumper Class Water Rights
- R-19-14 Adopting May 13, 2019 Memorandum from General Counsel Concerning Limits on Number of Unknown Small Pumper Class Members
- R-19-15 Approving Small Pumper or Replacement Well Applications
- R-19-16 Approving Applications for New Production / New Point of Extractions
- R-19-17 Approving Water Transfer Applications
- R-19-18 Adopting April 12, 2019 Memorandum from General Counsel Concerning Authority to Waive Assessments
- R-19-19 Approving New Production Applications
- R-19-20 Adopting May 16, 2019 Memorandum from General Counsel Concerning Collecting Delinquent Assessment
- R-19-21 Approving Request for Stipulation to Allow Intervention and Replacement Well Application
- R-19-22 Approving AV Watermaster 2018 Annual Report
- R-19-23 Approving Small Pumper and Replacement Well Applications
- R-19-24 Approving New Point of Extraction
- R-19-25 Approving Small Pumper Qualifying Documentation
- R-19-26 Approving Application for Water Transfer
- R-19-27 Adopting Replacement Water Assessments 2016, 2017, 2018 for AVSWCA

- R-19-28 Approving Small Pumper Qualifying, Replacement Wells and Non-Production Well Applications
- R-19-29 Approving Applications for New Production and New Point of Extractions
- R-19-30 Approving Applications for Small Pumpers, Replacement and Monitoring Wells
- R-19-31Approving Applications for Water Transfers
- R-19-32 Approving Applications for Small Pumpers, Replacement and Monitoring Wells
- R-19-33 Approving AV Watermaster Budget and Administrative Assessments for FY 2020.

Notable actions taken by the Board in 2019 are highlighted below:

- Held a Public Hearing to approve a proposed calendar year 2019 Administrative budget with an Administrative Assessment of $5 per acre foot.
- Accepted and filed the 2018 Financial Audit.
- Approved and submitted the 2018 Annual Report to the Court.
- Complied with the Sustainable Groundwater Management Act (SGMA) reporting requirements for adjudicated basins.
- Adopted a Replacement Water Assessment of $451 per acre-foot for Parties within the State Water Contractor service areas and $948 per acre-foot for Parties outside the State Water Contractor service areas to 2019.
- Established a Transfer Bulletin Board that allows Parties to have their interest in purchasing or selling Transfer water posted on the Watermaster website. Request forms are available for posting information and for removing the information from the Bulletin Board. Administrative staff is only involved with the updating of the website
- Approved the 2020-2021 extension of Todd Groundwater's contract.

The Judgment requires the Watermaster to annually certify a list of unpaid delinquent assessments. Administrative staff regularly provide the Watermaster with a list of outstanding assessments as part of their financial report in each Board packet. Current lists of delinquent assessments (Administrative, Variable, and Replacement) and delinquent annual production reporting are included in **Appendix M**.

Notice List. The Judgment requires the Watermaster to maintain a current list of Parties to receive notices on Watermaster activities. The Parties have an obligation to provide the Watermaster with their current contact information. The Watermaster recently identified and mailed invoices to over 4,000 potential Small Pumpers. Responses to those invoices will be used to update the Notice List with these Small Pumpers. The current Notice List is in **Appendix L**. This list will be updated and refined as appropriate. The Watermaster's website (www.avwatermaster.net) will also be used to notify interested parties of Watermaster activities.

Measuring Devices. In 2017, the Watermaster developed requirements for meter installing, testing, and reporting. These requirements were approved by the Court by order dated November 28, 2017 and are in the Rules and Regulations document. By March 1, 2018, all

Parties other than the Small Pumper Class were required to install meters on their wells for monitoring production and submit proof thereof to the Watermaster. The Watermaster requested and was granted an extension to the meter installation date from January 1, 2018 to March 1, 2018 to allow time for all producing Parties to comply with the requirements. Additional information is provided in **Section 3.9.1** of this report.

Meter installations are also required for any member of the Non-Pumper Class who has complied with the New Production Application Procedure specified in ¶18.5.13 of the Judgment. As provided in the Judgment, Producing Non-Pumper Class members shall report production to the Watermaster, and prior to the commencement of production, shall install a meter consistent with the requirement of the Rules and Regulations (¶9.2.2).

Rules and Regulations. The Rules and Regulations were developed in stages in order to obtain early court approval of those sections requiring early deadlines in the Judgment such as metering requirements. These sections were compiled with additional sections by the Watermaster Engineer in 2019 to develop a complete draft Rules and Regulations document. The draft document was provided to Watermaster Counsel who oversaw additional review and edits by an Ad Hoc Rules and Regulations committee. Several versions of the draft document were circulated by Watermaster Counsel among committee members and the Advisory Committee in late 2019 and early 2020. As previously mentioned, the Rules and Regulations document was approved on June 24, 2020 and July 22, 2020 and is available on the Watermaster website (www.avwatermaster.net).

Forms. Forms have been developed for reporting annual production and monthly meter readings; requests for information; Small Pumper qualifying documentation; requests for replacement wells, new point of extraction wells, use of a Production Right at a new location (no new well), non-production wells, and new production; request for transfers; requests to be added or removed from the Transfer Bulletin Board; and annual water storage and recovery reporting. These forms are updated from time to time when new issues arise or a need for additional information is identified. Original and updated forms are reviewed and approved by the Watermaster Board. Forms are listed in **Appendix N** and available on the Watermaster website.

Prior Year's Report. As provided in the Judgment, Annual Reports should also include the Annual Report from the prior year. To streamline this 2019 Annual Report, the 2018 Annual Report has been posted on the Watermaster website for easy downloading and reference (www.avwatermaster.net).

3 MONITORING OF SAFE YIELD COMPONENTS

As required by the Judgment, monitoring data have been compiled for the safe yield components in the Adjudication Area The monitoring program established for the basin includes the compilation of data on climate and streamflow, groundwater levels, groundwater quality, land subsidence, managed aquifer recharge (i.e., groundwater banking), amounts and use of imported water, groundwater production, and return flows. Groundwater levels are used to analyze annual changes in groundwater volume. Some data sets represent components of the Safe Yield calculation that can be monitored directly while other data sets support analyses to estimate components or check the reasonableness of components.

In addition to the data compiled for this 2019 Annual Report, the Watermaster Engineer has continued compiling historical hydrologic and hydrogeologic information regarding the safe yield components for the Watermaster based on available data. This hydrologic and hydrogeologic database supplements the water accounting spreadsheets developed by the Watermaster Engineer for the purposes of tracking production categories and other requirements of the Judgment. More detailed analyses of safe yield components will occur in future annual reports as funding is available.

3.1 GROUNDWATER BASIN AND ADJUDICATION AREA

The Antelope Valley Groundwater Basin underlies an alluvial valley with ground surface elevations ranging from 2,300 to 3,500 feet above mean sea level (msl). The basin is surrounded on the southwest and northwest by the San Gabriel Mountains and the Tehachapi Mountains, respectively, and on the southeast by a series of low ridges, buttes, and hills.

The southwest and northwest boundaries are controlled by two major geologic fault systems – the San Andreas fault at the base of the San Gabriel Mountains and the Garlock fault at the base of the Tehachapi Mountains. The northern boundary is defined by the contact of alluvial deposits with bedrock. An approximate five-mile section of the northern boundary abuts with the alluvial deposits of the Fremont Valley and is separated by a groundwater divide (**Figure 1**). To the east, a groundwater divide – generally located along the San Bernardino county line – has been used to separate the Antelope Valley from the El Mirage Valley and the Mojave adjudicated area. The Antelope Valley Adjudication Area as defined by the Court is slightly smaller than the groundwater basin (compare the shaded blue groundwater basin with the Adjudication Area on **Figure 1**).

Prior to development, groundwater flowed from the surrounding uplands toward natural surface depressions at ephemeral lake beds in the north (Rosamond Lake) and northeast (Rogers Lake). These natural flow directions have been re-directed locally toward pumping wells.

The basin has a long tradition of agricultural use dating back to the late 1800s. As both agriculture and urban land uses increased during the post-World War II era, groundwater provided about 90 percent of the overall supply. Reliance on groundwater decreased somewhat in the 1970s and 1980s after imported water was available in the basin. However, urban growth, an increase in irrigated acreage, and limitations on availability of imported water resulted in increases in pumping during the 1990s. In 2011, the Court ruled that the basin was in overdraft and required a physical solution to bring the basin into balance.

The physical solution in the Judgment establishes a safe yield for groundwater production and an allocation of that safe yield among basin producers. Two estimates of safe yield are provided in the Judgement:

- Native Safe Yield: 82,300 AFY
  Includes estimates of natural recharge plus return flows from groundwater use
- Total Safe Yield: 110,000 AFY
  Is the sum of Native Safe Yield plus the Imported Water Return Flows.

Native Safe Yield, set by the Court at 82,300 AFY, is based on estimates of natural groundwater recharge from the hydrologic system including subsurface inflows from the surrounding bedrock (referred to as mountain front recharge) and infiltration from precipitation and streamflow. Native Safe Yield also accounts for return flows from basin pumping (described below). As shown on **Figure 2**, the Native Safe Yield is the amount allocated among most of the basin producers. Recognizing that the importation of supplemental surface water adds to the safe yield, a Total Safe Yield of 110,000 AFY was set by the Court, based on average estimates of available imported water and the associated return flows. Allocations of return flows from imported water are assigned to certain Parties listed in the Judgment.

To provide context for data needed to monitor safe yield components, a summary of the Judgment's safe yield calculation is provided in the following sections. The details of the safe yield determination are documented in the Phase 3 Summary Expert Report (Beeby, et al., 2010)[5].

3.2 Safe Yield Determination in the Judgment

The process to develop a safe yield for the Adjudication Area of the groundwater basin involved years of detailed hydrogeologic analyses by numerous technical experts representing various parties in the litigation. The analyses included delineation of basin boundaries, descriptions of the geologic and hydrogeologic setting, evaluation of aquifers and aquitards, examination of water levels, assessment of groundwater occurrence and flow, and detailed accounting of the water budget, including inflows and outflows from the

[5] This report was prepared in association with Phase 3 of the trial. It is recognized that there were multiple phases that are not discussed herein; the Phase 3 Expert Report contains the most relevant information for summarizing the Safe Yield determination in the Judgment.

groundwater system and change in groundwater volume. These analyses culminated in a Summary Expert Report, published in July 2010 (Beeby, et al., 2010).

3.2.1 Natural Groundwater Recharge

Estimates of natural recharge to the groundwater basin developed by technical experts during litigation were used as the foundation of the safe yield determination. For the purposes of this discussion, the use of *natural recharge* refers to recharge associated with the natural hydrologic environment such as precipitation and streamflow. It specifically excludes the concept of return flows associated with groundwater pumping or use of imported water.

It is recognized that the amount of natural recharge does not always equate to the amount of groundwater that can be pumped sustainably from a basin because it is difficult to capture all of the replenished water without losing a significant amount to natural groundwater discharge (e.g., subsurface outflow from a basin). For the Antelope Valley, groundwater discharge to the dry lakes appears to be minimal and to occur only during wet periods. Subsurface outflow is uncertain, but likely occurs along limited segments of the basin boundary. Therefore, estimates of natural recharge were determined to be sufficient as a first approximation of the average annual amount of groundwater that could be used sustainably.

The natural groundwater recharge components were estimated by the technical experts during litigation using two separate methods: 1. a tabular mass balance (referred to as a water balance) approach, which accounted for each inflow and outflow associated with the groundwater system independently, while conserving the mass from the hydrologic cycle, and 2. estimates for changes of groundwater volume over time – developed through a comparison of groundwater elevation contour maps – and then using pumping estimates to solve for inflow (natural recharge). These two methods and results are described below.

3.2.1.1 Natural Groundwater Recharge using a Mass Balance Method

A mass balance approach to the water budget for the basin involves tracking of water into (inflows) and out of (outflows) the groundwater basin. This water tracking is illustrated by a schematic diagram on **Figure 3** (modified from Beeby, et al., 2010). The diagram represents the physical system of the groundwater basin and surrounding watershed. The mountains or uplands that surround the groundwater basin are shown on the left side of **Figure 3**; the playas (dry lakes) that represent a natural discharge area of the groundwater basin are shown on the right. Annual average flows estimated in the 2010 analyses are shown on the diagram in AFY for illustration purposes. In general, groundwater flows northeasterly from the upland areas to the dry lakes.

Precipitation provides the primary water source for the basin, including rainfall (or snowmelt) in the surrounding uplands and rainfall on the valley floor. In the uplands, rainfall either leaves the system through evapotranspiration (ET), runs off the surface into stream channels, or infiltrates into the fractured bedrock (upper left area of **Figure 3**). Some of the infiltrated water discharges back to the stream channels as baseflow; the remaining amount

is available for groundwater recharge, also referred to as mountain front recharge. The 2010 analysis by the technical experts during litigation estimated this amount at about 19,800 AFY, as shown on **Figure 3**.

As mountain streams reach the valley floor, most of the water infiltrates into the permeable alluvium and serves as groundwater recharge (see the mass balance of streamflow on **Figure 3**). This component is considered the largest source of groundwater recharge with estimates of about 30,000 to 40,000 AFY (shown as 36,600 AFY from the mass balance on **Figure 3**). The water budget also recognizes that a small amount of streamflow is diverted for use prior to infiltration. During wet years, flood flows reach the playas, where water pools and evaporates. Some of the flood water may infiltrate the surficial deposits, but the low permeability of the lakebed sediments restricts deep percolation and groundwater recharge. When groundwater levels are high, small amounts of groundwater can also discharge to the playas.

Given the desert climate of the area, rainfall rates on the groundwater basin floor are small, with most of the area receiving less than eight inches per year on average. Given the corresponding high rates of ET in the basin, most of this rainfall evaporates quickly, limiting the available water for infiltration into the basin sediments. The 2010 analyses concluded that groundwater recharge from soil infiltration does not likely occur in basin areas with an average annual rainfall of less than eight inches (Beeby, et al., 2010); that conclusion is supported by numerous technical studies on groundwater recharge in desert basins. While minor recharge occurs from direct precipitation in localized alluvial fan deposits along the northwestern rim of the basin (western edge of the West Antelope Subarea, see **Figure 1**), the overall mass balance indicates that groundwater recharge from direct precipitation is small; as such, it is not quantified on **Figure 3**.

In summary, the two primary sources of natural recharge were determined by the technical experts during litigation to be mountain-front recharge (about 19,800 AFY on **Figure 3**) and infiltration from streamflow (about 36,600 AFY on **Figure 3**), resulting in a total estimated natural recharge of 56,400 AFY.

3.2.1.2 Natural Groundwater Recharge using a Change in Groundwater Volume Method

The estimates for groundwater recharge above were checked for reasonableness by the technical experts during litigation through a separate groundwater level analysis involving the change in groundwater volume over time. This method involved preparation of nine groundwater elevation contour maps for nine years spanning a 59-year period from 1951 through 2009 (study period). These maps were used to assess water level changes (rise or declines) during eight specific time intervals and over the entire study period. Water level surfaces at the beginning and end of each period were electronically subtracted to estimate changes over the entire basin for each period (Beeby, et al., 2010).

In order to relate the water level changes to a volume of groundwater gain or loss, aquifer storage properties were developed based on a texture analysis (e.g., percentages of sand, gravel, silt, and clay) from geologic logs. Texture categories were assigned a storage property, referred to as specific yield (Sy). Sy is defined as the ratio of the volume of water

that will drain under gravity compared to a unit volume of the aquifer (expressed as a percentage) and is used to estimate the volume of water released from storage for a unit change in head. Because Sy varies throughout the aquifer system, the method assigned a Sy that corresponded to the horizontal location and the vertical interval of the aquifer where water levels had changed. This analysis provided the Basin-wide change of groundwater volume for various time intervals.

The change in groundwater volume was applied to the water balance equation as shown below:

Change in Groundwater volume = Inflows (recharge) - Outflows

Because outflows consisted primarily of groundwater pumping, investigators estimated pumping (less return flows) for the same time intervals as the contour map analysis. With estimates for both Outflows and Change in Groundwater Volume, the equation above could be re-arranged to solve for inflows (natural recharge). The change in volume method indicated average annual natural recharge between 55,000 to 58,000 AFY, results very similar to the results of the mass balance analysis described above (56,400 AFY). Recognizing uncertainty in the analysis, a natural groundwater recharge of 60,000 AFY was selected by the technical experts during litigation for the purposes of the safe yield analysis (Beeby, et al., 2010).

3.2.2 Native Safe Yield

Safe yield is defined in the Judgment as "the amount of annual extractions...over time equal to the amount of water needed to recharge...groundwater...and maintain it in equilibrium..." Because safe yield is defined in terms of groundwater extraction, the efficiency of groundwater use requires consideration.

All groundwater pumped from a well may not be consumed; if unused water is allowed to percolate back into the groundwater basin, that amount is referred to as *return flows*. Because it is difficult for irrigation systems to be 100 percent efficient, return flows result from almost all irrigation applications including agricultural, municipal (e.g., landscaping, parks), and domestic (e.g., lawns). In addition to irrigation, other water use practices can result in return flows including conveyance system losses, percolation of wastewater, or septic systems. A conceptual diagram of various groundwater uses and associated return flows is provided on **Figure 4**[6]. The amount of return flows varies with irrigation method, type of losses, soil properties, evapotranspiration, and other factors.

Because these return flows offset the amount of groundwater production in the basin, the amount of sustainable production from the Antelope Valley Groundwater Basin can be higher than the 60,000 AFY estimate for natural recharge. For example, if 25 percent of pumping actually returns to the groundwater system as return flows (indicating that 75

[6] As noted on Figure 4, the diagram was developed to illustrate the concepts of safe yield and does not depict the complexity of the multi-aquifer system of the Antelope Valley Groundwater Basin.

percent of groundwater production is consumed through evaporation, crop transpiration, or human consumption), then a safe yield of 80,000 AFY would allow for consumption of the 60,000 AFY of recharge and 20,000 AFY of return flows (60,000/0.75 = 80,000).

Using a mix of historical and recent land use practices, the Summary Expert Report evaluated various return flow estimates for the purposes of developing a sustainable yield (Native Safe Yield) for the Basin. Given the mix of land use practices observed over a recent 15-year period, an overall return flow of about 27.1 percent[7] was estimated to be reasonable. Applying this to the 60,000 AFY estimate for natural recharge, a Native Safe Yield of 82,300 AFY was derived. As shown on **Figure 2**, this value was used for the total Production Right in the Basin.

3.2.3 Total Safe Yield

Total Safe Yield is defined in the Judgment as the amount of groundwater that may be safely pumped from the Basin on a long-term basis and is specified as the sum of the Native Safe Yield plus return flows from imported water (¶3.5.51 of the Judgment). Beginning in the 1970s, supplemental surface water supplies were imported into the Basin from the State Water Project (SWP). This supplemental water decreased the reliance on groundwater supply and provided water to meet the growing demand of the valley. Depending on use, the SWP water also provides an additional component of groundwater recharge through return flows, increasing the overall safe yield for the Basin. This amount varies substantially with the availability and use of imported water.

In order to consider this supplemental supply in the adjudication, the team of technical experts during litigation evaluated amounts of imported water and its use over time. This analysis led the team to conclude that return flows from imported water resulted in about 27,700 AFY of additional groundwater supply to the Basin. Adding to the Native Safe Yield of 82,300 AFY, this amount provided a Total Safe Yield of 110,000 AFY.

Credits for imported water return flows are assigned in the Judgment according to use (see **Section 4.4** for a description of these credits). Some imported water may be delivered to a recharge facility (e.g., a spreading basin) and recharged directly into the groundwater basin for subsequent recovery and use; such a recharge facility is illustrated conceptually on **Figure 4**. When imported water is recharged directly, there are not "return flows" as defined by the Judgment; return flows occur only after imported water is used directly in the Basin.

The technical analysis in 2010 recognized that safe yield is not necessarily a constant value and can change over time with varying land use and water management practices. As described above, the Native Safe Yield has embedded assumptions of land use and return

[7] This groundwater return flow *percentage* is different from the Imported Water Return Flow percentages specified in the Judgment. Imported Water Return Flows represent a new water source in the basin and increase groundwater availability. Imported water return flows are also associated with a different land use mix (i.e., more imported water is used for municipal purposes, a use associated with a larger *percentage* of return flows compared to agricultural use).

flows. The Total Safe Yield will change based on average amounts of imported water available to the Basin over time. The Judgment allows the Watermaster Engineer to initiate a recommendation to change the Native Safe Yield ten years after the seven-year Rampdown Period (Year 17 of the Judgment).

3.3 CLIMATE DATA

Precipitation in the Antelope Valley watershed is the primary source of natural groundwater recharge and controls the location and pathways of natural recharge in the Basin. Average annual precipitation across the Antelope Valley watershed ranges from 4 inches to 47 inches with an area-weighted average of 8.3 inches per year (Beeby et al., 2010). Upland areas within the watershed but outside of the Adjudication Area account for most of the precipitation available for recharge. Area-weighted average precipitation amounts in the upland watershed are listed below:

- San Gabriel Mountains – 15.4 inches per year
- Tehachapi Mountains – 13.1 inches per year
- Eastern buttes – 8.7 inches per year
- Northern buttes – 9.2 inches per year

Average annual precipitation on the valley floor is typically less than 8 inches per year. Most subareas have an average annual precipitation rate less than about 5 inches per year.

For the 2010 analyses, precipitation data for 23 stations covering a 57-year period (1949-2005) were compiled and analyzed. A portion of these data sets has been compiled for Watermaster files, with an emphasis on active state- or federal-operated weather stations. Data were also obtained from additional stations with recent data to support analyses in this Annual Report (Calendar Year 2019). Many of these stations also provide other climate information such as reference ET (ET_o) and temperature.

Precipitation (and other climate) data for the Antelope Valley Adjudication Area and surrounding watershed are available from the following primary sources: Los Angeles County, California Irrigation Management Information System (CIMIS), and National Weather Service cooperative stations (data available through the Desert Research Institute - DRI). Data have been downloaded from these sources for 46 stations (as of April 2, 2020 or the most recent data available. **Table 3** provides station summary information; station locations are shown on **Figure 5**.

Precipitation data for 2019 are used to determine whether the year was wet, dry or average compared to long-term data. A graph of cumulative monthly 2019 precipitation was compared to similar curves for representative wet, average and dry conditions, using data from the Palmdale station (CIMIS and DRI). These data are shown graphically in the top chart on **Figure 6**; the general location of the Palmdale Station is highlighted on **Figure 5**.

Table 3. Precipitation and Evapotranspiration Stations

ID	Station Name	Elevation (feet msl)	Latitude	Longitude	Source	Period of Record		Frequency
						Min	Max	
1	Mojave		35.04917	-118.16194	DRI	Jan-1904	Feb-2019	Monthly
1005B	County Fire Station #81	2,767	34.51917	-118.28694	LA County	Oct-2016	Current	Daily
1017B	Little Rock Crk Above Dam Percip	3,267	34.47778	-118.02472	LA County	Oct-2016	Current	Daily
1058B	Palmdale W.D.	2,627	34.58806	-118.09194	LA County	Oct-1999	Current	Daily
1060B	Little Rock-Sycamore Camp Pcp	4,012	34.41722	-117.97028	LA County	Oct-2016	Current	Daily
1166B	Mile High Ranch	5,280	34.41111	-117.77083	LA County	Jan-2003	Dec-2017	Daily
117	Victorville	2,890	34.47591	-117.26351	CIMIS	Feb-1994	Current	Daily
120	County Fire Station #80	3,120	34.48833	-118.14194	LA County	Oct-2016	Current	Daily
1212	Lancaster Fss/Faa	2,320	34.73333	-118.21667	LA County	Oct-1999	Sep-2017	Daily
1240	Pearblossom-CALI.DW.R. Booster	3,050	34.50889	-117.92083	LA County	Oct-1999	May-2018	Daily
1242	Rocky Buttes Precip	2,540	34.64611	-117.84528	LA County	Oct-2016	Current	Daily
1243	Redman Precip	2,387	34.76500	-117.92611	LA County	Oct-2016	Current	Daily
1244	Roper Ranch Precip	2,438	34.67306	-118.01083	LA County	Oct-2016	Current	Daily
1245	Quartz Hill Precip	2,427	34.64944	-118.21722	LA County	Oct-2016	Current	Daily
1246	Scott Ranch Precip	2,718	34.79056	-118.45972	LA County	Oct-2016	Current	Daily
1247	North Lancaster Precip	2,340	34.76111	-118.10722	LA County	Oct-2016	Current	Daily
1248	Mescal Smith Precip	3,810	34.46667	-117.71111	LA County	Oct-2016	Current	Daily
1249	G-168 Pump Station	2,941	34.73444	-117.82833	LA County	Oct-2016	Current	Daily
1250	Avek Precip	2,825	34.52333	-117.92389	LA County	Oct-2016	Current	Daily
125B	San Francisquito Canyon Power House No.	2,105	34.59028	-118.45417	LA County	Oct-1999	Current	Daily
1267	Lancaster Reclamation Plant	2,302	34.77722	-118.15306	LA County	Oct-1999	Sep-2017	Daily
1268	Palmdale Reclamation Plant	2,565	34.59167	-118.08611	LA County	Oct-2016	May-2019	Daily
128B	Elizabeth Lake-Warm Springs Cmp Pcp	2,075	34.60833	-118.55944	LA County	Apr-2005	Current	Daily
1291	Rollin Ranch - Valyemo	5,040	34.41722	-117.75722	LA County	Mar-2011	May-2019	Daily
197	Palmdale	2,550	34.61498	-118.03249	CIMIS	Apr-2005	Current	Daily
2	Lancaster FF		34.74111	-118.21167	DRI	Jan-1974	Current	Monthly
220	Palmdale Central	2,630	34.59222	-118.1275	CIMIS	Mar-2011	Current	Daily
299F	Little Rock - Schwab	2,800	34.53667	-117.97861	LA County	Oct-2016	Jun-2017	Daily
3	Pear Blossom		34.50278	-117.89444	DRI	Jan-2015	Current	Monthly
321	Pine Canyon Patrol Station # 78	3,304	34.67417	-118.43083	LA County	Oct-1999	Current	Daily
322	Munz Valley Ranch	2,600	34.71389	-118.35417	LA County	Oct-1999	Apr-2018	Daily
4	Palmdale DRI		34.61498	-118.03249	DRI	Jan-1903	Current	Monthly
409B	Pyramid Reservoir	2,505	34.67611	-118.77972	LA County	Oct-2016	May-2018	Daily
455B	Lancaster - State Hwy. Maintenance Sta.	2,395	34.68250	-118.13389	LA County	Oct-1999	Jan-2018	Daily
517B	Lewis Ranch Precip	4,615	34.41972	-117.88611	LA County	Oct-2016	Current	Daily
542	Fairmont	3,050	34.70417	-118.42778	LA County	Oct-2016	Apr-2018	Daily
564C	Llano	3,394	34.48556	-117.83444	LA County	Oct-2016	Current	Daily
598D	Neenach - Check 43	2,973	34.79472	-118.62222	LA County	Oct-1999	Current	Daily
747	Sanberg - Airways Station	4,510	34.74333	-118.72500	LA County	Oct-1999	Current	Daily
82F	Table Mountain	7,420	34.38222	-117.6775	LA County	Oct-2016	May-2018	Daily
83B	Big Pines Recreation Park Pcp	6,860	34.37889	-117.68889	LA County	Oct-2016	Current	Daily
AL388	Fire Station 114 (Lake Los Angles)	2,710	34.60667	-117.82556	LA County	Oct-2016	Current	Daily
AL468	Fire Station 77	3,459	34.75972	-118.79778	LA County	Oct-2016	Current	Daily
AL480	Fire Station #112 (Antelope Acres)	2,428	34.75444	-118.28833	LA County	Oct-2016	Current	Daily
AL481	Fire Station # 140 (Leona Valley)	3,172	34.61778	-118.28500	LA County	Oct-2016	Current	Daily
AL485	Lancaster Waterworks	2,460	34.66694	-118.12528	LA County	Oct-2016	Current	Daily

Current - Operational as of April 2, 2020

As indicated on **Figure 6**, average annual precipitation in the south-central area of the Basin is about 7.1 inches per year (e.g., 2001, a representative average year); annual precipitation ranges from about 15.4 inches per year in a wet year (1983) to below 2 inches per year with 2.9 inches per year (2012) used as a representative dry year (**Figure 6**). The 2019 annual precipitation was 8.93 inches, slightly above the average. As indicated by the cumulative

precipitation curve and the bar graph on **Figure 6**, the highest rainfall months were January (1.51 inches), February (2.27 inches), and December (2.62 inches).

The 2019 monthly precipitation, along with average monthly precipitation, is shown on the bar graph on **Figure 6**. This chart has been extended through March 2020 for purposes of the discussion of groundwater levels, presented in **Section 3.5.** As shown on the bottom of **Figure 6**, 2019 rainfall was above average for January, February, May, November, and December 2019, but less than or equal to average in the other months of 2019. In early 2020, rainfall was below average for January and February; however, March 2020 precipitation of 2.79 inches was more than double the monthly average of 0.98 inches (**Figure 6**).

3.4 STREAMFLOW DATA

As described above, runoff from the surrounding watershed provides significant groundwater recharge to the Basin (see **Figure 3**). Streams originate in the uplands and flow out onto the valley floor, where most of the water infiltrates into the basin sediments (as illustrated conceptually on **Figure 4**). The most hydrologically significant streams include drainages in the San Gabriel and the Tehachapi mountains, as listed below (Antelope Valley IRWMP, 2013):

- San Gabriel Mountains
  - Big Rock Creek
  - Little Rock Creek
  - Amargosa Creek
- Tehachapi Mountains
  - Oak Creek
  - Cottonwood Creek

The 2010 analyses compiled streamflow data from 18 stations spanning a 61-year period (1949-2009). These data were supplemented with characteristics of channel geometry at gaged and ungaged sites to allow for a more comprehensive assessment of runoff. Almost all historical data from these stations have been downloaded to supplement the Watermaster Engineer data files, but only five of these stations remain active. **Table 4** provides summary information for 24 streamflow stations, including most of the 18 stations used in the litigation, additional stations with available data, and three one-time measuring stations; the active stations provide data through April 2020 (indicated as 'current' in the last column of **Table 4**). Locations of these streamflow stations are shown on **Figure 5** (a few closely-positioned stations appear as one location on the map).

As shown in **Table 4**, discharge volumes are available for 19 streams (including tributaries to primary streams) at 24 gaging stations in the Adjudication Area and surrounding watershed. Also included in **Table 4** are three one-time measurement sites on Amargosa Creek, where the U.S. Geological Survey (USGS) documented infiltration rates for a potential enhanced recharge project for the City of Palmdale (see first three sites in **Table 4**).

Little Rock Creek contains an upstream reservoir, Littlerock Reservoir, jointly owned by PWD and LCID. As shown in **Table 4**, natural inflows are monitored by gage station ID 10264000. PWD maintains records of the discharge and diverts water from the reservoir. In 2019, PWD diverted 2,404.9 AF.

Table 4. Streamflow Gaging Stations

ID	Station Description	Source	Current Agency	Period of Record	
				Min	Max
	Amargosa C Nr Leona Siphon Nr Palmdale, CA (infiltration data only)	USGS			11/29/2013
	Amargosa C A 25th Street W Nr Palmdale, CA (infiltration data only)	USGS			11/29/2013
	Amargosa C Nr Palmdale, CA (infiltration data only)	USGS			11/29/2013
10264503	Barrel Springs Trib A Ca Aq Xing Nr Palmdale Ca	USGS		10/21/1988	2/13/1992
10263630	Big Rock C Ab Pallett C Nr Valyermo Ca	USGS/LA County	LA County F394-R	11/2/1988	Current
10263500	Big Rock C Nr Valyermo Ca	USGS	USGS	1/25/1969	Current
10263675	Big Rock C Wash A Hwy 138 Nr Llano Ca	USGS		12/12/1988	3/17/1993
10264640	Buckhorn C A E 120th Ave Nr Rogers Lake Ca	USGS		12/10/1996	3/7/2001
10263900	Buckhorn C Nr Valyermo Ca	USGS		5/8/1991	5/8/1991
10264550	City Ranch C Nr Palmdale Ca	USGS		1/13/1993	1/13/1993
10264555	Estates C Nr Quartz Hill Ca	USGS		5/1/1989	2/18/1993
10264510	Inn C A Palmdale Ca	USGS		12/16/1988	1/13/1993
10264605	Joshua C Nr Mojave Ca	USGS		4/1/1992	3/16/1993
10264501	Little Rock C A Hwy 138 Nr Littlerock Ca	USGS		4/10/1989	2/24/1992
10264000	Little Rock C At Little Rock Res Nr Littlerock Ca	USGS/LA County	LA County L1-R	1/1/2000	Current
10264682	Mescal C Nr Pinon Hills Ca	USGS/LA County		1/1/2000	5/21/2018
10264658	Mojave C A Forbes Ave A Edwards AFB Ca	USGS		12/6/1997	9/27/2000
10264660	Mojave C A Rosamond Blvd A Edwards Ca	USGS		12/6/1997	3/7/2001
10264600	Oak C Nr Mojave Ca	USGS		12/21/1988	3/16/1993
10263665	Pallett C A Big Rock C Nr Valyermo Ca	USGS/LA County	LA County F122-R	11/3/1988	Current
10264502	Peach Tree C Nr Littlerock Ca	USGS		12/16/1988	3/31/1992
10264530	Pine C Nr Palmdale Ca	USGS		1/13/1990	3/18/1993
10264675	Rogers Lk Trib A Edwards Afb Ca	USGS		2/3/1998	2/3/1998
10264100	Santiago Cyn C Ab Little Rock C Nr Littlerock Ca	USGS/LA County	LA County F1252-R	1/1/2000	Current
10264636	Sled Track Cyn A Lancaster Blvd Nr Rogers Lake Ca	USGS		12/10/1996	3/7/2001
10264508	Somerset C A Palmdale Ca	USGS		1/24/1989	2/17/1994
10264560	Spencer Cyn C Nr Fairmont Ca	USGS		2/14/1992	2/14/1992

Current - Operational as of April 2, 2020

Previously, USGS monitored stream gage stations listed in **Table 4** and published data on the USGS National Water Information System (NWIS). Currently, USGS monitors only one station (Big Rock C Near Valyermo Ca). Los Angeles County now monitors four of the former USGS stations including Big Rock Creek, Little Rock Creek, Pallett Creek, and Santiago Canyon Creek (**Table 4**).

Although data are limited with respect to the number of streams being actively monitored, data from Big Rock Creek and Little Rock Creek provide consistent, long-term data for analysis. In addition, previous work by USGS for the City of Palmdale provides some measured infiltration rates along Amargosa Creek to assist with future estimates of groundwater recharge.

3.5 GROUNDWATER LEVELS

USGS currently monitors water levels in approximately 146 wells within and adjacent to the Antelope Valley Adjudication Area. Wells in recent USGS monitoring programs are shown on **Figure 7**. The number of wells in this regional monitoring program varies from year to year based, in part, on access and well status/operation. Water level monitoring occurs in Spring and Fall of each year, with most wells typically measured in March and a smaller subset measured in October. The network contains relatively good coverage for each of the Management Subareas (**Figure 7**). The network also contains wells in alluvial areas adjacent to the Adjudication Area including Fremont Valley and north of the Rogers Lake Subarea, if needed.

The USGS monitoring program was developed, in part, to comply with the California Statewide Groundwater Elevation Monitoring (CASGEM) program for the groundwater basin. This program was developed by the Antelope Valley State Water Contractors Association (District 40, 2014[8]); program costs were previously shared by AVEK, LCID, and PWD, with additional funding from USGS. Recognizing its benefits for the safe yield component monitoring, the Antelope Valley Watermaster has agreed to share in the program costs and has provided about $15,000 to $16,000 per year to the program since 2017.

Most of the wells in the monitoring program are production wells rather than dedicated monitoring wells. USGS has implemented monitoring protocols to avoid inaccurate water levels measurements that may be affected by recent pumping. To supplement these data, the Watermaster Engineer has been identifying and requesting data from monitoring wells owned by others in the Basin to incorporate into the program. This process includes any new monitoring well applications approved by Watermaster Staff in the Basin, which requires well owners to provide monitoring data to the Antelope Valley Watermaster. In addition, water level data from monitoring and/or production wells have been provided to

[8] District 40 prepared the CASGEM Monitoring Plan for the Antelope Valley State Water Contractors Association on file with DWR.

the Watermaster Engineer by many of the public water suppliers, imported water suppliers, and mutual water companies in support of the Annual Report analyses.

3.5.1 Water Level Trends and Fluctuations

To examine water level changes over time in representative wells, hydrographs have been prepared for wells with relatively long records in the Watermaster Engineer database. Working hydrographs were initially developed for more than 5,000 wells with elevation data and reviewed to identify representative wells. A quantitative approach was developed in 2019 for hydrograph selection based on the number and duration of water level measurements, local trends and fluctuations, and the spatial distribution of hydrographs throughout the Basin. Specifically, each hydrograph in the program was rated using a simplified point system (low-5 points, medium-10 points, or high-15 points) for the following criteria:

- ***Ongoing/Recent monitoring*** – Wells that are part of the current USGS monitoring network or have recent data were prioritized. If a well had recent data from 2018 or 2019, it was scored high; wells with the most recent data occurring in 2010 to 2017 were scored medium; all other wells were scored low for this criterion.
- ***Historical monitoring*** – Wells were evaluated for the length of the monitoring record by prioritizing wells that provide sufficient data to compare water level trends over the last few decades. Wells with data extending back to 1973 were given a high rating; wells with data only in the last five years were rated low with records in between scored medium.
- ***Number of measurements*** – Each hydrograph was assessed for continuity of monitoring to better evaluate local fluctuations in the Basin. Wells with greater than 50 measurements were scored high, greater than 25 and 15 records were medium and low respectively. Wells with less than 15 measurements were not scored.
- ***Location*** – Wells were prioritized for broad distribution across the Basin, distribution in each subarea, and availability of other wells nearby. Wells were scored based on a high score for unique locations and a low score for numerous wells in clusters.
- ***Trends*** – Finally, each hydrograph was assessed on a qualitative basis for continuity of monitoring, representation of local or regional trends, and presence of outliers or unrealistic/questionable data. Wells demonstrating representative trends with consistent data were scored high, wells with representative trends but without consistent monitoring were scored medium, and remaining wells were scored low.

The 17 top scoring wells (60 points and higher) are shown on **Figure 7**. For wells with similar trends and data, one from each trend group was selected for display. Accordingly, the selected wells are judged to adequately represent the range of local groundwater conditions across the Basin. Backup hydrographs can be used for local specific analyses as needed. Hydrograph data are displayed from 1997 to 2020 representing the last 23 years of groundwater elevations. Although groundwater elevations vary across the Basin, all vertical

scales on the hydrographs cover 100 feet to facilitate comparison of water level trends and fluctuations.

As shown on **Figure 7**, most wells indicate an overall declining trend of varying magnitudes over the 23-year period including at least one well in each Basin Subarea (e.g., hydrographs shown clockwise by USGS_501, USGS_4301, USGS_3501, USGS_5001, USGS_2001, USGS_2901, USGS_31001, USGS_45101, USGS_4801, USGS_5201, USGS_44001, and USGS_101). For some wells with overall declining trends, water levels have stabilized in recent years. In general, declines are less significant in the northern Basin (e.g., USGS_4301, USGS_75101, USGS_3501, USGS_5001, and USGS_2001) and other areas with lower amounts of pumping. The largest decline is indicated in the east-central portion of the Central Antelope Valley Subarea where one hydrograph indicates an overall decline of about 60 feet (USGS_5201). In addition, two representative hydrographs indicate areas where water levels are rising (USGS_1101, USGS_4401), including one well near a groundwater banking project. Wells with semi-annual data indicate seasonable fluctuations (Spring to Fall) of a few feet to more than 10 feet.

Given that this is only the second year of Rampdown, it is too early to draw conclusions regarding impacts from the Judgment on water levels; in addition, the imprint of climate and the availability of imported water also affect Basin water levels. Although a detailed local analysis of water level trends and fluctuations is beyond the scope of this Annual Report, hydrographs are presented to allow for improved monitoring and understanding of Basin-wide trends and fluctuations going forward.

It is recognized that the Antelope Valley groundwater basin consists of multiple aquifers, which also require consideration in any water level analysis. Well construction information is limited and needs to be matched to water level data to the extent available. Additional construction data are being compiled for future analyses on an aquifer-specific basis.

3.5.2 Groundwater Elevation Contour Maps

To further examine groundwater conditions for the 2019 Annual Report, two Basin-wide groundwater elevation contour maps have been prepared for Spring 2019 and Spring 2020, with most data measured in March representing seasonal high water levels. These time periods were selected based on the large amount of available data and the ability to analyze changes in groundwater levels over a one-year period. In addition, Spring measurements are less likely than Fall measurements to be affected by recent heavy pumping, which is typically associated with the summer irrigation season[9]. By developing these two maps one year

[9] It is recognized that March irrigation occurs for some crops in the Antelope Valley, such as alfalfa and carrots, among others. According to a land use study by California State University, Los Angeles (Qiu, 2013), October appears to be the month when most crops in the Antelope Valley are not irrigated (i.e., end of the growing season for carrots and onions and prior to irrigation for winter grains). However, late fall measurements may be complicated by recovering water levels. In addition, other water supply wells may be pumping more in October than in spring. Spring data are also

apart, a change in groundwater volume can be approximated for calendar year 2019, the period covered in this Annual Report.

Wells with water level measurements in either Spring 2019 or Spring 2020 are shown on **Figure 8**. Wells are color-coded by the agency (source) that provided the data. The number of wells for each of these data sets is summarized in **Table 5**. Water level data for the DWR wells was not available for 2019 or 2020 so those wells do not appear in **Table 5** and are not shown on **Figure 8**.

Table 5. Water Level Data by Source

Source of Water Level Data	Wells with 2019 Data	Wells with 2020 Data
U.S. Geological Survey (USGS)	170	146
Sanitation Districts of Los Angeles County (LACSD)	73	62
Antelope Valley-East Kern Water Agency (AVEK)	23	23
Los Angeles County Department of Public Works (LADPW)	52	57
Palmdale Water District (PWD)	20	23
Rosamond Community Services District (RCSD)	3	2

Contours were generated from these data using an electronic contouring program and adjusted locally, as needed. Wells outside the Adjudication Area were used to slightly adjust the orientation of the contours along the northern edge of the Adjudication Area, but those wells are not used in the change in storage analysis and are not shown on the contour maps to avoid confusion. Wells with measurements in only one of the two-time periods were reviewed to determine if the incomplete data created artificial differences in the two contour maps. Where this occurred, wells were removed for the purposes of the change in storage analysis.

Management Subareas defined in the Judgment are considered in the analysis (**Figure 8**). Because some of these boundaries were developed along known or inferred geologic faults, data were examined to determine if groundwater elevations indicated a discontinuity across a Subarea boundary. In the southeast, the subarea boundary between the South East Subarea and the Central Antelope Valley Subarea was observed to create a discontinuity,

---

preferred by DWR for adjudication basin reporting. For these and other reasons, spring measurements are retained for the purposes of monitoring water levels and groundwater storage in the Basin.

but the line of discordance was slightly different from the Judgment-defined subarea boundary. For purposes of the groundwater elevation analysis, an additional line was added in that area for purposes of contouring the data.

The contour maps for March 2019 and March 2020 are presented on **Figures 9** and **10**, respectively and discussed below.

Spring 2019 Water Levels: As shown on **Figure 9**, groundwater elevation contours in the southeast and west-northwest portions of the map indicate relatively large hydraulic gradients (contours closely spaced) and groundwater flow toward the central portion of the Basin. Water levels are lowest in the Palmdale area and adjacent areas to the northeast – areas where much of the groundwater production occurs in the Basin. The lowest water levels during March 2019 are below 2,100 feet msl in Palmdale (**Figure 9**). Relatively low groundwater elevations (below 2,200 feet msl) are also observed in the Rogers Lake Subarea beneath Edwards Air Force Base in the north. This dry lake area represents one of the natural discharge areas of the Basin.

In past Annual Reports, groundwater contours were not shown for a portion of the South East Subarea because of lack of reliable groundwater level data in that area. Since then, records for a well within this previously-excluded area became available and are used to generate groundwater contours throughout the South East Subarea (**Figure 9**). However, the inclusion of this well indicates groundwater elevations in and around the previously-excluded area approximately 300 feet lower than previously mapped. Consequently, the Spring 2019 contour map has been revised from the Spring 2019 contour map presented in the 2018 Annual Report.

As indicated by the contours on **Figure 9**, there are two subarea boundaries that appear to impede water levels and create discontinuities in water levels. In the northwest, the boundary between the Willow Springs Subarea and the West Antelope Subarea creates such a discontinuity as indicated by a break in the contours (**Figure 9**; see **Figure 8** for Subarea names). This boundary is located generally along the fault zone of the Willow Springs, Cottonwood, and Rosamond faults, indicating that the faults impede water levels in the subsurface. *The change in water levels across the fault zone ranges from about 300 feet on* the eastern part of the boundary to more than 400 feet in the west.

In the southeast, the boundary between the Central Antelope Valley Subarea and the South East Subarea also indicates an area of disruption in water levels. The presence of the buttes and bedrock outcrops near and along the boundary suggests geologic faulting (inferred) and the subarea boundary has been based on both geologic (faults) and hydrogeologic (water levels) data. Although recent data confirm a discontinuity in groundwater elevations along the northern portion of the subarea boundary, the line of discontinuous groundwater elevations diverges from the subarea boundary along its southern portion (on **Figure 9**, compare the Management Subarea boundary shown in black with the line of discontinuous groundwater elevations shown in orange). For contouring purposes, an additional boundary line (shown in orange on **Figure 9**) has been interpreted. The water level declines around pumping wells northwest of the boundary do not appear to be affecting water levels

southeast of the boundary. Water level differences of about 100 feet (northeast part of the boundary) to more than 300 feet (along the contouring zone boundary) are indicated on **Figure 9**. The remaining Management Subarea boundaries of the Central Antelope Valley Subarea (with the Rogers Lake Subarea to the northeast and the West Antelope Subarea to the northwest) do not appear to impede groundwater flow.

Spring 2020 Water Levels: Groundwater elevation contours for Spring 2020 are shown on **Figure 10**. Given the scale and contour interval of the maps, water levels on **Figure 10** appear almost identical to water levels on **Figure 9**. Previous analyses indicate that, except in areas of localized recharge or near certain pumping centers, water levels only change a few feet in most Basin areas from year to year; this observation is consistent with the 2019 and 2020 data and the hydrographs displayed on **Figure 7**. Patterns of groundwater flow and hydraulic gradients are also similar on both contour maps. The two Management Subarea boundaries that disrupted the contours for 2019 on **Figure 9** are also interpreted similarly on **Figure 10**.

Water Level Change from Spring 2019 to Spring 2020: Notwithstanding the similarities in **Figures 9** and **10**, several local areas have experienced significant water level changes from Spring 2019 to Spring 2020. For illustration purposes, the two contour maps have been electronically subtracted to develop a contour map of water level change, as presented on **Figure 11**. The changes are highlighted with color – areas of water level rise are shown in blue, and water level declines are shown in orange. Light yellow represents areas where water levels are generally unchanged. Contours have also been added to the map to more clearly differentiate among the areas of water level changes.

As shown on **Figure 11**, there are numerous areas of localized changes, the largest of which appear to be associated with local pumping centers (lower water levels) or groundwater banking areas (higher water levels). For example, water levels at the AVEK Westside Water Bank in the West Antelope Subarea increased more than 40 feet from 2019 to Spring 2020 (**Figure 11**). These changes are consistent with the timing of recent recharge at the groundwater bank; AVEK recharged 46,654 AF in 2019 and an additional 5,902 AF in January through March 2020 at the Westside Water Bank. Increases are also noticed in the Upper Amargosa Creek Recharge Project area in the southern portion of the Central Antelope Valley Subarea and in the vicinity of the AVEK Eastside Water Bank. In 2019, AVEK spread[10] 1,160 AF in the Eastside Water Bank and 9 AF in the Upper Amargosa Creek Recharge Project area. In addition, AVEK spread 409 AF at the Upper Amargosa Creek Recharge Project area and 96 AF at the Eastside Water Bank between January and March 2020. Although these volumes are smaller than at the Westside Bank, recharge at upper Amargosa Creek occurred over a smaller area where basin sediments are thinner and, as such, recharge has a larger impact on local water level changes.

[10] The word "spread" is generally used in this report to mean the amount of water delivered to a recharge basin and spread in its ponds. The word "recharge" is generally used in this report to mean the amount of spread water that is presumed to percolate into the basin.

Other areas of smaller localized water levels changes are observed across the Central Antelope Valley Subarea. As indicated by the blue shading on **Figure 11**, water levels have risen between 0 and 10 feet over a broad area in the west and in smaller areas in the northeast and southeast portions of the Central Antelope Valley Subarea. As indicated on **Figure 6**, above average rainfall occurred in November and December of 2019, and in March of 2020, which is associated with increases in recharge and surface water supply coupled with decreases in pumping.

The South East Subarea had the largest area of overall decline in 2019. Although most wells indicated a decline of less than 10 feet, the changes occurred over a relatively broad area of the subarea.

The Willow Springs Subarea and the Rogers Lake Subarea did not indicate significant water level changes from 2019 to 2020, although most wells indicated a slight decline in water levels. These two subareas have few wells and water levels and changes are less certain due to sparse data.

3.5.3 *Change in Groundwater Volume*

The surface of water level change on **Figure 11** was used to estimate the volume of groundwater change for each subarea and the total Adjudication Area. The methodology involves the application of the aquifer specific yield (Sy, a unitless hydraulic parameter) to the change in water levels to estimate the change in groundwater volume between Spring 2019 and Spring 2020. For this analysis, a methodology was employed similar to the one used in the 2010 Summary Expert Report (Beeby, et al., 2010), whereby a locally-estimated Sy value was correlated to the depth intervals where water level changes occurred at each of the monitoring locations (as discussed previously – see **Section 3.2.1.2** above).

To conduct this analysis, the Watermaster Engineer exported the water level elevations associated with changes from the Spring 2019 to the Spring 2020 map and compared the depth intervals to the Sy data. A Sy value was selected from the 2010 data set for each interval where water levels had either risen or declined. In this manner, the 2019-2020 water level changes occur within the same intervals and textures[11] used to derive the associated Sy value. The storage changes are combined for each subarea as summarized on **Table 6**.

[11] In this context, *texture* refers to the physical nature of the aquifer according to the relative proportions of sand, silt, and clay. These proportions affect aquifer storage parameters including specific yield.

Table 6. Change in Groundwater Volume for Management Subareas

Management Subarea	Area (acres)	Average Specific Yield[1]	Ave. Change Groundwater Elevation (ft)	2019 Change in Groundwater Volume (AF)
Central Antelope Valley Subarea	310,193	0.13	1.72	69,352
Rogers Lake Subarea	177,708	0.15	-0.28	-7,175
South East Subarea	183,666	0.14	-0.60	-15,665
West Antelope Subarea	166,150	0.13	0.55	11,695
Willow Springs Subarea	52,740	0.11	-0.03	-200
TOTAL	**890,457**	-	-	**58,007**

[1]Area-weighted averages are provided for the specific yield and change in groundwater elevation; calculations of change in groundwater volume were performed continuously over the entire water level change surface and do not match a simple multiplication of the averages and the acres.

This analysis indicated an increase of approximately 58,007 AF of groundwater volume from March 2019 to March 2020 in the Basin. As shown on **Figure 11** and in **Table 6**, these changes varied from subarea to subarea across the Basin. Overall increases in groundwater volume occurred in the Central and West Antelope subareas while decreases of groundwater volume occurred in the South East, Rogers Lake, and Willow Springs subareas.

To provide context for these changes, **Table 7** summarizes the historical change in groundwater volume calculations for 2016 through 2019 and indicates a total cumulative change in groundwater volume of 123,790 AF since 2016. In brief, data suggest a net increase in groundwater volume for the West Antelope and Central Antelope Valley subareas and a net decline in the remaining subareas.

The most significant decline in groundwater volume is indicated in the South East Subarea (**Table 7**). It is noted that the groundwater conditions in the South East Subarea are complex due to a series of buttes and hills indicating shallow bedrock (and potential geologic faulting) and aquifers in this area are not well-defined. In addition, a portion of this subarea had been previously excluded from the analysis due to insufficient data in areas of shallow groundwater. Additional data collection and analysis may be warranted for an improved understanding of local groundwater conditions in this subarea.

Table 7. Historical Change in Groundwater Volume

Management Subarea	2016 Change in Groundwater Volume (AF)	2017 Change in Groundwater Volume (AF)	2018 Change in Groundwater Volume (AF)	2019 Change in Groundwater Volume (AF)	2016-2019 Change in Groundwater Volume (AF)
Central Antelope Valley Subarea	60,993	16,258	59,830	69,352	206,433
Rogers Lake Subarea	(4,032)	4,232	(12,663)	(7,175)	(19,638)
South East Subarea	(1,461)	(55,150)	(73,566)	(15,665)	(145,842)
West Antelope Subarea	(4,973)	52,514	28,259	11,695	87,495
Willow Springs Subarea	3,235	(7,144)	(549)	(200)	(4,658)
TOTAL	**53,762**	**10,710**	**1,311**	**58,007**	**123,790**

3.6 Subsidence Monitoring

The historical decline of groundwater levels has been linked to land subsidence in the Basin. Water level declines cause a decrease in the aquifer pore pressure, allowing for re-arrangement and compaction of fined-grained units (i.e., clay) in the subsurface. As these sediments compact, the land surface can sink.

Historical land subsidence from groundwater pumping has been documented by USGS and others in the Antelope Valley (Ikehara and Phillips, 1994). Between 1930 and 1992, up to 6.6 feet of land subsidence occurred near Lancaster. At Edwards Air Force Base, land subsidence has caused cracked (fissured) runways and accelerated erosion on Rogers lakebed. USGS reports that this subsidence has also permanently reduced groundwater storage capacity by about 50,000 AF[12].

The distribution of land subsidence in the Antelope Valley from 1930 to 1992 is shown in feet of subsidence by the red contours on the top figure of **Figure 12** (Ikehara and Phillips, 1994). Historical land subsidence has primarily affected the northern half of the Central Antelope Valley Subarea, and small portions of the West Antelope and Rogers Lake subareas (top figure of **Figure 12**). An analysis of satellite-based InSAR (interferometric synthetic aperture radar) data indicate an additional 0.2 to 0.6 feet of land subsidence occurred between 1993 to 2005 in sections of the subsidence-prone area. Land subsidence from groundwater level declines can be a relatively slow process and continue for years after the pore pressure changes have occurred.

Additional information and data on historical land subsidence are available through USGS, which has established a network of 85 elevation benchmarks for the purposes of monitoring

[12] In general, this loss of capacity is due to a one-time compaction of fine-grained layers that did not likely store significant quantities of usable groundwater.

land subsidence, as shown on the bottom figure of **Figure 12**. In addition, three extensometers have been installed at Edwards Air Force Base to measure land subsidence directly.

More recently, DWR has entered into an agreement with TRE ALTAMIRA, a satellite imagery processing firm, to provide annual maps of ground surface displacement (including land subsidence), primarily for use in development of Groundwater Sustainability Plans (GSPs). These maps of land subsidence are derived from InSAR data published on the DWR online SGMA Data Viewer (TRE ALTAMIRA, 2020). Data were available in the Antelope Valley from October 2018 through September 2019 (WY 2019), covering most of the reporting period for this Annual Report (bottom figure of **Figure 12**).

These InSAR data indicated no to relatively low detectable rates of subsidence throughout the Basin during 2019 (bottom figure of **Figure 12**). Most of the Basin did not experience any measurable land subsidence and, in general, detectable land subsidence was concentrated in the same areas where historical subsidence had been mapped by USGS (top figure of **Figure 12**). In those areas, including the north-central Central Antelope Valley Subbasin and southern Rodgers Lake Subarea, land subsidence ranged up to about 0.5 inches locally, but was generally lower than about 0.1 inches.

Currently, the Watermaster Engineer is using the ongoing water level monitoring program as a proxy for subsidence monitoring. If water levels are maintained above historic lows in key areas of historical subsidence, then decreasing pore pressures in previously un-compacted clay layers can be avoided. By monitoring water levels and maintaining levels above historic lows, when possible, further land subsidence from groundwater pumping can be mitigated.

For future Annual Reports, the Watermaster Engineer will continue to supplement water level monitoring with DWR publicly-available InSAR data, assuming the continuation of online mapping. It is recognized that local subsidence could continue as a result of historical conditions, but if water levels are maintained, exacerbation of this situation can be mitigated.

3.7 Groundwater Quality

Groundwater provides a high-quality water supply for beneficial uses in the Antelope Valley groundwater basin (SNMP, 2014). Total dissolved solids (TDS), an indicator of overall salt and mineral content, are present in groundwater at an average concentration of 300 to 350 milligrams per liter (mg/L) (DWR, 2004; SNMP 2014). These concentrations reflect a relatively low salt content and are significantly below the California Upper Secondary maximum contaminant level (MCL)[13] of 1,000 mg/L, which is based on aesthetic effects.

[13] Secondary MCLs are non-mandatory water quality standards established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations such as taste, color, and odor. These standards are not health-based and do not indicate a risk to human health.

Figure 13 shows a distribution of the maximum TDS concentrations in wells sampled between January 2010 and March 2020. Data are from the State Water Resources Control Board (SWRCB or State Board) Groundwater Ambient Monitoring and Assessment (GAMA) program and supplemented by USGS monitoring. Data were downloaded from the GAMA Groundwater Information System (SWRCB, 2020) and the USGS NWIS (USGS, 2020).

As shown on **Figure 13**, groundwater contains relatively low TDS over most of the Basin. TDS concentrations increase in the northern Basin with concentrations up to about 800 mg/L near the dry lakes and higher than 1,500 mg/L in a localized area in the northeast portion of the Rogers Lake Subarea (**Figure 13**). Other local areas of elevated TDS concentrations are found in the northeastern and southern portions of the Central Antelope Valley Subarea.

Consistent with other desert basin aquifers in Southern California, natural trace elements, such as arsenic and boron can be elevated locally in the Antelope Valley (USGS and SWRCB, 2013). In general, groundwater quality meets drinking water standards and water quality management goals throughout most areas of the Basin (SNMP, 2014).

As part of the CASGEM monitoring plan, USGS samples a subset of Antelope Valley wells for groundwater quality. Sampling occurs in about 35 CASGEM wells on a rotational basis. Typically, about 10 wells are selected for chemical analyses, with the remaining wells sampled for specific conductance and temperature only. Data are archived online in the USGS NWIS.

In addition to the USGS analyses, public water suppliers are required to sample groundwater quality in public supply wells. Each entity has groundwater quality monitoring requirements associated with its permit from the Division of Drinking Water (DDW), SWRCB. Data are summarized in Consumer Confidence Reports prepared annually by the water purveyors. DDW (formerly Department of Public Health) also maintains these data in a public water quality database. Several public water suppliers have also provided recent groundwater quality data to the Watermaster Engineer.

The Salt Nutrient Management Plan for the Antelope Valley (SNMP) has developed a groundwater quality monitoring plan using wells from the SWRCB GAMA program (SNMP, 2014). The plan includes 23 wells owned and operated by established water utilities or the U.S. Air Force in central and southeast portions of the Basin. The program supplements ongoing groundwater monitoring programs by monitoring constituents associated with management goals in the Basin including TDS, nitrate, chloride, arsenic, total chromium, fluoride, and boron.

Data from these monitoring programs can be accessed by the Watermaster Engineer as needed to evaluate changes in any key constituents of concern in local areas.

3.8 Surface Water Quality

Numerous local agencies monitor the various sources of surface water in the Adjudication Area. Collection of the quality data for imported water (SWP water), recycled water, and

stormwater is ongoing; data can be compiled into the Watermaster database in the future for analysis depending on priorities and budget.

SWP water is treated at the PWD Leslie O. Carter Water Treatment Plant (WTP) for use by PWD and LCID. SWP water is also treated at four AVEK treatment facilities (Quartz Hill WTP, Eastside WTP, Rosamond WTP, and Acton WTP). SWP water is high quality with TDS concentrations typically in the upper 200 mg/L range.

Recycled water is produced at the Los Angeles County Sanitation District's (LACSD) Palmdale and Lancaster water reclamation plants (WRPs), Edwards Air Force Base (EAFB) Air Force Research Laboratory Treatment Plant and the Main Base Wastewater Treatment Plant (WWTP), and the RCSD's WWTP. Tertiary treated effluent from LACSD is used for agriculture, purple pipe system (parks, landscaping, etc.), and environmental purposes. Treated water from the two EAFB plants is used only on the base. The RCSD WWTP has the capacity to treat 1.3 million gallons per day (mgd) of secondary-treated water and 0.5 mgd of tertiary-treated water.

The RCSD WWTP is in the process of being upgraded and currently discharges its wastewater in clay-lined ponds for evaporation. Improvements to the RCSD WWTP are in progress, including denitrification of effluent; when upgrades are complete, RCSD will use percolation ponds to recharge effluent into the local groundwater basin under a new Waste Discharge Permit and Monitoring and Reporting Plan. These data will be accessed and reviewed by the Watermaster Engineer under conditions of a Storage Agreement with the Watermaster.

Currently, recycled water in the Antelope Valley meets most drinking water standards (SNMP, 2014). EAFB recycled water quality tends to have higher salt and nutrient concentrations (e.g., TDS, nitrate, chloride); elevated TDS and chloride concentrations have been linked to the higher mineral content in the lower aquifer, which serves as the source water for recycled water in that area (SNMP, 2014).

Littlerock Reservoir, jointly owned by PWD and LCID, collects runoff from the San Gabriel Mountains. Water from Littlerock Reservoir discharges to Lake Palmdale and is subsequently treated at the PWD treatment plant. Water quality in Lake Palmdale is considered good with TDS concentrations of about 150 mg/L (SNMP, 2014).

3.9 Groundwater Production Monitoring and Meter Installation

The Physical Solution allocates groundwater production of the Native Safe Yield among numerous parties to the Judgment including the U.S. Federal Government, the State of California, Overlying Producers (Exhibit 4 of the Judgment), Non-Overlying Producers (Exhibit 3 of the Judgment), and members of the Small Pumper Class (see **Figure 2**). Although exact locations for all production wells are not known, locations of active wells were compiled (or approximated) during the adjudication litigation to support development of a groundwater model. This work was conducted by Geoscience Support Services as

technical experts in the litigation to analyze the recovery of the basin with reduced groundwater pumping.

Model input files were obtained from Geoscience Support Services by the Watermaster Engineer in February 2018 to support future analyses. These files contain locations of a partial list of wells owned by Parties in the Judgment as shown on **Figure 14**. The map shows locations of water supply wells owned by the Public Water Suppliers (yellow), Agricultural Landowners (green), the U.S. Federal Government (brown) and the State of California (blue) at the time of the trial (about 2014). The service areas of the Public Water Suppliers are also shown on **Figure 14** to better differentiate among the wells. The Watermaster is in the process of getting location information for wells within the Adjudicated Area. This map will be updated with that information in the 2020 Annual Report.

The production wells owned by Mutual Water Companies (MWCs) (included in Exhibit 4 of the Judgment) are represented in the model well files by parcels served, as shown by the striped parcels on **Figure 14**. Well locations for additional Exhibit 4 Parties and other Parties with rights to produce groundwater (e.g., the Non-Stipulating Parties) were not available in the well file.

For this annual report, a basin-wide map showing the distribution and amounts of groundwater pumping in 2019 has been developed from information provided by Parties on their 2019 Annual Production Reports (**Figure 15**). Only wells with known locations (most by APNs) are shown on the map. The large red circles indicate areas where production is over 1,000 AF in 2019 and can represent more than one well in close proximity. The slightly smaller orange circles designate areas where production ranged from 100 to 1,000 AFY, while yellow circles indicate areas where production was between 50 and 100 AFY. Green circles indicate areas with production greater than 0 but less than 50 and blue circles indicate wells that did not produce anything in 2019. As indicated on **Figure 15**, groundwater pumping occurs throughout the Basin with the most concentrated area of pumping in the eastern half of the Central Antelope Valley Subarea. Production totals for the Basin and by Party are included in the water accounting discussions in **Section 4** of this report, along with various related appendices.

The open purple circles on **Figure 15** represent wells where 2019 production has not yet been reported. A list of outstanding production reports is included in **Appendix M**. The Watermaster Staff and Watermaster Engineer are in the process of requesting/gathering missing well APNs for about 34 Exhibit 3, Exhibit 4 and Non-Stipulating Parties. Only about one-third of the Non-Stipulating Parties have reported 2019 Annual Production, which totals less than 500 AF.

The Watermaster is in the process of identifying the Small Pumpers in the Adjudicated Area. A review of Los Angeles County and Kern County parcel databases was conducted in late 2019 and early 2020 to identify potential Small Pumper parcels[14]. This list of potential Small

[14] District 40 volunteered its staff time to conduct this review. The Watermaster is appreciative of this offer and efforts.

Pumpers is being reviewed and refined to eliminate duplicates and identify properties that receive water from a water district.

Potential Small Pumpers identified from this database search is represented by parcel locations shown on **Figure 16**. This map replaces the Small Pumper parcel map shown in the 2018 Annual Report that was based on model input files obtained from Geoscience Support Services by the Watermaster Engineer. These more-recently developed parcels will be verified over time, combined with parcels from newly-defined Small Pumpers (from unknown Small Pumpers submitting qualification applications), and presented in future Annual Reports. These locations will be incorporated into the Small Pumper monitoring program as summarized in **Section 3.9.2** below.

3.9.1 Production Monitoring and Metering

The Judgment requires the Watermaster Engineer to monitor safe yield components, including groundwater production, and to ensure that reductions in pumping take place pursuant to the terms of the Judgment (¶18.5.2). Since 2018, production monitoring (i.e., reporting) has included documentation of how each Party measures the reported production. Although production in public water supply wells is measured directly with well meters, many of the agricultural and other wells in the Basin did not historically install meters. As such, reported production for those wells has historically been estimated using a variety of methods including electrical records or crop consumption data.

As stated by the Judgment, all Parties (except the Small Pumper Class) have been required to install meters on their wells by December 23, 2017 (within two years after the Judgment) to measure production directly. The Watermaster requested and was granted an extension to March 1, 2018 to complete the required meter installation. The Watermaster Engineer has developed Rules and Regulations providing guidance and requirements for selection, installation, and testing of well meters. The approved Rules and Regulations are posted on the Watermaster website.

To ensure that meters were properly installed, the Watermaster Engineer has selected numerous contractors and qualified personnel as Pre-Qualified Meter Installers. All Pre-Qualified Meter Installers were required to comply with consistent reporting and documentation of new meter installations. In addition, the rules required documentation of existing well meters to ensure that all wells were metered in compliance with the regulations. The requirements also allow for a variance in the rules if well owners can demonstrate that an alternative meter installation will result in accurate production monitoring. Materials related to the meter requirements are available on the Watermaster website, including the pertinent Rules and Regulations, and the list of pre-approved meter installers and testers.

At the end of 2019, there are still some Parties that had not completed metering in compliance with the Rules and Regulations. Watermaster Counsel developed a memorandum with options available for the Watermaster to ensure meter installation compliance and a recommended enforcement process, which was implemented in early

2019. Administrative staff, Watermaster Counsel, and the Watermaster Engineer are working together on enforcement to achieve full compliance with meter requirements. Administrative staff maintains a list of non-compliant Parties for reporting to the Board.

In addition to enforcement activities, procedures will be needed to estimate unreported Production amounts, so that a full water accounting can be performed. This accounting is needed to support other components of the Judgment, such as determining Replacement Obligations or Carry Over amounts.

3.9.2 Small Pumper Class Production Monitoring

The Judgment defined a Small Pumper Class of Producers as "all private (i.e., non-governmental) Persons and entities that own real property within the Basin, as adjudicated, and that have been pumping less than 25 acre-feet per Year on their property during any Year from 1946 to the present" (¶3.5.44). The Judgment allows any Small Pumper Class Member to produce up to 3 AFY for reasonable and beneficial use on their overlying land without being subject to a Replacement Water Assessment (¶5.1.3).

As mentioned above, a review of Los Angeles County and Kern County parcel databases was conducted in late 2019 and early 2020 to develop a reliable list of potential Small Pumper parcels (**Figure 16**). Over 4,000 potential parcels were identified. This list includes all the Small Pumpers listed in the Judgement (*Exhibit A to Judgment Approving Small Pumper Class Action Settlements: List of Known Small Pumper Class Members for Final Judgment*) and is being refined to remove duplicates, identify owners of multiple parcels, and determine which parcels may be subject to water delivery by a public water supplier.

In May 2020, Administrative Staff mailed Administrative Assessment invoices to all of these potential Small Pumper parcels. The invoices covered 2016 to 2020 Administrative Assessments based on an average production of 1.2 AFY per existing household or parcel (¶5.1.3). In addition to an invoice, each Small Pumper parcel also received a Small Pumper Information form to complete and return to the Watermaster with the invoice payment. The information form includes contact information, APN number, and parcel address; this information will be used to update the current Small Pumper list.

The Judgment states that the "primary means for monitoring the Small Pumper Class Members' Groundwater use...will be based on physical inspection by the Watermaster, including the use of aerial photographs and satellite imagery" (¶5.1.3.2). The level of monitoring needed to document this groundwater use, along with appropriate monitoring tools, is being considered by the Watermaster Engineer. The development of a more accurate list of Small Pumpers with parcel locations and contact information is a significant step towards ongoing monitoring of Small Pumper production.

The Watermaster Engineer and Watermaster Counsel have been made aware of multiple Small Pumpers that appeared to be producing groundwater in excess of the maximum amount. As those parties have been identified, the Administrative Staff and Watermaster Counsel have contacted each, worked to obtain relevant data, eliminate any over-

production under the Judgment, and require payment of assessments and other steps to bring them into compliance with the Judgment. Should the Watermaster develop a reasonable belief that any Small Pumper Class Member is using in excess of 3 AFY, the Watermaster can require, among other actions, the well owner to install a meter at the well owner's expense.

The combined steps of refining the Small Pumper list over time and development of land use maps and other information on groundwater use will improve the ability to monitor Small Pumper production as required by the Judgment.

3.9.3 2019 Land Use Monitoring

To provide a Basin-wide perspective for groundwater use, land use in the Adjudication Area will be incorporated into the monitoring program. A color-infrared (CIR) aerial photograph taken in Fall 2018 and provided by the U.S. Department of Agriculture (USDA) is shown on **Figure 17** to illustrate the overall land use in the Basin. This is the most recent CIR aerial photograph available. The USDA typically updates its CIR aerial photograph every two years and the 2020 one will likely be available in 2021. A CIR photograph is particularly useful for interpretation of natural resources, especially vegetation. The Adjudication Area and Management Subareas are also shown on the image, although subarea names have been omitted to maximize the viewing area (see **Figure 16** and others for Subarea names). The Federal lands of Edwards Air Force Base are excluded from this satellite image for national security reasons.

CIR aerial photographs vary in overall tone, which complicates the interpretation of the color tones on the photograph. In general, red tones on the image indicate live vegetation; the red color intensifies with vegetation density and health. This occurs because healthy vegetation reflects significant near-infrared light, assigned to be red on various images. As plant vigor decreases, the vegetation will show as lighter shades of red and pink, various shades of greens, and possibly tans. Dead vegetation (wheat stubble as an example) will often be greens or tans.

The image on **Figure 17** allows for identification of irrigated crops, especially alfalfa fields, by the intense bright red areas of the Basin. As shown on the figure, most of the irrigated agriculture at the time of the photograph (Fall) is indicated in the eastern half of the Central Antelope Subarea. Additional agriculture also occurs throughout the remainder of the Basin, with some fields visible but not being irrigated as of the date of this aerial photograph. A comparison of **Figure 17** with **Figure 14** shows a correlation between the location of agricultural wells and indicated irrigated fields across the Basin.

The number of acres associated with irrigated agriculture in 2019 was obtained from the agricultural commissioners of Kern and Los Angeles counties as shown in **Table 8**. Data compiled for the 2016 through 2018 Annual Reports are also included for comparison on the table. Data for Kern County is from the Kern County Department of Agriculture and Measurement Standards annual GIS crop maps. Data for the Los Angeles County area is

estimated cultivated agricultural lands based on Pesticide and Restricted Material Permits from the Los Angeles County Agricultural Commissioner/Weights & Measures.

Table 8. 2016 to 2019 Estimated Agricultural Acreage in the Antelope Valley

Irrigated Agriculture	Kern County (acres)	LA County (acres)	Total (acres)
2019	1,240	9,218	10,458
2018	1,606	10,651	12,257
2017	3,070	15,884	18,954
2016	2,232	14,219	16,451

Source: Kern County Department of Agriculture and Measurement Standards.
Los Angeles County Agricultural Commissioner/Weights & Measures.

As indicated by the data in **Table 8**, the number of irrigated agricultural acres in the Basin increased by about 15 percent from 2016 to 2017, then decreased by about 35 percent between 2017 and 2018. An additional decrease of about 15 percent occurred between 2018 and 2019. From 2016 through 2019, the data indicate that total irrigated agricultural acres have declined by about 36 percent, commensurate with the mandatory reduction in pumping (Rampdown). As production is reduced during the Rampdown Period in compliance with the Judgment, the irrigated agricultural acreage that is economically viable for farming may continue to decline.

4 WATER ACCOUNTING

This section provides details on the water accounting for the Parties to the Judgment. The accounting process includes documentation of the Rampdown schedule, 2019 production, actual Rampdown use, allocation and use of Imported Water Return Flows (IWRFs), Carry Over water, and information on other water categories such as transfers and storage. Also included are details on the wastewater and recycled water practices that occurred within the Adjudication Area in 2019 and details on the well applications program for 2019.

Production Rights, Rampdown, Unused Federal Reserved Water Right, Imported Water Return Flows, and Carry Over water available to each Party in 2019 are tabulated in a single line entry for each Party in the tables in **Appendix B**. Other water available to Parties, such as transfers and storage, are tabulated in separate appendices and discussed in more detail in this section. Accounts remain incomplete for Parties that have not reported their 2016, 2017, 2018, and/or 2019 annual production. Parties are encouraged to contact the Watermaster Staff and Watermaster Engineer if their records differ from what is presented in this report.

4.1 PRODUCTION RIGHT AND PRODUCTION CATEGORIES

Production Right is defined in the Judgment as "the amount of Native Safe Yield that may be Produced each Year free of any Replacement Water Assessment and Replacement Obligation. The total of the Production Rights decreed in this Judgment equals the Native Safe Yield" (¶3.5.32). The circle graph on **Figure 2** illustrates the allocation of Production Rights among the Antelope Valley Producers, which totals 82,300 AFY[15].

Additional groundwater production categories are identified throughout the Judgment; the primary production categories are listed on the left side of **Figure 2**. These categories, including provisions and limitations in the Judgment, have been considered in developing the water accounts. To ensure that the Watermaster Engineer and each Party have the same understanding as to the amounts of water in each Party's accounts, selected tables of these accounts will be posted on the Watermaster website.

4.2 RAMPDOWN SCHEDULE

In accordance with Paragraph 8.3 of the Judgment, Producers that were allocated a portion of the Native Safe Yield (except the Small Pumper Class, the State of California and the United States) must reduce production from a Pre-Rampdown Production amount to the Production Right. In this manner, the Basin will be brought into balance over the seven-year Rampdown Period in accordance with the Judgment-defined Native Safe Yield. The Pre-Rampdown Production amount is defined as the "reasonable and beneficial use of Groundwater, excluding Imported Water Return Flows, at a time prior to this Judgment, or the Production Right, whichever is greater" (¶3.5.28). The Rampdown Period extends from

[15] Figure 2 does not include Production Rights of the Non-Stipulating Parties.

2016 through 2022; the reduction in production associated with the Rampdown occur in years 2018-2022. Accordingly, 2019 is the second year of reduced production during Rampdown.

The Rampdown schedule for 2016 through 2022 for each Party with a Pre-Rampdown Production right is provided in **Appendix A**. **Table A-1** lists the Rampdown schedule for the Exhibit 3 Non-Overlying and Non-Stipulating Parties while **Table A-2** lists the Rampdown schedule for the Exhibit 4 Overlying Producers. Beginning in 2018, Pre-Rampdown Production is reduced linearly over a five-year period to reach the Production Right in 2023, the first year after Rampdown.

Pre-Rampdown Production amounts for the Exhibit 4 Producers were provided in the Judgment. Pre-Rampdown Production amounts (**Table A-1**) for the Exhibit 3 Producers and Non-Stipulating Parties were not provided in the Judgment and the values in **Table A-1** have been approved by the Watermaster Board (Todd Groundwater memorandum dated June 22, 2018).

4.3 2019 Reported Production and Water Accounting

In compliance with the Judgment, Todd Groundwater has worked with Administrative Staff to develop a production reporting process including a reporting form and a deadline for submittals. Although reporting compliance has improved over the three years of implementation, not all Parties have complied with the requirements. Types of Parties and the associated reported 2019 production are summarized in **Table 9**.

Table 9. 2019 Production Reported by Party

Party	Total Number of Parties	2019 Reported Production (AF)	Number of Missing Production Reports
Exhibit 3 Parties	11	23,630.32	0
Exhibit 4 Parties	105	53,395.20	18
U.S. Federal	1	1,240.76	0
State of California	9	0	7
Non-Stipulating Parties[2]	8	508.9	2
TOTALS[1]	134	78,775.18	27

1. Includes 9,261.96 AF of recovery from stored imported water.
2. SCI California Funeral Services, Inc. dba Joshua Memorial Park intervened to become a Non-Stipulating Party in 2019. The Parties and Court are in the process of determining Its Production Right and Rampdown allowance. This Party will be added to the table when these values are final.

The Production Rights of the 27 missing Production Reports add up to about 1,853 AF (see **Appendix M-2**) which represents about 2.3 percent of the Native Safe Yield.

Administrative Staff has been working with Parties to improve production reporting compliance and to infill missing production reports from previous years. The current status of reporting for 2016 through 2018 production is summarized in **Table 10**. Data in **Tables 9** and **10** indicate that reported production has declined since 2016, but accurate amounts cannot be determined without production reporting by all Parties. In addition to non-reporting Parties, these two tables do not include all the production categories associated with Native Safe Yield. For example, the following production is not summarized in the tables: metered and unmetered production from the Small Pumper Class members, production that recovers stored imported water, and most of the New Production approved after the Final Judgment. The

Appendix M-2 contains a list of Exhibit 3, Exhibit 4, State of California, United States, and Non-Stipulating Parties that have not submitted a 2016, 2017, 2018, and/or 2019 Annual Production Reports. Rules and Regulations have incorporated incentives for production reporting compliance including requiring complete reporting prior to approval of new wells or transfers. Enforcement actions are being considered to achieve compliance with reporting requirements in the Judgment.

Table 10. Status of Production Reporting for 2016 through 2018

Party	Total Number of Parties	2016 Reported Production (AF)	Number of Missing Production Reports	2017 Reported Production (AF)	Number of Missing Production Reports	2018 Reported Production (AF)	Number of Missing Production Reports
Exhibit 3 Parties	11	31,889.89	0	29,240.30	0	30,849.48	0
Exhibit 4 Parties	104	75,976.84	16	58,819.41	16	50,023.47	12
U.S. Federal	1	1,094.01	0	1,174.00	0	1,321.27	0
State of California	9	0	8	0	8	527.75	6
Non-Stipulating Parties	8	478.6	2	621.55	2	0.08	2
TOTALS	133	109,439.34	26	89,855.26	26	82,722.05	20

Appendix B presents detailed accounting of water sources (Production Right, Rampdown, unused Federal Reserved Rights, Imported Water Return Flows, Transfers, Carry Over water, and use of stored water in lieu of groundwater) for 2019 for each Party to the Judgment. For the 2019 report, columns have been added to similar tables presented in previous annual reports to account for transfer water and to account for the use of stored imported water instead of groundwater for LCID and AVEK. Note that all Parties may not have rights to all these water source types. In addition to the sources of water available for production each year, the tables show the amount of groundwater produced and the sources of water assigned to that production for 2019. Production was first assumed to be derived from each Party's Production Right (as required by the Judgment). Additional production was then assumed to come from Rampdown, allocation of unused Federal Reserved Rights, IWRFs, and then Carry Over, if applicable. More details of IWRFs are in **Section 4.4**.

To facilitate review by the Parties, columns on the tables in **Appendix B** have been numbered and formulas used to develop the account details are shown. Providing the column numbers and formulas allows Parties to better understand how numbers were derived and ensure that the amounts developed by the Watermaster Engineer balance with each Party's internal records.

Tables B-1 and **B-2** present the water accounts for the Exhibit 3 Non-Overlying Producers and the Exhibit 4 Overlying Producers, respectively. **Table B-3** contains water accounts for Other Parties including:

- United States Federal Government
- State of California,
- Non-Stipulating producers
- Antelope Valley Joint Union High School District (AVJUHSD), City of Lancaster, and PPHCSD
- Small Pumper Class members known or suspected to have produced over 3 AFY
- Parties with rights to Imported Water Return Flows but have no other rights to produce
- Defaulted Parties that are known or suspected of producing groundwater and are in the process of requesting New Production or in discussions with the Watermaster.

Finally, **Table B-4** provides water accounts for those entities that have been granted New Production under the Antelope Valley Watermaster Rules and Regulations (see **Section 4.11** for information on the New Production well application process). Replacement Water Assessments must be paid for all New Production. The first successful New Production application was approved in March 2018.

As per the Judgment (¶5.1.4.1), unused Federal Reserved Water Rights (associated with Edwards Air Force Base and Air Force Plant 42) in any given year will be allocated to the Non-Overlying Production Rights holders (except for Boron CSD and West Valley County Water District) in the following year, in proportion to Production Rights set forth in Exhibit 3 of the Judgment. This unused portion of the Federal Reserved Right is to be used by the Non-Overlying parties in the year available and is not subject to Carry Over (¶15). The United States is to give the Watermaster at least a ninety-day notice if its Production is anticipated to increase more than 200 AFY in the following 12-month period (¶11.1). Increased demand by the United States can be meet with increasing Production or by accepting imported water deliveries. Any Party can propose a water substitution or replacement to the United States. If a Party's proposed imported water substitution is agreed upon by the United States, the United States will reduce Production by that amount and the Party can Produce that amount of Native Safe Yield free from a Replacement Water Assessment in addition to their Production Right (¶11.2).

The Non-Stipulating Parties are subject to all provisions of the Judgment but are not entitled to benefits provided by Stipulation, including but not limited to Carry Over and Transfers (¶5.1.10) (**Table B-3**). Other Parties, such as the City of Lancaster and the AVJUHSD, were

given rights to produce groundwater up to certain amounts until recycled water becomes available (**Table B-3**). Phelan Piñon Hills Community Services District (PPHCSD) does not have Production Rights, but according to the Judgment, is allowed to pump up to 1,200 AFY from its Well #14 provided such production does not cause Material Injury and the District pays a Replacement Water Assessment and any other costs deemed necessary to protect Production Rights defined in the Judgment, on all water produced and exported (**Table B-3**). The bottom of **Table B-3** lists six Parties that have rights to Imported Water Return Flows but do not have Production Rights. These six Parties have the right to produce, carry over, transfer, or store these Imported Water Return Flows in the future if they choose.

Small Pumper Class Members can produce up to 3 AFY for reasonable and beneficial use on their overlying land without being subject to a Replacement Water Assessment, reporting production or installing a meter on their well(s). Small Pumper Class Members pumping over 3 AFY are required to install meters on their wells.

Table B-4 lists applicants that have been granted New Production. A total of 34 New Production applications were approved through April 2020 but 5 of these have either encountered dry boreholes and subsequently withdrew their applications or have decided not to drill at this time.

4.4 Imported Water Use and Return Flows

AVEK, PWD, and LCID are State Water Project (SWP) contractors with turnouts along the east branch of the California Aqueduct to import SWP water into the Antelope Valley. AVEK imports SWP water and treats a portion of this water at its four water treatment plants for delivery to its municipal and industrial customers. AVEK also delivers untreated SWP water for agriculture use and recharge for subsequent recovery and delivery to its customers. PWD imports SWP water for treatment through its water treatment plant located at Lake Palmdale and delivers the treated water to its urban customers directly. PWD also wheels small amounts of imported water to AVEK and LCID. LCID does not have a treatment plant for its SWP allocation but has conducted exchanges with AVEK in the past. Some of LCID's SWP Table A water has been delivered to AVEK in exchange for the return of an equal amount of AVEK's approved future allocation of SWP Table A water to LCID. LCID completed an upgrade to their existing recharge facility and a Storage Agreement for banking and recovery was approved in 2020.

Between 2007 and 2018, 5,635 AF of LCID's Table A water has been delivered to AVEK for future return to LCID. This imported water has been included in AVEK imported water totals. In 2019, AVEK did not import any of LCID's Table A SWP water.

Appendix C-1 provides details on the amount of water imported by AVEK, PWD, and LCID, and the amounts recharged (banked), sold to customers, or put into Lake Palmdale in 2019. A total of 74,287.05 AF of SWP water was imported into the Adjudicated Area in 2019. AVEK imported 61,787.05 AF, PWD imported 12,066.00 AF, and LCID imported 434.00 AF.

Appendix C-2 provides a summary of the amount of water spread and recovered at each of AVEK's storage and recovery locations. Information includes the total imported water stored at the beginning and end of 2019 and the amount of water recovered for use inside and outside the Adjudicated Area. For this annual report, banking and recovery information is shown separately for each storage and recovery location, while for past annual reports only the sum of all locations was shown. AVEK provided the Watermaster this information and includes the following recharge locations:

- High Desert Water Bank
- Westside Water Bank
- Eastside Water Bank
- Other AVEK Recovery Locations (West Avenue H Wellfield Project and the WSSP-1 Well locations)

AVEK has been refining its water accounting and has provided a facilities location map and detailed flowcharts showing where its water went in 2019. These are included for reference in **Appendix I.** One flowchart depicts the distribution of AVEK's imported water, groundwater, and recovered water supply (total of 71,021.02 AF) (**Appendix I Figure 2**). The other flowchart depicts water AVEK distributed for other agencies (total of 21,027 AF) (**Appendix I Figure 3**). These flowcharts illustrate the complexity of AVEK's water distribution. Note that the Watermaster Engineer is unable to independently verify all these numbers and relies on the banking Parties to supply accurate information for the annual reports.

Appendix C-3 contains storage and recovery information for the other projects and Parties in the Adjudicated Area. These include Antelope Valley Water Storage LLC, Tejon Ranchcorp, LCID, Upper Amargosa Creek Recharge Project Parties, and the AVSWCA recharge at Big Rock Creek. In 2019, no water was stored or recovered at the Willow Springs Water Bank. In 2019, 1,523 AF was spread at the Tejon Water Bank and no water was recovered.

LCID completed an upgrade to its existing recharge facility and a Storage Agreement for banking and recovery was approved in 2020. It began recharging at the end of 2019 while the Storage Agreement terms were being worked out. In 2019, it spread 234 AF at this location and recovered 28 AF for delivery to its customers. A Storage Agreement for RCSD was also approved in 2020, but it is still in the process of constructing its new Rosamond Water Reclamation Plant. Construction began in November 2019 and is projected to continue for 18 months.

The Upper Amargosa Creek Recharge Project Parties (AVEK, City of Palmdale, PWD, and District No. 40) recharged 9 AF at this location in 2019. The AVSWCA (AVEK, PWD, and LCID) recharged 690 AF at the Big Rock Creek Recharge site in 2019.

All the banks have a storage loss factor of 10 percent except for the Tejon Water Bank which has a storage loss factor of 6 percent. The Tejon Ranchcorp Company is in the process of gathering information supporting this 6 percent storage loss factor and for development of a

Storage Agreement. Antelope Valley Water Storage LLC has recently submitted technical documents for its Willow Springs Water Bank for development of a Storage Agreement. AVEK will also be supplying the Watermaster with technical documents for its banking locations. The need and format for a Storage Agreement for pre-existing banks is currently being discussed along with the potential fees associated with this review and development of the Storage Agreements. These pre-existing banks include AVEK's Eastside Water Bank and Westside Water Bank, the Willow Springs Water Bank, and the Tejon Water Bank.

As provided in Paragraph 5.2 of the Judgment, Parties listed on Exhibit 8 of the Judgment have a right to produce – in any year – Imported Water Return Flows equal to the applicable percentage multiplied by the average amount of imported water used by that Party within the Basin in the preceding five-year period. This calculation does not include imported stored water in the Basin pursuant to a Storage Agreement (see **Section 4.8**). AVEK has rights to the Imported Water Return Flows used by Parties not on Exhibit 8 of the Judgment. **Appendix D** lists imported water use for 2011 through 2019 and Imported Water Return Flows for 2016 through 2020 by the 37 Parties on Exhibit 8. Return flows from agricultural imported water use are set in the Judgment at 34 percent and return flows from municipal and industrial imported water use are set in the Judgment at 39 percent of the amount of imported water used.

Additional information on stored water and storage agreements is provided in **Section 4.8**.

4.5 Carry Over Water

Producers can carry over an unproduced portion of an annual Production Right or a right to Imported Water Return Flows to the next year under certain conditions as defined by the Judgment. Producers are also allowed to purchase imported water and forego a portion of the Production Right to the Carry Over water account (In Lieu Production Right Carry Over, ¶15.1 of Judgment). Carry Over water amounts for Producers with unused Production Rights or Imported Water Return Flows for 2019 are documented in the tables in **Appendix B**. For future Annual Reports, these Carry Over accounts may be tabulated in a separate appendix to show aging of the separate Carry Over accounts. According to the Judgment, water eligible for these accounts may be carried over for up to ten years. At the end of the Carry Over period, the Producer may enter into a Storage Agreement with the Watermaster to store unproduced portions of Carry Over water. If not converted to a Storage Agreement, Carry Over water not Produced by the end of the tenth year reverts to the benefit of the Basin and the Producer no longer has a right to the Carry Over water (¶15.1, 15.2, 15.3).

4.6 Replacement Obligations

The purpose of Replacement Water is to ensure that each Party may fully exercise its Production Right by keeping the basin in hydrologic balance. A Producer has a Replacement Obligation if its production of groundwater is more than the sum of its rights to pump groundwater including Production Rights, Carry Over water, Imported Water Return Flows, in-lieu production, and Stored water. During the first two years of the Rampdown Period

(2016 and 2017), Producers were not subject to Replacement Water Assessment fees. An exception to this was Phelan Pinon Hills Community Services District (PPHCSD). PPHCSD does not have a Production Right, but according to the Judgment is allowed to pump up to 1,200 AFY from its Well #14 provided such use does not cause Material Injury and PPHCSD pays a Replacement Water Assessment and any other costs deemed necessary to protect Production Rights defined in the Judgment, on all water produced and exported.

Replacement Obligations are listed in **Appendix E. Appendix E** includes the producers that have Replacement Obligations, the Replacement Obligation amount, if a transfer or payment was used to fulfill the Replacement Obligation, and the status of recharging the Replacement water. The columns on the left are for 2016, 2017, and 2018 Replacement Obligations and the 4 columns on the right are for 2019 Replacement Obligations.

The State Water contractors in the Antelope Valley area (AVEK, PWD, and LCID) hired an independent contractor to develop a methodology to determine the RWA fee in areas inside and outside of the State Water Contractor service areas (**Appendix O**). The Replacement Water Assessment fee for 2019 was set at $451 per acre-foot for Producers within the State Water Contractor service areas and at $948 per acre-foot for Producers outside the State Water Contractor service areas, with the differences reflecting capital costs paid through property taxes by Parties inside the State Water Contractor service areas.

4.7 TRANSFERS

All transfers of Production Rights or other rights to produce groundwater under the Judgment that have occurred to date are tabulated in **Appendix F**. This year, the transfers have been reported on three separate tables. The **Appendix F-1** table lists permanent transfers that are not associated with a split of rights, the **Appendix F-2** table lists non-permanent transfers that are generally one-time transfers, and the **Appendix F-3** table lists transfers that are associated with a split of Production Rights. Transfers that are associated with a property sale or a successor-in-interest appear in the second column of the water accounting tables (**Appendix B**). No change in Production Rights or production locations are associated with these types of transfers.

The **Appendix F** tables include the names of the Transferor and the Transferee and the parcels associated with each Party. Also listed is the type of transfer (e.g., property sale, transfer of rights, merger, split of rights). The tables also include the transferred amount and date of transfer as well as the status of the voting rights associated with any permanent transfer of Production Rights. The transferees associated with Production Right transfers are also indicated in the second column of the water accounting tables (**Appendix B**) to show who the new owner of those Production Rights is.

Transfer amounts are also shown in the water accounting tables (**Appendix B**) in two places. Transfers that occurred before 2020 are shown in the left portion of the tables in the *Water Available for Use in 2019* section. This transfer water can be used to satisfy a 2018 RWA or becomes supply available for the Party to use in 2019. Transfers that were approved in 2020

are shown at the end (right side) of the **Appendix B** water accounting tables. This is water that the Party has available for use for a 2019 RWA and/or for use in 2020.

Transfers to Parties are represented as a positive number since it is additional water available to that Party while transfers from Parties are represented as a negative number since the Transferee has sold that water to another Party and it is no longer available to the Transferee. There have been no transfers by the Antelope Valley United Mutuals Group[16]. As required in the Judgment, a separate accounting for Antelope Valley United Mutuals Group transfers will occur if any of such transfers take place.

4.8 Stored Water and Storage Agreements

All Parties have the right to store water in the Basin pursuant to a Storage Agreement with the Watermaster. Storage could include Carry Over water or imported water that has been brought into the Basin and recharged. AVEK may export any of its imported Stored Water to any area outside its jurisdictional boundaries and the Basin, provided all water demands within its jurisdictional boundaries are met. Stored Water that originated as other imported water may also be exported, subject to a technical determination by the Watermaster of the percentage of the Stored Water that is unrecoverable; such unrecoverable Stored Water is dedicated to the Basin (¶14 of the Judgment).

Production from Stored Water is not subject to an Administrative Assessment (¶9.1 of the Judgment). Paragraph 6.3 of the Judgment prohibits unauthorized Parties to claim rights to produce any Stored Water recharged in the Basin, except pursuant to a Storage Agreement with the Watermaster.

According to the Judgment, Carry Over water can be carried over for up to ten years. At the end of the Carry Over period, the Producer may enter into a Storage Agreement with the Watermaster to store unproduced portions of Carry Over water. Since this is year four of the Judgment, no Parties have entered into Storage Agreements for Carry Over water.

Several storage and recovery (banking) projects involving Stored Water are currently in operation in the Basin including some projects that were in existence prior to the Judgment. Nothing in the Judgment limits or modifies operations of these preexisting banking projects (operators are listed in ¶14 of the Judgment).

[16] The members of the Antelope Valley United Mutuals Group are Antelope Park Mutual Water Company, Aqua-J Mutual Water Company, Averydale Mutual Water Company, Baxter Mutual Water Company, Bleich Flat Mutual Water Company, Colorado Mutual Water Co., El Dorado Mutual Water Company, Evergreen Mutual Water Company, Land Projects Mutual Water Co., Landale Mutual Water Co., Shadow Acres Mutual Water Company, Sundale Mutual Water Company, Sunnyside Farms Mutual Water Company, Inc., Tierra Bonita Mutual Water Company, West Side Park Mutual Water Co. and White Fence Farms Mutual Water Co., together with the successor(s)-in interest to any member thereof.

In 2019, recharge occurred at the following locations:

- AVEK Westside Water Bank
- AVEK Eastside Water Bank
- Upper Amargosa Creek Recharge Facility (participating Project Parties: City of Palmdale, PWD, District No. 40, and AVEK)
- Big Rock Creek Recharge (participating Parties: AVEK, PWD, and LCID)
- Tejon Ranchcorp and Tejon Ranch Company's Tejon Water Bank
- LCID upgrade to its existing State Water Project water recharge facility.

No water was recharged in 2019 at the remaining recharge locations in the Basin:

- AVEK High Dessert Water Bank
- Antelope Valley Water Storage LLC Willow Spring Water Bank (formerly the Antelope Valley Water Bank).

Additionally, the RSCD Reclamation Water Treatment Plant and recharge ponds upgrade is anticipated to be completed in 2021.

These banking projects are described below, and operations are documented quantitatively in **Appendices C-2** and **C-3**. Storage Agreements with LCID and RCSD were approved in 2020 and listed in **Appendix G**.

AVEK's Westside Water Bank (formally referred to as Water Supply Stabilization Project No. 2 (WSSP-2)) is capable of storing up to 150,000 AF of water using low-bermed recharge basins covering about 1,000 acres of agricultural fields. AVEK's Eastside Water Bank consists of three 2-acre recharge basins and three groundwater wells that are used for recharge and recovery of raw SWP water. The recovered water is blended for delivery to the Eastside Water Treatment Plant. In 2017, AVEK also started recharging water in its new High Desert Water Bank, which is on a 1,500-acre site and will have a 280,000 AF capacity in the groundwater basin to store approximately 70,000 AFY per year of SWP surface water conveyed to the site via the California Aqueduct. **Appendices C-1** and **C-2** summarize AVEK storage and recovery in 2019 at its High Desert, Westside, and Eastside water banks and at its West Avenue H Wellfield and the WSSP-1 Well locations recovery sites.

Another groundwater bank in Antelope Valley is the Willow Springs Water Bank (WSWB) (formerly called the Antelope Valley Water Bank). The WSWB is located on 1,838 acres of agricultural land near Rosamond in Antelope Valley. It consists of percolation ponds and has a reported storage space of 500,000 AF and recharge and recovery capacities of 100,000 AFY. The Southern California Water Bank Authority (formerly called the Semitropic-Rosamond Water Bank Authority) operates the WSWB and the Semitropic Water Storage District Stored Water Recover Unit (SWRU), which is not located in Antelope Valley. Operating both the WSWB and the SWRU, which are located in different areas in Kern County, provides more flexibility to acquire, exchange and deliver water. The combined storage space capacity is reported at 800,000 AF with a 133,000 AFY recharge capacity and a

200,000 AFY recovery capacity. Banking information indicates that 200,000 shares will be issued to customers in the combined facilities. Each share will provide customers with the following capacities:

- 1 AFY recovery plus lower priority capacity when available
- 3 AF in SWRU or 5 AF in WSWB of storage plus lower priority capacity when available
- 0.33 AFY in SWRU or 1 AFY in WSWB of recharge plus lower priority capacity when available.

Water agencies can purchase shares in the water bank and pay annual fees per share plus fees for depositing water and for extracting water. Ten percent of all water deposited in the water bank is required to be left behind to keep the bank viable. The basin is also credited with evaporation losses based on actual conditions including temperature and wind conditions when the percolation occurs (Beuhler, 2017).

In 2019, no water was recharged or recovered from the WSWB (**Appendix C-3**). Pumping of native groundwater did occur in accordance with the bank's Exhibit 4 Production Right (1,772 AF) to support the agricultural property at the water bank.

The Tejon Water Bank was built in 2006 and is owned and operated by the Tejon Ranchcorp and Ranch Company on 160 acres in northeast Kern County. In 2019, 1,523 AF of AVEK water was spread at this recharge location; no water was recovered (**Appendix C-3**).

LCID has just completed an upgrade to its existing State Water Project water recharge facility and a Storage Agreement for banking and recovery was approved at the February 26, 2020 Antelope Valley Watermaster Board meeting. LCID has begun recharging at its 1.25-acre recharge basin and anticipates that annual spreading will generally exceed 400 AFY. The basin can hold approximately 7.5 AF of water at one time and spreading rates will range between 1 to 8 AF/day. In 2019, LCID spread 234 AF in its recharge facility (**Appendix C-3**).

Additional recharge in 2019 also occurred at the Upper Amargosa Creek Recharge Project (9 AF) and at the Big Rock Creek Recharge Site (690 AF) (**Appendix C-3**).

At the end of 2019, these Parties that store water in the Adjudicated Area possess a collective total of 174,445 AF of recoverable stored water (see **Appendices C-2** and **C-3)**. Storage at each location is summarized below.

- AVEK High Desert Water Bank = 5,213.55 AF
- AVEK Westside Water Bank = 107,269.06 (79,459.06 AF is AVEK water and 27,810.00 AF is water that was stored for use outside the Adjudicated Area)
- AVEK Eastside Water Bank = -653.97 AF (deficit)
- West Avenue H Wellfield Project and the WSSP-1 Well locations = -4,133.30 AF (deficit)
- Tejon Water Bank = 47,328.06 AF

- Antelope Valley Water Storage LLC Willow Spring Water Bank = 18,610.10 AF
- LCID recharge facility = 182.60 AF
- Upper Amargosa Creek Recharge Project[18] = 8.10 AF
- Big Rock Creek Recharge Site[17] = 621.00 AF.

To date, the Watermaster has entered into two storage agreements, both approved in 2020 (**Appendix G**). One is with RCSD for recharge of treated wastewater and the other is with LCID for its re-activation of its SWP recharge site. As indicated in **Section 4.4**, the need and format for a Storage Agreement for pre-existing banks is currently being discussed along with the potential fees associated with this review and development of the Storage Agreements. These pre-existing banks include AVEK's Eastside Water Bank and Westside Water Bank, the Willow Springs Water Bank, and the Tejon Water Bank.

4.9 Drought Program

The Judgment contains provisions for a Drought Program which is defined as a water management program – in effect only during the Rampdown Period – that affects the operations and Replacement Water Assessments of the participating Public Water Suppliers (called Drought Program Participants)[18] (¶3.5.12).

During the Rampdown Period, District 40 agrees to purchase from AVEK each year an amount of water equal to 70 percent of District 40's total annual demand or, if that amount is not available from AVEK, as much water as AVEK makes available at no more than the then-current AVEK treated water rate. District 40 is not required to purchase more than 50,000 AFY from AVEK (¶8.4.1). **Table 11** summarizes District 40's total annual demand and the amount of imported water purchased from AVEK between 2016 and 2019.

Table 11. District 40 Water Demand and Imported Water Supply

District 40 Imported Water Use	2016	2017	2018	2019
Total Water Use (Groundwater + Imported)	42,461.14	44,342.76	46,199.45	43,423.22
Imported Water Use	26,459.24	26,946.45	28,925.81	30,610.54
Percent of Imported Water Use	62.31%	60.77%	62.61%	70.49%

During the Rampdown Period, the Drought Program Participants agree to minimize excess groundwater production and use all water made available by AVEK at no more than the current AVEK treated water rate in any year they produce groundwater in excess of their rights under the Judgment. Drought Program Participant Production is not considered

[17] Upper Amargosa Creek Recharge Facility participating Project Parties are the City of Palmdale, PWD, District No. 40, and AVEK. Big Rock Creek Recharge participating Parties are AVEK, PWD, and LCID.

[18] Drought Program Participants are District 40, Quartz Hill Water District, Littlerock Creek Irrigation District, California Water Service Company, Desert Lake Community Services District, North Edwards Water District, City of Palmdale, and Palm Ranch Irrigation District (¶8.4).

excess Production exempt from a Replacement Water Assessment under this Drought Program unless a Drought Program Participant has utilized all water supplies available to it including its Production Right, Imported Water Return Flow rights, unused Production allocation of the Federal Reserved Water Rights, imported water, and Production rights previously transferred from another Party (¶8.4.2).

The Drought Program Participants are exempt from Replacement Water Assessments for Production in excess of their respective rights up to a total of 40,000 AF over the Rampdown Period with a maximum of 20,000 AF in any single year for District 40 and a total of 5,000 AF over the Rampdown Period for all other Drought Program Participants combined. Any excess Production under this Drought Program needs to be for direct delivery to customers within their respective service areas (¶8.4.3). **Table 12** shows the amount of production in excess of Drought Program Participants' available water between 2016 and 2019.

Table 12. Drought Program Participants Production in Excess of Rights

Drought Program Participants	Production in Excess of Rights (AFY)			
	2016	2017	2018	2019
District No. 40	0.00	0.00	0.00	0.00
Quartz Hill Water District	0.00	0.00	0.00	0.00
Littlerock Creek Irrigation District	0.00	0.00	0.00	0.00
California Water Service Company	0.00	0.00	0.00	0.00
Desert Lake Community Services District	0.00	0.00	0.00	0.00
North Edwards Water District	0.00	0.00	0.00	0.00
City of Palmdale	0.00	0.00	0.00	0.00
Palm Ranch Irrigation District[1]	0.00	57.48	41.65	0.00
Total	**0.00**	**57.48**	**41.65**	**0.00**

1. Palm Ranch ID received a one-time transfer of 2,850 AF in 2019 and 41.65 AF of this was used as its Replacement Obligation for 2018 overproduction.

As shown in the table, Palm Ranch Irrigation District is the only Drought Program Participant that produced in excess of its total groundwater rights. In 2019, Palm Ranch Irrigation District received a one-time transfer of 2,850 AF of which 41.65 AF was used as its Replacement Obligation for 2018 overproduction. No Replacement Obligation was needed for the 2017 because during the first two years of the Rampdown Period (2016 and 2017), Producers were not subject to Replacement Water Assessment fees.

4.10 Changes in Use

Annual reports are to include a compilation of changes in use (¶18.5.18.17 of the Judgment). Changes in use have been documented through Transfers (see **Section 4.6** and

Appendix F) and through New Point of Extraction applications (see **Section 4.11** and **Appendix H**).

4.11 Well Applications for New or Replacement Production Wells

New and replacement wells drilled in the Adjudication Area of the Antelope Valley are subject to approval by the Antelope Valley Watermaster. A new well is any well that does not presently exist but is proposed to be constructed. A replacement well is a specific kind of new well that is located within 300 feet of an existing well and owned by the same Party that intends to construct the new well.

There is also an approval process for non-production wells. Non-production wells include piezometers, monitoring wells, and cathodic protection wells that will pump only minimal amounts of groundwater associated with well construction and/or groundwater sampling.

Prior to approval of a well application, the Watermaster Board must make the following findings:

- Applicant has a known right to produce groundwater under the Judgment, or qualifies as an unknown small pumper, or is a non-pumper with no pumping rights but agrees to purchase replacement water.
- Applicant with a right to produce groundwater requests a replacement well (within 300 feet of an existing well) or a new well from a new point of extraction; or applicant is a non-pumper with no pumping rights and requests a well for new production; or applicant requests a non-production well.
- Applicant's well will not cause Material Injury as defined by the Judgment and the Rules and Regulations.

The forms associated with these types of wells applications are available on the Watermaster website:

- Small Pumper Qualifying Documentation
- Replacement Well Application
- Non-Production Well Application (e.g., monitoring wells, test wells, etc.)
- New Point of Extraction Application
- New Production Application.

In 2019, the following well applications and Small Pumper Qualifying Documentations have been approved:

- 7 monitoring wells
- 5 Replacement wells
- 6 New Points of Extraction
- 14 New Production wells

- 33 Small Pumper Qualifying Documentations (3 of these Small Pumper Qualifying Documentations were submitted in association with a Replacement Well application listed above).

Information on these approved applications is listed in **Appendix H**.

4.12 Wastewater and Recycled Water

Antelope Valley area wastewater is treated at LACSD's Palmdale and Lancaster WRPs, EAFB Air Force Research Laboratory Treatment Plant and the Main Base WWTP, and the RCSD's WWTP. Quantities of effluent and reuse for 2019 are tabulated in **Appendix J**.

5 REFERENCES

Antelope Valley Integrated Regional Water Management Plan (IRWMP), Final, 2013 Update, prepared by the Integrated Regional Water Management Group with assistance from RMC Water and Environment.

Beeby, Robert; Durbin, Timothy; Leever, William; Leffler, Peter; Scalmanini, Joseph C.; and Wildermuth, Mark, (Beeby, et al.), 2010, Summary Expert Report Phase 3 – Basin Yield and Overdraft, Antelope Valley Area of Adjudication, July.

California Department of Water Resources (DWR), 2004, California's Groundwater Bulletin 118, Antelope Valley Groundwater Basin 6-44, last updated 2/27/04.

Ikehara, M.E., and S.P. Phillips, 1994, Determination of Land Subsidence Related to Ground-Water-Level Declines Using Global Positioning System and Leveling Surveys in Antelope Valley, Los Angeles and Kern Counties, California, 1992, USGS Water-Resources Investigation Report 94-4184, Sacramento, California, 107 p.

Los Angeles County Waterworks District No. 40 (District 40), 2014, California Statewide Groundwater Elevation Monitoring (CASGEM) Monitoring Plan, Antelope Valley Groundwater Basin (DWR Bulletin 118 Basin No. 6-44), Antelope Valley State Water Contractors Association, September.

Qiu, Hon-lie, Ph.D., 2013, Mapping Past Crop Acreage from Remote Sensing Imagery (2000 – 2012), A Report Submitted to the Antelope Valley – East-Kern Water Agency (AVEK), Department of Geosciences and Environment, California State University – Los Angeles, July 15.

Salt and Nutrient Management Plan (SNMP) for the Antelope Valley, 2014, prepared by Los Angeles County Department of Public Works Waterworks District No. 40, Los Angeles County Sanitation Districts Nos. 14 and 20, Antelope Valley Salt and Nutrient Management Planning Stakeholders Group, May.

State Water Resources Control Board (SWRCB), 2020, Groundwater Ambient Monitoring and Assessment (GAMA), accessed May 2020, https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/.

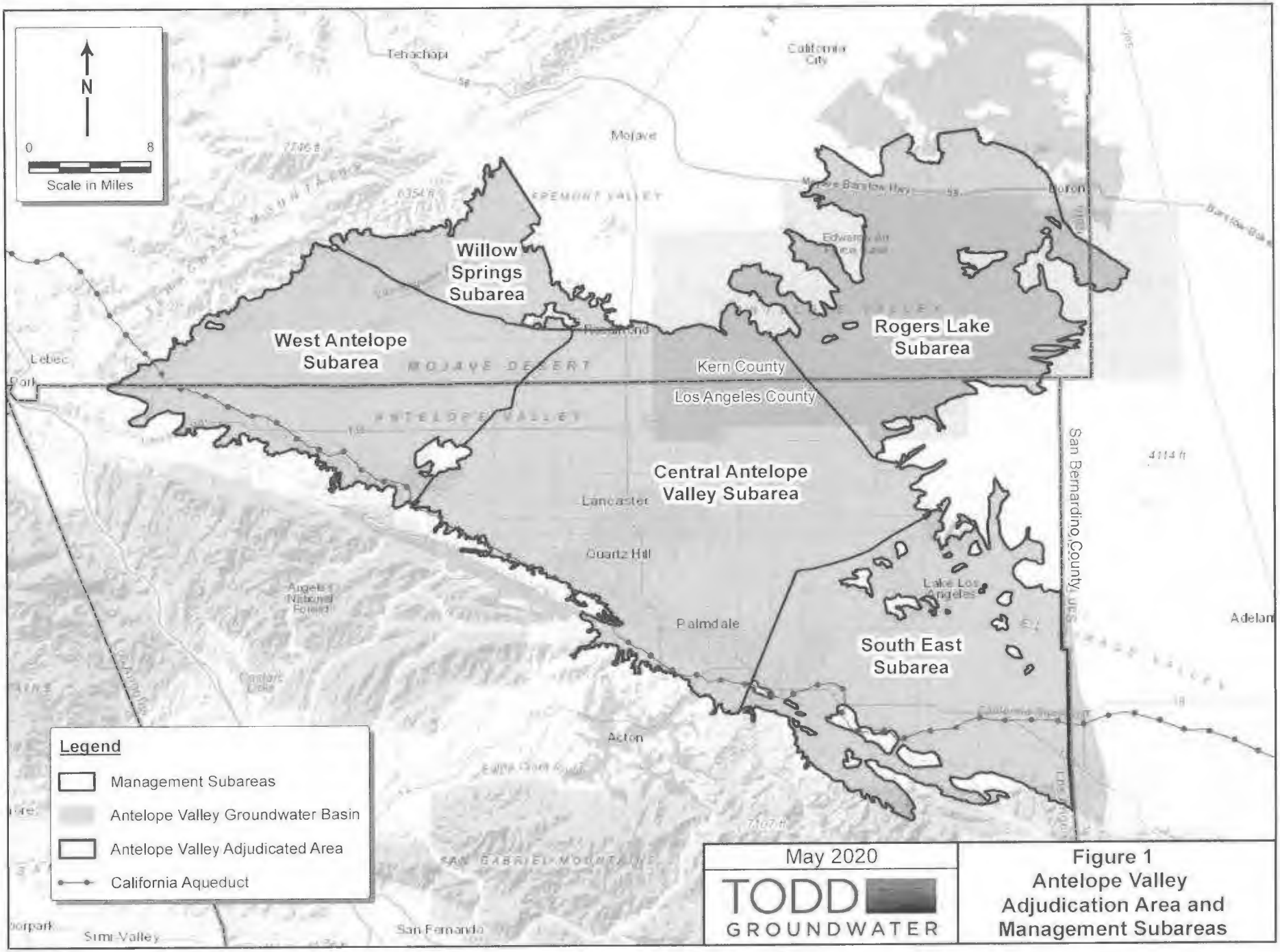
TRE ALTAMIRA, 2020, InSAR Land Surveying and Mapping Services in Support of the DWR SGMA Program, March, accessed May 2020, https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub.

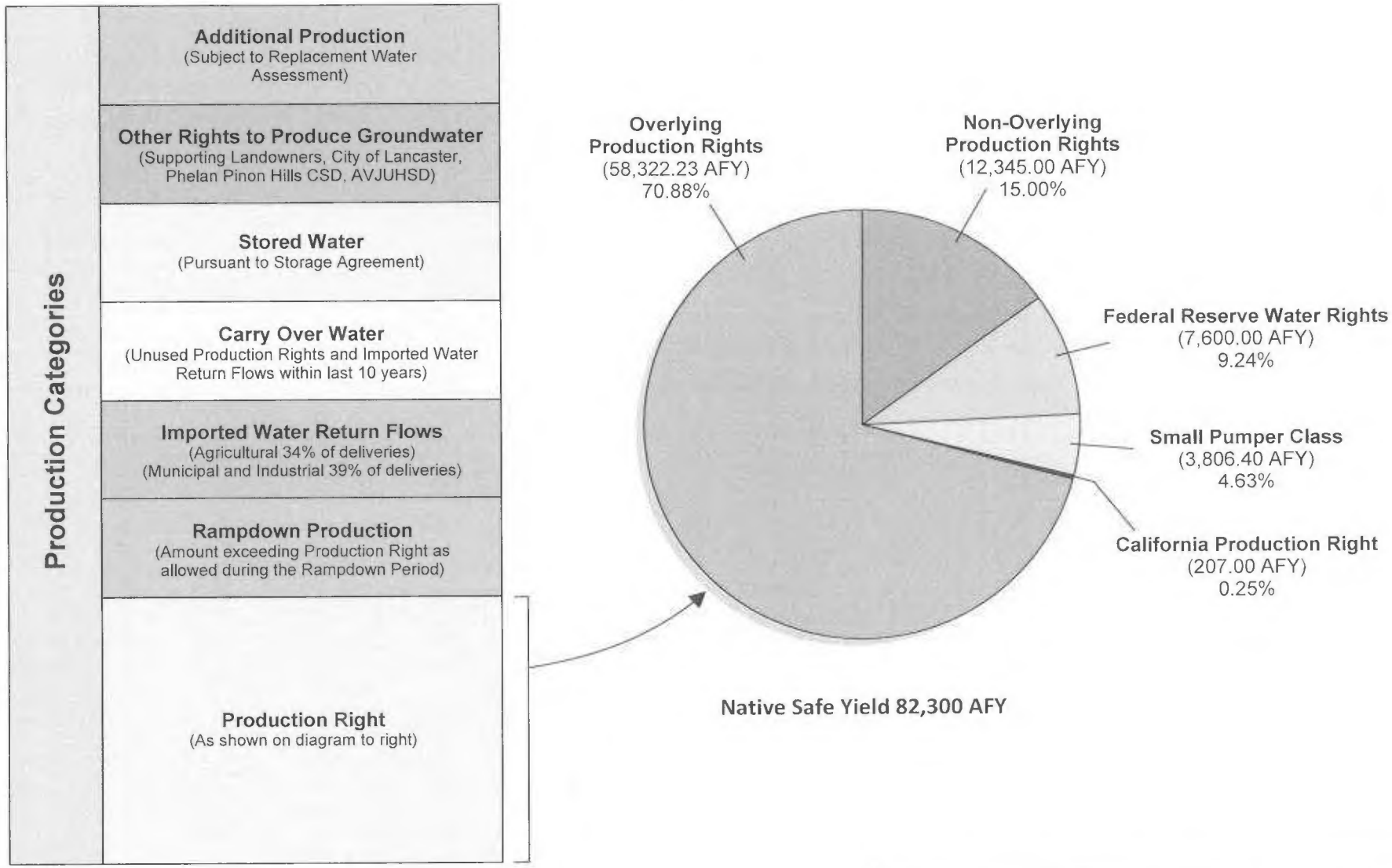
U.S. Department of Agriculture (USDA), 2018, Color-infrared (CIR) aerial photography, Antelope Valley – Palmdale area, California.

U.S. Geological Survey (USGS) and the California State Water Resources Control Board (SWRCB), 2013, Groundwater Quality in the Antelope Valley, California, Fact Sheet 2012-3033, January.

U.S. Geological Survey (USGS), 2020, National Water Information System, accessed May 2020, https://waterdata.usgs.gov/nwis.

Figures

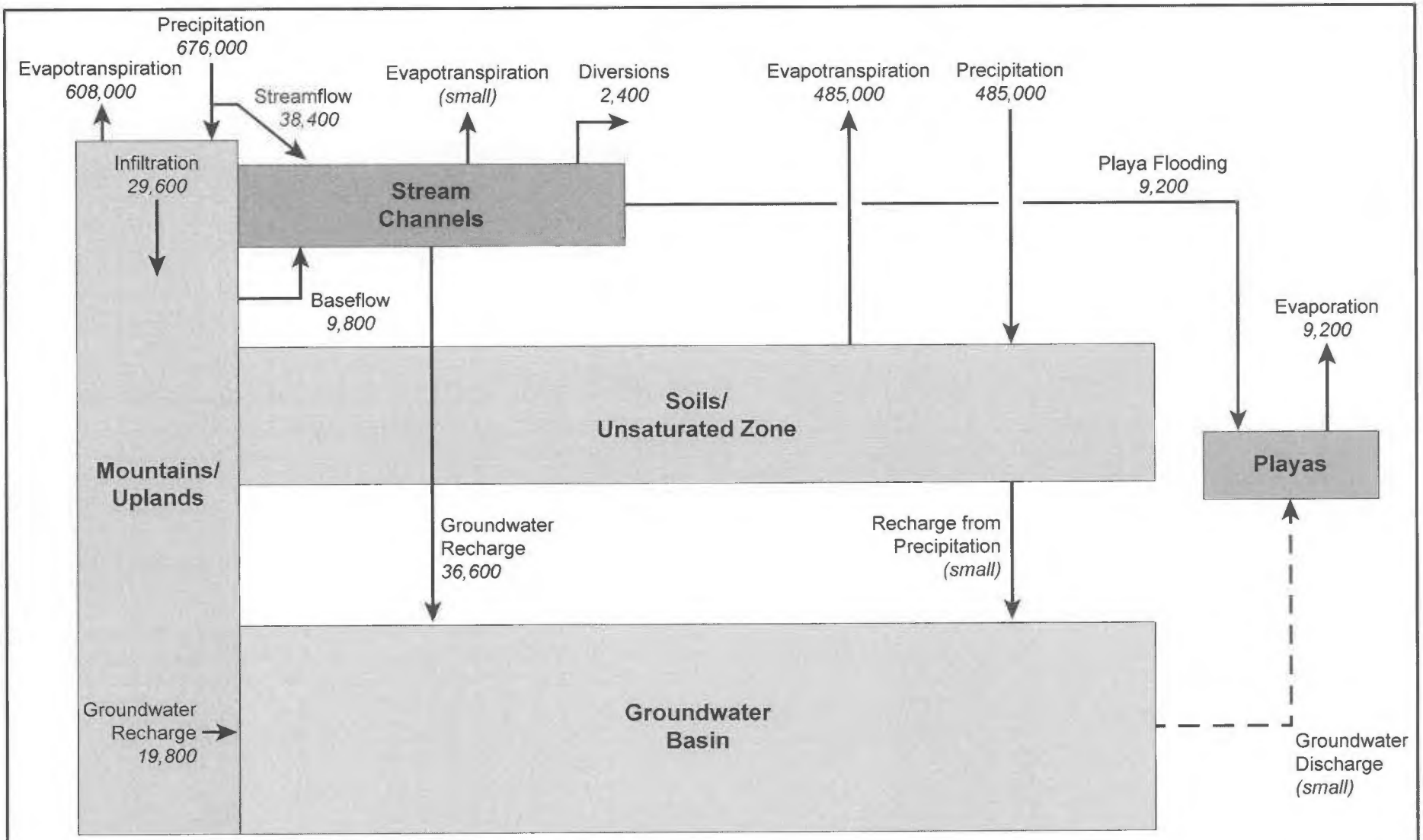

N
0
8
Scale in Miles
Willow Springs Subarea
West Antelope Subarea
Rogers Lake Subarea
Central Antelope Valley Subarea
South East Subarea
Kern County
Los Angeles County
Tehachapi
California City
Mojave
Boron
Lebec
Lancaster
Quartz Hill
Palmdale
Acton
Lake Los Angeles
San Bernardino County
Legend
Management Subareas
Antelope Valley Groundwater Basin
Antelope Valley Adjudicated Area
California Aqueduct
May 2020
TODD GROUNDWATER
Figure 1
Antelope Valley
Adjudication Area and
Management Subareas



May 2020

TODD GROUNDWATER

Figure 2
Adjudication Production Categories



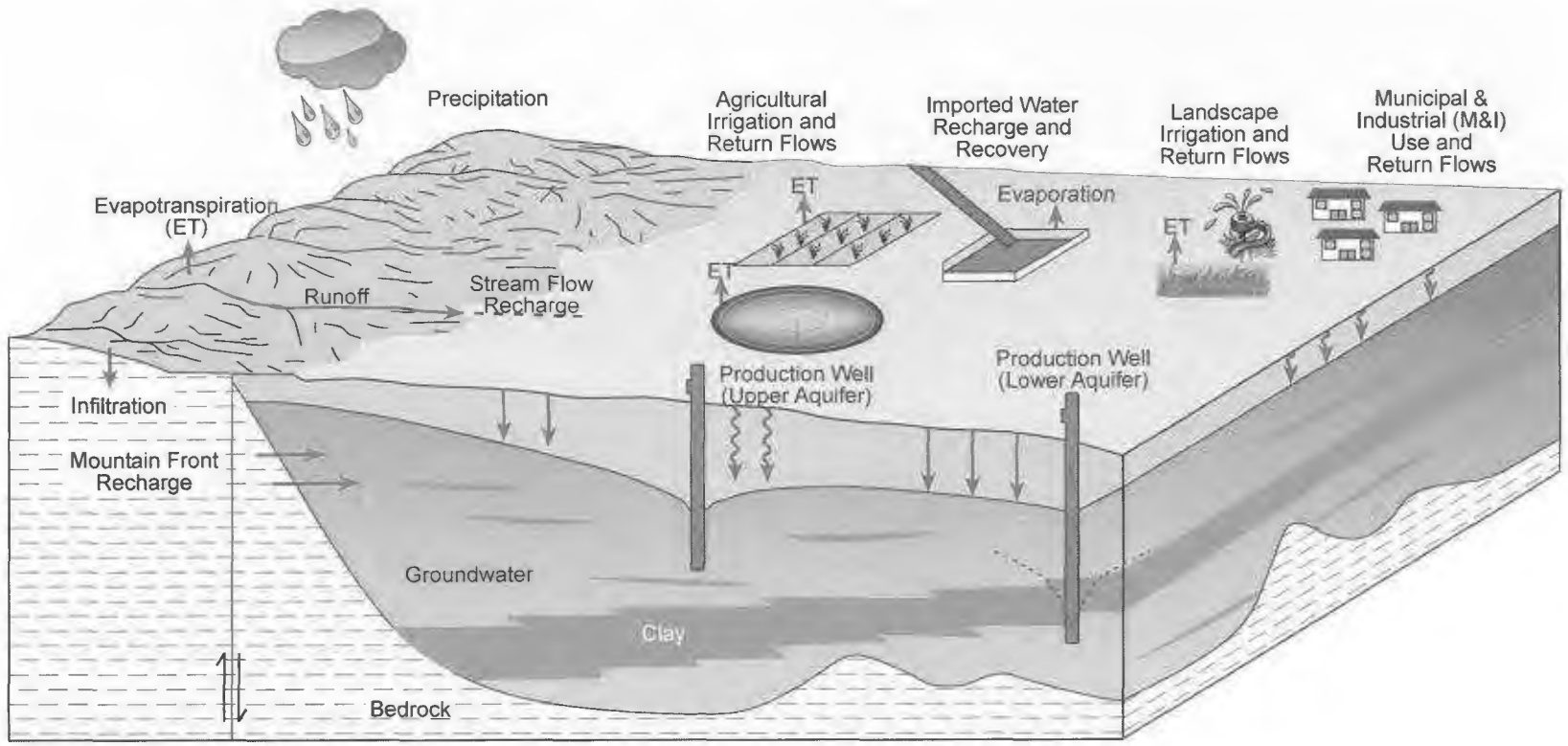
Note:
Values represent estimates of recharge and discharge as average annual flows in AFY. Conceptual diagram illustrates sources of natural groundwater recharge that were estimated to support the Native Safe Yield determination in the Judgment. Diagram does not include return flows, which also are a component of the Native Safe Yield.

Source: Modified from Beeby et al., 2010.

May 2020

TODD GROUNDWATER

Figure 3
Schematic Diagram
Natural Groundwater
Recharge Components



Recharge and discharge

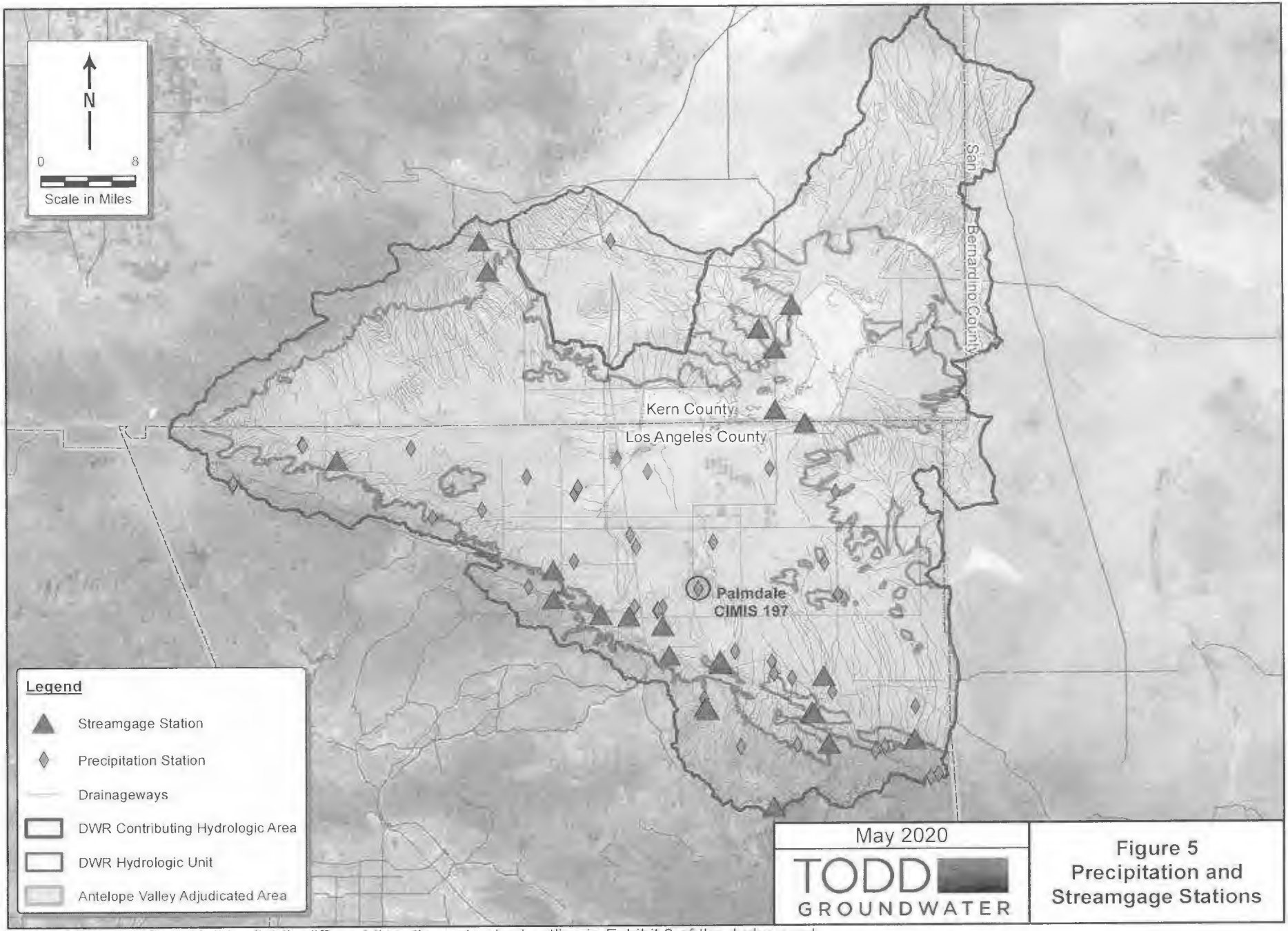
Recharge from return flows

Note:
This diagram was developed to illustrate the concepts of the Safe Yield components in the Antelope Valley Groundwater Basin; it is not meant to accurately depict the complexity of the multi-aquifer system in the basin.

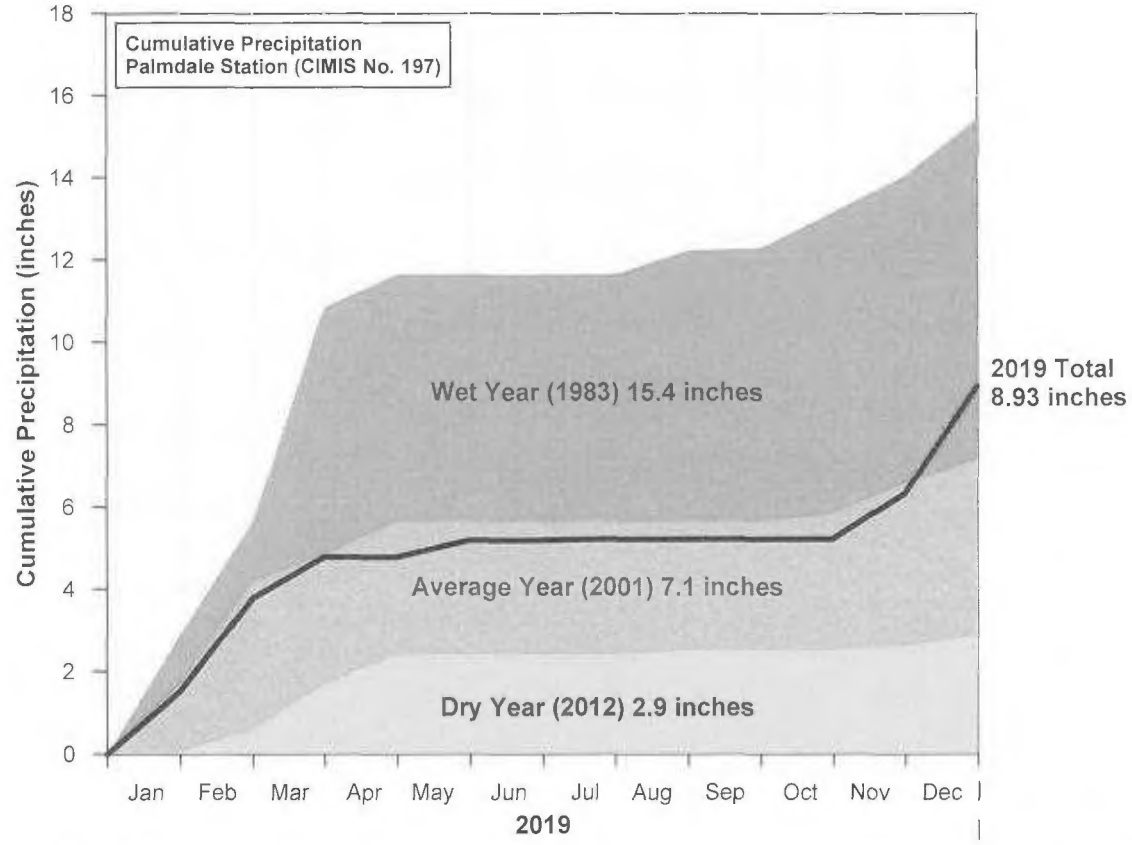
May 2020

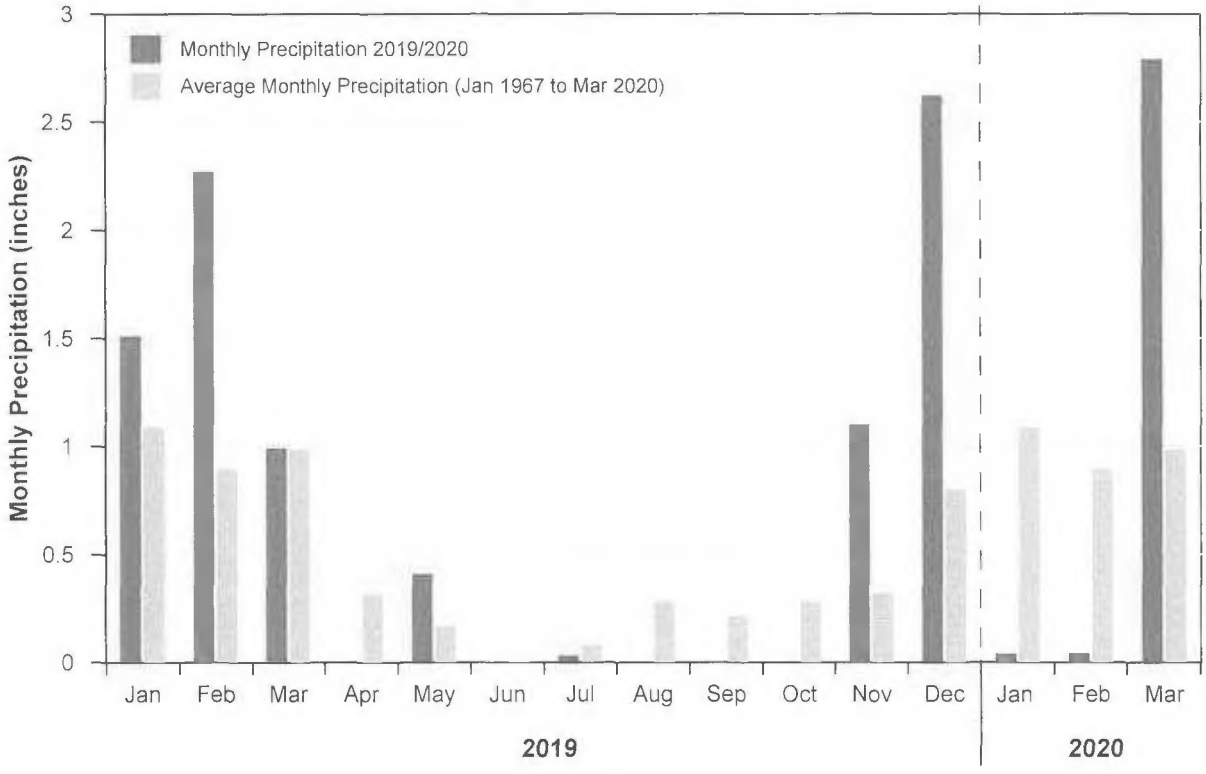
TODD GROUNDWATER

Figure 4
Conceptual Diagram of Safe Yield Components



Note: DWR Hydrologic Unit is slightly different than the watershed outline in Exhibit 9 of the Judgement





May 2020

TODD GROUNDWATER

Figure 6
Antelope Valley Precipitation 2019

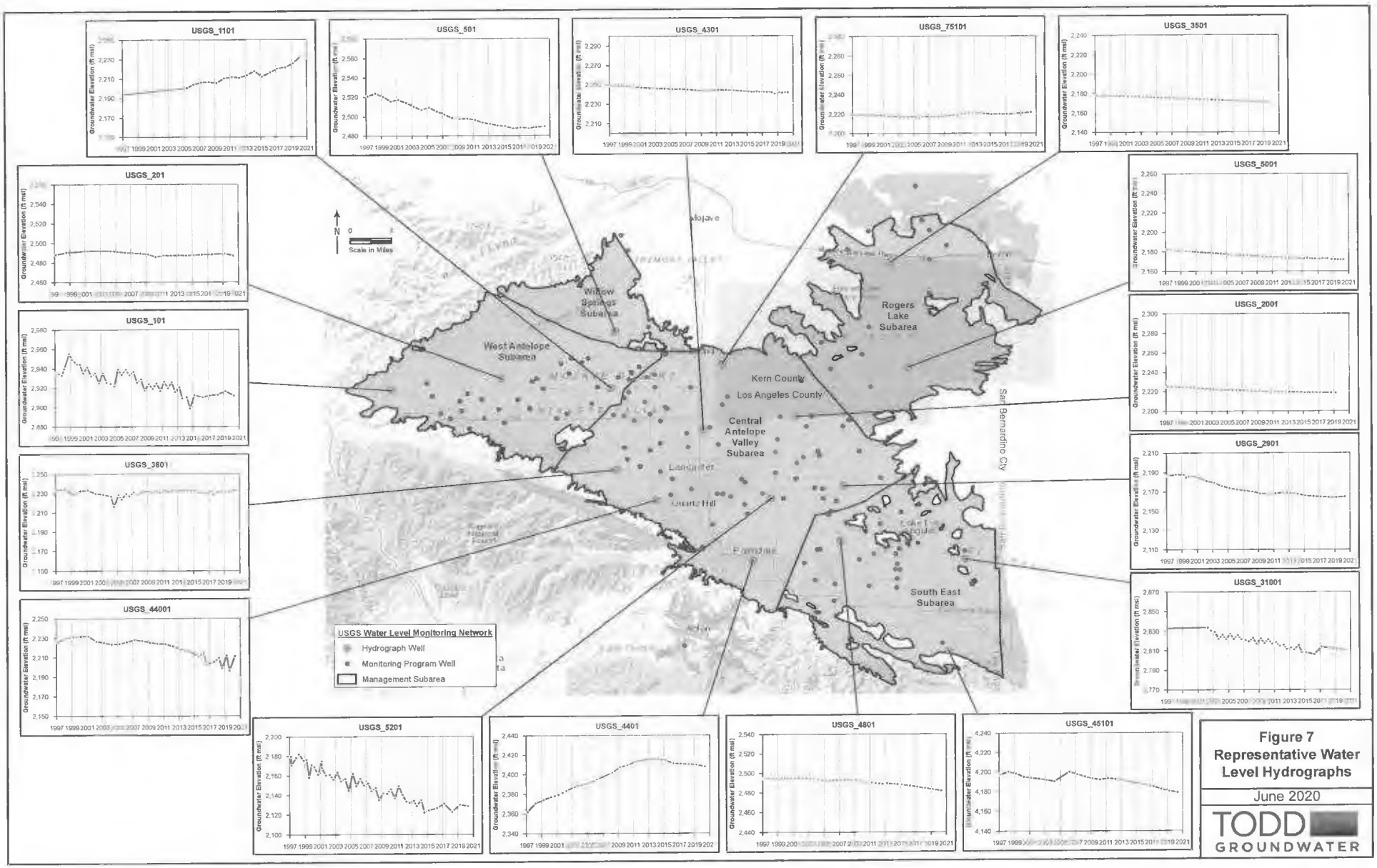


Figure 7
Representative Water Level Hydrographs

June 2020

TODD GROUNDWATER

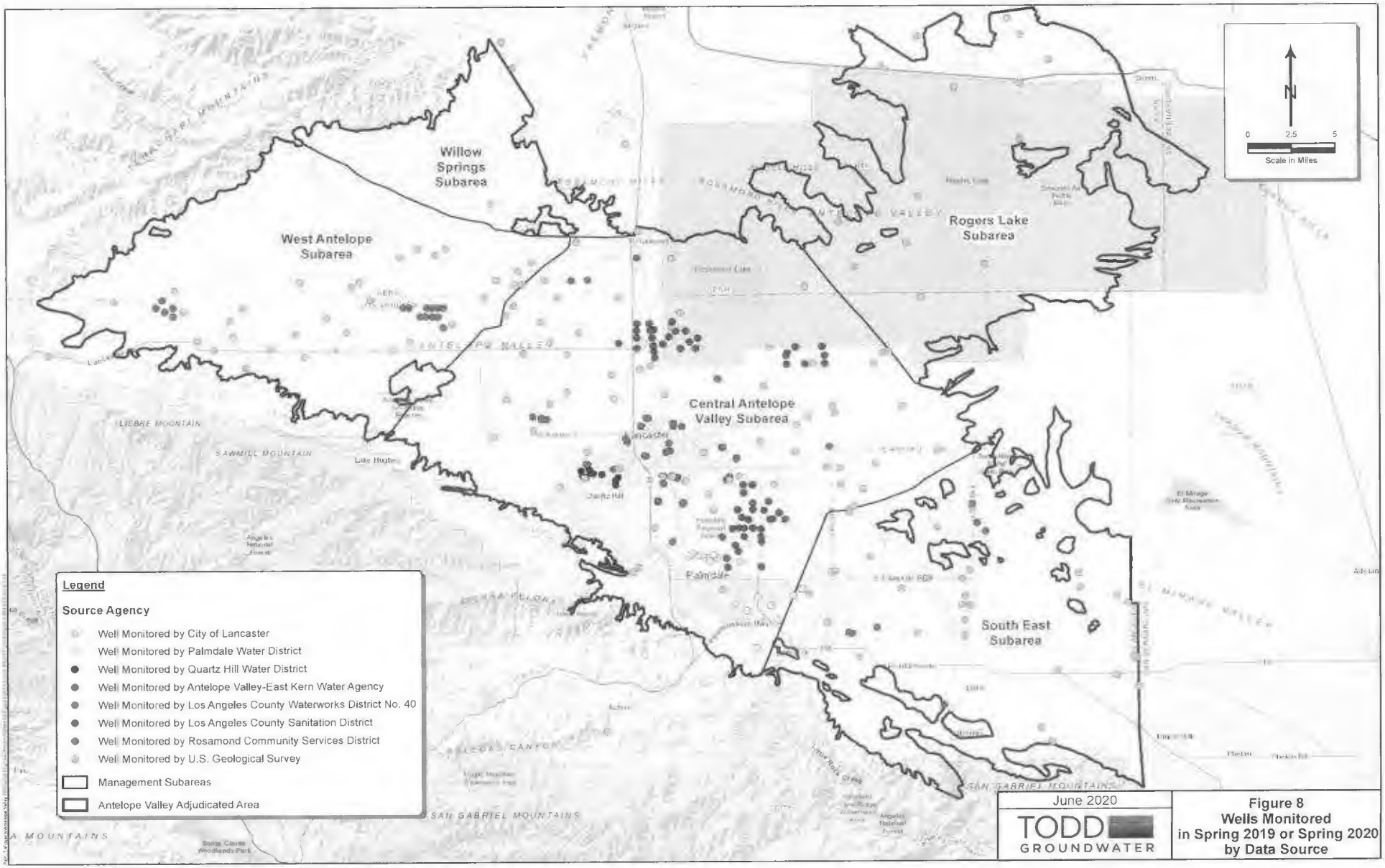
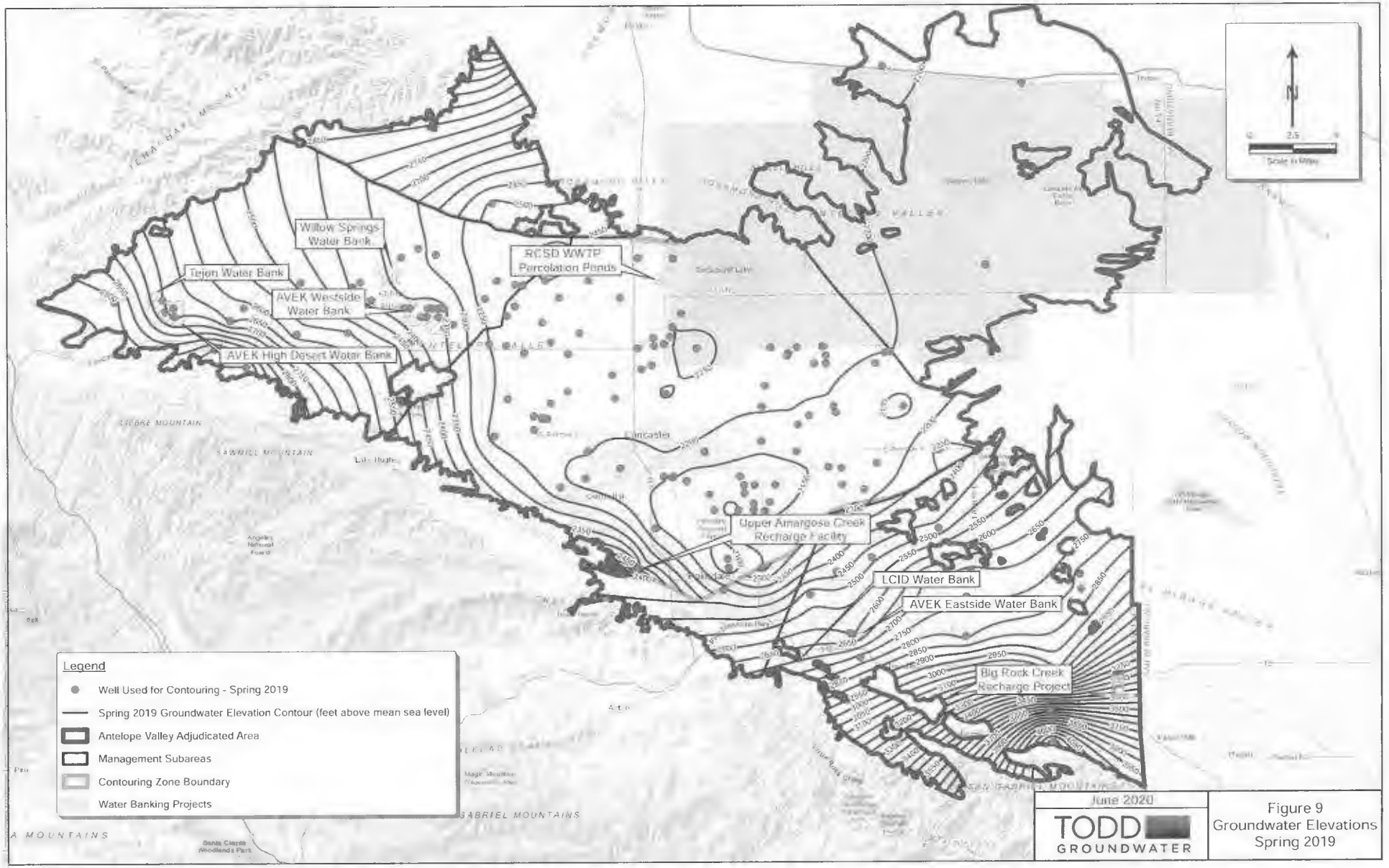
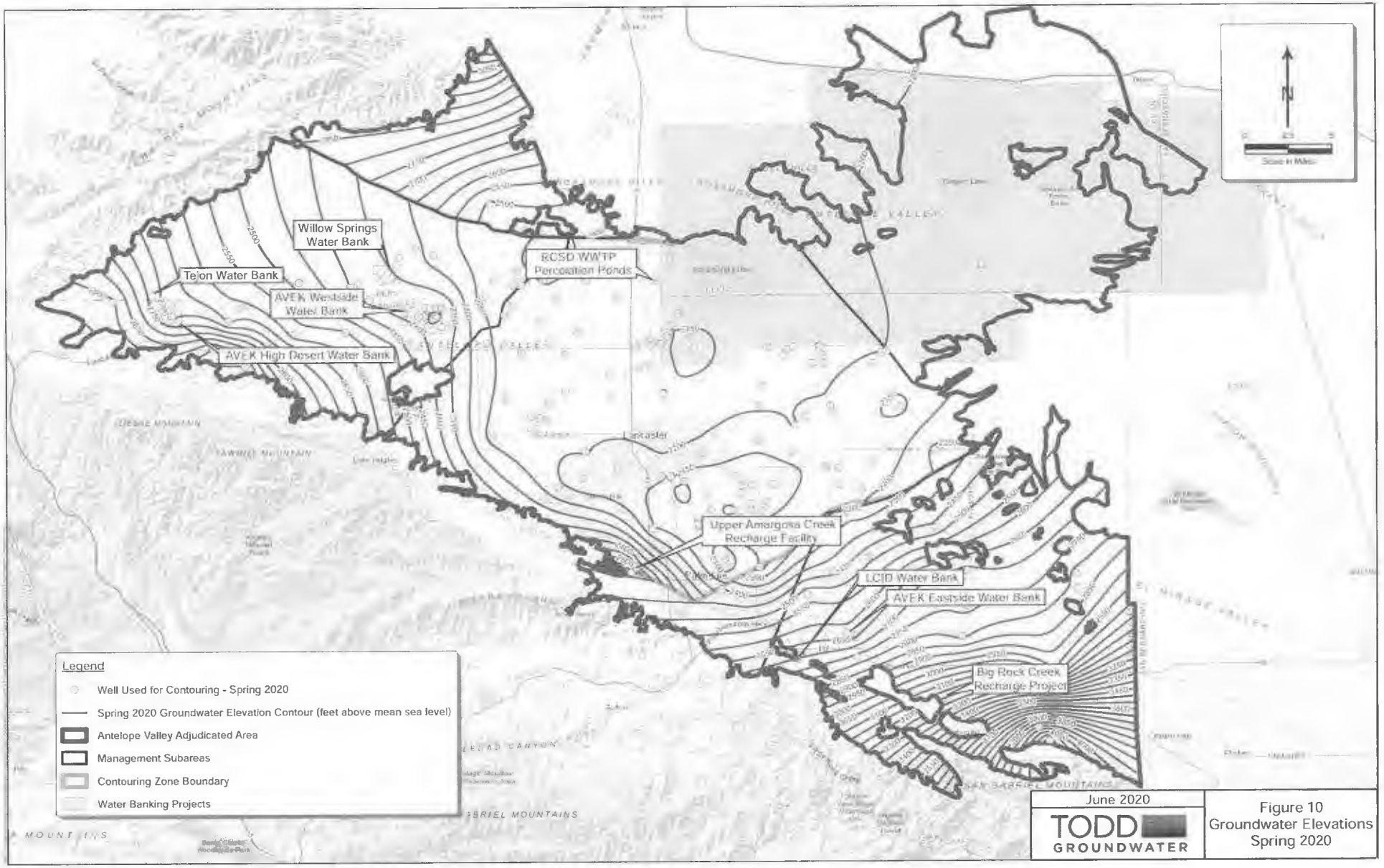
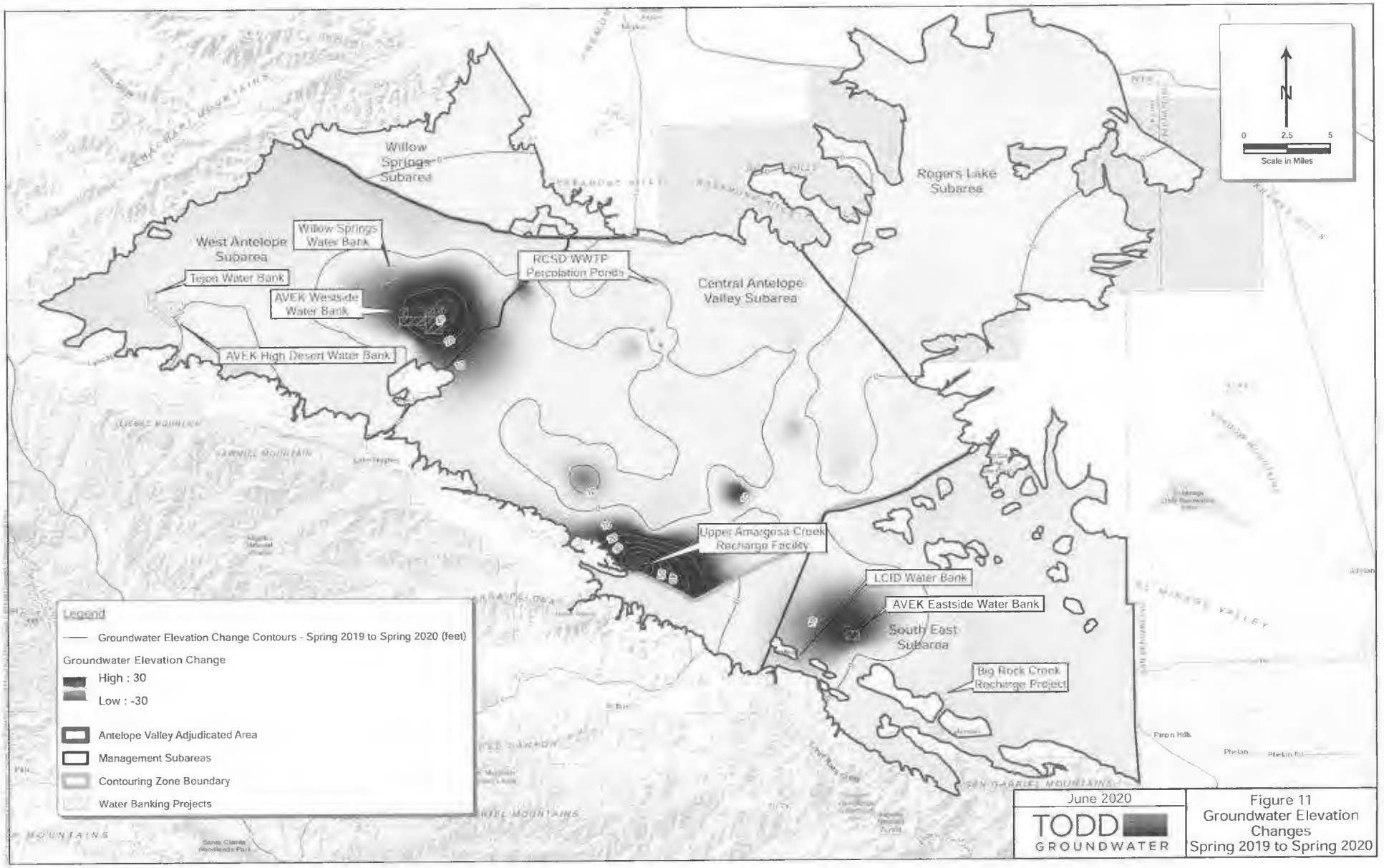


Figure 8
Wells Monitored in Spring 2019 or Spring 2020 by Data Source


Willow Springs Water Bank
Tejon Water Bank
AVEK Westside Water Bank
AVEK High Desert Water Bank
RCSD WWTP Percolation Ponds
Upper Amargosa Creek Recharge Facility
LCID Water Bank
AVEK Eastside Water Bank
Big Rock Creek Recharge Project
Lancaster
Legend
Well Used for Contouring - Spring 2019
Spring 2019 Groundwater Elevation Contour (feet above mean sea level)
Antelope Valley Adjudicated Area
Management Subareas
Contouring Zone Boundary
Water Banking Projects
June 2020
TODD GROUNDWATER
Figure 9
Groundwater Elevations
Spring 2019


Willow Springs Water Bank
Tejon Water Bank
AVEK Westside Water Bank
AVEK High Desert Water Bank
RCSD WWTP Percolation Ponds
Upper Amargosa Creek Recharge Facility
LCID Water Bank
AVEK Eastside Water Bank
Big Rock Creek Recharge Project
Lancaster
Legend
Well Used for Contouring - Spring 2020
Spring 2020 Groundwater Elevation Contour (feet above mean sea level)
Antelope Valley Adjudicated Area
Management Subareas
Contouring Zone Boundary
Water Banking Projects
June 2020
TODD GROUNDWATER
Figure 10
Groundwater Elevations
Spring 2020


Willow Springs Subarea
Rogers Lake Subarea
West Antelope Subarea
Willow Springs Water Bank
Tejon Water Bank
AVEK Westside Water Bank
AVEK High Desert Water Bank
RCSD WWTP Percolation Ponds
Central Antelope Valley Subarea
Upper Amargosa Creek Recharge Facility
LCID Water Bank
AVEK Eastside Water Bank
South East Subarea
Big Rock Creek Recharge Project
N
0
2.5
5
Scale in Miles
Legend
Groundwater Elevation Change Contours - Spring 2019 to Spring 2020 (feet)
Groundwater Elevation Change
High : 30
Low : -30
Antelope Valley Adjudicated Area
Management Subareas
Contouring Zone Boundary
Water Banking Projects
June 2020
TODD GROUNDWATER
Figure 11
Groundwater Elevation Changes
Spring 2019 to Spring 2020

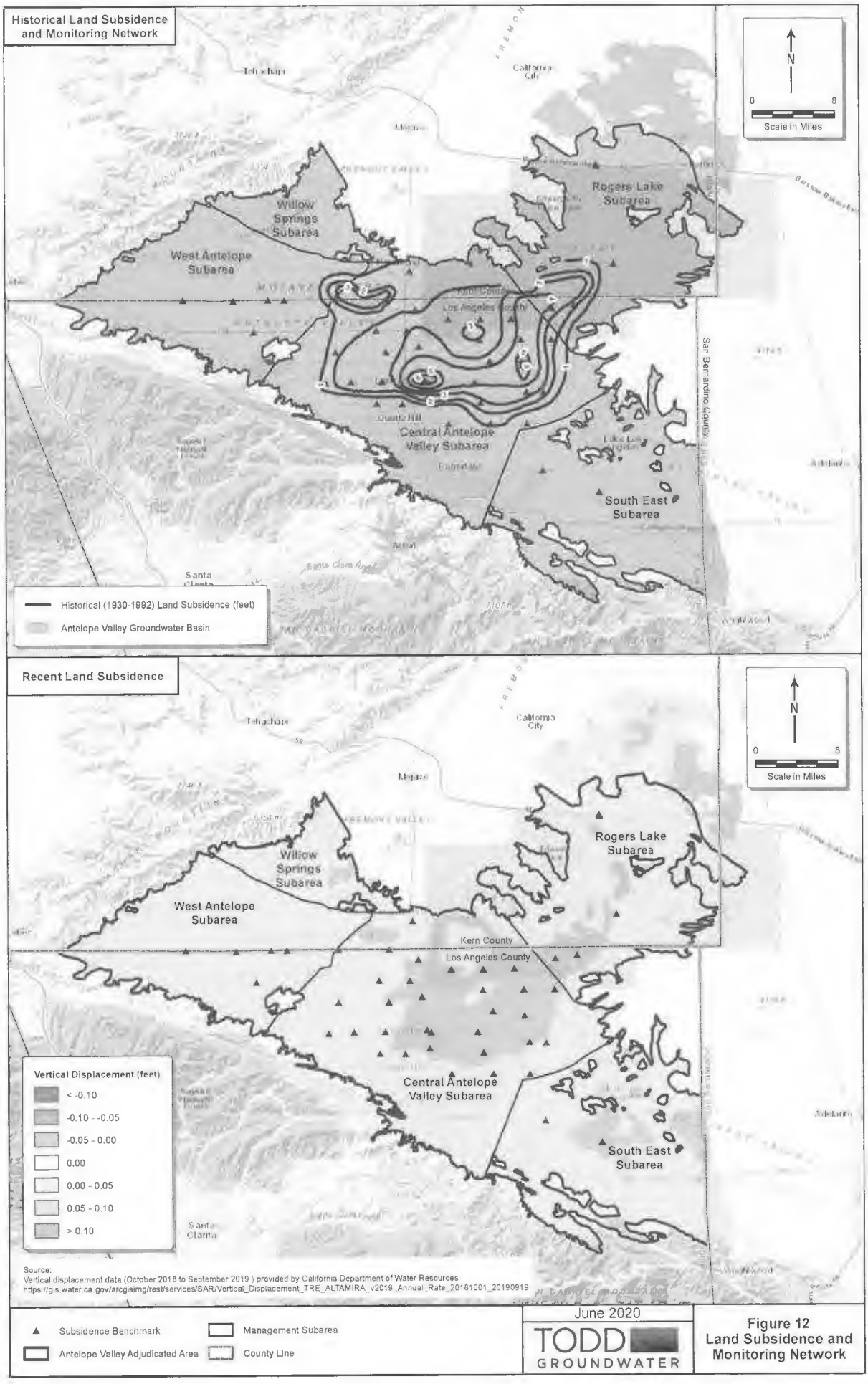
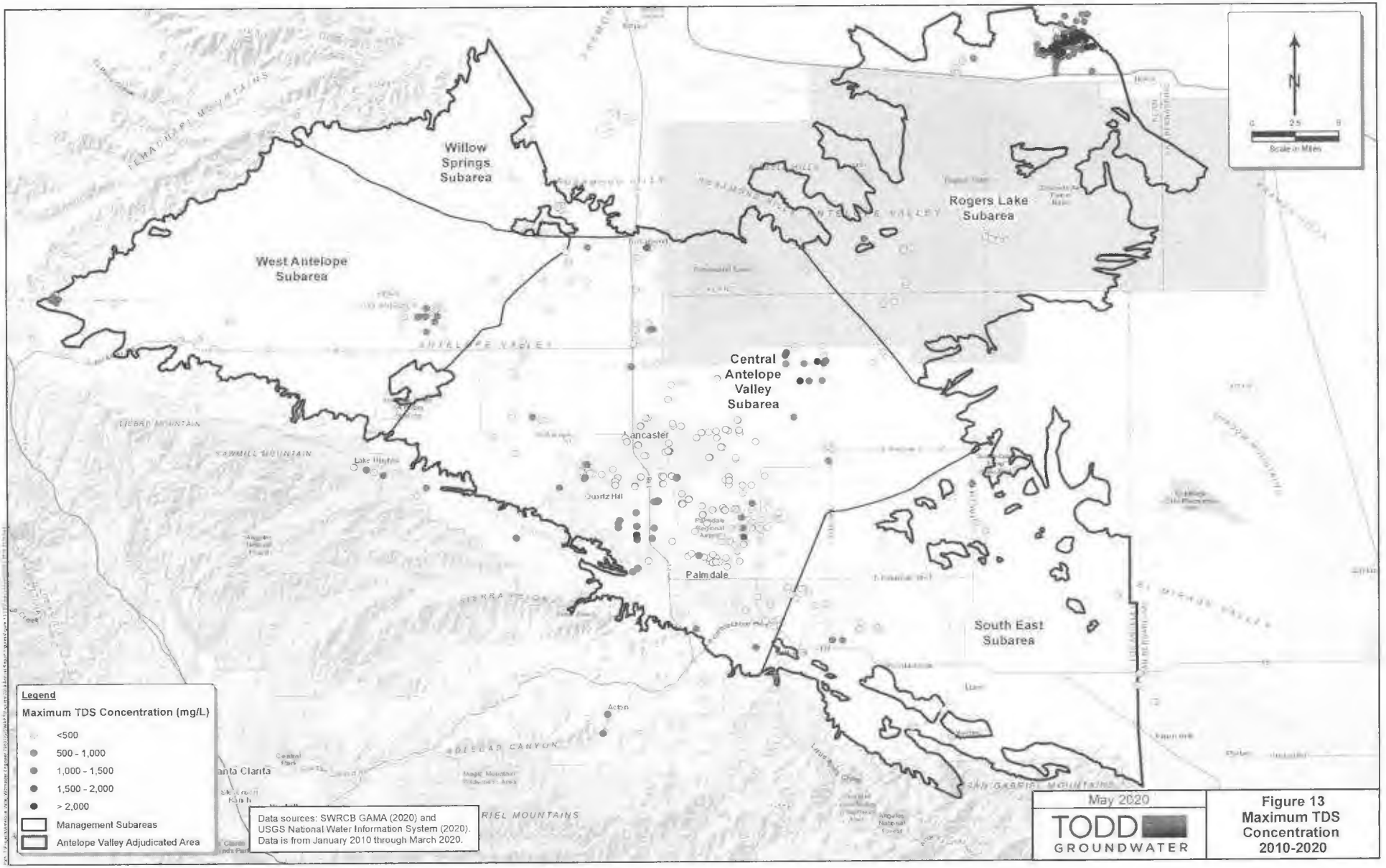


Figure 12
Land Subsidence and Monitoring Network


Willow Springs Subarea
Rogers Lake Subarea
West Antelope Subarea
Central Antelope Valley Subarea
South East Subarea
Lancaster
Palmdale
Quartz Hill
Lake Hughes
Acton
Santa Clarita
Legend
Maximum TDS Concentration (mg/L)
<500
500 - 1,000
1,000 - 1,500
1,500 - 2,000
> 2,000
Management Subareas
Antelope Valley Adjudicated Area
Data sources: SWRCB GAMA (2020) and USGS National Water Information System (2020). Data is from January 2010 through March 2020.
May 2020
TODD GROUNDWATER
Figure 13
Maximum TDS Concentration
2010-2020

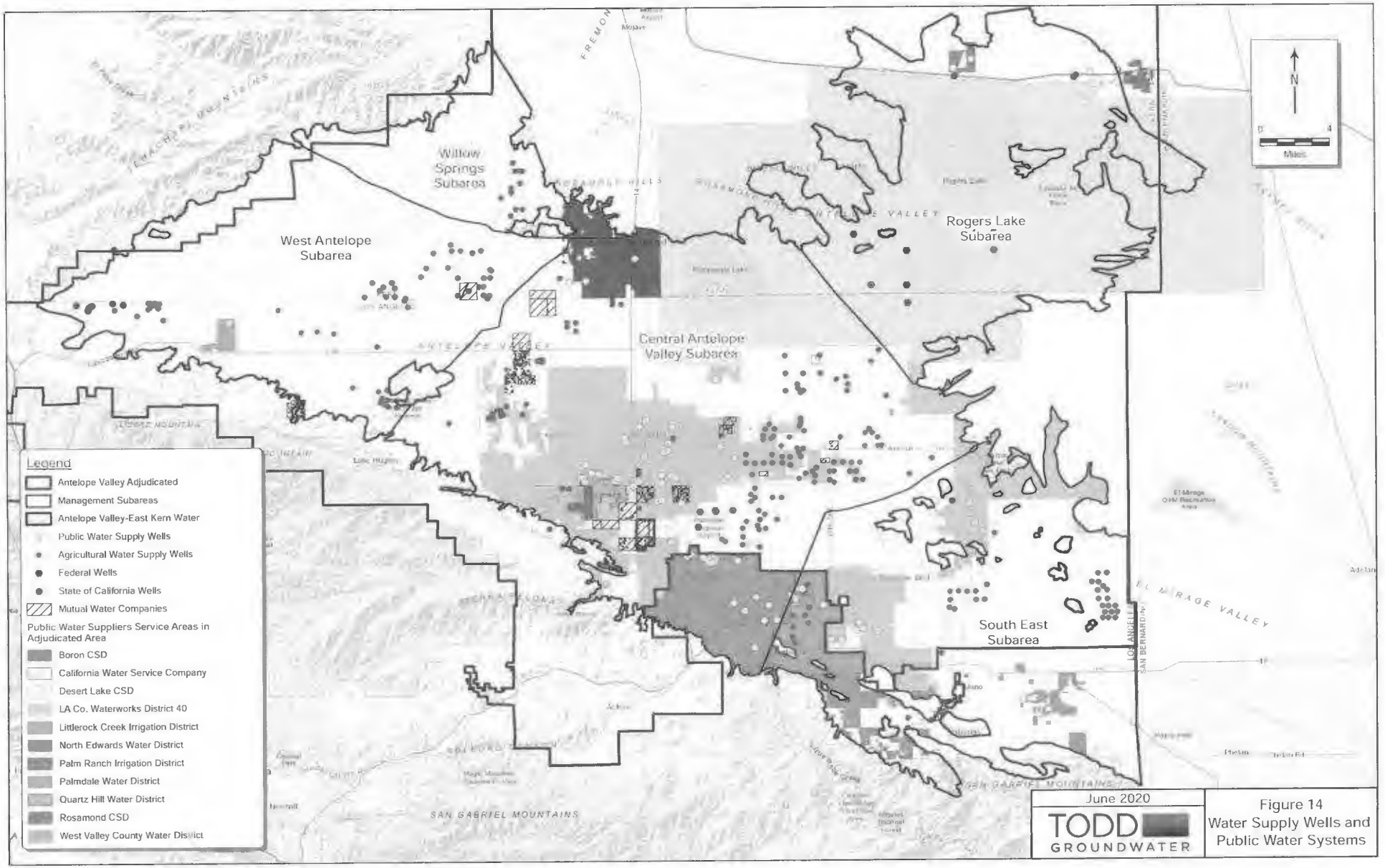


Figure 14
Water Supply Wells and Public Water Systems

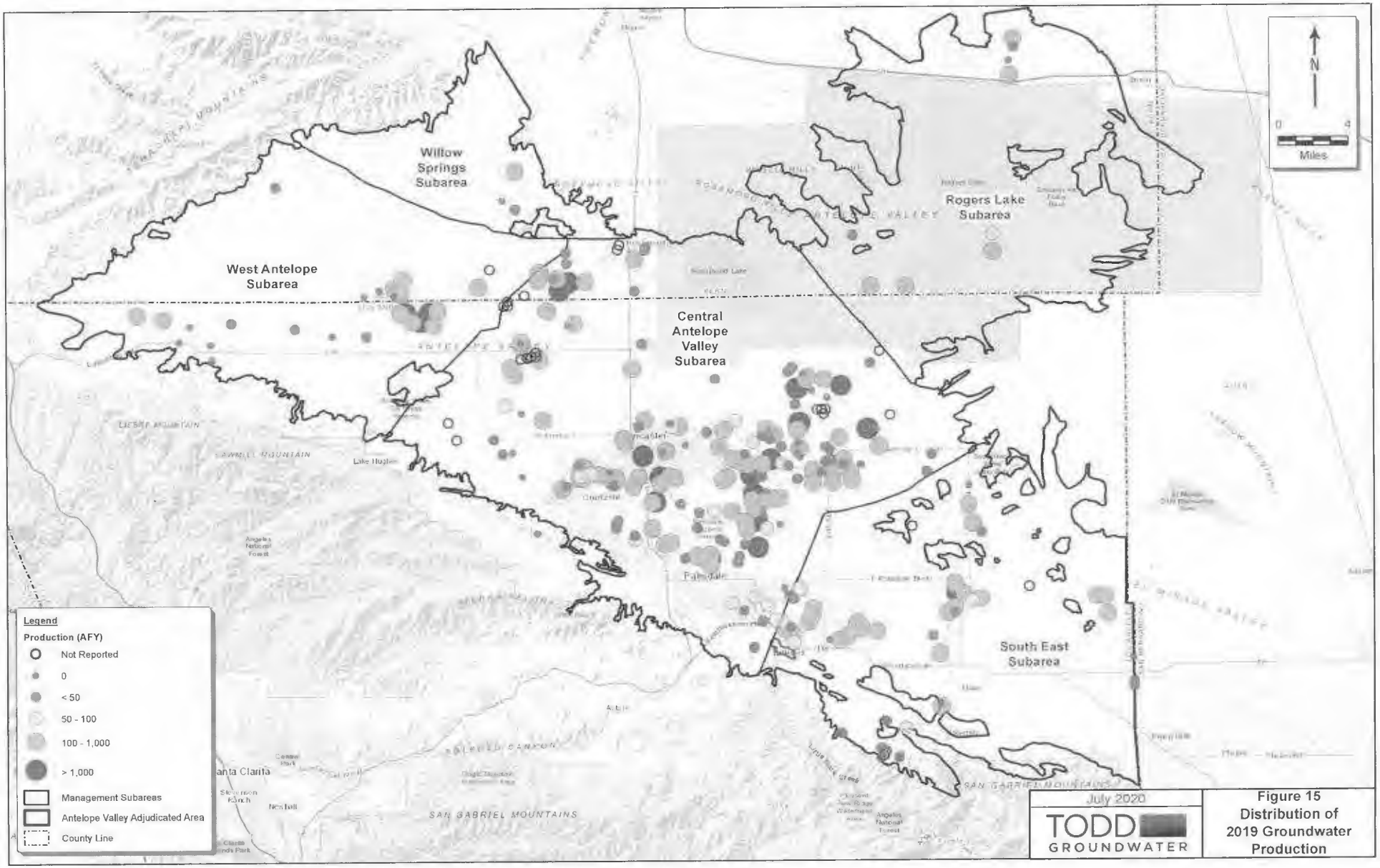


Figure 15
Distribution of 2019 Groundwater Production

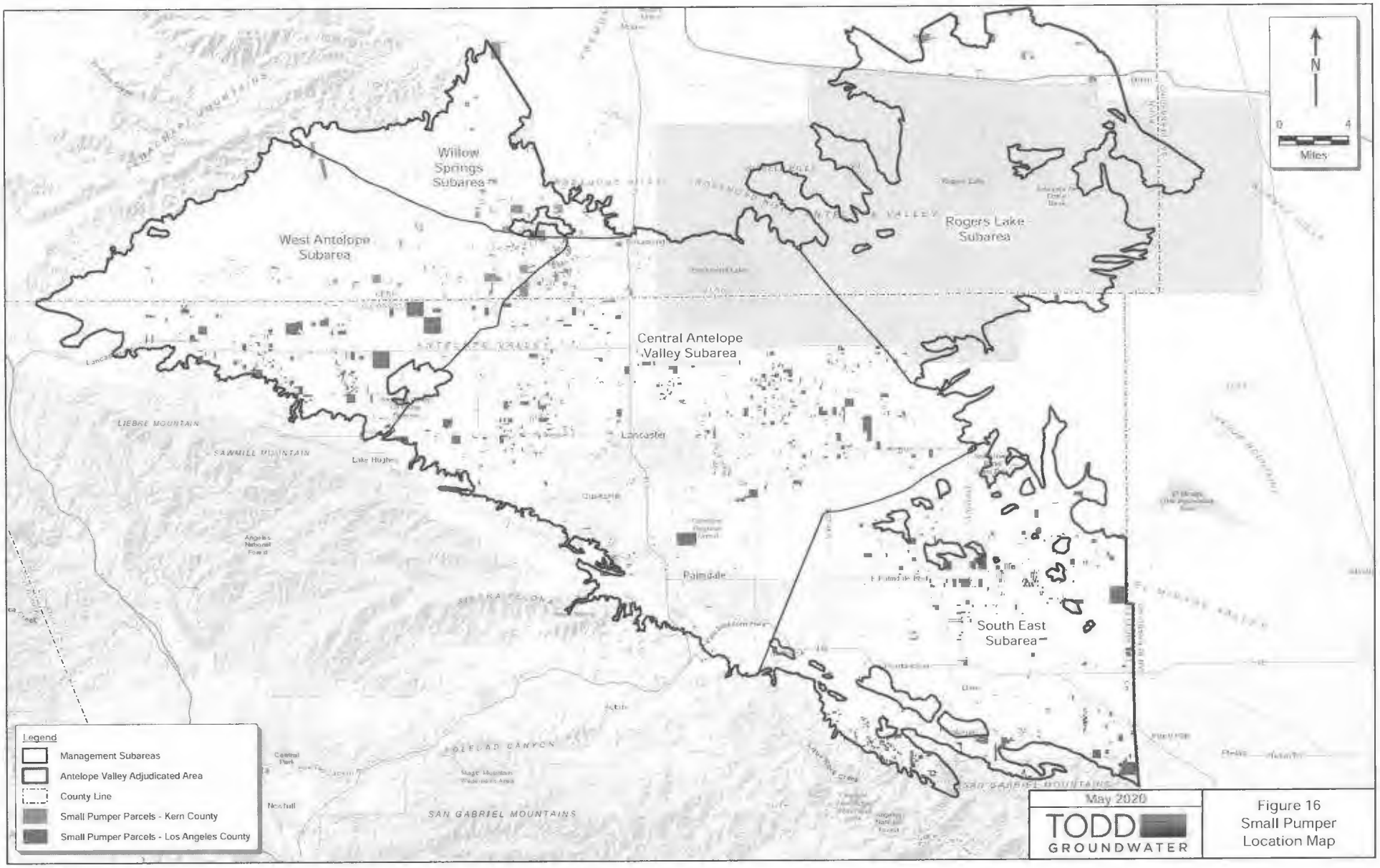
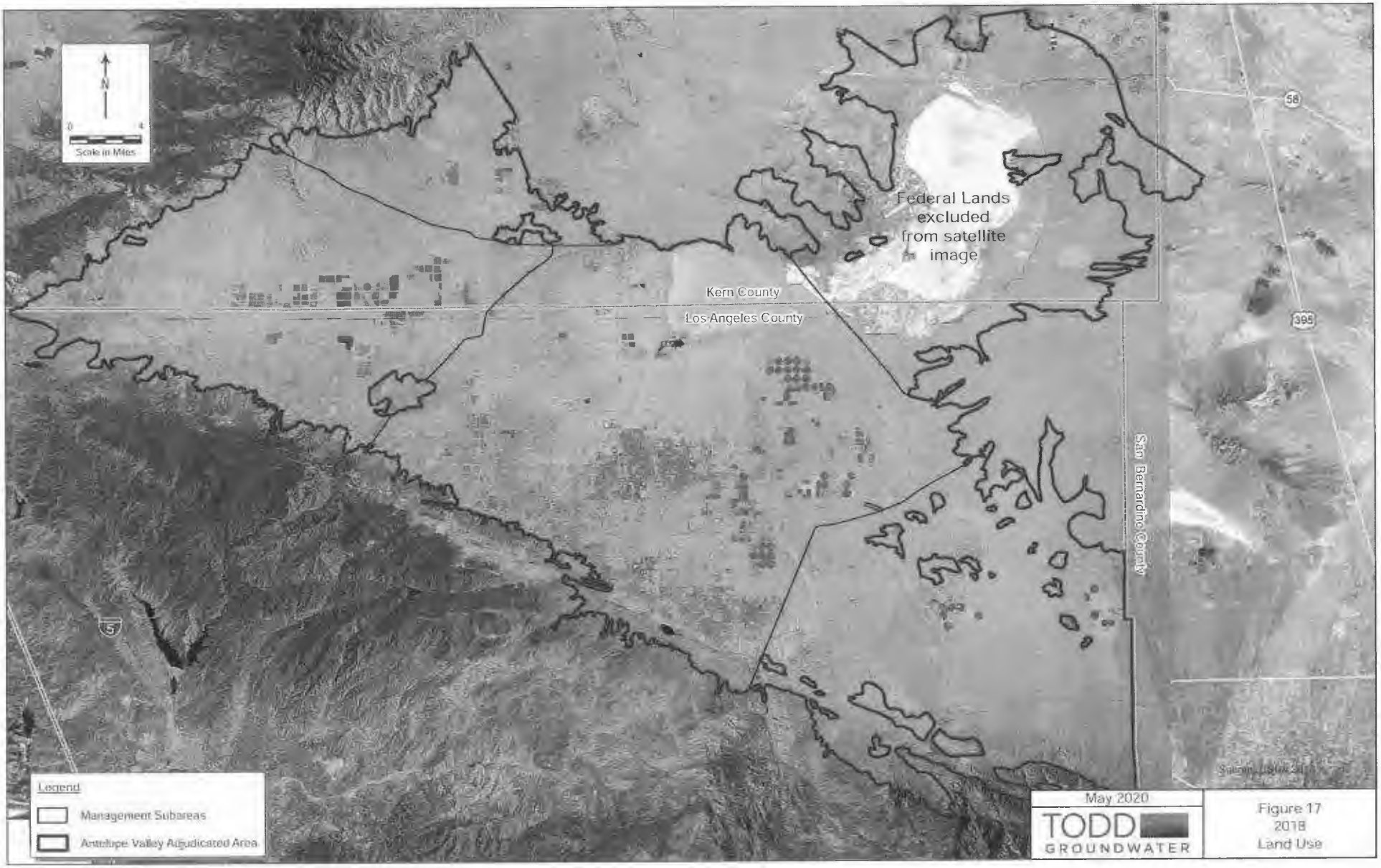


Figure 16
Small Pumper
Location Map


N
0
4
Scale in Miles
Federal Lands
excluded
from satellite
image
Kern County
Los Angeles County
San Bernardino County
58
395
5
Legend
Management Subareas
Antelope Valley Adjudicated Area
May 2020
TODD
GROUNDWATER
Figure 17
2018
Land Use

Appendices

Appendix A

Rampdown Tables

A-1. Exhibit 3 Non-Overlying Producers and Non-Stipulating Parties Rampdown Schedule

A-2. Exhibit 4 Overlying Producers Rampdown Schedule

Table A-1 Exhibit 3 Non-Overlying Producers and Non-Stipulating Parties Rampdown Schedule

Exhibit 3 Non-Overlying Producers	Pre-Rampdown Production (AFY)	Rampdown Targets (AFY)							Production Right (AFY)
		2016	2017	2018	2019	2020	2021	2022	
Boron Community Services District	153.02	153.02	153.02	135.85	118.68	101.51	84.34	67.17	50.00
California Water Services Company	589.76	589.76	589.76	548.66	507.56	466.45	425.35	384.24	343.14
Desert Lake Community Services District	73.53	73.53	73.53	73.53	73.53	73.53	73.53	73.53	73.53
Littlerock Creek Irrigation District	1,420.19	1,420.19	1,420.19	1,316.25	1,212.32	1,108.38	1,004.45	900.51	796.58
Los Angeles County Waterworks District No. 40	6,789.26	6,789.26	6,789.26	6,789.26	6,789.26	6,789.26	6,789.26	6,789.26	6,789.26
North Edwards Water District	102.92	102.92	102.92	93.94	84.95	75.97	66.99	58.00	49.02
Palm Ranch Irrigation District	1,095.47	1,095.47	1,095.47	990.51	885.55	780.58	675.62	570.65	465.69
Palmdale Water District	2,769.63	2,769.63	2,769.63	2,769.63	2,769.63	2,769.63	2,769.63	2,769.63	2,769.63
Quartz Hill Water District	2,397.09	2,397.09	2,397.09	2,091.53	1,785.97	1,480.41	1,174.85	869.29	563.73
Rosamond Community Services District	2,917.88	2,917.88	2,917.88	2,498.97	2,080.06	1,661.15	1,242.24	823.33	404.42
West Valley County Water District	185.00	185.00	185.00	160.83	136.67	112.50	88.33	64.17	40.00
Total	18,493.75	18,493.75	18,493.75	17,468.96	16,444.17	15,419.38	14,394.58	13,369.79	12,345.00

Non-Stipulating Parties	Pre-Rampdown Production (AFY)	Rampdown Targets (AFY)							Production Right (AFY)
		2016	2017	2018	2019	2020	2021	2022	
Desert Breeze MHP, LLC	20.35	20.35	20.35	19.98	19.60	19.23	18.85	18.48	18.10
Milana VII, LLC dba Rosamond Mobile Home Park	28.00	28.00	28.00	26.95	25.90	24.85	23.80	22.75	21.70
Reesdale Mutual Water Company	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Juanita Eyherabide, Eyherabide Land Co., LLC and Eyherabide Sheep Company	14.56	14.56	14.56	14.13	13.71	13.28	12.85	12.43	12.00
Clan Keith Real Estate Investments, LLC dba Leisure Lake Mobile Estates	148.10	148.10	148.10	134.08	120.07	106.05	92.03	78.02	64.00
White Fence Farms Mutual Water Company No. 3	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
LV Ritter Ranch, LLC	950.87	950.87	950.87	792.39	633.91	475.44	316.96	158.48	0.00
Robar Enterprises, Inc., HI-Grade Materials, Co., and CJR, a General Partnership	675.00	675.00	675.00	596.67	517.33	438.00	358.67	279.33	200.00
SCI California Funeral Services, Inc. dba Joshua Memorial Park[1]	To be determined	To be determined	To be determined	To be determined	To be determined	To be determined	To be determined	To be determined	To be determined
Total	**1,863.88**	**1,863.88**	**1,863.88**	**1,611.20**	**1,357.52**	**1,103.84**	**850.16**	**596.48**	**342.80**

1. SCI California Funeral Services, Inc. dba Joshua Memorial Park intervened to become Non-Stipulating Party in 2019. The Parties and Court are in the process of determining its Production Right and Rampdown.

Table A-2 Exhibit 4 Overlying Producers Rampdown Schedule

Original Exhibit 4 Producers	Transferees	Pre-Rampdown Production[1] (AF)	Rampdown Targets (AF)							Production Right (AF)
			2016	2017	2018	2019	2020	2021	2022	
60th Street Association Water System		2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16
Adams Bennett Investments, LLC		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antelope Park Mutual Water Company		208.75	[illegible]	[illegible]	202.27	195.80	189.32	[illegible]	176.37	169.89
Antelope Valley Joint Union High School District		71.74	71.74	71.74	66.62	61.49	56.37	51.25	46.12	41.00
Antelope Valley Mobile Estates		19.88	19.88	19.88	18.03	16.17	14.32	12.46	10.61	8.75
Antelope Valley Water Storage LLC		1,772.00	1,772.00	1,772.00	1,772.00	1,772.00	1,772.00	1,772.00	1,772.00	1,772.00
Antelope Valley-East Kern Water Agency (AVEK)		4,000.00	4,000.00	4,000.00	3,925.00	3,850.00	3,775.00	3,700.00	3,625.00	3,550.00
Aqua-J Mutual Water Company		44.90	44.90	44.90	44.81	44.72	44.63	44.53	44.44	44.35
AV Solar Ranch 1, LLC		96.00	[illegible]	96.00	[illegible]	[illegible]	96.00	96.00	96.00	96.00
Averydale Mutual Water Company		257.95	257.95	257.95	257.35	256.75	256.15	255.55	254.95	254.35
Bahlman: Gene Bahlman	Hernandez: Luis Hernandez; property sale (2017)	5.25	5.25	5.25	5.21	5.17	5.13	[illegible]	5.04	5.00
Baxter Mutual Water Company		44.75	44.75	44.75	43.13	41.51	39.89	38.26	36.64	35.02
Benz, Mark W. And Nancy L. Benz	Terrazas: Gloria Terrazas; property sale (2015)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Big Rock Mutual Water Company		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bittner Trust, Glen Brittner, Trustee		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Bleich Flat Mutual Water Company		33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50
Blum: Sheldon R. Blum, Trustee of the 1998 Family Trust		50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Bolthouse Properties LLC		16,805.89	16,805.89	16,805.89	15,662.41	14,518.93	13,375.45	12,231.96	11,088.48	9,945.00
Bookman: Thomas and Julie Bookman 2007 Trust		272.50	272.50	272.50	249.75	227.00	204.25	181.50	158.75	136.00
Borax: U.S. Borax		1,905.00	1,905.00	1,905.00	1,905.00	1,905.00	1,905.00	1,905.00	1,905.00	1,905.00
Bridwell: James and Elizabeth Bridwell		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Burrows/200 A40 H LLC		295.00	295.00	295.00	295.00	295.00	295.00	295.00	295.00	295.00
Calandri Water Company, LLC (Sonrise Farms)		3,803.00	3,803.00	3,803.00	3,465.17	3,127.33	2,789.50	2,451.67	2,113.83	1,776.00
Cardile: Sal and Connie Cardile	Pool: Noel Pool; property sale (2015)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Carle: Irma Ann Carle Trust, Irma-Anne Carle, Trustee		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chavez: Effren Chavez		44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00
City of Los Angeles, Department of Airports		7,851.00	7,851.00	7,851.00	7,205.00	6,559.00	5,913.00	5,267.00	4,621.00	3,975.00
Close: C. Louise R. Close Living Trust		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Colorado Mutual Water Company		25.90	25.90	25.90	25.84	25.78	25.72	25.66	25.60	25.54
Copa De Oro Land Company	Copa De Oro Land Company (2020)	325.00	325.00	325.00	325.00	325.00	10.00	10.00	10.00	10.00
	WDS California II, LLC (2020)						315.00	315.00	315.00	315.00
County Sanitation Districts of Los Angeles 14 & 20	LA County District No. 14: 3,060 AFY (2019)	8,000.00	8,000.00	8,000.00	7,233.33	5,820.00	5,130.00	4,440.00	3,750.00	3,060.00
	LA County District No. 20: 340 AFY (2019)					646.67	570.00	493.33	416.67	340.00
Del Sur Ranch LLC		600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00	600.00
Diamond Farming/Crystal Organic LLC/Grimmway/Lapis		3,354.00	3,354.00	3,354.00	3,126.00	2,898.00	2,670.00	2,442.00	2,214.00	1,986.00
Dickey: Randall and Billie Dickey		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
El Dorado Mutual Water Company		276.05	276.05	276.05	275.40	274.75	274.11	273.46	272.81	272.16
eSolar Inc.; Red Dawn Suntower LLC	Rosamond Community Services District (2016)	150.00	150.00	[illegible]	150.00	150.00	150.00	150.00	150.00	150.00
eSolar Inc.; Sierra Sun Tower, LLC		5.76	5.76	5.76	5.30	4.84	4.38	3.92	3.46	3.00
eSolar Inc.; Tumbleweed Suntower LLC		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Evans: Lawrence Dean Evans, Jr. and Susan Evans		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Evergreen Mutual Water Company		69.50	69.50	69.50	69.34	69.18	69.02	68.86	68.70	68.54
Findley: Ruth C. Findley		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
First Mutual Water Company		15.62	15.62	15.62	13.89	12.16	10.44	8.71	6.98	5.25
Frankenberg: Leah Frankenberg		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Godde: Steve, Pamela & Gary Godde c/o Rife Silva & Co LLC	*[Receives IWRF Rights from Forrest Godde (an Exhibit B Party (2017))]*	1,461.50	1,461.50	1,461.50	1,331.75	1,202.00	1,072.25	942.50	812.75	683.00
Gorrindo Resourceful LLC		629.00	629.00	629.00	[illegible]	629.00	629.00	629.00	629.00	629.00
Granite Construction Company (Big Rock Facility)		126.00	126.00	126.00	126.00	126.00	126.00	126.00	126.00	126.00
Granite Construction Company (Little Rock Sand and Gravel, Co.)	Rampdown & Production Rights split equally between Granite Construction and Little Rock Sand and Gravel (6/7/18 Stipulation and Order)	400.00	400.00	400.00	372.33	344.67	317.00	289.33	261.67	234.00
Griffin: Laura Griffin Trustee of the Family Bypass Trust		1,170.00	1,170.00	1,170.00	1,086.33	1,002.67	919.00	835.33	751.67	668.00
H & N Development Co. West Inc.		1,799.75	1,799.75	1,799.75	1,634.46	1,469.17	1,303.88	1,138.58	973.29	808.00
Healy: Jane Healy and Healy Enterprises Inc.		700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00	700.00
Kyle: Trustees of the Kyle Revocable Living Trust		9,275.00	9,275.00	9,275.00	8,340.83	7,406.67	6,472.50	5,538.33	4,604.17	3,670.00
Land Projects Mutual Water Company		622.50	622.50	622.50	621.01	619.51	618.02	616.53	615.03	613.54
Landale Mutual Water Company		157.75	157.75	157.75	157.39	157.02	156.66	156.30	155.93	155.57
Landinv Inc.	FS Land Holding Company, LLC; property sale; 736.44 AF (2016) — 600 AFY to Diamond Farming (217 AF), Crystal Organic (190 AF), Grimmway (193 AF) (2018)	2,000.00	1,520.00	1,520.00	600.00	600.00	600.00	600.00	600.00	600.00
	Remain with FS Land Holding Company, LLC: 136.44 AF (2018)				789.41	658.81	528.22	397.63	267.03	136.44
	Radcast: merger, 232.56 AF (2017)		480.00	480.00	438.76	397.52	356.28	315.04	273.80	232.56
Lands of Promise Mutual Water Company		64.61	64.61	64.61	57.46	50.30	43.15	36.00	28.84	21.69
Lane Family Trusts		1,402.00	1,402.00	1,402.00	1,297.17	1,192.33	1,087.50	982.67	877.83	773.00
LeClair: Marie A. Unini and Robert J. LeClair		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table A-2 Exhibit 4 Overlying Producers Rampdown Schedule

Original Exhibit 4 Producers	Transferees	Pre-Rampdown Production[1] (AF)	Rampdown Targets (AF)							Production Right (AF)
			2016	2017	2018	2019	2020	2021	2022	
Leer: James M. Leer, III and Diane Leer		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Littlerock Aggregate Co., Inc., Holliday Rock Co., Inc.		405.00	405.00	405.00	362.67	320.33	278.00	235.67	193.33	151.00
Llano Del Rio Water Company		572.65	572.65	572.65	523.71	474.77	425.83	376.88	327.94	279.00
Llano Mutual Water Company		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marltorena: Trustees of the Marltorena Living Trust		3,800.55	3,800.55	3,800.55	3,462.96	3,125.37	2,787.78	2,450.18	2,112.59	1,775.00
McWilliams: Dennis M. and Diane K. McWilliams		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Miner: Richard Miner		1,089.40	1,089.40	1,089.40	1,074.33	1,059.27	1,044.20	1,029.13	1,014.07	999.00
Miracle Improvement Corporation dba Golden Sands Mobile Home Park/Trailer Park	New Goldensands investment, property sale (2016)	45.40	45.40	45.40	42.33	39.27	36.20	33.13	30.07	27.00
Munz: 2014 Revocable Trust, Terry A. & Kathleen M. Munz		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Nebeker: Eugene B. Nebeker		4,016.00	4,016.00	4,016.00	3,642.50	3,269.00	2,895.50	2,522.00	2,148.50	1,775.00
Northrop Grumman Systems Corporation		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
NRG Solar Alpine, LLC		64.21	64.21	64.21	59.84	55.47	51.11	46.74	42.37	38.00
R and M Ranch, Inc.		1,458.00	1,458.00	1,458.00	1,329.33	1,200.67	1,072.00	943.33	814.67	686.00
Reca: John and Adrienne Reca		501.45	501.45	501.45	459.71	417.97	376.23	334.48	292.74	251.00
Richter: Suzanne J. Richter		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Rosamond High School		586.40	586.40	586.40	522.37	458.34	394.32	330.29	266.26	202.23
Rosamond Ranch	FS Land Holding Company, LLC, property sale (2015)	598.00	598.00	598.00	598.00	598.00	598.00	598.00	598.00	598.00
Rose Villa Apartments		22.72	22.72	22.72	20.20	17.69	15.17	12.65	10.14	7.62
Sahara Nursery and Farm		22.18	22.18	22.18	22.15	22.12	22.09	22.06	22.03	22.00
Saint Andrew's Abbey, Inc.		175.00	175.00	175.00	162.83	150.67	138.50	126.33	114.17	102.00
Schilling: Lawrence J. and Mary P. Schilling Trustees of the L&M Schilling 1992 Family Trust		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Selak: Lila Mabel Selak; Barbara Aznarez Decd Trust and Mabel Selak Trust	(Received 1 AF from Siebert (July 2018)] See Siebert for this reporting.	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00	150.00
Service Rock Products, L.P.		503.00	503.00	503.00	463.67	424.33	385.00	345.67	306.33	267.00
SGS Antelope Valley Development, LLC		57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00
Shadow Acres Mutual Water Company		52.60	52.60	52.60	52.46	52.31	52.17	52.03	51.88	51.74
Sheep Creek Water Company		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Siebert: Jeffrey and Nancee Siebert	Remaining Siebert Rights after 1 AF transferred to Selak (July 2018)	200.00	200.00	200.00	183.33	167.67	152.00	136.33	120.67	105.00
	Transferred 1 AF to Selak (July 2018)	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Sonrise Ranch, LLC		662.00	662.00	662.00	551.67	441.33	331.00	220.67	110.33	0.00
Southern California Edison Company		17.75	17.75	17.75	16.13	14.50	12.88	11.25	9.63	8.00
Sundale Mutual Water Company		472.23	472.23	472.23	472.23	472.23	472.23	472.23	472.23	472.23
Sunnyside Farms Mutual Water Company, Inc.		75.40	75.40	75.40	75.21	75.02	74.83	74.64	74.45	74.26
Tejon Ranchcorp and Tejon Ranch Co.		3,414.00	3,414.00	3,414.00	3,117.33	2,820.67	2,524.00	2,227.33	1,930.67	1,634.00
Tierra Bonita Mutual Water Company		40.75	40.75	40.75	40.68	40.61	40.54	40.46	40.39	40.32
Tierra Bonita Ranch		505.00	505.00	505.00	492.50	480.00	467.50	455.00	442.50	430.00
Triple M Property Co.		15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Turk Trust dated December 16, 1998		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Van Dam: Craig Van Dam, Marta Van Dam, Nick Van Dam, Janet Van Dam	Van Dam: Craig and Marta: 610 AFY (2018)	1,037.00	1,037.00	1,037.00	925.32	862.26	799.19	736.13	673.06	610.00
	Van Dam, Nick and Janet: 30 AFY (2018)				45.51	42.41	39.31	36.20	33.10	30.00
Van Dam Family Trust - 1996; High Desert Dairy	High Desert Dairy LLC 1,817 AFY (2020)	9,931.50	9,931.50	9,931.50	8,812.08	7,692.67	3,714.97	3,082.31	2,449.66	1,817.00
	Gary Van Dam 466 AFY (2020)						952.76	790.51	628.25	466.00
	Craig & Marta Van Dam 466 AFY (2020)						952.76	790.51	628.25	466.00
	Nick & Janet Van Dam 466 AFY (2020)						952.76	790.51	628.25	466.00
Vulcan Materials Co., Vulcan Lands Inc., Consolidated Rock Products Co., Calmat Lands, Co., Allied Concrete & Materials		519.10	519.10	519.10	475.92	432.73	389.55	346.37	303.18	260.00
WAGAS Land Company LLC		984.15	984.15	984.15	916.79	849.43	782.08	714.72	647.36	580.00
WDS California II, LLC	(Received 315 AF from Copa de starting Jan 2020)	2,397.00	2,397.00	2,397.00	2,190.67	1,984.33	1,778.00	1,571.67	1,365.33	1,159.00
Weatherbie: Michael and Dolores A. Weatherbie		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
West Side Park Mutual Water Co.		280.75	280.75	280.75	280.10	279.45	278.81	278.16	277.51	276.86
White Fence Farms Mutual Water Co.		783.05	783.05	783.05	781.23	779.41	777.59	775.77	773.95	772.13
William Fisher Memorial Water Company		4.53	4.53	4.53	4.53	4.53	4.53	4.53	4.53	4.53
Willow Springs Company: Richard Nelson		180.65	180.65	180.65	173.04	165.43	157.83	150.22	142.61	135.00
Wilson: Donna Wilson		10.00	10.00	10.00	9.50	9.00	8.50	8.00	7.50	7.00
Total		105,893.63	105,892.63	105,892.63	97,964.29	90,035.83	82,107.43	74,179.03	66,250.63	58,322.23

1. Exhibit 4 of the Judgment shows a Pre-Rampdown Production total of 105,878.08 AF due to the inadvertent omission of the last two entries in the sum on Exhibit 4 (Donna Wilson and William Fisher Memorial Water Company). The corrected sum of 105,893.63 will be used going forward.

Appendix B

Water Accounting Tables

B-1. Exhibit 3 Non-Overlying Producers Water Accounting

B-2. Exhibit 4 Overlying Producers Water Accounting

B-3. Other Parties (Non-Exhibit 3 or -Exhibit 4) Water Accounting

B-4. New Production Water Accounting

Table B-1 Exhibit 3 Non-Overlying Producers Water Accounting

last updated 6/29/20

Original Exhibit 3 Producers Public Water Suppliers	Water Available for Use in 2019 (AF)									2019 Water Use and Accounting (AF)														2020 Water Sources (AF)				
	Production Right	2019 Rampdown Production	Unused Federal Reserve Right for use in 2019	Imported Water Return Flows for 2019	Transfers (Not Permanent)	Transfer Water used for a 2018 Replacement Water Obligation	Carry Over Water for use in 2019	Carry Over Water plus Transfer Water for use in 2019	Total Water for use in 2019	2019 Total Groundwater Production	Amount of Groundwater Production that is recovery of stored water	Adjusted Groundwater Production	Production Right Used	Rampdown Used (Max is Rampdown Production Right)	Unused Federal Reserve Right Used	IWRF Used	Carry Over and Transfer Water Used	Over Production	Replacement Obligation[1]	Production Right to Carry Over for use in 2020	IWRF to Carry Over for use in 2020	Remaining Carry Over Water	2020 Rampdown	Unused Federal Reserve Right	Imported Water Return Flows for 2020	Carry Over Water (including past Transfer Water) for use in 2020	2020 Transfers (Not Permanent)
	Judgment	*As per Resolution R-18-22*	*Allocated as per Judgment*	*Imported Water Use Table from AVEK and information from PWD and LCID*	*See Appendix F*	*See Appendix E*	*From 2018 Annual Report*	*[Unused Transfer Water + Carry Over Water] [5-6+7]*	*2+3+4+8*	*Annual Production Reporting*	*Recovered Stored Water from Annual Production Reporting*	*[Total GW Production - Amount that is recovered stored water] [10-11]*	*If [12>1] then [1], otherwise 12]*	*If [12≤13] then 0, if [12>2] then [2-13], otherwise 12-13]]*	*If [12≤ 13+14] then 0, if [12-13-14>3] then [3], otherwise [12-13-14]*	*If [12≤ 13+14+15] then 0, If [12-13-14-15>4] then 4], otherwise [12-13-14-15]*	*If [12≤ 13+14+15+16] then 0, If [12-13-14-15-16>13] then 13], otherwise [12-13-14-15-16]*	*If [12-13-14-15-16-17]>0 then [12-13-14-15-16-17], otherwise 0*	*[18]*	*If [1-13]>0 then [1-13], otherwise 0*	*If [4-16]>0 then [4-16], otherwise 0*	*[B-17]*	*Agreed Upon*	*Amended as per Judgment (R-18-22 AF)*	*Imported Water Use Data from AVEK, PWD, and LCID*	*[20+21+22]*	*See Appendix F*
Boron Community Services District	50.00	118.68	0.00	68.77	0.00	0.00	73.34	73.34	260.79	0.17	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.83	68.77	73.34	101.51	0.00	79.40	191.94	
California Water Services Company	343.14	507.56	175.80	1.32	0.00	0.00	101.63	101.63	786.31	373.60	0.00	373.60	343.14	30.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	101.63	466.45	178.06	2.63	102.95	
Desert Lake Community Services District	73.53	73.53	37.67	35.90	0.00	0.00	327.44	327.44	474.54	0.51	0.00	0.51	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.02	35.90	327.44	73.53	38.16	39.19	436.36	
Littlerock Creek Irrigation District	796.58	1,212.32	408.12	0.00	0.00	0.00	0.00	0.00	1,620.44	1,293.46	28.00	1,265.46	796.58	415.74	53.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,108.38	413.35	33.85	0.00	
Los Angeles County Waterworks District No. 40, Antelope Valley[2]	6,789.26	6,789.26	3,478.41	9,782.54	0.00	0.00	11,343.65	11,343.65	31,393.86	12,812.68	0.00	12,812.68	6,789.26	0.00	3,478.41	2,545.01	0.00	0.00	0.00	0.00	0.00	7,737.53	11,343.65	6,789.26	3,523.01	10,396.33	18,581.18	8,581.60
North Edwards Water District	49.02	84.95	25.11	0.00	0.00	0.00	0.00	0.00	110.07	75.48	0.00	75.48	49.02	26.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.97	25.44	0.00	0.00	
Palm Ranch Irrigation District[3]	465.69	885.55	238.59	7.68	2,850.00	41.65	0.00	2,808.35	3,940.17	883.44	0.00	883.44	465.69	417.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.68	2,808.35	780.58	241.65	33.78	2,816.03	
Palmdale Water District	2,769.63	2,769.63	1,418.99	3,798.05	100.00	0.00	5,904.19	6,004.19	13,990.86	4,425.03	0.00	4,425.03	2,769.63	0.00	1,418.99	236.41	0.00	0.00	0.00	0.00	0.00	3,561.64	6,004.19	2,769.63	1,437.19	4,085.72	9,565.83	
Quartz Hill Water District	563.73	1,785.97	288.82	1,055.44	0.00	0.00	3,730.38	3,730.38	6,860.61	1,365.00	0.00	1,365.00	563.73	801.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,055.44	3,730.38	1,480.41	292.53	1,016.03	4,785.82	
Rosamond Community Services District	404.42	2,080.06	207.20	5.02	0.00	0.00	371.65	371.65	2,663.93	2,275.80	0.00	2,275.80	554.42	1,675.64	45.74	0.00	0.00	0.00	0.00	0.00	0.00	5.02	371.65	1,661.15	209.86	9.55	376.67	1,180.00
Transfer from eSolar Inc.; Red Dawn Suntower LLC - Exhibit 4	150.00	150.00	0.00	0.00	0.00	0.00			150.00															150.00	0.00	0.00		
West Valley County Water District	40.00	136.67	0.00	0.00	0.00	0.00	0.00	0.00	136.67	125.15	0.00	125.15	40.00	85.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.50	0.00	0.00	0.00	
Total[3]	12,651.20	24,944.17	6,278.73	14,754.72	2,950.00	41.65	21,852.28	24,760.63	62,388.24	23,630.32	28.00	23,602.32	12,372.15	3,452.47	4,996.29	2,781.42	0.00	0.00	0.00	122.85	11,973.30	24,760.63	15,569.38	6,359.24	15,696.48	36,856.78	9,761.60

1. PRID's 2018 Replacement Obligation was revised to 41.65 AF in January 2020 to reflect error in Unused Federal Reserved Water Right formula in 2018 water accounting tables.
2. Los Angeles County Waterworks District No. 40 also received a transfer of 4,487.13 AF of stored imported water from AVEK's Westside Water Bank. Recovery of this stored imported water will be shown in the Appendix E tables when recovery occurs.
3. Production Right total of 12,495 AF does not include the 150 AF that RCSD received from an Exhibit 4 Party transfer (eSolar Inc.; Red Dawn Suntower LLC)
Future tables may include rights to Stored Water.

TODD GROUNDWATER
Watermaster Engineer

Table B-2 Exhibit 4 Overlying Producers Water Accounting

Last updated 7/17/20

Original Exhibit 4 Overlying Producers	Transferors of Permanent [illegible]	Water Available for Use in 2019 (AF): [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Carry Over Water plus Transfer Water for use in 2019	Total Water for use in 2019	2019 Water Use and Accounting (AF): 2019 Total Groundwater Production	Amount of Groundwater Production that is recovery of stored water	Adjusted Groundwater Production	Production Right Used	Rampdown Used	[illegible] Used	[illegible] Water Used	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2020 Water Sources (AF): [illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]																					[illegible]	[illegible]	[illegible]	
County Sanitation Districts of Los Angeles 14 & 20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]														[illegible]								
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table B-2 Exhibit 4 Overlying Producers Water Accounting

last updated 7/17/20

Original Exhibit 4 Overlying Producers	Transfers of Permanent PR	1 Production Right	2 2019 Rampdown Production	3 Imported Water Return Flows for 2019	4 Transfers (Not Permanent)	5 Transfer Water used for a 2018 Replacement Water Obligation	6 Carry Over Water for use in 2019	7 Carry Over Water plus Transfer Water for use in 2019	8 [illegible] for use in 2019	9 2019 Total Groundwater Production	10 Amount of Groundwater Production that is recovery of stored water	11 Adjusted Groundwater Production	12 Production Right Used	13 Rampdown Used	14 [illegible] Used	15 Carry Over and Transfer Water Used	16 Over Production	17 Replacement Obligation	18 Production Right to Carry Over for use in 2020	19 IWRF to Carry Over for use in 2020	20 Remaining Carry Over Water	21 2020 Rampdown	22 Imported Water Return Flows for 2020	23 Carry Over Water (including past Transfer Water) for use in 2020	24 2020 Transfers (Not Permanent)
		[illegible]	[illegible]	Imported Water Use Table from AVEK	See Appendix F	See Appendix E	from 2018 Annual Report	[Unused Transfer Water + Carry Over Water] [4-5+6]	[illegible]	Annual Production Reporting	Recovered Stored Water from Annual Production Reporting	[Total GW Production - Amount that is recovered stored water] [9-10]	if [11>1] then [1], otherwise [11]	if [11 ≤ 12] then 0, if [11>2] then [2-12], otherwise [11-12]	if [11 ≤ 12+13] then 0, if [11-12-13>3] then [3], otherwise [11-12-13]	if [11 ≤ 12+13+14] then 0, if [11-12-13-14>7] then [7], otherwise [11-12-13-14]	if [11-12-13-14-15>0] then [11-12-13-14-15], otherwise 0	[16]	if [1-12]>0 then[1-12], otherwise 0	if [3-14]>0, then [3-14], otherwise 0	[7-15]	Rampdown Tables	Imported Water Use Table from AVEK	[18+19+20]	See Appendix F
Frankenberg: Leah Frankenberg		1.00	[illegible]	0.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Godde: Steve, Pamela & Gary Godde c/o Rife Silva & Co LLC	[Receives IWRF Rights from Ferrer Godde for Exhibit 8 Party (2017)]	683.00	1,202.00	0.00	0.00	0.00	683.00	683.00	1,885.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	683.00	0.00	683.00	1,072.25	[illegible]	[illegible]	
Gorrindo Resourceful LLC		629.00	629.00	[illegible]	0.00	0.00	1,887.00	1,887.00	2,516.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	629.00	0.00	1,887.00	629.00	0.00	2,516.00	
Granite Construction Company (Big Rock Facility)		126.00	[illegible]	[illegible]	0.00	0.00	314.92	314.92	441.04	118.20	[illegible]	[illegible]	118.20	0.00	0.00	0.00	[illegible]	0.00	7.80	0.12	314.92	126.00	0.00	322.84	
Granite Construction Company (Little Rock Sand and Gravel, Co.)	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	21.29	[illegible]	[illegible]	[illegible]	[illegible]	211.79	0.00	0.00	0.00	[illegible]	0.00	[illegible]	0.00	[illegible]	317.00	0.00	[illegible]	
[illegible] Laura Griffin Trustee of the Family Bypass Trust		668.00	1,002.67	[illegible]	0.00	0.00	665.80	665.80	[illegible]	[illegible]	0.00	2.10	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	665.90	0.00	665.80	919.00	0.00	[illegible]	
H & N Development Co. West Inc		[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	1,469.17	[illegible]	0.00	1,559.94	808.00	[illegible]	0.00	0.00	[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	
Healy: Jane Healy and Healy Enterprises Inc.		700.00	700.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	700.00	0.00	[illegible]	700.00	0.00	[illegible]	
[illegible] Trustees of the Kyle Revocable Living Trust		3,670.00	7,406.67	0.00	0.00	0.00	0.00	0.00	7,406.67	4,679.55	[illegible]	4,679.55	3,670.00	1,009.55	0.00	0.00	[illegible]	[illegible]	0.00	0.00	0.00	6,472.50	0.00	[illegible]	
Land Projects Mutual Water Co.		613.54	619.51	0.00	0.00	0.00	[illegible]	95.62	[illegible]	[illegible]	0.00	575.00	575.00	0.00	0.00	[illegible]	0.00	[illegible]	38.54	0.00	95.62	618.02	[illegible]	[illegible]	
Landale Mutual Water Co		[illegible]	157.02	[illegible]	0.00	0.00	[illegible]	[illegible]	243.84	[illegible]	0.00	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	[illegible]	82.77	[illegible]	4.99	[illegible]	
Landinv Inc.	PS Land Holding Company, LLC: 736.44 AF (2016) — 600 AFY to Diamond Farming (217 AF), Crystal Organic (190 AF), Grimmway (193 AF) (2018)	600.00	600.00	0.00	0.00	0.00	367.40	[illegible]	967.40	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	600.00	0.00	367.40	600.00	[illegible]	967.40	
	PS Land Holding Company, LLC: 736.44 AF (2016) — [illegible] with PS Land Holding Company, LLC: 136.44 AF (2018)	136.44	658.81	0.00	0.00	0.00	1,600.22	1,600.22	2,259.03	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	1,600.22	528.22	0.00	[illegible]	
	Radcast; merger, 232.56 AF (2017)	232.56	[illegible]	0.00	0.00	0.00	[illegible]	697.68	1,095.20	0.00	0.00	0.00	[illegible]	[illegible]	0.00	0.00	0.00	0.00	232.56	0.00	[illegible]	356.28	0.00	930.24	
Lands of Promise Mutual Water Company		21.69	[illegible]	0.00	[illegible]	0.00	#VALUE!	[illegible]	#VALUE!	Not Reported	0.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	[illegible]	#VALUE!	#VALUE!	#VALUE!	#VALUE!	[illegible]	[illegible]	0.00	#VALUE!	
Lane Family Trusts		773.00	1,192.33	[illegible]	0.00	0.00	[illegible]	[illegible]	1,295.29	735.00	0.00	735.05	[illegible]	0.00	0.00	0.00	0.00	0.00	37.95	6.17	[illegible]	1,087.50	8.08	160.51	-205.00
LeClair: Marie A. Unini and Robert J. LeClair		1.00	1.00	0.00	0.00	0.00	[illegible]	0.90	[illegible]	0.70	[illegible]	[illegible]	0.70	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.90	[illegible]	0.00	1.20	
Leer: James M. Leer, III and Diane Leer		1.00	1.00	0.00	0.00	0.00	1.27	[illegible]	2.27	[illegible]	0.00	0.43	0.43	0.00	0.00	0.00	0.00	0.00	0.57	0.00	1.27	[illegible]	[illegible]	1.84	
Littlerock Aggregate Co., Inc., Holiday Rock Co., Inc		151.00	320.33	0.00	0.00	0.00	[illegible]	0.00	320.33	[illegible]	0.00	[illegible]	151.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	278.00	0.00	0.00	
Llano Del Rio Water Company		[illegible]	474.77	0.00	0.00	0.00	563.01	563.01	1,037.78	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	279.00	0.00	563.01	425.83	0.00	842.01	
Llano Mutual Water Company		[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	
[illegible]: Trustees of the [illegible] Living Trust		1,775.00	[illegible]	0.00	[illegible]	0.00	[illegible]	[illegible]	6,764.34	[illegible]	0.00	549.04	549.04	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	3,039.01	2,737.78	0.00	4,864.37	
McWilliams: Dennis M. and Diane K. McWilliams		[illegible]	[illegible]	0.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	[illegible]	[illegible]	0.00	[illegible]	
Miner: Richard Miner		999.00	1,059.27	0.00	0.00	0.00	2,093.27	2,093.27	[illegible]	[illegible]	0.00	[illegible]	5.50	0.00	0.00	0.00	0.00	0.00	993.50	0.00	2,093.27	1,064.20	0.00	3,086.77	
Miracle Improvement Corporation dba Golden Sands Mobile Home Park/Trailer Park	New Goldensands Investment, property sale (2016)	[illegible]	39.27	0.00	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	0.00	28.50	27.00	1.50	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	36.20	0.00	[illegible]	
Munz: 2014 Revocable Trust, Terry A. & Kathleen M. Munz		[illegible]	3.00	0.00	[illegible]	0.00	[illegible]	[illegible]	15.80	Not Reported	0.00	[illegible]	#VALUE!	[illegible]	[illegible]	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	3.00	0.00	[illegible]	
Nebeker: Eugene B. Nebeker		[illegible]	3,269.00	0.00	-1,391.00	0.00	1,391.10	0.10	3,269.10	592.80	0.00	592.80	[illegible]	0.00	0.00	0.00	0.00	0.00	1,182.20	[illegible]	[illegible]	2,895.50	0.00	1,182.30	[illegible]
Northrop Grumman Systems Corporation		2.00	2.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.43	0.43	0.00	0.00	0.00	0.00	0.00	1.57	0.00	3.00	[illegible]	0.00	4.57	
NRG Solar Alpine, LLC		[illegible]	55.47	0.00	0.00	0.00	105.91	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	105.91	[illegible]	0.00	141.83	
R and M Ranch, Inc.		686.00	[illegible]	0.00	0.00	0.00	0.00	0.00	1,200.67	792.00	[illegible]	792.00	[illegible]	106.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,072.00	[illegible]	0.00	
Reca: John and Adrienne Reca		251.00	417.97	[illegible]	0.00	0.00	604.00	604.00	1,021.97	61.00	0.00	61.00	61.00	0.00	0.00	0.00	0.00	0.00	190.00	0.00	[illegible]	[illegible]	0.00	[illegible]	
Richter: Suzanne J. Richter		1.00	1.00	0.00	0.00	0.00	2.50	2.50	3.50	0.60	0.00	[illegible]	0.40	0.00	0.00	0.00	0.00	0.00	0.60	0.00	2.50	1.00	0.00	[illegible]	
Rosamond High School		[illegible]	458.34	0.00	0.00	0.00	486.97	486.97	[illegible]	[illegible]	[illegible]	68.84	68.84	0.00	0.00	0.00	0.00	0.00	133.39	0.00	[illegible]	[illegible]	0.00	[illegible]	
[illegible] Ranch	PS Land Holding Company, LLC, property sale (2019)	[illegible]	598.00	0.00	0.00	0.00	1,794.00	1,794.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	1,794.00	598.00	0.00	2,392.00	
Rose Villa Apartments		[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	#VALUE!	#VALUE!	Not Reported	0.00	#VALUE!	[illegible]	[illegible]	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	[illegible]	[illegible]	15.17	0.00	#VALUE!	
Sahara Nursery and Farm		[illegible]	22.12	0.00	[illegible]	0.00	[illegible]	42.81	64.93	11.17	[illegible]	11.17	[illegible]	0.00	[illegible]	0.00	0.00	0.00	10.83	0.00	42.81	[illegible]	0.00	[illegible]	
Saint Andrew's Abbey, Inc		102.00	[illegible]	[illegible]	0.00	0.00	87.86	[illegible]	[illegible]	[illegible]	0.00	79.81	79.81	[illegible]	0.00	0.00	0.00	0.00	22.19	0.00	87.86	138.50	0.00	110.05	
Schilling: Lawrence J. and Mary F. Schilling Trustees of the L&M Schilling 1992 Family Trust		[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	1.80	5.80	2.80	0.00	[illegible]	2.84	0.00	0.00	0.00	0.00	0.00	1.16	0.00	1.80	4.00	0.00	2.96	
Selak: Lila Mabel Selak; Barbara Aznarez Decd Trust and Mabel Selak Trust	[illegible] (successors in interest) [Received 1 [illegible] Siebert (July 2018). See Siebert for [illegible] reporting]	[illegible]	150.00	[illegible]	[illegible]	[illegible]	450.00	53.00	203.00	0.00	0.00	[illegible]	0.00	[illegible]	[illegible]	0.00	0.00	0.00	150.00	0.00	[illegible]	150.00	[illegible]	[illegible]	
Service Rock Products, L.P.		267.00	424.33	[illegible]	[illegible]	[illegible]	196.30	[illegible]	622.63	[illegible]	0.00	[illegible]	267.00	128.30	0.00	[illegible]	0.00	0.00	[illegible]	0.00	198.30	385.00	0.00	198.30	
SGS Antelope Valley Development, LLC		57.00	57.00	0.00	0.00	0.00	#VALUE!	[illegible]	#VALUE!	Not Reported	0.00	#VALUE!	#VALUE!	[illegible]	#VALUE!	#VALUE!	#VALUE!	[illegible]	[illegible]	#VALUE!	[illegible]	57.00	0.00	[illegible]	
Shadow Acres Mutual Water Company[2]		[illegible]	[illegible]	53.96	0.00	0.00	67.07	67.07	172.94	[illegible]	0.00	[illegible]	51.74	0.57	14.89	0.00	[illegible]	[illegible]	0.00	38.57	[illegible]	[illegible]	[illegible]	105.64	

Table B-2 Exhibit 4 Overlying Producers Water Accounting

last updated 7/17/20

Original Exhibit 4 Overlying Producers	Transfers of Permanent PR	Water Available for Use in 2019 (AF): Production Right	2019 Rampdown Production	Imported Water Return Flows for 2019	Transfers (Not Permanent)	Transfer Water used for a 2018 Replacement Water Obligation	Carry Over Water for use in 2019	Carry Over Water plus Transfer Water for use in 2019	Total Water for use in 2019	2019 Water Use and Accounting (AF): 2019 Total Production	Amount of Groundwater Production that is recovery of stored water	Adjusted Groundwater Production	Production Right Used	Rampdown Used	IWRF Used	Carry Over and Transfer Water Used	Over Production	Replacement Obligation	Production Right to Carry Over for use in 2020	IWRF to Carry Over for use in 2020	Remaining Carry Over Water	2020 Water Sources (AF): 2020 Rampdown	Imported Water Return Flows for 2020	Carry Over Water (including past Transfer Water) for use in 2020	2020 Transfers (Not Permanent)
		[illegible]	[illegible]	[illegible]	See Appendix F	See Appendix E	From 2018 Annual Report	[Unused Transfer Water + Carry Over Water] [4-5+6]	[illegible]	Annual Production Reporting	Recovered Stored Water from Annual Production Reporting	[Total GW Production - Amount that is recovered stored water] [9-10]	if [11>1] then [1], otherwise [11]	if [11 ≤ 12] then 0, if [11>2] then [2-12], otherwise [11-12]	if [11 ≤ 12+13] then 0, if [11-12-13>3] then [3], otherwise [11-12-13]	if [11 ≤ 12+13+14] then 0, if [11-12-13-14>7] then [7], otherwise [11-12-13-14]	if [11-12-13-14-15>0] then [11-12-13-14-15], otherwise 0	[16]	if [1-12]>0 then[1-12], otherwise 0	if [3-14]>0, then [3-14], otherwise 0	[7-15]	Rampdown Tables	Imported Water Use Table from AVEK	[18+19+20]	See Appendix F
[illegible]		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Siebert: Jeffrey and Nancee Siebert	Remaining Siebert Rights after 1 AF transferred to Sebk (July 2018)	105.00	167.67	0.00	0.00	[illegible]	210.00	210.00	377.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	105.00	0.00	[illegible]	[illegible]	0.00	[illegible]	
	Transferred 1 AF to Sebk (July 2018)	1.00	[illegible]	0.00	0.00	[illegible]	1.00	1.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	[illegible]	1.00	0.00	1.00	
Sonrise Ranch, LLC		0.00	441.33	[illegible]	0.00	0.00	0.00	0.00	[illegible]	19.46	[illegible]	19.46	0.00	19.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	331.00	0.00	0.00	
Southern California Edison Company		[illegible]	[illegible]	0.00	0.00	0.00	22.95	22.95	[illegible]	0.30	0.00	0.30	[illegible]	0.00	0.00	0.00	0.00	0.00	7.70	[illegible]	[illegible]	12.88	0.00	30.63	
Sundale Mutual Water Company		472.23	[illegible]	0.00	[illegible]	0.00	202.86	[illegible]	675.09	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	[illegible]	202.86	472.23	0.00	[illegible]	
Sunnyside Farms Mutual Water Company, Inc.[2]		[illegible]	75.02	[illegible]	0.00	0.00	[illegible]	58.22	170.63	[illegible]	0.00	122.10	74.26	[illegible]	11.37	[illegible]	0.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	48.51	
Tejon Ranchcorp and Tejon Ranch Co		1,634.00	2,820.67	292.81	0.00	0.00	876.70	876.70	3,990.18	1,523.09	0.00	1,523.09	1,523.09	0.00	0.00	0.00	0.00	0.00	110.91	292.81	876.70	2,524.00	[illegible]	1,280.42	
Tierra Bonita Mutual Water Company		[illegible]	40.61	[illegible]	0.00	[illegible]	18.95	[illegible]	[illegible]	[illegible]	0.00	[illegible]	32.01	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	
Tierra Bonita Ranch		[illegible]	480.00	0.00	[illegible]	0.00	0.00	0.00	480.00	480.00	0.00	480.00	430.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	
Triple M Property Co.		35.00	[illegible]	[illegible]	0.00	0.00	33.00	33.00	48.00	Not Reported	0.00	[illegible]	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	[illegible]	0.00	[illegible]	
Turk Trust dated December 16, 1998		[illegible]	[illegible]	0.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	0.06	0.00	0.00	0.00	0.00	0.00	[illegible]	[illegible]	2.90	[illegible]	0.00	[illegible]	
Van Dam: Craig Van Dam, Marta Van Dam, Nick Van Dam, Janet Van Dam (640 AFY Production Right)	Van Dam: Craig and Marta: 610 AFY (2018) — Van Dam: Craig and Marta: 608 AFY (2020)	608.00	[illegible]	0.00	-400.00	0.00	[illegible]	[illegible]	1,069.34	[illegible]	0.00	158.13	[illegible]	[illegible]	0.00	0.00	0.00	0.00	449.87	0.00	[illegible]	799.19	0.00	[illegible]	-430.00
	Van Dam: Craig and Marta: 610 AFY (2018) — Calandri Farms: 1 AFY (2020-pending intervention)	[illegible]																				0.00	0.00	[illegible]	
	Van Dam: Craig and Marta: 610 AFY (2018) — V Lions: 1 AFY (2020-pending intervention)	1.00																				0.00	0.00	0.00	4,152 (pending intervention)
	Van Dam, Nick and Janet: 30 AFY (2018)	30.00	42.41	[illegible]	0.00	0.00	0.00	0.00	42.41	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	[illegible]	0.00	
Van Dam Family [illegible] 1996, High Desert Dairy	High Desert Dairy, 1,817 AFY (2020)	3,215.00	7,692.67	0.00	0.00	0.00	[illegible]	[illegible]	7,692.67	5,880.73	[illegible]	5,880.73	3,215.00	2,665.73	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	3,714.97	0.00	0.00	
	Van Dam, Gary and Sonrise Ranch: 466 AFY (2020)																					952.76	0.00	0.00	
	Van Dam: Craig and Marta: 466 AFY (2020)																					952.76	0.00	0.00	
	Van Dam, Nick and Janet: 466 AFY (2020)																					952.76	0.00	0.00	
Vulcan Materials Co., Vulcan Lands Inc., Consolidated Rock Products Co., Calmat Lands, Co., Allied Concrete & Materials		260.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	[illegible]	[illegible]	0.00	[illegible]	260.00	172.73	0.00	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.00	0.00	205.00
WAGAS Land Company LLC		580.00	849.43	[illegible]	0.00	[illegible]	[illegible]	#VALUE!	#VALUE!	Not Reported	0.00	[illegible]	[illegible]	#VALUE!	#VALUE!	[illegible]	#VALUE!	#VALUE!	[illegible]	#VALUE!	#VALUE!	782.08	0.00	[illegible]	
WDS [illegible]	[Received 315 AF from Cope de starting Jan 2020]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	3,477.00	3,377.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,159.00	0.00	3,377.00	[illegible]	0.00	4,536.00	
Weatherbie, Michael and Dolores A. Weatherbie	Graves: Thomas Graves, property sale (2020)	1.00	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	Not Reported	0.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	[illegible]	#VALUE!	#VALUE!	[illegible]	[illegible]	0.00	#VALUE!	
West Side Park Mutual Water Co.		275.86	279.49	0.00	0.00	0.00	217.08	217.08	[illegible]	209.80	0.00	[illegible]	205.80	[illegible]	0.00	0.00	0.00	0.00	[illegible]	0.00	217.08	278.81	0.00	288.14	
White Fence Farms Mutual Water Co		772.13	[illegible]	[illegible]	0.00	0.00	1,154.83	1,154.83	2,001.90	431.97	0.00	431.97	431.97	0.00	0.00	[illegible]	0.00	0.00	340.16	67.66	1,154.83	[illegible]	76.78	1,562.65	
William Fisher Memorial Water Company		[illegible]	4.53	0.00	0.00	0.00	#VALUE!	[illegible]	#VALUE!	Outside of Basin	0.00	[illegible]	#VALUE!	[illegible]	#VALUE!	#VALUE!	#VALUE!	[illegible]	#VALUE!	[illegible]	[illegible]	4.53	0.00	[illegible]	
Willow Springs Company [illegible]		135.00	[illegible]	0.00	0.00	0.00	99.87	[illegible]	[illegible]	[illegible]	0.00	84.78	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	0.00	350.09	
Wilson: Donna Wilson		[illegible]	[illegible]	0.00	[illegible]	0.00	18.00	18.00	27.00	[illegible]	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	18.00	[illegible]	0.00	[illegible]	
		[illegible]	[illegible]	[illegible]	-5,338.00	0.00	#VALUE!	#VALUE!	#VALUE!	55,385.20	[illegible]	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	[illegible]	#VALUE!	#VALUE!	12,115.34	81,957.43	1,864.02	#VALUE!	[illegible]

1. Pursuant to Section 5.1.8 of the Judgment, Antelope Valley Joint Union High School District has an additional 29 AF of Production for use on its athletic fields and other public spaces. When recycled water becomes available to Quartz Hill High School at a [illegible] than the lowest cost of any of the following: Replacement Obligation, Replacement Water, or other water that is delivered to AVJUHSD at Quartz Hill High School, AVJUHSD will stop producing the 29 AF groundwater and use recycled water. AVJUHSD produced 137.87 AF in 2019. 108.87 AF is included in Table B-2 and 29 AF is included in Table B-3.
2. There was an error in the Carry Over Water for Use in 2018 values in previous tables for Shadow Acres MWC and Sunnyside Farms MWC. Actual values are slightly higher and have been corrected in this table.
3. In early 2020, Calandri reduced the amount of its 2018 Production from its own Production Right and increased the amount of Production from the County Sanitation Districts by 470.20 AF. The County Sanitation Districts agreed to this change via a 2/4/20 email. Consequently, the Water Available for use in 2019 in the 2019 Annual Report is different from those listed in the 2018 Annual Report.
Future tables may include rights to Stored Water.

Table B-3 Other Parties (Non Exhibit 3 or Exhibit 4) Water Accounting

last updated 7/8/20

Other Parties (Non Exhibit 3 or Exhibit 4)	Transferees	Water Available for Use in 2019 (AF): Production Right[1]	2019 Rampdown or Right to Produce	Imported Water Return Flows for 2019	Transfers (Non Permanent)	Transfer Water used for a 2018 Replacement Water Obligation	Carry Over Water for use in 2019	Carry Over (Unused Transfer Water) for use in 2019	Total Water for use in 2019	2019 Water Use and Accounting (AF): 2019 Total Groundwater Production (blank if not yet reported)	Amount of Groundwater Production that is recovery of stored water	Adjusted Groundwater Production	Production Right or Right to Produce Used	Rampdown Used (if applicable)	IWRF Used (if applicable)	Carry Over and Transfers Water Used (if applicable)	Over Production	Replacement Obligation	Production Right to Carry Over for use in 2019[1]	IWRF to Carry Over for use in 2019	Remaining Carry Over Water	2020 Water Sources (AF): 2020 Rampdown or Right to Produce	Imported Water Return Flows for 2020	Carry Over Water (including past Transfers Water) for use in 2020	2020 Transfers (Not Permanent)
		[illegible]	As per Judgment and Rescaled on R-18-22	Imported Water Use Table from AVEK	See Appendix F	See Appendix E	From 2018 Annual Report	(Unused Transfer Water + Carry Over Water) (4-5+6)	[illegible]	[illegible]	Recovered Stored Water from Annual Production Reporting	[illegible]	If (11>1) then (1), otherwise (11)	[illegible]	[illegible]	[illegible]	[illegible]	(16)	If (1-12)>0 then (1-12), otherwise 0	If (3-14)>0, then (3-14), otherwise 0	(7-15)	Agreed Upon	Imported Water Use Table from AVEK	(18+19+20)	See Appendix F
[illegible]																									
[illegible]		7,600.00	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	[illegible]	0.00	0.00	7,600.00	0.00	0.00	
[illegible]																									
Department of Water Resources		104.00	104.00	0.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	0.00	#VALUE!	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	#VALUE!	[illegible]	[illegible]	[illegible]	104.00	0.00	[illegible]	
Department of Parks and Recreation		[illegible]	[illegible]	2.58	0.00	0.00	[illegible]	[illegible]	#VALUE!	Not Reported	0.00	[illegible]	#VALUE!	#VALUE!	[illegible]	[illegible]	#VALUE!	[illegible]	[illegible]	[illegible]	#VALUE!	[illegible]	[illegible]	[illegible]	
Department of Transportation		47.00	47.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	Not Reported	0.00	#VALUE!	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	47.00	0.00	[illegible]	
State Lands Commission		[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	#VALUE!	#VALUE!	#VALUE!	[illegible]	#VALUE!	#VALUE!	[illegible]	[illegible]	#VALUE!	
Department of Corrections and Rehabilitation		[illegible]	3.00	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	Not Reported	0.00	#VALUE!	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	
50th District Agricultural Association		32.00	32.00	0.00	0.00	0.00	64.00	64.00	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	32.00	0.00	[illegible]	[illegible]	0.00	[illegible]	
Department of Veteran Affairs		[illegible]	3.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.00	[illegible]	
Highway Patrol		[illegible]	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	#VALUE!	Not Reported	0.00	#VALUE!	[illegible]	#VALUE!	[illegible]	[illegible]	#VALUE!	#VALUE!	[illegible]	#VALUE!	[illegible]	[illegible]	[illegible]	#VALUE!	
Department of Military		[illegible]	3.00	0.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	Not Reported	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]																									
Desert Breeze MHP, LLC		18.10	19.60	0.00	0.00	[illegible]	[illegible]	#VALUE!	#VALUE!	16.01	0.00	16.01	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	Not Applicable	[illegible]	0.00	Not Applicable	
Milosa VX, LLC dba Rosamond Mobile Home Park		21.70	[illegible]	0.00	0.00	[illegible]	Not applicable	[illegible]	[illegible]	24.22	0.00	[illegible]	21.70	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	Not Applicable	24.85	0.00	Not Applicable	
Reesdale Mutual Water Company		23.00	23.00	0.00	0.00	0.00	0.00	0.00	23.00	12.00	0.00	12.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Not Applicable	23.00	0.00	Not Applicable	
Juanita [illegible] Eyherabide Land Co., LLC and Eyherabide Sheep Company		12.00	[illegible]	0.00	0.00	[illegible]	0.00	[illegible]	13.71	Not Reported	[illegible]	#VALUE!	#VALUE!	[illegible]	#VALUE!	[illegible]	[illegible]	[illegible]	0.00	[illegible]	Not Applicable	[illegible]	0.00	Not Applicable	
Clan Keith Real Estate Investments, LLC dba Leisure Lake Mobile Estates		64.00	120.07	0.00	0.00	0.00	0.00	0.00	120.07	131.78	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	[illegible]	[illegible]	0.00	0.00	Not Applicable	106.05	0.00	[illegible]	
White Fence Farms Mutual Water Company No. 3		[illegible]	0.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	0.43	0.00	0.43	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Not Applicable	4.00	0.00	Not Applicable	
LV Ritter Ranch, LLC		0.00	613.91	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	Not Reported	0.00	[illegible]	[illegible]	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00	#VALUE!	Not Applicable	475.44	0.00	Not Applicable	
Rober Enterprises, Inc., Hi-Grade Materials, Co., and CJR, a General Partnership		[illegible]	537.11	0.00	0.00	[illegible]	0.00	0.00	[illegible]	324.46	[illegible]	324.46	200.00	124.46	0.00	0.00	0.00	0.00	[illegible]	0.00	Not Applicable	438.00	0.00	Not Applicable	
[illegible]		To be [illegible]	To be determined	0.00	0.00	0.00	0.00	0.00	#VALUE!	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	Not Applicable	23.00	[illegible]	Not Applicable	
[illegible]																									
Antelope Valley Joint Union High School District[2]		29.00	[illegible]	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	0.00	29.00	29.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	Not Applicable	29.00	0.00	Not applicable	
City of Lancaster		500.00	500.00	0.00	0.00	0.00	0.00	[illegible]	500.00	447.93	0.00	[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	Not Applicable	500.00	0.00	Not applicable	
Phelan Pinon Hills CSD[3]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,200.00	[illegible]	0.00	[illegible]	[illegible]	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00	Not Applicable	1,200.00	0.00	Not applicable	
[illegible]																									
Antelope Valley Country Club		[illegible]	3.00	[illegible]	400.00	112.35	0.00	[illegible]	[illegible]	465.05	0.00	465.05	3.00	0.00	[illegible]	287.65	[illegible]	135.58	[illegible]	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]
Derrick, Olin & Beatrice	[illegible]	[illegible]	[illegible]	[illegible]	397.00	397.00	0.00	0.00	[illegible]	[illegible]	0.00	#VALUE!	[illegible]	[illegible]	[illegible]	#VALUE!	#VALUE!	#VALUE!	0.00	0.00	0.00	[illegible]	0.00	[illegible]	
Long Valley Road L.P.		[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.00	1,068.31	1,071.31	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]	3.00	0.00	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	[illegible]	0.00	#VALUE!	#VALUE!	[illegible]	[illegible]	#VALUE!	#VALUE!	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	#VALUE!	
[illegible]		[illegible]	3.00	0.00	0.00	0.00	0.00	0.00	[illegible]	Not Reported	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	
Tapia Brothers Farms		[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	0.00	#VALUE!	[illegible]	[illegible]	#VALUE!	[illegible]	[illegible]	#VALUE!	0.00	0.00	0.00	[illegible]	0.00	0.00	
Zamrzla, Johnny		[illegible]	3.00	0.00	0.00	0.00	0.00	[illegible]	3.00	Not Reported	0.00	[illegible]	[illegible]	#VALUE!	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.00	0.00	[illegible]	
[illegible]																									
[illegible]		0.00	0.00	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00	[illegible]	
Antelope Valley Water Company		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	[illegible]	[illegible]	0.00	0.00	0.00	
Edgemont Acres MWC		0.00	0.00	60.48	0.00	0.00	[illegible]	0.00	60.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00		[illegible]	
[illegible] Goode		0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Harter, Scott Harter		0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	
Warnack Trust		0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[illegible]																									
40th Street Mutual Water Company		0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]	[illegible]	0.00	20.95	0.00	0.00	[illegible]	0.00	20.95	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	
AV Resource Conservation District		0.00	0.00	60.48	0.00	0.00	0.00	0.00	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	9.62	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00		[illegible]	
Piute Mutual Water Company	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.13	0.00	11.13	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	
sPower		0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	Not Reported	0.00	[illegible]	#VALUE!	[illegible]	[illegible]	[illegible]	#VALUE!	#VALUE!	0.00	#VALUE!	#VALUE!	0.00	0.00	[illegible]	

1. United States Production Right to Carry Over for use in 2019 is the Unused Federal Reserved Water Right available to 9 public water suppliers in 2019 as per the Judgment.
2. Pursuant to Section 5.1.8 of the Judgment, Antelope Valley Joint Union High School District [illegible] additional 29 AF of Production for use on its athletic fields and other public spaces. When recycled water becomes available to Quartz Hill High School at a price equal to or less than the lowest cost of any of the following: Replacement Obligation, Replacement Water, or other water that is delivered to AVJUHSD at Quartz Hill High School, AVJUHSD will stop producing the 29 AF groundwater and use recycled water. This 29 AF has been subtracted from their reported 2016 through 2019 Production shown on the Exhibit 4 Overlying Producers Water Accounting table.
3. Phelan Pinon Hills CSD Replacement Obligation is equal to its total groundwater production as per Judgment Section 6.4.1.2
4. The 3.0 acre-foot Production Right for the Small Pumper Class reflects the maximum annual Production by Small Pumper Class members without incurring a Replacement Water Assessment. Additional Small Pumpers may be overproducing and include William Felder, Parvaneh Sadwar, Johnny Rogers/Mark Ritter, Philip Arkin, Mountain Brook LLC, and Magaly Molina (from AVWM Admin Staff database)

[illegible]uture tables may include rights to Stored Water

TODD GROUNDWATER
Watermaster Engineer

Table B-4 New Production Water Accounting

Includes approved New Production applications through June 2020

New Production (date approved)	Estimated Production on Application (AFY)	2019 Total Groundwater Production	Inside State Water Contractor Area	Replacement Water Assessment[1]	Status of Intervening[3]
40th Street East Water Group (May 2020) (previous name: 40th St MWC)	21 to 37	NA since approved in 2020	Yes		NA: Defaulted Party
Alegre, Juan Carlos & Ceidy D. (March 2018)	<1.0	Not Reported	Yes		NA: Willis Class
Ambriz, Juan (December 2018)	<1.0	0.07	Yes	$32	NA: Willis Class
Ancheta, Nathaniel (April 2020)	1.0	NA since approved in 2020	Yes	NA	NA: Willis Class
Carmen Vela, Maria del (July 2018)	<1.0	Not Reported	Yes		NA: Willis Class
Castillo, Juan (March 2018)	<1.0	Decided not to drill at this time			
Collins, Raymond & Maryann (January 2019)	<2.0	0.00	Yes	$0	NA: Willis Class
Connelly, Myles (January 2019)	≤1.0	Not Reported	Yes		NA: Willis Class
Cooper, Ron (March 2018)	<1.0	Unable to build his proposed house. Well drilled by Abundant and capped.			
Copart, Inc. (June 2020)	21.6 initially reducing to 12.2	NA since approved in 2020	Yes	NA	PENDING
Espinoza, Leticia (April 2019)	<3.0	Started pumping in 2020	Yes	NA	NA: Willis Class
Estrada, Jesus (Sept 2019)	<1.0	Not Reported	Yes		NA: Willis Class
Estrada, Juan & Mayra (April 2020)	1.0	NA since approved in 2020	Yes	NA	NA: Willis Class
Fong, Alama (April 2018)	<1.0	Not Reported	Yes		NA: Willis Class
French, Christopher & Nancy (March 2018) **DRY**	<1.0	Borehole was dry so applicant withdrew application			
Garcia, Ervin and Carolina Espina (June 2019)	<1.0	Well completed May 2020	Yes	NA	NA: Willis Class
Hounanian, Masis (June 2019)	<2.5	Not Reported	Yes		NA: Willis Class
Jimenez Esparza, David (June 2018)	<1.0	Well completed Feb 2020	Yes	NA	NA: Willis Class
Juniper Hills Land Conservation Trust (May 2019)	<1.0	Not Reported	No		NA: Willis Class
Korn, Carrie (March 2018) **DRY**	<1.0	Borehole was dry so applicant withdrew application			
LA COSEPA (May 2018)[2]	14.16	Meter documentation in progress, will send production report when available	Yes		Motion for Leave to Intervene in the Judgment 8-9-2018
Magana, Paul (March 2018)	<1.0	Well completed May 2018, no electricity or production as of May 2020	Yes	NA	NA: Willis Class
Meng, Sifan (April 2020)	<1.0	NA since approved in 2020	Yes	NA	NA: Willis Class
Ming, Lin (April 2019)	<1.0	Not Reported	Yes		NA: Willis Class
Ormonde, Antonio (Sept 2019)	2.0	Well completed Aug 2016, waiting for permits to build	Yes	NA	NA: Willis Class
Ovespyan, Andrey (May 2019)	<1.0	0.00	Yes	$0	NA: Willis Class
Park, Young (August 2018)	3.0	Well completed Dec 2019, no electricity or production at this time	Yes	NA	NA: Willis Class
Perez, Espiridion and Yvonne (March 2018)	<1.0	0.10	Yes	$45	NA: Willis Class
Piute MWC (April 2020)	21.0	11.13	Yes	$5,020	NA: Defaulted Party
Rodriguez, Erik (March 2019)	<1.0	Well completed Dec 2019, no electricity or production at this time	Yes	NA	NA: Willis Class
Torres, J. Martin (Jan 2020)	1.0	NA since approved in 2020	Yes	NA	NA: Willis Class
Trang, Sroy (May 2019)	<1.0	Well completed Aug 2019, no pump or electricity at this time	Yes	NA	NA: Willis Class
Ugonwa, Bonaventure (June 2019)	6.00	Well completed Jan 2020, no meter at this time	Yes	NA	NA: Willis Class
Webster, Anthony (March 2018)	<1.0	Decided not to drill			
Witmeyer Trust (Randy Sharp) (March 2018)	<1.0	Well completed Sept 2018, sold property to Emmanuel Jimenez (No contact information available)	Yes		NA: Willis Class
Zaghian, Roben (May 2019)	2.0-3.0	Not Reported	Yes		NA: Willis Class

1. The 2019 Replacement Water Assessment (RWA) for wells within the boundaries of AVEK, PWD or LCID is $451. The 2019 RWA for wells outside these boundaries is $948.
2. Estimated production amount listed is water demand at full buildout of project.
3. Defaulted and Willis Class members are in the Judgment and do not need to intervene.

Appendix C

Imported Water Tables

C-1. Imported Water, 2019

C-2. AVEK Storage and Recovery Locations, 2019

C-3. Other Storage and Recovery Locations, 2019

Appendix C-1 Imported Water, 2019

Importer of State Water Project (SWP) Water	2019 Imported Water (AF)
Antelope Valley-East Kern Water Agency (AVEK)	61,787.05
Palmdale Water District (PWD)	12,066.00
Littlerock Creek Irrigation District (LCID)	434.00
Total Imported SWP Water	74,287.05

AVEK Use of Imported Water (inside Adjudicated Area)	2019 Imported Water (AF)
SWP Water Deliveries to Treatment Plants	
For Customer Use Inside the Adjudicated Area	30,340.49
For Customer Use Outside the Adjudicated Area	1,437.43
SWP (Untreated) Water Deliveries to AVEK Other Locations	
For AVEK Customer Use Inside the Adjudicated Area	77.65
For AVEK Customer Use Outside the Adjudicated Area	26.55
AVEK Storage (Spreading) to High Desert Water Bank	0.00
AVEK Storage (Spreading) to Westside Water Bank	26,654.00
AVEK Storage (Spreading) to Eastside Water Bank	1,160.00
AVEK Storage (Spreading) to Big Rock Creek	245.00
AVEK Storage (Spreading) to Upper Amargosa Creek	9.00
Storage (Spreading) - Willow Springs Water Bank[1]	0.00
Storage (Spreading) - Tejon Ranch Co. Water Bank[1]	1,523.00
Total SWP Water Deliveries Unaccounted-for Water[2]	313.92
Total	61,787.05

PWD Use of Imported Water	2019 Imported Water (AF)
SWP Entering Lake Palmdale for Customer Use	11,821.00
SWP Spread at Big Rock Creek	245.00
Total	12,066.00

LCID Use of Imported Water	2019 Imported Water (AF)
SWP Spread at LCID Recharge Site	234.00
SWP Spread at Big Rock Creek	200.00
Total	434.00

1. Amount of imported water delivered to non-AVEK facilities.
2. Unaccounted-for Water could include losses/gains due to inaccuracies in meters, measurements, & record keeping, as well as operational uses & losses due to repair, maintenance, evaporation, & leakage.

TODD GROUNDWATER
Watermaster Engineer

Appendix C-2 AVEK Storage and Recovery Locations, 2019

Antelope Valley-East Kern Water Agency (AVEK) Storage and Recovery Locations	Acre-feet
High Desert Water Bank-AVEK Water	
Total Recoverable Stored Water at end of 2018[1]	5,213.55
Amount Spread in 2019	0.00
Storage Loss Factor[2]	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[2]	0.00
Amount Recovered for use inside Adjudicated Area	0.00
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[3]	0.00
Total Amount of Stored Water Recovered in 2019	0.00
Amount of Recoverable Stored Water for use inside Adjudicated Area	5,213.55
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019	5,213.55
Westside Water Bank-AVEK Water	
Total Recoverable Stored Water at end of 2018[1]	62,411.59
Amount Spread in 2019	26,654.00
Storage Loss Factor[2]	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[2]	23,988.60
Amount Recovered for use inside Adjudicated Area	5,811.36
Total Amount Recovered for use outside Adjudicated Area	896.99
Amount Recovered Unaccounted-for Water[3]	232.78
Total Amount of Stored Water Recovered in 2019[4]	6,941.13
Amount of Recoverable Stored Water for use inside Adjudicated Area[5]	79,459.06
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019[5]	79,459.06
Westside Water Bank-Others Imported Water	
Total Recoverable Stored Water at end of 2018[6]	9,810.00
Amount Spread in 2019[6]	20,000.00
Storage Loss Factor[2]	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[2]	18,000.00
Amount Recovered for use inside Adjudicated Area	0.00
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[3]	0.00
Total Amount of Stored Water Recovered in 2019[4]	0.00
Amount of Recoverable Stored Water for use inside Adjudicated Area	0.00
Amount of Recoverable Stored Water for use outside Adjudicated Area	27,810.00
Total of Recoverable Stored Water at end of 2019 (Others Imported Water)[6]	27,810.00

Appendix C-2 AVEK Storage and Recovery Locations, 2019

Eastside Water Bank-AVEK Water	
Total Recoverable Stored Water at end of 2018[1,7]	(931.09)
Amount Spread in 2019	1,160.00
Storage Loss Factor[2]	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[2]	1,044.00
Amount Recovered for use inside Adjudicated Area	766.88
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[3]	0.00
Total Amount of Stored Water Recovered in 2019	766.88
Amount of Recoverable Stored Water for use inside Adjudicated Area	(653.97)
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019[7]	(653.97)
Other Recovery Locations-AVEK Water	
Total Recoverable Stored Water at end of 2018[7,8]	(2,607.35)
Amount Spread in 2019	NA
Storage Loss Factor[2]	NA
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[2]	NA
Amount Recovered for use inside Adjudicated Area	1,371.93
Total Amount Recovered for use outside Adjudicated Area	148.66
Amount Recovered Unaccounted-for Water[3]	5.36
Total Amount of Stored Water Recovered in 2019	1,525.95
Amount of Recoverable Stored Water for use inside Adjudicated Area[5]	(4,133.30)
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019[7]	(4,133.30)

1. Amount of Total Recoverable Stored Water at end of 2018 may differ from AV Watermaster Final 2018 Report due to the addition/removal of Others (i.e., non-AVEK agencies) previously stored/recovered water at AVEK storage/recovery facilities.

2. Storage loss factors may not yet have been verified by the Watermaster Engineer.

3. Unaccounted-for Water could include losses/gains due to inaccuracies in meters, measurements, timing and record keeping, as well as operational uses and losses due to repair, maintenance, evaporation and leakage.

4. Total Amount of Stored Water Recovered at AVEK Westside Water Bank includes production from AVEK "EW" (potable) and "RG" (non-potable) groundwater wells.

5. Recoverable Stored Water at end of 2019 includes a small portion of recovered water made available for future delivery to two AVEK customers outside of the Adjudicated Area, as reported in that year's annual report in which the water was used. For example, in 2019, 567.05 AF was provided to outside customers.

6. Amount of Others (i.e. non-AVEK) Imported Water delivered to AVEK storage/recovery facilities located inside the Adjudicated Area.

7. Recoverable Stored Water deficit shown is short-term, limited to a single location, and/or due to required drought/emergency production or minimal operations for equipment maintenance. Overall long-term recharge/recovery operations can expect fluctuation in groundwater storage balances related to annual availability of Imported Water and customer demand.

8. Other recovery locations include West Avenue H Wellfield Project and the WSSP-1 Well locations and are pre-existing AVEK projects used for water production during local supply or operational drought/emergency conditions only. Minimal operations for equipment maintenance may occur.

Appendix C-3 Other Storage and Recovery Locations, 2019

Antelope Valley Water Storage, LLC Storage and Recovery	Acre-feet
Willow Springs Water Bank	
Total Recoverable Stored Water at end of 2018	18,610.10
Amount Spread in 2019	0.00
Storage Loss Factor[1]	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[1]	**0.00**
Amount Recovered for use inside Adjudicated Area	0.00
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[2]	**0.00**
Total Amount of Stored Water Recovered in 2019	**0.00**
Amount of Recoverable Stored Water for use inside Adjudicated Area	18,610.10
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019	18,610.10

Tejon Ranchcorp and Tejon Ranch Company Storage and Recovery	Acre-feet
Tejon Water Bank	
Total Recoverable Stored Water at end of 2018	45,896.44
Amount Spread in 2019	1,523.00
Storage Loss Factor[1]	6%
Additional Amount of Water Stored in 2019 (after applying 6% loss factor)[1]	**1,431.62**
Amount Recovered for use inside Adjudicated Area	0.00
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[2]	0.00
Total Amount of Stored Water Recovered in 2019	**0.00**
Amount of Recoverable Stored Water for use inside Adjudicated Area	47,328.06
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019	47,328.06

Littlerock Creek Irrigation District Storage and Recovery[3]	Acre-feet
LCID SWP Recharge Site	
Total Recoverable Stored Water at end of 2018	**0.00**
Amount Spread in 2019	234.00
Storage Loss Factor	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)	**210.60**
Amount Recovered for use inside Adjudicated Area	28.00
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[2]	0.00
Total Amount of Stored Water Recovered in 2019	**28.00**
Amount of Recoverable Stored Water for use inside Adjudicated Area	182.60
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019	**182.60**

Appendix C-3 Other Storage and Recovery Locations, 2019

Upper Amargosa Creek Recharge Project Parties: AVEK, City of Palmdale, PWD, and District No. 40	Acre-feet
Upper Amargosa Creek Recharge Site[4]	
Total Recoverable Stored Water at end of 2018	0.00
Amount Spread in 2019	9.00
Storage Loss Factor[1]	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[1]	8.10
Amount Recovered for use inside Adjudicated Area	0.00
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[2]	0.00
Total Amount of Stored Water Recovered in 2019	0.00
Amount of Recoverable Stored Water for use inside Adjudicated Area	8.10
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019	8.10

AV State Water Contractors Association: AVEK, PWD, and LCID	Acre-feet
Big Rock Creek Recharge Site[5]	
Total Recoverable Stored Water at end of 2018	0.00
Amount Spread in 2019	690.00
Storage Loss Factor[1]	10%
Additional Amount of Water Stored in 2019 (after applying 10% loss factor)[1]	621.00
Amount Recovered for use inside Adjudicated Area	0.00
Total Amount Recovered for use outside Adjudicated Area	0.00
Amount Recovered Unaccounted-for Water[2]	0.00
Total Amount of Stored Water Recovered in 2019	0.00
Amount of Recoverable Stored Water for use inside Adjudicated Area	621.00
Amount of Recoverable Stored Water for use outside Adjudicated Area	0.00
Total of Recoverable Stored Water at end of 2019	621.00

1. Storage loss factors may not yet have been verified by the Watermaster Engineer.

2. Unaccounted-for Water could include losses/gains due to inaccuracies in meters, measurements, and record keeping, as well as operational uses and losses due to repair, maintenance, evaporation and leakage.

3. LCID also spread 200 AF at the Big Rock Creek Recharge Site.

4. Upper Amargosa Creek Recharge Project (UACP) is a pre-existing Project proposed by the City of Palmdale in 2006, with agreement executed between the participating Project Parties (City of Palmdale, PWD, LACWW District 40, and AVEK) in 2013. All water recharged in 2019 (9.0 AF) is currently classified as AVEK SWP Imported Water, notwithstanding any agreement between the parties. No recovery of water has occurred to date, and will be based on future agreement between Project parties.

5. Big Rock Creek recharge site is an AV State Water Contractors Association (AVSWCA) preexisting project proposed for recharge prior to 2002. AVSWCA members are AVEK, PWD, and Littlerock Creek ID. As part of the pilot testing of this site, the total Imported Water spread at Big Rock Creek in 2019 was 690 AF (PWD=245 AF, LCID=200 AF, AVEK= 245 AF). Development of this site by the AVSWCA as a long-term project will require further approval.

Appendix D

Imported Water Return Flows

Appendix D Imported Water Return Flows, 2016-2019 (for Parties listed on Exhibit 8 of Judgment)

Imported Water Deliveries - Exhibit 8 Parties[1]	Water Use Type[2]	Return Flow Percent	Imported Water Use (AF) 2011	2012	2013	2014	2015	2016	2017	2018	2019	2011-2015 Five Year Average	2012-2016 Five Year Average	2013-2017 Five Year Average	2014-2018 Five Year Average	2015-2019 Five Year Average	2016 Return Flow Credit (AF)	2017 Return Flow Credit (AF)	2018 Return Flow Credit (AF)	2019 Return Flow Credit (AF)	2020 Return Flow Credit (AF)
Imported by AVEK																					
A.V. Materials	M&I	39	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	[illegible]	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Antelope Valley Country Club	M&I	39	[illegible]	134.14	125.57	[illegible]6.78	105.17	88.00	139.12	88.68	102.81	103.63	105.93	106.93	99.55	104.76	40.42	41.31	41.70	38.82	40.86
Antelope Valley-East Kern Water Agency (AVEK) (Amount sold to Parties not on Exhibit 8)	M&I	39	2,565.28	2,668.56	2,389.40	2,155.94	1,897.88	2,132.00	2,260.03	2,282.25	1,725.51	2,335.41	2,248.76	2,167.05	2,145.62	2,059.53	910.81	877.01	845.15	836.79	803.22
	Ag	34	[illegible]	1,969.88	2,195.17	134.82	47.65	40.65	116.97	41.33	37.59	1,490.99	877.63	507.05	76.28	56.84	506.94	298.40	172.40	25.94	19.32
Antelope Valley Water Company	M&I	39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antelope Valley Water Storage, LLC	Ag	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boron CSD[3]	M&I	39	[illegible]	201.59	[illegible]	[illegible]	158.50	162.21	171.75	209.13	316.42	186.60	179.89	173.92	176.34	203.60	72.77	70.16	[illegible]	68.77	79.40
California Department of Parks	M&I	39	[illegible]	6.00	6.00	5.50	9.07	6.57	6.00	6.00	6.05	6.21	6.63	6.63	6.63	6.74	2.42	2.58	2.58	2.58	2.63
California Water Service Company-Lancaster	M&I	39	0.00	0.00	0.00	[illegible]	0.00	[illegible]	5.00	10.87	16.84	0.00	0.20	1.20	3.37	6.74	0.00	0.08	[illegible]	1.32	2.63
Copa de Oro Land Co.	Ag	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crystal Organic Farms	Ag	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Desert Lake CSD	M&I	39	[illegible]	116.14	90.67	82.21	92.50	78.99	81.46	125.14	124.31	98.83	92.10	85.17	92.06	100.48	38.54	35.92	33.21	35.90	39.19
Diamond Farming Company	Ag	34	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00
Edgemont Acres MWC	M&I	39	[illegible]45.23	191.86	182.31	165.51	131.33	154.34	159.85	164.34	137.64	163.25	165.07	158.67	155.07	149.50	63.67	64.38	61.88	60.48	58.30
El Dorado MWC	M&I	39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.53	35.10	13.63	2.04	2.75	3.06	9.16	10.97	0.79	1.07	1.19	3.57	4.28
Eyherabide Sheep Co.	Ag	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Godde, Forrest	Ag	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00
Granite Construction Co	M&I	39	[illegible]	2.00	1.50	0.50	1.00	0.00	0.00	0.00	0.00	1.50	1.00	0.60	0.30	0.20	0.59	0.39	0.23	0.12	0.08
Grimmway	Ag	34	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00
H&N Development Co. West	M&I	39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Harter, Scott	Ag	34	0.00	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LADPW- District No. 40	M&I	39	[illegible]0,110.72	31,259.56	31,170.24	22,741.50	20,344.18	26,459.24	26,946.45	28,925.81	30,610.54	27,125.24	26,394.94	25,532.32	25,083.44	26,657.24	10,578.84	10,294.03	9,957.61	9,782.54	10,396.33
Landale MWC	M&I	39	6.76	0.00	8.51	0.00	[illegible]	0.00	18.78	0.82	[illegible]	9.51	8.16	11.92	10.38	12.81	3.71	3.18	4.65	4.05	4.99
Lane Family Trust	Ag	34	[illegible]8.50	19.78	22.59	15.61	15.90	15.70	15.40	28.18	43.59	18.48	17.92	17.04	18.16	23.75	6.28	6.09	5.79	6.17	8.08
Littlerock Aggregate, Co.	M&I	39	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Palm Ranch ID	M&I	39	594.53	97.91	35.53	2.85	3.00	56.64	30.98	4.97	337.55	146.76	39.19	25.80	19.69	86.63	57.24	15.28	10.06	7.68	33.78
Quartz Hill WD	M&I	39	[illegible]	4,229.00	3,352.78	3,436.24	2,608.19	2,453.25	2,385.86	2,647.75	2,930.99	3,501.92	3,215.89	2,847.26	2,706.26	2,605.21	1,365.75	1,254.20	1,110.43	1,055.44	1,016.03
Rosamond CSD	M&I	39	333.75	40.09	122.85	30.42	1.41	10.38	19.92	2.21	88.53	105.70	41.03	37.00	12.87	24.49	41.22	16.00	14.43	5.02	9.55
Shadow Acres MWC	M&I	39	217.61	204.88	[illegible]	84.39	139.70	139.12	161.40	162.07	159.49	176.37	160.67	151.97	137.34	152.36	68.78	62.66	59.27	53.56	[illegible]
St. Andrew's Abbey, Inc.	M&I	39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
Sunnyside Farms MWC	M&I	39	154.94	159.16	148.46	103.37	55.98	111.12	123.87	84.71	68.34	124.38	115.62	108.56	95.81	88.80	48.51	45.09	42.34	37.37	[illegible]
Tejon Ranch Co.	Ag	34	0.00	1,046.80	1,801.00	0.00	0.00	0.00	0.00	4,306.03	1,523.00	569.56	569.56	360.20	861.21	1,165.81	193.65	193.65	122.47	292.81	[illegible]
U.S. Borax	M&I	39	1,872.88	1,617.09	1,172.19	[illegible]	1,127.86	931.87	1,165.22	1,224.78	1,407.27	1,331.36	1,143.16	1,052.79	1,063.31	1,171.40	519.23	445.83	410.59	414.69	456.85
Warnack Trust	Ag	34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Westside Park MWC	M&I	39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White Fence Farms MWC	M&I	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	66.59	[illegible]	70.10	67.66	75.78
AVEK Total[4]			43,560.08	44,164.44	43,491.87	30,196.28	26,926.75	[illegible]	34,027.33	40,548.08	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Imported by LCID																					
Littlerock Creek ID[5]	M&I	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	390.60	0.00	0.00	0.00	0.00	78.12	0.00	0.00	0.00	0.00	30.47
Imported by PWD																					
Palmdale WD[6]	M&I	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10,240.78	[illegible]	9,616.43	9,738.58	[illegible]	3,993.90	4,076.58	[illegible]	[illegible]	4,085.72
[illegible]			53,592.37	60,529.59	54,091.08	38,552.72	32,780.57	43,480.45	47,851.73	50,759.03	52,323.42	47,909.27	45,886.88	43,351.31	42,684.90	45,439.04	18,580.66	17,822.63	16,862.80	16,599.33	17,658.91

1. Imported water use data from AVEK with the exception of PWD and LCID.
2. Some water use types were uncertain and assigned a likely type.
3. As per Judgment, Boron CSD has the right to Produce Imported Water Return Flows, up to 78 AFY, based on the applicable percentage multiplied by the average amount of Imported Water used by Boron CSD outside the Basin, but within its service area in the preceding five Year period (not including Imported Stored Water in the Basin) without having to establish that the Imported Water Return Flows augment the Basin Groundwater supply.
4. Imported Water Deliveries include a portion of water AVEK recovered from banking in previous years.
5. LCID imported 434 AF of water in 2019. 200 AF as spread at LCID's recharge location and 234 AF was spread at Big Rock Creek recharge location. Ninety percent of that banked imported water is recoverable for delivery for its customers consequently its IWRF credit is 90% of the total amount imported.
6. PWD imported 12,066 AF of water in 2019. 245 AF was spread at the Big Rock Creek recharge location and 11,821 AF went directly into Lake Palmdale. Ninety percent of that banked imported water is recoverable for delivery for its customers consequently its IWRF credit is 90% of the total amount imported.

Appendix E

Replacement Obligations

Appendix E Replacement Obligations

last updated 7/20/20

Producer	2018 (and 2016, 2017 for select producers)				2019			
	Groundwater Production Subject to a Replacement Obligation (AF)	Used Transfer or Paid	Replacement Water Assessment Status[3]	Status of Recharge	Groundwater Production Subject to a Replacement Obligation (AF)	Used Transfer or Paid	Replacement Water Assessment Status[3]	Status of Recharge
40th Street MWC (Defaulted Party)	2016=23.76 2017=19.74 2018=20.18	Was approved New Production in May of 2020 and will be invoiced.	Pending	Pending	20.95	Was approved New Production in May of 2020 and will be invoiced.	Pending	Pending
60th Street Association Water System	4.66	Submitted 2016-2019 Production Reporting on 6/2/20 and will be invoiced.	Pending	Pending	2.62	Submitted 2016-2019 Production Reporting on 6/2/20 and will be invoiced.	Pending	Pending
Antelope Valley Country Club	112.35	Transfer	In 2019, AV Country Club received a one-time transfer of 400 AF of which 112.35 AF will be used as its 2018 Replacement Obligation.	NA	135.58	Transfer	IN 2020, AV Country Club received a one-time transfer of 450 AF of which 135.58 AF will be used as its 2019 Replacement Obligation.	NA
Antelope Valley Joint Union High School District	58.54	Received 8/26/19	$24,294.10	Pending	47.38	Pending	Pending	Pending
Brittner Trust, Glen Brittner, Trustee	6.88	2018 Annual Production Report was submitted in August 2019, after the 2018 Annual Report was completed. Party has been invoiced.	Pending	Pending	11.00	Pending	Pending	Pending
Clan Keith Real Estate Investments, LLC dba Leisure Lake Mobile Estates	18.51	Received 10/28/20	$7,681.65	Pending	11.71	Pending	Pending	Pending
Derrick, Olin & Beatrice	397.00	Transfer	In 2019, the Derricks received a one-time transfer of 397 AF for their 2018 Replacement Obligation.	NA	2019 Production Not Reported			
H & N Development Co. W	0.00	NA	NA	NA	90.77	Used a portion of its 2020 Production Right	Used a portion of its 2020 Production Right	NA
Long Valley Road L.P.	322.69	Transfer	In 2019, Long Valley Road received a one-time transfer of 1,391 AF of which 322.69 AF was used for its 2018 Replacement Obligation.	NA	0.00	NA	NA	NA
New Goldensands Investment (Miracle Improvement Corporation dba Golden Sands Mobile Home Park/Trailer Park)	17.67	Received 8/26/19	$7,333.05	Pending	0.00	NA	NA	NA
Palm Ranch Irrigation District[1]	41.65	Transfer	In 2019, Palm Ranch ID received a one-time transfer of 2,850 AF of which 41.65 AF was used for its 2018 Replacement Obligation.	NA	0.00	NA	NA	NA
Phelan Pinon Hills CSD[2]	2016=770.63 2017=385.18 2018=176.83	In litigation	In litigation	In litigation	3.16	In litigation	In litigation	In litigation
Piute MWC (Defaulted Party)	2016=14.29 2017=9.88 2018=9.14	Was approved New Production in April of 2020 and has been invoiced.	Pending	Pending	11.13	Was approved New Production in April of 2020 and was billed for its RWAs.	Pending	Pending
Ritter, Mark	2016 - 2018=791	Received 5/2/19	$328,265.00	Pending	2019 Production Not Reported			
sPower	Dates to be determined=151.74	Received 1/10/19	$62,972.10	Pending	2019 Production Not Reported			
Vulcan Materials Co., Vulcan Lands Inc., Consolidated Rock Products Co., Calmat Lands, Co., Allied Concrete & Materials	54.65	Received 8/26/19	$22,679.75	Pending	186.52	Transfer	In 2020, Vulcan received a one-time transfer of 205 AF of which 186.52 AF will be used as its 2019 Replacement Obligation.	NA

Table summarizes Replacement Obligations as of May 2020. Note that not all Parties have reported production. Other entities have potential Replacement Obligations and are in discussions with the Watermaster Attorney and include Small Pumpers pumping more than 3 AFY and entities with no rights to produce. Additional unidentified entities may also have Replacement Obligations and will be added to the table when identified.

Littlerock Aggregate/Holiday Rock had a 2018 Replacement Obligation of 651.33 AF based on reported 2018 production. Subsequently, they provided information on a potential meter reading error and requested to have production reduced from 1,014 AF to 284 AF. The Watermaster agreed to this smaller amount but retains the right to request full payment if future information indicates otherwise.

1.PRID's 2018 Replacement Obligation was revised to 41.65 AF in January 2020 to reflect error in Unused Federal Reserved Water Right formula in 2018 water accounting tables.

2. PPHCSD does not have Production Rights but can pump up to 1,200 AFY from Well #14 and pay a Replacement Water Assessment

3. Replacement Water Assessment rates are as follows:

Year	Antelope Valley State Water Contractor Boundaries	
	Inside	Outside
2016	$415.00	$888.00
2017	$415.00	$896.00
2018	$415.00	$914.00
2019	$451.00	$948.00
2020	$486.00	$989.00

TODD GROUNDWATER
Watermaster Engineer

Appendix F

F-1. Permanent Transfers (not related with split of rights), 2016 through June 2020

F-2. Non-Permanent Transfers, 2016 through June 2020

F-3. Split of Production Rights Transfers, 2016 through June 2020

Appendix F-1 Permanent Transfers (not related with split of rights), 2016 through June 2020

Transferor	Transferee	Type of Transfer	Amount (AFY)	Original Parcel(s) (APN#)	Parcels Water Transferred to (APN#)	Type of Right Transferred	Voting Rights after Transfer	Date/Comments
Copa de Oro	WDS CA II	Transfer of Production Rights and All Remaining Carry Over Water (associated with a transfer of Carry Over water -see Appendix F-2)	315 AFY Production Rights and 871.4 AF of 2016-2018 Carry Over and 283 AF of 2019 Carry Over water (see comments)	359-032-40	359-011-01 and 359-011-05	Permanent: Exhibit 4 Production Rights and Remaining Carry Over Water	No Change-Exhibit 4	Approved August 2019: 315 AFY of Production Rights and all remaining Carry Over water at the end of 2019. With this transfer, Copa de Oro Land Company will maintain a Production Right of 10 AFY.
eSolar Inc.; Red Dawn Suntower LLC	Rosamond Community Services District	Transfer of Production Rights	150	3256-006-901 (new LA County numbering- was previously 3256-006-013)	RCSD Service Area, specifically Well #9 on 375-113-19	Permanent: Exhibit 4 Production Right	Will need to remain an Exhibit 4 landowner voting right although transferred to an Exhibit 3 Party	Approved May 2019. February 16, 2016 Purchase and Sale Agreement.
Godde: Forrest G. Godde 1998 Trust (has only Imported Water Return Flow rights - No Production Rights)	Steven F. Godde, Pamela M. Godde, Gary M. Godde	All interests of Forrest G. Godde 1998 Trust assigned to Steven, Pamela, and Gary Godde.	Right to Imported Water Return Flows	3205-001-084	3205-001-084 3219-015-001 374-302-04	Imported Water Return Flow Right	Not applicable since only Imported Water Return Flows were transferred	As per a June 8, 2017 assignment of Forrest G. Godde 1998 Trust to Steven Forrest Godde, Pamela Marie Godde, and Gary Matthias Godde. Steven, Pamela, and Gary Godde have a combined Exhibit 4 Production Right.
Siebert: Jeffrey and Nancee Siebert	Selak: Steven and Christine Selak	Transfer of a portion of their Production Rights	[illegible]	3256-018-001 3256-018-005 to -012 3256-008-005 3256-008-009	Buying as Investment	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4	Approved July 2018
Van Dam: Craig	Calandri Farms	Transfer of a portion of their Production Rights	[illegible]	3220-006-097 3384-001-001 3384-001-003	3307-017-959 3307-017-948 3307-017-938 3307-017-941 3301-017-937 3307-017-902 3307-017-936 3307-017-935	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4 (new Exhibit 4 Party)	Conditionally approved June 2020 pending Calandri Farms intervenes into the Judgement
Van Dam: Craig	V Lions Operations, L.P.	Transfer of a portion of their Production Rights	1	3220-006-097 3384-001-001 3384-001-003	Buying as Investment	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4 (new Exhibit 4 Party)	Conditionally approved June 2020 pending V Lions intervenes into the Judgement

TODD GROUNDWATER
Watermaster Engineer

Appendix F-2 Non-Permanent Transfers, 2016 through June 2020

Transferor	Transferee	Type of Transfer	Amount (AFY)	Original Parcel(s) (APN#)	Parcels Water Transferred to (APN#)	Type of Right Transferred	Voting Rights after Transfer	Date/Comments
Antelope Valley East Kern Water Agency (AVEK)	Los Angeles County Waterworks District No. 40	One time transfer of Carry Over Water, Production Rights, and Stored Imported Water	13,068.73 (7,759.06 AF of Carry Over water, 822.54 AF of Production Rights and 4,487.13 AF of Stored Imported Water)	AVEK well locations and Westside Water Bank	Los Angeles County Waterworks District No. 40 well locations	One-time: Exhibit 4 Production Right and Stored Imported Water	NA: one-time transfer	June 2020. In response to lease agreement for 2016-2020.
County Sanitation District #14 of Los Angeles County (via an agreement with Calandri Farms)	Palm Ranch Irrigation District	One time transfer of Production Rights (via an agreement with Calandri Farms)	2,850	3307-017-902 3307-017-935 3307-007-936 3307-017-937 3307-017-938 3307-017-941 3307-017-948 3307-017-959	3203-016-900 3203-032-902 3204-012-902 3204-012-903	One-time: Exhibit 4 Production Right	NA: one-time transfer	March 2019
County Sanitation District #14 of Los Angeles County (via an agreement with Calandri Farms)	V Lions Operations	One time transfer of Production Rights (via an agreement with Calandri Farms)	4,152	3307-017-902 3307-017-935 3307-007-936 3307-017-937 3307-017-938 3307-017-941 3307-017-948 3307-017-959	Buying as investment	One-time: Exhibit 4 Production Right	NA: one-time transfer	Conditionally approved June 2020 pending V Lions Intervenes into the Judgement
Lane Family Trust	Vulcan Materials Co.	Transfer of Production Rights	205	3051-008-007 3051-008-010 3102-027-034 3248-024-031 261-196-07	3080-021-003 3051-009-016	One-time: Exhibit 4 Production Right	NA: one-time transfer	Approved February 2020
Nebeker: Gene	Long Valley Road L.P.	One time transfer of Carry Over Water	1,391	3260-010-109	3075-007-001 3075-007-002 3075-007-003 3075-007-009 3075-007-010	One-time: Exhibit 4 Carry Over	NA: one-time transfer	Approved May 2019
Nebeker: Gene	RCSD	One time transfer of Carry Over Water	1,180	3260-010-109	375-010-20 375-113-19	One-time: Exhibit 4 Carry Over	NA: one-time transfer	Approved February 2020
Selak: Lilia Mabel Selak Trust	Olin & Beatrice Derrick	One time transfer of Carry Over Water	397	3219-012-007	3374-003-002 3374-003-005 3374-003-006 3374-003-007	One-time: Exhibit 4 Carry Over	NA: one-time transfer	Approved October 2019: Transfer for 2018 Replacement Water Assessments as per Agreement with AV Watermaster. 200 AF from Richard Selak and 197 AF from Steven Selak.
Van Dam: Craig and Marta Van Dam	Antelope Valley Country Club	One time transfer of Carry Over Water	400	3220-006-097 3384-001-001 3384-001-003	3005-004-081 3005-003-026 3005-003-028 3005-003-029	One-time: Exhibit 4 Carry Over	NA: one-time transfer	Approved April 2019. To be used for Replacement Water Obligations. *(Updated AVCC parcel numbers 4/9/20)*
Van Dam: Craig and Marta Van Dam	Antelope Valley Country Club	One time transfer of Carry Over Water	450	3220-006-097 3384-001-001 3384-001-003	3005-004-081 3005-003-026 3005-003-028 3005-003-029	One-time: Exhibit 4 Carry Over	NA: one-time transfer	Approved April 2020. To be used for Replacement Water Obligations.
WDS California II, LLC	Palmdale Water District	One time transfer of Carry Over Water	100	359-011-01 359-011-05 359-041-27 359-041-30 359-174-12 359-175-01 359-321-01 359-331-24 261-194-45	PWD service area	One-time: Exhibit 4 Carry Over	NA: one-time transfer	Approved December 2018. September 11, 2018 Transfer Request. Water to be used in 2018.
WDS California II, LLC	AVEK	One time transfer of Stored Imported Water	11,643	359-011-01 359-011-05 359-041-27 359-041-30 359-174-12 359-175-01 359-321-01 359-331-24 261-194-45	3258-001-902 3258-010-900 3258-010-901 3258-010-902 3261-001-900 3261-001-901 3261-099-900	NA: One-time stored imported water	NA: one-time transfer	Approved April 2020.

Appendix F-3 Split of Production Rights Transfers, 2016 through June 2020

Transferor	Transferee	Type of Transfer	Amount (AFY)	Original Parcel(s) (APN#)	Parcels Water Transferred to (APN#)	Type of Right Transferred	Voting Rights after Transfer	Date/Comments
County Sanitation Districts Nos. #14 and #20 of Los Angeles County split of Production Rights	District #14	Split up Production Rights, Rampdown, and Carry Over water	3,060	3116-007-900 3302-015-904 3302-027-915 3302-030-909 3307-002-904	3116-007-900 3302-015-904 3302-027-915 3302-030-909 3307-002-904	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	Approved October 2019: Rampdown and Carry Over water will also be divided in accordance with the 90% and 10% split (minus the above transfer from District #14 to PRID).
	District #20		340	3025-035-292 3025-024-900 3025-054-275	3025-050-270	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	
FS Holding Company (originally Landinv rights)	Diamond Farming	Transfer of Production Rights	217	358-030-03 359-011-28 359-051-01 359-051-02	346-031-08 346-031-10 346-031-11 3376-032-001 3378-001-003 3378-001-004 3378-001-005 3378-001-006 3378-002-002 3378-002-004 3378-002-005 3386-014-005	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4	Approved August 2018. September 27, 2017 Water Rights Grant Deed: Landinv, Inc. had 969 AFY of Overlying Production Rights. In 2016, 736.44 AF was transferred to FS Land Holding Company. This FS Land Holding transfer to Diamond is for a portion (217 AF) of those rights. Transfer form signed July 26, 2018.
	Grimmway Enterprises	Transfer of Production Rights	193		346-031-08 346-031-10 346-031-11 3376-032-001 3378-001-003 3378-001-004 3378-001-005 3378-001-006 3378-002-002 3378-002-004 3378-002-005 3386-014-005	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4	Approved August 2018. September 27, 2017 Water Rights Grant Deed: Landinv, Inc. had 969 AFY of Overlying Production Rights. In 2016, 736.44 AF was transferred to FS Land Holding Company. This FS Land Holding transfer to Grimmway is for a portion (193 AF) of those rights. Transfer form signed July 26, 2018.
	Crystal Organic Farms	Transfer of Production Rights	190		346-031-08 346-031-10 346-031-11 3376-032-001 3378-001-003 3378-001-004 3378-001-005 3378-001-006 3378-002-002 3378-002-004 3378-002-005 3386-014-005	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4	Approved August 2018. September 27, 2017 Water Rights Grant Deed: Landinv, Inc. had 969 AFY of Overlying Production Rights. In 2016, 736.44 AF was transferred to FS Land Holding Company. This FS Land Holding transfer to Crystal Organic is for a portion (190 AF) of those rights. Transfer form signed July 26, 2018.
Landinv, Inc.	FS Land Holding Company, LLC via North Rosamond Solar	Transfer in connection with property sale (subsequently transferred 600 AFY to Grimmway, Diamond, Crystal-see separate entry for FS Land Holding Company)	736.44	358-030-03 359-011-28 359-051-01 359-051-02	same	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4	July 21, 2016 & December 15, 2016 (as per January 19, 2017 letter): Landinv, Inc. has 969 AFY of Overlying Production Rights. Landinv, Inc. transferred a portion of its overlying production rights (736.44 AFY) from four parcels to North Rosamond Solar on July 21, 2016. On December 15, 2016 North Rosamond Solar deeded rights to FS Land Holding Company.
	RADCAST Investments, Inc.	Transfer in connection with a company merger	232.56	3201-003-005 3201-003-006 3201-004-007	same	Permanent: Exhibit 4 Production Right	No Change-Exhibit 4	July 30, 2017 (as per February 6, 2018 letter): Landinv, Inc. merged into RADCAST Investments. The remaining rights are 969 - 736.44 = 232.56 AFY.
Van Dam: Craig Van Dam, Marta Van Dam, Nick Van Dam, Janet Van Dam	Craig and Marta Van Dam	Split up Production Rights (640 AF total)	610	3220-006-006 3220-006-097 3220-006-098 3220-006-099 3220-006-100 3384-001-001 3384-001-002 3384-001-003	3220-006-006 3220-006-097 3220-006-099 3384-001-001 3384-001-002 3384-001-003	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	Approved June 2018
	Nick and Janet Van Dam		30		3220-006-098 3220-006-100	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	
Van Dam Family Trust - 1996; High Desert Dairy	High Desert Dairy LLC	Split up Production Rights (3,215 AF total)	1817	3307-014-019 3382-017-015 3382-018-026 3302-024-003 3302-024-903	3307-014-019 3382-017-015 3382-018-026	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	Approved February 2020. Transfer effective January 1, 2020.
	Gary Van Dam (including Sonrise Ranch)		466		3307-014-019 3382-017-015 3382-018-026 3382-011-009 3382-011-010 3386-028-012 3386-028-013 3386-028-014 3386-028-015	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	
	Craig & Marta Van Dam		466		3220-006-097	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	
	Nick & Janet Van Dam		466		3302-024-003 3302-031-003 3302-024-903	Permanent Split of Exhibit 4 Production Rights	No Change-Exhibit 4	

Appendix G

Storage Agreements

Appendix G Storage Agreements

Party	Description and Date Approved
Littlerock Creek Irrigation District	LCID completed an upgrade to its existing State Water Project water recharge facility: (1) recharging will be monitored throughout the calendar year on a monthly basis during operation; (2) banking delivery rates will generally range from 0.5-4 cfs (1-8 AF/day); (3) estimated recharge will generally be a minimum of 400 acre-feet per year; and (4) the 1.25-acre recharge basin can hold approximately 7.5 acre-feet of water at one time. The Storage Agreement was approved at the February 26, 2020 Antelope Valley Watermaster Board meeting.
Rosamond Community Services District	RCSD is upgrading its wastewater treatment facility to treat up to 1.27 million gallons per day to acceptable levels for disposal by percolation to groundwater: (1) continuous average flow of 1.20 MGD to percolation ponds 24 hours a day 365 days a year; (2) expected infiltration rate for the percolation ponds is approximately 0.5 feet per day; and (3) expected monthly and annual recharge of 112 AF and 1,343 AF, respectively. The Storage Agreement was approved at the April 22, 2020 Antelope Valley Watermaster Board meeting.

Appendix H

Approved Well Applications and Small Pumper Qualifying Documentation, 2019

Appendix H Approved Well Applications and Small Pumper Qualifying Documentation

Date on Application	Date Todd Received Complete Application Material	APN#	Request Type	Use of Well	Provided Small Pumper Qualifying Documentation	Subarea	Applicant/ Property Owner	Owner Phone	Owner email	Well Driller	Driller email	Driller Phone	In State Water Contractor Service Area (AVEK, PWD or LCID)?	Estimated Pumping	Well Depth (feet)	Screened Interval (feet-depth)	Casing Diameter (inches) and Material
Approved Well Applications: January 2019 - December 2019																	
Approved on 1/23/19: (2 New Production, 1 New Pt of Extraction, 1 Replacement, 12 SM P Q applications) 16 Total																	
6/18/2018	11/27/2018	3277-029-005	New Production	Domestic	No	West Antelope	Raymond and Maryann Collins	310-936-1188	remcollins@gmail.com	Bryant Pump & Drilling (Glenn (Bud) Bryant)	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	<2 AFY	420	240-420	6" SDR 17 PVC
7/27/2018	12/13/2018	3059-022-059	New Production	Domestic	No	South East	Myles Connelly	805-490-4262	mtchammer1@gmail.com	Vics Well Drilling (Victor Lyles)	vicswelldrilling@yahoo.com	661-917-7560	PWD	<1 AFY	unknown, between 250 and 400	Not Provided	unknown, 4.5" to 5"
11/29/2018	11/29/2018	3220-002-034	New Point of Extraction	Municipal - MWC	No	Central	Land Projects MWC	661-948-2550	LPMWC@verizon.com	Not Available	Not Available	Not Available	AVEK	400 AFY now	450	300-450	12" SDR 17 PVC
11/21/2018	11/29/2018	3278-021-024	Small Pumper Qualifying	Agricultural	Yes	West Antelope	Elmer Martinez	818-388-4522	elmerwc6v@yahoo.com	Existing well drilled in April 2011 by Bryant Pump & Drilling	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	possibly >3 AFY, meter required	400	50-400	6 5/8" Sch 80 PVC
11/30/2018	12/11/2018	3059-012-006	Small Pumper Qualifying	Domestic	Yes	South East	Hugo and Slouxsie Calderon	661-944-9497	sxcalderon@live.com	Two wells supply property? One drilled in 1965; other is unknown (pre-2012?).	Not Available	Not Available	PWD	< 3 AFY	Not Available	Not Available	Not Available
11/13/2018	12/11/2018	3059-022-043	Small Pumper Qualifying-2 parcels	Domestic	Yes	South East	Alan and Michelle Kirschenbaum	661-944-2678	[redacted]	Existing well drilled in 2012 by Rottman Drilling	edward.robledo@rottmandrilling.com	661-942-6125		10 gpm; 0.06 AFY	412	210-412	6" SDR 17 PVC
		3059-022-044		Domestic	Yes	South East	Alan and Michelle Kirschenbaum	661-944-2678	drivlines@sbcglobal.net								
		3032-04-21	Replacement Well	Agricultural	No	South East	Bolthouse Farms										
		252-311-22-00-8	Small Pumper Qualifying	Domestic	Yes	Willow Springs	DeLano, Milton & Sherry										
		3059-08-11	Small Pumper Qualifying	Domestic	Yes	South East	Hardy, Frank & Pamela										
		3059-021-019	Small Pumper Qualifying	Domestic	Yes	South East	Hardy, Corrine Family Trust										
		3059-026-012	Small Pumper Qualifying	Domestic	Yes	South East	Pierre Trust, Donald & Ella										
		3059-026-002	Small Pumper Qualifying	Domestic	Yes	South East	Powell Revocable Trust, Stephany										
		3059-022-039	Small Pumper Qualifying	Domestic	Yes	South East	Uner, Atilla										
		3060-020-093	Small Pumper Qualifying	Domestic	Yes	South East	West, Anthony										
		3059-019-036	Small Pumper Qualifying	Domestic	Yes	South East	Whitt, Ronald & Louise										
Approved on 2/27/19: (2 Monitoring Wells and 3 SM P Q applications) 5 Total																	
		3266-017-015	Small Pumper Qualifying	Domestic	Yes	Central	Burr, Terry and Gail										
		3279-009-020	Small Pumper Qualifying	Domestic	Yes	West Antelope	Czaki, Isabella										
		3059-022-045	Small Pumper Qualifying	Domestic	Yes	South East	Ohnmacht, Greg & Amy										
		3022-028-904	Monitoring Well	Monitoring	No	Central	US Air Force - Plant 42										
		3000-034-901	Monitoring Well	Monitoring	No	Central	US Air Force - Plant 42										
Approved on 3/27/19: (1 New Production, 1 New Pt of Extraction, 5 SM P Q applications) 7 Total																	
1/30/2019	2/19/2019	3080-022-013	New Point of Extraction	Industrial	No	South East	Granite Construction	661-802-2744	karan.patel@gcinc.com	Myers Bros Well Drilling	[redacted]	559-582-9031	No	225 AFY	700	400-700	16" steel
2/4/2019	3/1/2019	3170-010-002	New Production	Domestic	No	Central	Rodriguez, Erik	661-456-6874	antelopesoccerleague@yahoo.com	Abundant Water Well, Inc	[redacted]yahoo.com	661-713-3443	AVEK	<1 AFY	300	Not provided	5" SDR 17
		3059-018-060	Small Pumper Qualifying	Domestic	Yes	South East	Benefiel, Jane										
		375-180-25	Small Pumper Qualifying	Domestic	Yes	Central	Littie Family Trust, Gary & Debra										
		3059-022-064	Small Pumper Qualifying	Domestic	Yes	South East	Myers, William & Linda										
		3059-022-003	Small Pumper Qualifying	Domestic	Yes	South East	Vegos, Charles & Tamara										
		3059-021-022	Small Pumper Qualifying	Domestic	Yes	South East	Witt, Robert & Evelyn										
Approved on 4/24/19: (2 New Production, 2 SM P Q applications) 4 Total																	
11/11/2018	4/4/2019	3384-007-007	New Production	Domestic	No	Central	Ming, Lin	912-665-0051	[redacted]om	Abundant Water Well, Inc	abundantwaterwells@yahoo.com	661-713-3443	AVEK	<1 AFY	400'	Not provided	5" SDR 17
2/28/2019	4/5/2019	3307-014-052	New Production	Domestic	No	Central	Espinoza, Leticia	661-371-6514	armasstar97@gmail.com	Bryant Pump & Drilling (Glenn (Bud) Bryant)	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	<3 AFY	350'	200-350	6" SDR 17
		3060-022-034	Small Pumper Qualifying	Domestic	Yes	South East	Edgar, Micheal Ann (Ronald Sugajski Trust)										
		3060-030-059	Small Pumper Qualifying	Domestic	Yes	South East	Richards, Monica										

Appendix H Approved Well Applications and Small Pumper Qualifying Documentation

Date on Application	Date Todd Received Complete Application Material	APN#	Request Type	Use of Well	Provided Small Pumper Qualifying Documentation	Subarea	Applicant/ Property Owner	Owner Phone	Owner email	Well Driller	Driller email	Driller Phone	In State Water Contractor Service Area (AVEK, PWD or LCID)?	Estimated Pumping	Well Depth (feet)	Screened Interval (feet-depth)	Casing Diameter (inches) and Material
Approved on 5/22/19: (4 New Production applications) 4 Total																	
no date	4/8/2019	3218-033-012	New Production	Domestic & agricultural	No	Central	Zaghian, Roben	818-660-9319	zaghianart@outlook.com	Bryant Pump & Drilling (Glenn (Bud) Bryant)	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	2-3 AFY	400'	300-400	6" SDR 17
3/20/2019	4/16/2019	3240-006-053	New Production	Agricultural, family garden	No	Central	Ovespyan, Andrey	818-456-2949	dredaylove76@gmail.com	Bryant Pump & Drilling (Glenn (Bud) Bryant)	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	<1 AFY	400'	Not provided	6" SDR 17
April 2019 (no day)	4/19/2019	3060-022-056	New Production	Domestic	No	South East	Juniper Hills Land Conservation Trust	818-913-1334	nevadainc8@yahoo.com	Lundigan Drilling (Britt Lundigan)	lundiganbritt@gmail.com	661-944-3129	No	<1 AFY	Not provided	Not provided	4.5" or 5" PVC
4/15/2019	5/2/2019	3363-006-010	New Production	Domestic, outdoor irrigation of landscaping	Yes	South East	Trang, Sroy	626-476-9399	sroytrang@gmail.com	Abundant Water Well, Inc	abundantwaterwells@yahoo.com	661-713-3443	AVEK	0.50 AFY	400'	Not provided	5" SDR 17
Approved on 6/25/19: (3 New Production) 3 Total																	
4/15/2019	5/7/19 & 5/15/19	3111-005-080, 3111-003-116, 3111-003-121	New Production, shared well	Domestic	No	Central	Ugonwa, Bonaventure	231-884-7386	nwosu5566@roadrunner.com	Vics Well Drilling	vicswelldrilling@yahoo.com	661-917-7560	AVEK	15 gpm/6 AFY	500'	400-500	6" ?
4/23/2019	5/16/2019	3118-005-043	New Production	Industrial office	No	Central	Hounanian, Masis	818-726-8299	zaghianart@outlook.com	Bryant Pump & Drilling (Glenn (Bud) Bryant)	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	5 gpm/<2.5 AFY	300'	220-400'	6" SDR 17
No date but signed on 5/20/19	6/6/2019	3047-011-006	New Production	Domestic	No	South East	Garcia, Ervin and Carolina Espina	323-434-3489	garciafamily342@yahoo.com	Lundigan Drilling (Britt Lundigan)	lundiganbritt@gmail.com	661-944-3129	PWD	5-10 gpm/<1 AFY	Not provided	Not provided	4.5" or 5" PVC
Approved on 7/24/19: (1 Replacement w/ Sm P Q, 1 additional SM P Q applications) 2 Total																	
		3059-012-024	Small Pumper Qualifying	Domestic	Yes	South East	Creelman, Peter and Diana										
		3060-030-036	Replacement Well (and Sm P Q)	Domestic	Yes	South East	Rutledge, William										
Approved on 8/28/19: (3 New Pt of Extraction, 1 SM P Q applications) 4 Total																	
6/5/2019	7/15/2019	3386-028-009 3386-028-007 3386-027-001	New Point of Extraction	Agricultural	No	Central	Calandri Water Company	661-946-9022	brad@calandrisonrisefarms.com	Existing Tierra Bonita Ranch well	Not Applicable	Not Applicable	AVEK	Not provided	Not provided	Not provided	Not provided
6/5/2019	7/15/2019	3302-027-915 3302-030-909 3307-002-904	New Point of Extraction	Agricultural	No	Central	Calandri Water Company	661-946-9022	brad@calandrisonrisefarms.com	Existing LA County Sanitation Districts well	Not Applicable	Not Applicable	AVEK	Not provided	Not provided	Not provided	Not provided
6/5/2019	7/15/2019	375-020-012	New Point of Extraction	Agricultural	No	Central	Calandri Water Company	661-946-9022	brad@calandrisonrisefarms.com	Existing AVEK Stoner Ranch well	Not Applicable	Not Applicable	AVEK	Not provided	Not provided	Not provided	Not provided
		3060-020-015	Small Pumper Qualifying	Domestic	Yes	South East	Letterman, Salvador & Joanne										
Approved on 9/25/19: (2 New Production, 1 New Point of Extraction, 1 Replacement (w/Sm P Q), 4 SM P Q applications) 8 Total																	
7/31/2019	8/7/2019	3040-008-046	New Production	Domestic	No	South East	Estrada, Jesus	310-292-3349	estrada111569@gmail.com	Abundant Water Well, Inc	abundantwaterwells@yahoo.com	661-713-3443	AVEK	10-15 gpm; 0.5 AFY	300	Not provided	5" SDR 17
5/29/2019	9/4/2019	3175-001-017	New Production	Industrial	No	Central	Ormonde, Antonio	661-944-2666	[illegible]	Bryant Pump & Drilling (Glenn (Bud) Bryant)	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	30-40 gpm; 2 AFY	360	200-360	8.625" PVC Sch. 80
9/11/2019	9/11/2019	252-312-05	New Pt of Extraction (shared well)	Domestic	Yes	Willow Springs	Ross, Donald and Cindy	323-376-5360	[illegible]	Bryant Pump & Drilling (Glenn (Bud) Bryant)	bryantsh2o4u@yahoo.com	661-256-2117	AVEK	< 3 AFY	300	120-300	6.625" SDR 17 PVC
		3039-019-063	Small Pumper Qualifying	Domestic	Yes	South East	Coronado, Bryan										
		3060-020-088	Small Pumper Qualifying	Domestic	Yes	South East	Lowe, Delores										
		3060-021-045	Small Pumper Qualifying	Domestic	Yes	South East	Lowe, Steven & Margot										
		252-312-05	Small Pumper Qualifying	Domestic	Yes	Willow Springs	Ross, Donald & Cindy										
		3268-001-005	Small Pumper Qualifying	Domestic	Yes	South East	Shu, Joseph & Rosa										
		3268-001-005	Replacement Well (and Sm P Q)	Domestic	Yes	South East	Shu, Joseph & Rosa										

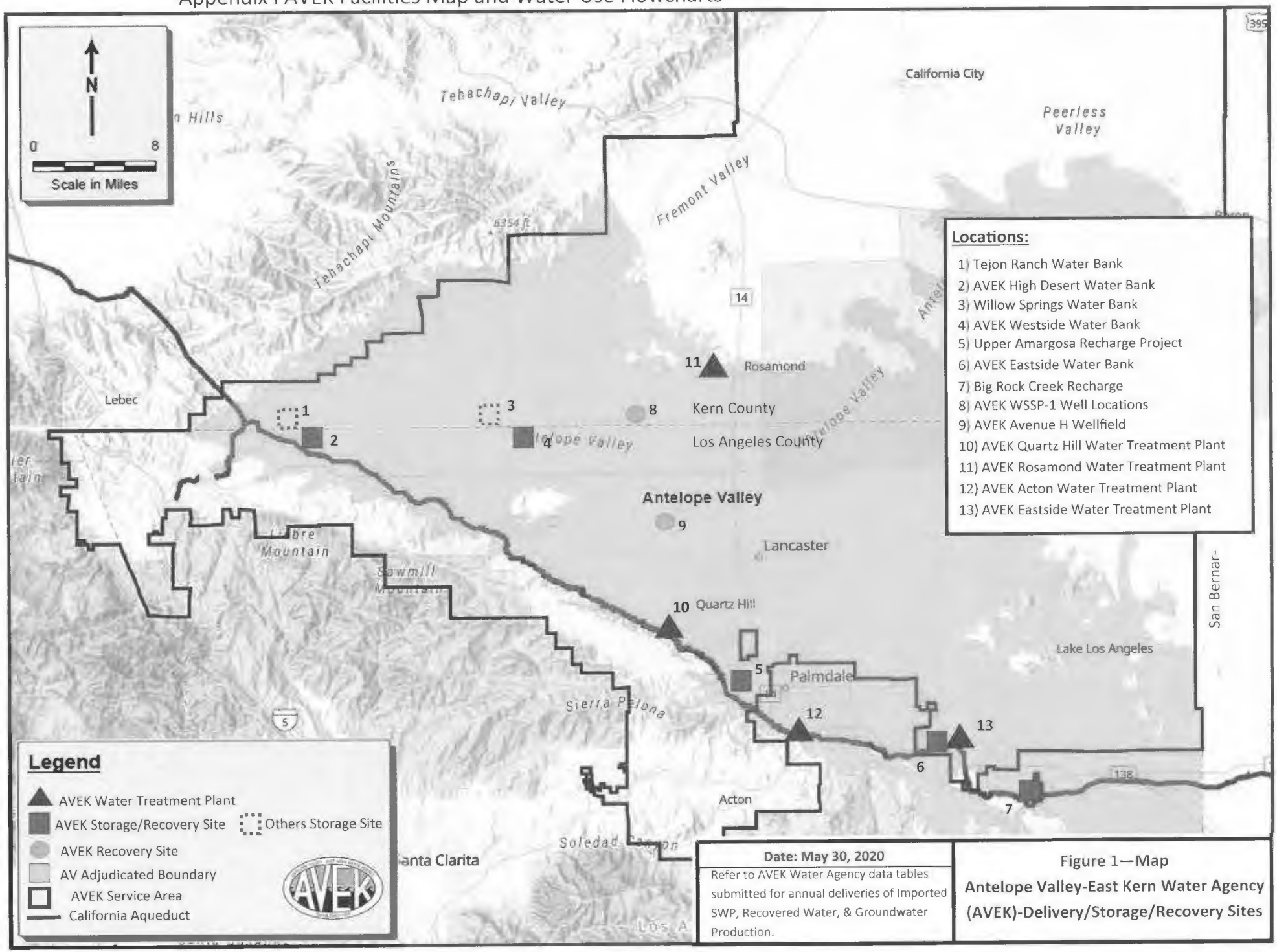
Appendix H Approved Well Applications and Small Pumper Qualifying Documentation

Date on Application	Date Todd Received Complete Application Material	APN#	Request Type	Use of Well	Provided Small Pumper Qualifying Documentation	Subarea	Applicant/ Property Owner	Owner Phone	Owner email	Well Driller	Driller email	Driller Phone	In State Water Contractor Service Area (AVEK, PWD or LCID)?	Estimated Pumping	Well Depth (feet)	Screened Interval (feet-depth)	Casing Diameter (inches) and Material
Approved on 10/23/19: (1 Replacement, 1 SM P Q applications, 3 monitoring wells) 5 Total																	
		3059-007-049	Small Pumper Qualifying	Domestic	Yes	South East	Granger, Tracy										
		3145-013-007	Replacement Well	Domestic	No	Central	Guerrero, Samuel										
		3137-015-036	Monitoring Well	Monitoring	No	Central	Petro Lock, Inc.										
		3048-018-910	Monitoring Well	Monitoring	No	South East	Littlerock Creek Irrigation District										
		3137-015-054	Monitoring Well	Monitoring	No	Central	MINA LLC										
Approved on 12/18/19: (1 Replacement (with Sm P Q), 1 SM P Q applications, 2 monitoring wells) 4 Total																	
		3137-011-039	2 Monitoring Wells	Monitoring	No	Central	Estahbanati Family Trust										
		3256-017-016	Replacement Well	Domestic	Yes	West Antelope	Kiattisak, Seuy and Nattawat										
		3060-022-048	Small Pumper Qualifying	Domestic	Yes	South East	Martin, Charles and Sandra										

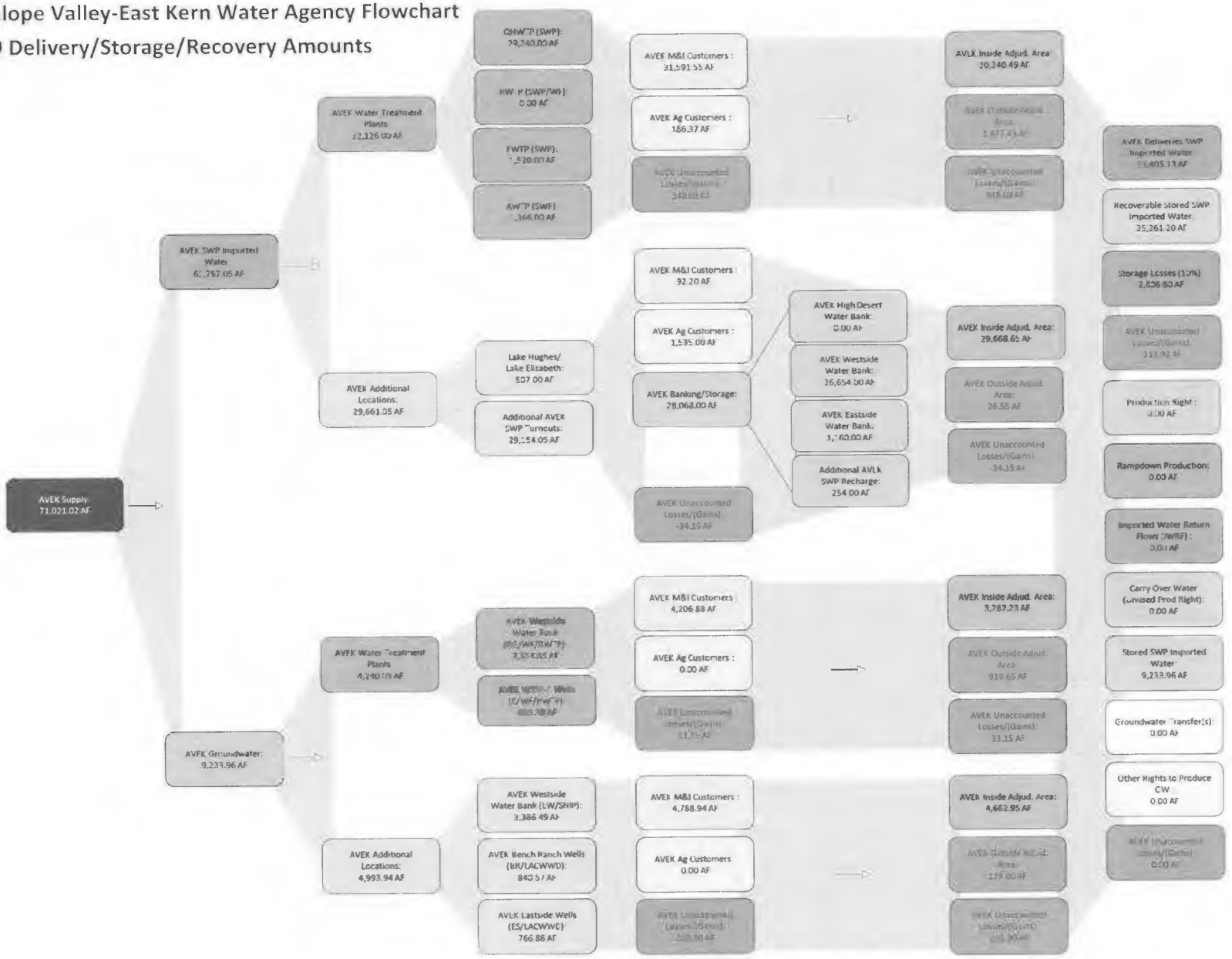
Appendix I

AVEK Facilities Map and Water Use Flowcharts

Appendix I AVEK Facilities Map and Water Use Flowcharts

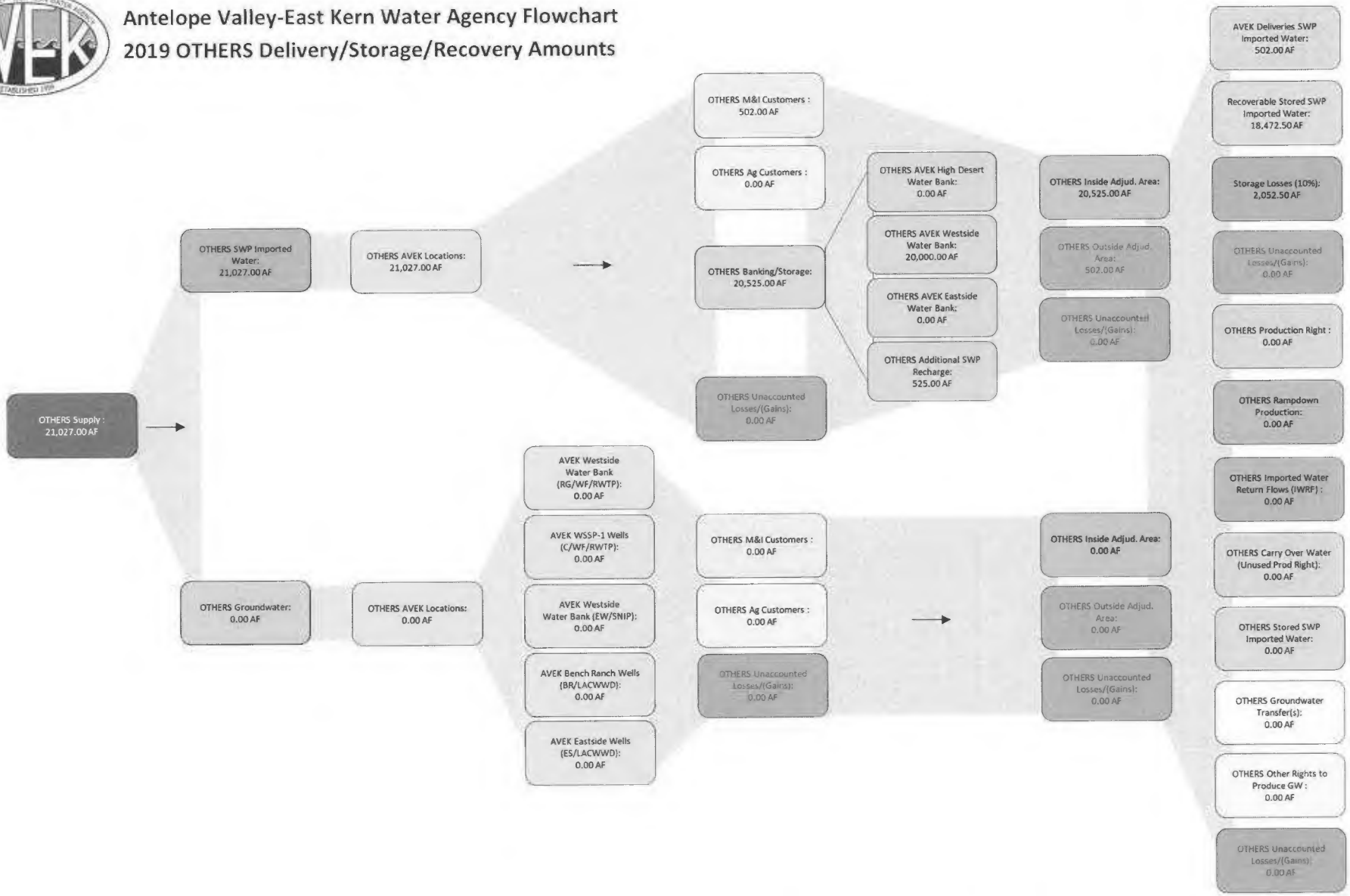


Antelope Valley-East Kern Water Agency Flowchart
2019 Delivery/Storage/Recovery Amounts



Date: May 22, 2020	Figure 2—Flowchart
Refer to AVEK Water Agency data tables submitted for annual deliveries of Imported SWP, Recovered Water, & Groundwater Production.	Antelope Valley-East Kern Water Agency (AVEK)-2019 Delivery/Storage/Recovery

Antelope Valley-East Kern Water Agency Flowchart
2019 OTHERS Delivery/Storage/Recovery Amounts



Date: May 22, 2020

Refer to AVEK Water Agency data tables submitted for annual deliveries of Imported SWP, Recovered Water, & Groundwater Production.

Figure 3—Flowchart
Antelope Valley-East Kern Water Agency
Others 2019 Delivery/Storage/Recovery

Appendix J

Wastewater and Recycled Water, 2019

Appendix J Wastewater and Recycled Water, 2019

Plant	Treated Plant Effluent (AF)	Reuse of Treated Wastewater (AF)	
Lancaster WRP[1]	15,052	12,490	
Palmdale WRP[2]	9,021	8,653	
Plant	**Treated Plant Effluent (AF)**	**To Percolation Test Basin (AF)**	**To Evaporation Ponds (AF)**
RCSD	1,222	95	1,127
Plant	**Total Flow to Plant (AF)**	**Irrigation (AF)**	**To Evaporation Ponds (AF)**
Edward AFB-Main Plant[3]	391	257	130
Edwards AFB-AFRL[4]	34	0	34

1.All the effluent is recycled. Effluent totals may not match reuse amounts because of changes in storage, losses due to evaporation, and metering differences. Recycled water produced by the Lancaster WRP was delivered to three main reuse sites: Piute Ponds (also known as Paiute Ponds), Apollo Community Regional Park, and the Eastern Agricultural Site. Recycled water was also delivered to the City of Lancaster's Division Street Corridor Recycled Water Project for municipal uses in the Antelope Valley and a small portion was provided for Lancaster WRP in-plant uses. Four lined and four unlined reservoirs at the Lancaster WRP provided seasonal storage of recycled water.

2. All the effluent is recycled. Effluent totals may not match reuse amounts because of changes in storage, losses due to evaporation, and metering differences. Recycled water produced by the Palmdale WRP was used for agricultural purposes at the Palmdale Agricultural Site, municipal and industrial uses by Palmdale Recycled Water Authority recycled water customers, and landscape and other in-plant uses at the Palmdale WRP.

3. All the effluent is recycled. Plant inflow may not match reuse amounts because of changes in storage, losses due to evaporation, and metering differences.

4. Totals do not include potential losses but only the amounts sent to evaporation ponds.

Data from: LACSD Lancaster Water Reclamation Plant 2019 Annual Water Recycling Monitoring Report, March 27, 2020.

LACSD Palmdale Water Reclamation Plant 2019 Annual Water Monitoring Report, February 28, 2020.

RCSD data from email received 4/14/20

EAFB data from 2019 Annual Monitoring and Source Report for the Main Base WWTP (1/10/20) and 2019 Annual Monitoring and Source Report for the Air Force Research Lab (AFRL) WWTP (1/9/20)

Appendix K

Watermaster Financial Budgets

K-1. Approved Administrative Budget, 2020

K-2. Financial Audit, 2019

Appendix K-1 Approved Administrative Budget, 2020

Exhibit "A"

Antelope Valley Watermaster

Final - Administrative Budget CY 2020

		BUDGET 2020	PROJECTED 2019	BUDGET 2019	ACTUAL 2018
Revenue - Administrative Assessments					
1000	Non-Overlying Production Rights (Exhibit 3)	61,725	61,725	84,225	107,109
1100	Overlying Production Rights (Exhibit 4)	291,610	291,610	370,000	370,652
1300	Small Pumpers (Based on 75% Collection Rate)	75,600	TBD	TBD	Deferred
1500	State of California	1,035	1,035	1,035	2,992
1600	City of Lancaster	2,500	2,500	2,500	2,500
1650	Phelan Pinon Hill CSD		1,925		2,697
1675	Supporting Landowner Parties	1,750	1,710	1,710	1,749
1700	Federal Reserve Water Right	8,000	8,000	8,000	1,094
1800	Unused Federal Reserve Water Right	25,500	25,500	25,500	
1900	Imported Water Return Flows	87,500	84,785	90,000	179,621
1925	Variable Assessments	100,000	109,446		
1950	Miscellaneous				
	Application Fees (Admin. and Engineer)	25,000	50,965	25,000	22,450
	Late Fees/Outstanding Assessments		2,726	12,443	3,916
1975	New Production Parties		130	130	
1990	Excess / (Loss) from Previous Year	4,978	(57,002)	(74,451)	(23,853)
	Total Revenue	685,198	585,055	546,092	670,927
Expenses - Administration/Engineer/Legal					
2000	Contracted Administrative Expenses				
	AVEK Interim Administrative Staff				35,000
	PWD Interim Administrative Staff				10,000
	Administrative Services - AVEK and PWD	75,000	70,000	108,901	
	Administrative Services - Meter Compliance	35,000			
	Annual Financial Audit	5,000	4,000	4,000	7,000
	Processing Various Applications (Admin. and Engineer)	25,000	50,965		
2100	Postage and Printing				
	Postage and P.O. Box Rental	500	100	100	96
	Outside Printing and Supplies	1,000	200	250	121
2200	Information and Document Management				
	Glotrans Document Management	14,400	14,400	14,400	14,400
	Computer Software	200	150	150	109
	Website	1,200	1,068		4,069
2300	Membership and Insurance				
	D&O Coverage	1,750	1,523	2,600	2,621
2400	Watermaster Legal Services				
	Legal Services - Board and Administrative Functions	210,000	210,000	255,000	251,212
2500	Watermaster Engineer				
	Watermaster Engineer - TODD 2020 Scope	224,310			
	Watermaster Engineer - TODD Per Original Proposal		141,126	252,538	289,648
	Watermaster Engineer - Amendment No. 1 (2018 Scope)				98,653
	Watermaster Engineer - Amendment No. 2 (2019 Scope)			(111,412)	
	Watermaster Engineer - Amendment No. 3 (2019 Scope)		20,320		
	Watermaster Engineer - Amendment No. 4 (2019 Scope)		50,000		
2600	Watermaster Special Contract Services				
	USGS Contract - Water Level Monitoring (25%)	16,375	16,225	16,225	15,000
	Watermaster Engineer Recruitment Contract				
2700	Watermaster Administrative Stabilization Fund	75,463			
	Total Administrative Expenses	685,198	580,077	542,752	727,929

Appendix K-2. Financial Audit, 2019

ANTELOPE VALLEY
WATERMASTER
EST. 2016

Antelope Valley Watermaster

Annual Financial Report

For the Fiscal Year Ended December 31, 2019

ANTELOPE VALLEY
WATERMASTER
EST. 2016

Antelope Valley Watermaster

Board of Directors as of December 31, 2019

Name	Title	Elected/ Appointed	Current Term
Robert Parris	Chair	Appointed	Ongoing
Dennis Atkinson	Vice-Chair	Appointed	Ongoing
Adam Ariki	Director	Appointed	Ongoing
John Calandri	Director	Appointed	Ongoing
Leo Thibault	Director	Appointed	Ongoing

Antelope Valley Watermaster
Matthew Knudson, Administrator
PO Box 3025
Quartz Hill, California 93586
(661) 234-8233 – https://avwatermaster.net/

Antelope Valley Watermaster

Annual Financial Report

For the Fiscal Year Ended December 31, 2019

Antelope Valley Watermaster
Annual Financial Report
For the Fiscal Year Ended December 31, 2019

Table of Contents

Financial Section

Fedak & Brown LLP
Certified Public Accountants

Charles Z. Fedak, CPA, MBA
Christopher J. Brown, CPA, CGMA
Andy Beck, CPA

Cypress Office:
6081 Orange Avenue
Cypress, California 90630
(657) 214-2307
FAX (714) 527-9154

Riverside Office:
1945 Chicago Avenue, Suite C-1
Riverside, California 92507
(951) 783-9149

Independent Auditor's Report

Board of Directors
Antelope Valley Watermaster
Quartz Hill, California

Report on the Financial Statements

We have audited the accompanying financial statements of the Antelope Valley Watermaster (Watermaster), which comprises the statement of net position as of December 31, 2019, and the related statement of revenues, expenses, and changes in net position for the year then ended, and the related notes to the financial statements, which collectively comprise the Watermaster's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and the State Controller's Minimum Audit Requirements for California Special Districts. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the Antelope Valley Watermaster as of December 31, 2019, and the respective changes in net position, and, where applicable, cash flows thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated June 30, 2020, on our consideration of the Watermaster's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Watermaster's internal control over financial reporting and compliance. This report can be found on pages 18 and 19.

Fedak & Brown LLP

Fedak & Brown LLP
Cypress, California
June 30, 2020

Antelope Valley Watermaster
Management's Discussion and Analysis
For the Year Ended December 31, 2019

The following Management's Discussion and Analysis (MD&A) of activities and financial performance of the Antelope Valley Watermaster (Watermaster) provides an introduction to the financial statements of the Watermaster for the year ended December 31, 2019. We encourage readers to consider the information presented here with additional information that we have furnished in the accompanying basic financial statements and related notes, which follow this section.

Financial Highlights

- The Watermaster's net position increased 8,807.41% or $2,047,900 to $2,071,152.
- The Watermaster's total revenues increased 240.82% or $1,840,223 to $2,604,381.
- The Watermaster's total expenses decreased 28.94% or $226,664 to $556,481.

Using This Financial Report

This annual report consists of a series of financial statements. The Statement of Net Position, Statement of Revenues, Expenses, and Changes in Net Position, and Statement of Cash Flows provide information about the activities and performance of the Watermaster using accounting methods similar to those used by private sector companies.

The Statement of Net Position includes all of the Watermaster's investments in resources (assets), deferred outflows of resources, obligations to creditors (liabilities), and deferred inflows of resources. It also provides the basis for evaluating the results of operations, evaluating the capital structure of the Watermaster, and assessing the liquidity and financial flexibility of the Watermaster. All of the current year's revenues and expenses are accounted for in the Statement of Revenues, Expenses, and Changes in Net Position. This statement measures the success of the Watermaster's operations over the past year and can be used to determine if the Watermaster has successfully recovered all of its costs through its rates and other charges. In addition to tracking cost recovery performance, this statement can also be used to evaluate the results of operations and creditworthiness. The final required financial statement is the Statement of Cash Flows, which provides information about the Watermaster's cash receipts and cash payments during the reporting period. The Statement of Cash Flows reports cash receipts, cash payments, and net changes in cash resulting from operations, investing, non-capital financing, and capital and related financing activities, and provides answers to such questions as where did cash come from, what was cash used for, and what was the change in cash balance during the reporting period.

Financial Analysis of the Watermaster

One of the most important questions asked about the Watermaster's finances is, "Is the Watermaster better off or worse off as a result of this year's activities?" The Statement of Net Position and the Statement of Revenues, Expenses, and Changes in Net Position report information about the Watermaster in a way that helps answer this question. These statements include all assets, deferred outflows of resources, liabilities, and deferred inflows of resources using the *accrual basis of accounting*, which is similar to the accounting method used by most private sector companies. All of the current year's revenues and expenses are taken into account regardless of when the cash is received or paid.

These two statements report the Watermaster's net position and changes in them. You can think of the Watermaster's net position – the difference between assets and deferred outflows of resources less liabilities and deferred inflows of resources – as one way to measure the Watermaster's financial health, or financial position. Over time, increases or decreases in the Watermaster's net position are one indicator of whether its financial health is improving or deteriorating. However, one will need to consider other non-financial factors such as changes in economic conditions, population growth, zoning, and new or changed government legislation, such as changes in Federal and State water quality standards.

Notes to the Basic Financial Statements

The notes to the basic financial statements provide additional information that is essential to a full understanding of the data provided in the basic financial statements. The notes to the basic financial statements can be found on pages 9 through 17.

Statements of Net Position

Condensed Statements of Net Position

	2019	2018	Change
Assets:			
Current assets	$ 2,126,004	79,335	2,046,669
Total assets	2,126,004	79,335	2,046,669
Liabilities:			
Current liabilities	54,852	56,083	(1,231)
Total liabilities	54,852	56,083	(1,231)
Net position:			
Restricted	2,063,167	65,832	1,997,335
Unrestricted	7,985	(42,580)	50,565
Total net position	$ 2,071,152	23,252	2,047,900

As noted earlier, net position may serve over time as a useful indicator of a government's financial position. In the case of the Watermaster, assets exceeded liabilities by $2,071,152, as of December 31, 2019.

Statements of Revenues, Expenses, and Changes in Net Position

Condensed Statements of Revenues, Expenses, and Changes in Net Position

	2019	2018	Change
Revenues:			
Operating revenues	$ 2,603,806	763,246	1,840,560
Non-operating revenues	575	912	(337)
Total revenues	2,604,381	764,158	1,840,223
Expenses:			
Operating expenses	556,481	783,145	(226,664)
Total expenses	556,481	783,145	(226,664)
Change in net position	2,047,900	(18,987)	2,066,887
Net position, beginning of year	23,252	42,239	(18,987)
Net position, end of year	$ 2,071,152	23,252	2,047,900

Net position increased 8,807.41% or $2,047,900 to $2,071,152, as a result of ongoing operations.

Total revenues increased 240.82% or $1,840,223 to $2,604,381, primarily due to an increase of $1,927,253 in replacement water assessments, which was offset by a decrease of $95,579 in imported water return flow.

Total expenses decreased 28.94% or $226,664 to $556,481, primarily due to a decrease of $221,471 in watermaster engineer expenses, which was offset by an increase of $17,957 in contracted administrative services.

Conditions Affecting Current Financial Position

Management is unaware of any conditions which could have a significant impact on the Watermaster's current financial position, net position, or operating results based on past, present, and future events.

Requests for Information

This financial report is designed to provide the Watermaster's present users, including funding sources, customers, stakeholders, and other interested parties with a general overview of the Watermaster's finances and to demonstrate the Watermaster's accountability with an overview of the Watermaster's financial operations and financial condition. Should the reader have questions regarding the information included in this report or wish to request additional financial information, please contact the Watermaster's Administrator, Matthew Knudson at Antelope Valley Watermaster, PO Box 3025, Quartz Hill, California, 93586 or (661) 234-8233.

Basic Financial Statements

Antelope Valley Watermaster
Statement of Net Position
December 31, 2019

		2019
Current assets:		
Cash and cash equivalents (note 2)	$	62,837
Cash and cash equivalents - restricted (note 2)		451,507
Accounts receivable - restricted		1,611,660
Total current assets		2,126,004
Total assets		2,126,004
Current liabilities:		
Accounts payable and accrued expenses		33,852
Customer deposits		21,000
Total current liabilities		54,852
Total liabilities		54,852
Net position:		
Restricted		2,063,167
Unrestricted		7,985
Total net position	$	2,071,152

See accompanying notes to the basic financial statements

Antelope Valley Watermaster
Statement of Revenues, Expenses, and Changes in Net Position
For the Year Ended December 31, 2019

		2019
Operating revenues:		
Fixed production rights	$	385,349
Variable assessments		109,446
Replacement water assessments		1,997,335
Imported water return flow		84,785
Application fees		26,891
Total operating revenues		2,603,806
Operating expenses:		
Contracted administrative services		66,699
Watermaster engineer		218,497
Watermaster special contract		20,022
Information and documents		16,800
Legal and professional fees		232,378
Insurance expenses		1,829
Dues and subscriptions		256
Total operating expenses		556,481
Operating income		2,047,325
Non-operating revenue:		
Interest earnings		575
Total non-operating revenue		575
Change in net position		2,047,900
Net position, beginning of year		23,252
Net position, end of year	$	2,071,152

See accompanying notes to the basic financial statements

Antelope Valley Watermaster
Statement of Cash Flows
For the Year Ended December 31, 2019

		2019
Cash flows from operating activities:		
Cash receipts from purveyors	$	1,068,434
Cash paid to vendors and suppliers for materials and services		(557,712)
Net cash provided by operating activities		510,722
Cash flows from investing activities:		
Investment earnings		575
Net cash provided by investing activities		575
Net increase in cash and cash equivalents		511,297
Cash and cash equivalents, beginning of year		3,047
Cash and cash equivalents, end of year	$	514,344
Reconciliation of cash and cash equivalents to the statement of net position:		
Cash and cash equivalents	$	514,344
Total cash and cash equivalents	$	514,344
Reconciliation of operating income to net cash provided by operating activities:		
Operating income	$	2,047,325
Changes in assets, deferred outflows of resources, liabilities, and deferred inflows of resources:		
Increase in assets:		
Accounts receivable		(1,535,372)
Increase (Decrease) in liabilities:		
Accounts payable and accrued expenses		(22,231)
Customer deposits		21,000
Total adjustments		(1,536,603)
Net cash provided by operating activities	$	510,722

See accompanying notes to the basic financial statements

(1) Reporting Entity and Summary of Significant Accounting Policies

A. Organization and Operations of the Reporting Entity

The Antelope Valley Watermaster (Watermaster) was formed by the Antelope Valley Groundwater Cases Final Judgment Santa Clara Case No. 1-05-CV-049053 signed on December 23, 2015. The Watermaster's primary duty is to administer a Judgment that has the goal of protecting the sustainable use of the Antelope Valley Groundwater Basin (Basin) as a source of groundwater supply. The Basin is located in the western Mojave Desert – it encompasses 1,580 square miles in Los Angeles, Kern, and San Bernardino Counties. Approximately two-thirds of the Basin lies in Los Angeles County, with small portions extending into San Bernardino County, and the remainder in southeastern Kern County.

To administer the Judgment, the Court directed appointment of the Watermaster (a five-member board). In 2016, the Watermaster Board and an Advisory Committee were formed. The Board finalized the hiring of Todd Groundwater as Watermaster Engineer (required by the Judgment) in April 2017 to provide hydrogeological and technical analyses and to guide administrative functions to fulfill the Judgment.

The court-appointed Watermaster Board is made up of five members: One representative from the Antelope Valley East Kern Water Agency; one representative from the Los Angeles County Waterworks District No. 40; one representative from a public water supplier selected by various government districts; and two landowner representatives (exclusive of public agencies and members of the Non-Pumper and small pumper class). The Watermaster normally conducts monthly general meetings of the Board which are held on the fourth Wednesday of the month at the Watermaster's office.

B. Basis of Accounting and Measurement Focus

The Watermaster reports its activities as an enterprise fund, which is used to account for operations that are financed and operated in a manner similar to a private business enterprise, where the intent of the Watermaster is that the cost administering the Judgment on a continuing basis be financed or recovered primarily through various assessments. Revenues and expenses are recognized on the full accrual basis of accounting. Revenues are recognized in the accounting period in which they are earned, and expenses are recognized in the period incurred, regardless of when the related cash flows take place.

Operating revenues and expenses result from exchange transactions associated with the principal activity of the Watermaster. Exchange transactions are those in which each party receives and gives up essentially equal value. Management and administration expenses are also considered operating expenses. Other revenues and expenses not included in the above categories are reported as non-operating revenues and expenses.

C. Financial Reporting

The Watermaster's basic financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (GAAP), as applied to enterprise funds. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. The Watermaster solely operates as a special-purpose government which means it is only engaged in business-type activities; accordingly, activities are reported in the Watermaster's proprietary fund.

(1) Reporting Entity and Summary of Significant Accounting Policies, continued

C. Financial Reporting, continued

The Watermaster has adopted the following GASB pronouncements in the current year:

Governmental Accounting Standards Board Statement No. 83

In November 2016, the GASB issued Statement No. 83 – *Certain Asset Retirement Obligations.* This Statement (1) addresses accounting and financial reporting for certain asset retirement obligations (AROs), (2) establishes criteria for determining the timing and pattern of recognition of a liability and a corresponding deferred outflow of resources for AROs, (3) requires that recognition occur when the liability is both incurred and reasonably estimable, (4) requires the measurement of an ARO to be based on the best estimate of the current value of outlays expected to be incurred, (5) requires the current value of a government's AROs to be adjusted for the effects of general inflation or deflation at least annually, and (6) requires disclosure of information about the nature of a government's AROs, the methods and assumptions used for the estimates of the liabilities, and the estimated remaining useful life of the associated tangible capital assets.

Governmental Accounting Standards Board Statement No. 84

In January 2017, the GASB issued Statement No. 84 – *Fiduciary Activities.* The objective of this Statement is to improve guidance regarding the identification of fiduciary activities for accounting and financial reporting purposes and how those activities should be reported.

This Statement establishes criteria for identifying fiduciary activities of all state and local governments. The focus of the criteria generally is on (1) whether a government is controlling the assets of the fiduciary activity and (2) the beneficiaries with whom a fiduciary relationship exists. Separate criteria are included to identify fiduciary component units and postemployment benefit arrangements that are fiduciary activities.

This Statement describes four fiduciary funds that should be reported, if applicable: (1) pension (and other employee benefit) trust funds, (2) investment trust funds, (3) private-purpose trust funds, and (4) custodial funds. Custodial funds generally should report fiduciary activities that are not held in a trust or equivalent arrangement that meets specific criteria.

Governmental Accounting Standards Board Statement No. 88

In April 2018, the GASB issued Statement No. 88 – *Certain Disclosures Related to Debt, Including Direct Borrowings and Direct Placements*. The primary objective of this Statement is to improve the information that is disclosed in notes to government financial statements related to debt, including direct borrowings and direct placements. It also clarifies which liabilities governments should include when disclosing information related to debt.

This Statement defines debt for purposes of disclosure in notes to financial statements as a liability that arises from a contractual obligation to pay cash (or other assets that may be used in lieu of cash) in one or more payments to settle an amount that is fixed at the date the contractual obligation is established.

This Statement requires that additional essential information related to debt be disclosed in notes to financial statements, including unused lines of credit; assets pledged as collateral for the debt; and terms specified in debt agreements related to significant events of default with finance-related consequences, significant termination events with finance-related consequences, and significant subjective acceleration clauses.

(1) Reporting Entity and Summary of Significant Accounting Policies, continued

C. Financial Reporting, continued

Governmental Accounting Standards Board Statement No. 88, continued

For notes to financial statements related to debt, this Statement also requires that existing and additional information be provided for direct borrowings and direct placements of debt separately from other debt.

Governmental Accounting Standards Board Statement No. 90

In August 2018, the GASB issued Statement No. 90 – *Majority Equity Interests—an amendment of GASB Statements No. 14 and No. 61*. The primary objectives of this Statement are to improve the consistency and comparability of reporting a government's majority equity interest in a legally separate organization and to improve the relevance of financial statement information for certain component units. It defines a majority equity interest and specifies that a majority equity interest in a legally separate organization should be reported as an investment if a government's holding of the equity interest meets the definition of an investment. A majority equity interest that meets the definition of an investment should be measured using the equity method, unless it is held by a special-purpose government engaged only in fiduciary activities, a fiduciary fund, or an endowment (including permanent and term endowments) or permanent fund. Those governments and funds should measure the majority equity interest at fair value.

For all other holdings of a majority equity interest in a legally separate organization, a government should report the legally separate organization as a component unit, and the government or fund that holds the equity interest should report an asset related to the majority equity interest using the equity method. This Statement establishes that ownership of a majority equity interest in a legally separate organization results in the government being financially accountable for the legally separate organization and, therefore, the government should report that organization as a component unit.

This Statement also requires that a component unit in which a government has a 100 percent equity interest account for its assets, deferred outflows of resources, liabilities, and deferred inflows of resources at acquisition value at the date the government acquired a 100 percent equity interest in the component unit. Transactions presented in flows statements of the component unit in that circumstance should include only transactions that occurred subsequent to the acquisition.

The requirements of this Statement are effective for reporting periods beginning after December 15, 2018. Earlier application is encouraged. The requirements should be applied retroactively, except for the provisions related to (1) reporting a majority equity interest in a component unit and (2) reporting a component unit if the government acquires a 100 percent equity interest. Those provisions should be applied on a prospective basis.

Governmental Accounting Standards Board Statement No. 95

In May 2020, the GASB issued Statement No 95 – *Postponement of the Effective Dates of Certain Authoritative Guidance*. The primary objective of this Statement is to provide temporary relief to governments and other stakeholders in light of the COVID-19 pandemic. That objective is accomplished by postponing the effective dates of certain provisions in Statements and Implementation Guides that first became effective or are scheduled to become effective for periods beginning after June 15, 2018, and later.

(1) Reporting Entity and Summary of Significant Accounting Policies, continued

D. Assets, Liabilities, and Net Position

1. Use of Estimates

The preparation of the basic financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets, deferred outflows of resources, liabilities, and deferred inflows of resources, and disclosures of contingent assets, deferred outflows of resources, liabilities, and deferred inflows of resources, at the date of the financial statements and the reported changes in net position during the reporting period. Actual results could differ from those estimates.

2. Cash and Cash Equivalents

All deposits of the Watermaster are made in board-designated official depositories and are secured as required by State Law. Starting in 2019, the Watermaster created a money market cash account, where most of its cash is held. The Watermaster considers all highly liquid investments with a maturity of three months or less to be cash equivalents.

3. Accounts Receivable and Allowance for Uncollectible Accounts

The Watermaster extends credit to customers in the normal course of operations. When management deems customer accounts uncollectible, the Watermaster uses the allowance method for the reservation and write-off of those accounts. There is no allowance for uncollectible accounts as of December 31, 2019, as management believes all accounts will be collected.

4. Net Position

The financial statements utilize a net position presentation. Net position is categorized as follows:

- **Net Investment in Capital Assets** – Consists of capital assets, net of accumulated depreciation and amortization, and reduced by outstanding balances of any debt, or other long-term borrowings that are attributable to the acquisition, construction, or improvement of those assets.
- **Restricted** – Consists of assets that have restrictions placed upon their use by external constraints imposed either by creditors (debt covenants), grantors, contributors, or laws and regulations of other governments, or constraints imposed by law through enabling legislation.
- **Unrestricted** – Consists of the net amount of assets, deferred outflows of resources, liabilities, and deferred inflows of resources that are not included in the determination of the net investment in capital assets or restricted components of net position.

5. Water Production Assessments

Water production assessments are billed on a yearly basis and the respective revenues are recognized when earned.

6. Customer Deposits

Customer deposits consists of customer and developer deposits held at year-end.

7. Budgetary Policies

In accordance with the Judgment, the Watermaster shall prepare a proposed administrative budget for each year. The Watermaster shall hold a public hearing regarding the proposed administrative budget and adopt an administrative budget. The Watermaster's governing board is to make sure the administrative budget sets forth budgeted items and shows the allocation of the expenses amongst producers.

(2) Cash and Cash Equivalents

Cash and cash equivalents as of December 31 are classified in the accompanying financial statements as follows:

		2019
Cash and cash equivalents	$	62,837
Cash and cash equivalents - restricted		451,507
Total cash and cash equivalents	$	514,344

Cash and cash equivalents as of December 31 consist of the following:

		2019
Deposits held with financial institutions	$	514,344
Total cash and cash equivalents	$	514,344

Custodial Credit Risk

Custodial credit risk for *deposits* is the risk that, in the event of the failure of a depository financial institution, a government will not be able to recover its deposits, or will not be able to recover collateral securities that are in the possession of an outside party. The California Government Code and the Watermaster's investment policy do not contain legal or policy requirements that would limit the exposure to custodial credit risk for deposits or investments, other than the following provision for deposits: The California Government Code requires that a financial institution secure deposits made by state or local governmental units by pledging securities in an undivided collateral pool held by a depository regulated under state law (unless so waived by the governmental unit). The market value of the pledged securities in the collateral pool must equal at least 110% of the total amount deposited by the public agencies. Of the bank balances, up to $250,000 is federally insured and the remaining balance is collateralized in accordance with the Code; however, the collateralized securities are not held in the Watermaster's name.

(3) Net Position

Calculation of net position as of December 31 is as follows:

		2019
Restricted net position:		
Replacement water assessments	$	2,063,167
Total restricted net position		2,063,167
Unrestricted net position		7,985
Total net position	$	2,071,152

(4) Risk Management

The Watermaster is exposed to various risks of loss related to torts, theft of, damage to, and destruction of assets; errors and omissions; injuries to employees; and natural disasters. The Watermaster is a member of the Association of California Water Agencies/Joint Powers Insurance Authority (ACWA/JPIA), an intergovernmental risk sharing joint powers authority created to provide self-insurance programs for California water agencies. The purpose of the ACWA/JPIA is to arrange and administer programs of self-insured losses and to purchase excess insurance coverage.

At December 31, 2019, the Watermaster participated in the liability program of the ACWA/JPIA as follows:

- General and auto liability, public officials and employees' errors and omissions: Total risk financing self-insurance limits of $5,000,000, combined single limit at $5,000,000 per occurrence. The JPIA purchases additional excess coverage layers up to $55 million per occurrence total for general, auto and public officials liability, which increases the limits on the insurance coverage noted above.

Settled claims have not exceeded any of the coverage amounts in any of the last three years and there were no reductions in the Watermaster's insurance coverage during the years ended December 31, 2019, 2018 and 2017. Liabilities are recorded when it is probable that a loss has been incurred and the amount of the loss can be reasonably estimated net of the respective insurance coverage. Liabilities include an amount for claims that have been incurred but not reported (IBNR). There was no IBNR claims payable as of December 31, 2019, 2018 and 2017.

(5) Governmental Accounting Standards Board Statements Issued, Not Yet Effective

The Governmental Accounting Standards Board (GASB) has issued several pronouncements prior to December 31, 2019, that has effective dates that may impact future financial presentations.

Governmental Accounting Standards Board Statement No. 87

In June 2017, the GASB issued Statement No. 87 – *Leases.* The objective of this Statement is to better meet the information needs of financial statement users by improving accounting and financial reporting for leases by governments. This Statement increases the usefulness of governments' financial statements by requiring recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. It establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Under this Statement, a lessee is required to recognize a lease liability and an intangible right-to-use lease asset, and a lessor is required to recognize a lease receivable and a deferred inflow of resources, thereby enhancing the relevance and consistency of information about governments' leasing activities.

The requirements of this Statement are effective for reporting periods beginning after June 15, 2021. Earlier application is encouraged.

Governmental Accounting Standards Board Statement No. 89

In June 2018, the GASB issued Statement No. 89 – *Accounting for Interest Cost Incurred Before the End of a Construction Period.* The objectives of this Statement are (1) to enhance the relevance and comparability of information about capital assets and the cost of borrowing for a reporting period and (2) to simplify accounting for interest cost incurred before the end of a construction period.

(5) Governmental Accounting Standards Board Statements Issued, Not Yet Effective, continued

Governmental Accounting Standards Board Statement No. 89, continued

This Statement establishes accounting requirements for interest cost incurred before the end of a construction period. Such interest cost includes all interest that previously was accounted for in accordance with the requirements of paragraphs 5–22 of Statement No. 62, *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements,* which are superseded by this Statement. This Statement requires that interest cost incurred before the end of a construction period be recognized as an expense in the period in which the cost is incurred for financial statements prepared using the economic resources measurement focus. As a result, interest cost incurred before the end of a construction period will not be included in the historical cost of a capital asset reported in a business-type activity or enterprise fund.

This Statement also reiterates that in financial statements prepared using the current financial resources measurement focus, interest cost incurred before the end of a construction period should be recognized as an expenditure on a basis consistent with governmental fund accounting principles.

The requirements of this Statement are effective for reporting periods beginning after December 15, 2020. Earlier application is encouraged. The requirements of this Statement should be applied prospectively.

Governmental Accounting Standards Board Statement No. 91

In May 2019, the GASB issued Statement No. 91 – *Conduit Debt Obligations*. The primary objectives of this Statement are to provide a single method of reporting conduit debt obligations by issuers and eliminate diversity in practice associated with (1) commitments extended by issuers, (2) arrangements associated with conduit debt obligations, and (3) related note disclosures. This Statement achieves those objectives by clarifying the existing definition of a conduit debt obligation; establishing that a conduit debt obligation is not a liability of the issuer; establishing standards for accounting and financial reporting of additional commitments and voluntary commitments extended by issuers and arrangements associated with conduit debt obligations; and improving required note disclosures.

This Statement also addresses arrangements—often characterized as leases—that are associated with conduit debt obligations. In those arrangements, capital assets are constructed or acquired with the proceeds of a conduit debt obligation and used by third-party obligors in the course of their activities. Payments from third-party obligors are intended to cover and coincide with debt service payments. During those arrangements, issuers retain the titles to the capital assets. Those titles may or may not pass to the obligors at the end of the arrangements.

This Statement requires issuers to disclose general information about their conduit debt obligations, organized by type of commitment, including the aggregate outstanding principal amount of the issuers' conduit debt obligations and a description of each type of commitment. Issuers that recognize liabilities related to supporting the debt service of conduit debt obligations also should disclose information about the amount recognized and how the liabilities changed during the reporting period.

The requirements of this Statement are effective for reporting periods beginning after December 15, 2021. Earlier application is encouraged.

Governmental Accounting Standards Board Statement No. 92

In January 2020, the GASB issued Statement No. 92 – *Omnibus 2020*. The objectives of this Statement are to enhance comparability in accounting and financial reporting and to improve the consistency of authoritative literature by addressing practice issues that have been identified during implementation and application of certain GASB Statements.

(5) Governmental Accounting Standards Board Statements Issued, Not Yet Effective, continued

Governmental Accounting Standards Board Statement No. 92, continued

The requirements of this Statement are as follows: (1) The requirements related to the effective date of Statement 87 and Implementation Guide 2019-3, reinsurance recoveries, and terminology used to refer to derivative instruments are effective upon issuance; (2) The requirements related to intra-entity transfers of assets and those related to the applicability of Statements 73 and 74 are effective for fiscal years beginning after June 15, 2020; (3) The requirements related to application of Statement 84 to postemployment benefit arrangements and those related to nonrecurring fair value measurements of assets or liabilities are effective for reporting periods beginning after June 15, 2020; and (4) The requirements related to the measurement of liabilities (and assets, if any) associated with AROs in a government acquisition are effective for government acquisitions occurring in reporting periods beginning after June 15, 2021. Earlier application is encouraged and is permitted by topic.

Governmental Accounting Standards Board Statement No. 93

In March 2020, the GASB issued Statement No. 93 – *Replacement of Interbank Offered Rates*. The objective of this Statement is to address accounting and financial reporting implications that result from the replacement of an IBOR. This Statement achieves that objective by: (1) Providing exceptions for certain hedging derivative instruments to the hedge accounting termination provisions when an IBOR is replaced as the reference rate of the hedging derivative instrument's variable payment; (2) Clarifying the hedge accounting termination provisions when a hedged item is amended to replace the reference rate; (3) Clarifying that the uncertainty related to the continued availability of IBORs does not, by itself, affect the assessment of whether the occurrence of a hedged expected transaction is probable; (4) Removing LIBOR as an appropriate benchmark interest rate for the qualitative evaluation of the effectiveness of an interest rate swap; (5) Identifying a Secured Overnight Financing Rate and the Effective Federal Funds Rate as appropriate benchmark interest rates for the qualitative evaluation of the effectiveness of an interest rate swap; (6) Clarifying the definition of reference rate, as it is used in Statement 53, as amended; and (7) Providing an exception to the lease modifications guidance in Statement 87, as amended, for certain lease contracts that are amended solely to replace an IBOR as the rate upon which variable payments depend.

The requirements of this Statement are effective as follows: (1) The removal of LIBOR as an appropriate benchmark interest rate is effective for reporting periods ending after December 31, 2021; and (2) All other requirements of this Statement are effective for reporting periods beginning after June 15, 2021. Earlier application is encouraged.

Governmental Accounting Standards Board Statement No. 94

In March 2020, the GASB issued Statement No. 94 – *Public-Private and Public-Public Partnerships and Availability Payment Arrangements*. The primary objective of this Statement is to improve financial reporting by addressing issues related to public-private and public-public partnership arrangements (PPPs). As used in this Statement, a PPP is an arrangement in which a government (the transferor) contracts with an operator (a governmental or nongovernmental entity) to provide public services by conveying control of the right to operate or use a nonfinancial asset, such as infrastructure or other capital asset (the underlying PPP asset), for a period of time in an exchange or exchange-like transaction. Some PPPs meet the definition of a service concession arrangement (SCA), which the Board defines in this Statement as a PPP in which (1) the operator collects and is compensated by fees from third parties; (2) the transferor determines or has the ability to modify or approve which services the operator is required to provide, to whom the operator is required to provide the services, and the prices or rates that can be charged for the services; and (3) the transferor is entitled to significant residual interest in the service utility of the underlying PPP asset at the end of the arrangement.

(5) Governmental Accounting Standards Board Statements Issued, Not Yet Effective, continued

Governmental Accounting Standards Board Statement No. 94, continued

The requirements of this Statement are effective for reporting periods beginning after June 15, 2022, and all reporting periods thereafter. Earlier application is encouraged.

Governmental Accounting Standards Board Statement No. 96

In May 2020, the GASB issued Statement No. 96 – *Subscription-Based Information Technology Arrangements*. This Statement provides guidance on the accounting and financial reporting for subscription-based information technology arrangements (SBITAs) for government end users (governments). This Statement (1) defines a SBITA; (2) establishes that a SBITA results in a right-to-use subscription asset—an intangible asset—and a corresponding subscription liability; (3) provides the capitalization criteria for outlays other than subscription payments, including implementation costs of a SBITA; and (4) requires note disclosures regarding a SBITA. To the extent relevant, the standards for SBITAs are based on the standards established in Statement No. 87, Leases, as amended.

The requirements of this Statement are effective for reporting periods beginning after June 15, 2022, and all reporting periods thereafter. Earlier application is encouraged.

(6) Commitments and Contingencies

Grant Awards

Grant funds received by the Watermaster are subject to audit by the grantor agencies. Such audit could lead to requests for reimbursements to the grantor agencies for expenditures disallowed under terms of the grant. Management of the Watermaster believes that such disallowances, if any, would not be significant.

Litigation

In the ordinary course of operations, the Watermaster is subject to claims and litigation from outside parties. After consultation with legal counsel, the Watermaster believes the ultimate outcome of such matters, if any, will not materially affect its financial condition.

(7) Subsequent Events

Events occurring after December 31, 2019, have been evaluated for possible adjustment to the financial statements or disclosure as of June 30, 2020, which is the date the financial statements were available to be issued.

Report on Internal Controls and Compliance

Fedak & Brown LLP
Certified Public Accountants

Charles Z. Fedak, CPA, MBA
Christopher J. Brown, CPA, CGMA
Andy Beck, CPA

Cypress Office:
6081 Orange Avenue
Cypress, California 90630
(657) 214-2307
FAX (714) 527-9154

Riverside Office:
1945 Chicago Avenue, Suite C-1
Riverside, California 92507
(951) 783-9149

Independent Auditor's Report on Internal Controls Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

Board of Directors
Antelope Valley Watermaster
Quartz Hill, California

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the Antelope Valley Watermaster (Watermaster) as of and for the year ended December 31, 2019, and the related notes to the financial statements, which collectively comprises the Watermaster's basic financial statements, and have issued our report thereon dated June 30, 2020.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Watermaster's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Watermaster's internal control. Accordingly, we do not express an opinion on the effectiveness of the Watermaster's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Watermaster's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Watermaster's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Watermaster's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Fedak & Brown LLP

Fedak & Brown LLP
Cypress, California
June 30, 2020

Antelope Valley Watermaster

Management Report

December 31, 2019

Fedak & Brown LLP
Certified Public Accountants

Antelope Valley Watermaster

Management Report

Table of Contents

Fedak & Brown LLP
Certified Public Accountants

Charles Z. Fedak, CPA, MBA
Christopher J. Brown, CPA, CGMA
Andy Beck, CPA

Cypress Office:
6081 Orange Avenue
Cypress, California 90630
(657) 214-2307
FAX (714) 527-9154

Riverside Office:
1945 Chicago Avenue, Suite C-1
Riverside, California 92507
(951) 783-9149

CONFIDENTIAL

Board of Directors
Antelope Valley Watermaster
Quartz Hill, California

Dear Members of the Board:

In planning and performing our audit of the financial statements of the Antelope Valley Watermaster (Watermaster) as of and for the year ended December 31, 2019, in accordance with auditing standards generally accepted in the United States of America, we considered Watermaster internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Watermaster's internal control. Accordingly, we do not express an opinion on the effectiveness of the Watermaster's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

Our consideration of internal control was for the limited purpose described in the first paragraph and was not designed to identify all deficiencies in internal control that might be material weakness. Given these limitations during our audit we did not identify any deficiencies in internal control that we considered to be material weaknesses. However, material weaknesses may exist that have not been identified.

Summary of Current Year Comments and Recommendations

Our comments, all of which have been discussed with the appropriate members of management, are summarized as follows:

Net Position

We noted that the Watermaster's current year beginning net position as reported on the trial balance did not reconcile to its prior year ending net position as reported on prior year's audited financial statements. Generally, the ending net position should roll forward to the next year where current year beginning net position equals prior year ending net position. A variance can indicate an accounting error. In order to correct the discrepancy, an adjusting journal entry was posted to properly state net position and agree it to the Watermaster's prior year financial statements.

We recommend that the Watermaster implement procedures to ensure that prior year ending net position reconciles with current year beginning net position.

Management's Response

During the year, the Watermaster's bank account was compromised due to fraud. In the process of accounting for the transfer of funds to a new bank account, there were limitations in the accounting software and the transaction was applied to net position. Management and administration of the Watermaster is taking the proper corrective actions to prevent transactions from affecting net position.

Summary of Current Year Comments and Recommendations

Accounts Payable

We noted that the Watermaster's accounting records did not include an accounts payable balance for the current year and the prior year. The Watermaster is a proprietary enterprise fund where revenues are recorded when earned and expenses are recorded when incurred. Consequently, purchases and professional expenses should be reported as an expense as they are incurred, and a respective liability should be recorded.

We recommend that the Watermaster record its financial transactions on the full accrual basis of accounting; whereby, expenses are recorded as they are incurred instead of when they are paid.

Management's Response

The Watermaster's accounting software has limitations that create challenges in recording accounts payable. Management and administration of the Watermaster is exploring different options to report accounts payable at the end of the year.

Disclosure of Audit Adjustments and Reclassifications

As your external auditor, we assume that the books and records of the Watermaster are properly adjusted before the audit begins. In many cases, however, audit adjustments and reclassifications are made in the normal course of the audit process to present the Watermaster's financial statements in conformity with accounting principles generally accepted in the United States of America or for comparison purposes with the prior year. For the Board of Directors to gain a full and complete understanding and appreciation of the scope and extent of the audit process, we have presented these audit adjustments and reclassifications as an attachment to this letter. There can be very reasonable explanations for situations of having numerous adjustments as well as having no adjustments at all. However, the issue is simply disclosure of the adjustments and reclassifications that were made and to provide the Board of Directors with a better understanding of the scope of the audit.

Management's Response

We have reviewed and approved the audit adjustment entries provided by the auditor and have entered the entries into the Watermaster's accounting system.

* * * * * * * * * *

This communication is intended solely for the information and use of management, Board of Directors, and others within the Watermaster, and is not intended to be, and should not be, used by anyone other than these specified parties.

We appreciate the courtesy and cooperation extended to us during our examination. We would be pleased to discuss the contents of this letter with you at your convenience. Please do not hesitate to contact us.

Fedak & Brown LLP

Fedak & Brown LLP
Cypress, California
June 30, 2020

APPENDIX

Antelope Valley Watermaster

Audit/Finance Committee Letter

December 31, 2019

Fedak & Brown LLP
Certified Public Accountants

Charles Z. Fedak, CPA, MBA
Christopher J. Brown, CPA, CGMA
Andy Beck, CPA

Cypress Office:
6081 Orange Avenue
Cypress, California 90630
(657) 214-2307
FAX (714) 527-9154

Riverside Office:
1945 Chicago Avenue, Suite C-1
Riverside, California 92507
(951) 783-9149

Board of Directors
Antelope Valley Watermaster
Quartz Hill, California

We have audited the financial statements of the business-type activities of the Antelope Valley Watermaster (Watermaster) for the year ended December 31, 2019. Professional standards require that we provide you with information about our responsibilities under generally accepted auditing standards (and, if applicable, *Government Auditing Standards* and the Uniform Guidance), as well as certain information related to the planned scope and timing of our audit. We have communicated such information in our engagement letter to you dated April 23, 2020. Professional standards also require that we communicate to you the following information related to our audit.

Significant Audit Matters

Qualitative Aspects of Accounting Practices

Management is responsible for the selection and use of appropriate accounting policies. The significant accounting policies used by the Watermaster are described in Note 1 to the financial statements. No new accounting policies were adopted and the application of existing policies was not changed during 2019. We noted no transactions entered into by the Watermaster during the year for which there is a lack of authoritative guidance or consensus. All significant transactions have been recognized in the financial statements in the proper period.

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ significantly from those expected. The most sensitive estimate affecting the Watermaster's financial statements was:

> Management's estimate of the fair value of cash and cash equivalents is based on information provided by financial institutions. We evaluated the key factors and assumptions used to develop the fair value of cash and cash equivalents in determining that it is reasonable in relation to the financial statements taken as a whole.

Certain financial statement disclosures are particularly sensitive because of their significance to financial statement users. The most sensitive disclosure affecting the financial statements were:

> The disclosure of fair value of cash and cash equivalents in Note 2 to the financial statements represents amounts susceptible to market fluctuations.

The financial statement disclosures are neutral, consistent, and clear.

Difficulties Encountered in Performing the Audit

We encountered no significant difficulties in dealing with management in performing and completing our audit.

Corrected and Uncorrected Misstatements

Professional standards require us to accumulate all known and likely misstatements identified during the audit, other than those that are clearly trivial, and communicate them to the appropriate level of management. Management has corrected all such misstatements. In addition, none of the misstatements detected as a result of audit procedures and corrected by management were material, either individually or in the aggregate, to each opinion unit's financial statements taken as a whole.

Disagreements with Management

For purposes of this letter, a disagreement with management is a financial accounting, reporting, or auditing matter, whether or not resolved to our satisfaction, that could be significant to the financial statements or the auditor's report. We are pleased to report that no such disagreements arose during the course of our audit.

Management Representations

We have requested certain representations from management that are included in the management representation letter dated June 30, 2020.

Management Consultations with Other Independent Accountants

In some cases, management may decide to consult with other accountants about auditing and accounting matters, similar to obtaining a "second opinion" on certain situations. If a consultation involves application of an accounting principle to the Watermaster's financial statements or a determination of the type of auditor's opinion that may be expressed on those statements, our professional standards require the consulting accountant to check with us to determine that the consultant has all the relevant facts. To our knowledge, there were no such consultations with other accountants.

Other Audit Findings or Issues

We generally discuss a variety of matters, including the application of accounting principles and auditing standards, with management each year prior to retention as the Watermaster's auditors. However, these discussions occurred in the normal course of our professional relationship and our responses were not a condition to our retention.

Restriction on Use

This information is intended solely for the information and use of the Board of Directors and management of the Watermaster and is not intended to be, and should not be, used by anyone other than these specified parties. This restriction is not intended to limit the distribution of this letter, which is a matter of public record.

Conclusion

We appreciate the cooperation extended to us by Matthew Knudson, Administrator, and the Watermaster staff in the performance of our audit testwork.

We will be pleased to respond to any questions you have about the foregoing. We appreciate the opportunity to continue to be of service to the Watermaster.

Fedak & Brown LLP

Fedak & Brown LLP
Cypress, California
June 30, 2020

Antelope Valley Watermaster
Schedule of Adjusting Journal Entries
December 31, 2019

Account	Description		Debit	Credit
Adjusting Journal Entries JE # 1				
AJE - To agree net position to prior year financial statements.				
3001	Retained Earnings	$	56,083.17	
5005	Legal & Professional Fees			23,042.92
5007	Watermaster Engineer			33,040.25
Total			**56,083.17**	**56,083.17**
Adjusting Journal Entries JE # 2				
AJE - To adjust automatic QuickBooks journal entry when a new cash account was opened during FY19.				
2001	Retainers		288,578.07	
3000	Opening Balance Equity			288,578.07
Total			**288,578.07**	**288,578.07**
Adjusting Journal Entries JE # 3				
CPE - To record manual A/P accrual due to QuickBooks Online limitations.				
5001	Contracted Administrative Services		3,268.75	
5001	Contracted Administrative Services		498.10	
5003	Information and Document Management		1,200.00	
5004	Insurance Expenses		306.99	
5005	Legal & Professional Fees		16,317.83	
5007	Watermaster Engineer		9,532.71	
2000	Accounts Payable (A/P)			31,124.38
Total			**31,124.38**	**31,124.38**
Adjusting Journal Entries JE # 4				
AJE - To record adjustments to A/P related to an AVSWCA invoice for the services rendered November 1, 2019 through October 31, 2020. The accrual is for the months of November 2019 and December 2019.				
5008	Watermaster Special Contract Services		2,729.17	
2000	Accounts Payable (A/P)			2,729.17
Total		$	**2,729.17**	**2,729.17**

Antelope Valley Watermaster
Schedule of Adjusting Journal Entries, continued
December 31, 2019

Account	Description		Debit	Credit
Adjusting Journal Entries JE # 5				
RJE - To reclassify Replacement Water Assessment credit memo to Olin Derrick related to a carryover water transfer per Court Judgment.				
4502	Replacements Water Assessments	$	81,755.00	
4502	Replacements Water Assessments		83,000.00	
4503	Temporary Water Transfer Request Fees			164,755.00
Total		$	**164,755.00**	**164,755.00**
	Total Adjusting Journal Entries	$	**543,269.79**	**543,269.79**

Legend:

AJE	Audit Adjusting Entry
CPE	Client Prepared Entry
RJE	Reclassifying Journal Entry

Appendix L

Notice List

Appendix L Notice List

Producer A-Z	Party	Producer Name	Street Address	City, State and Zip	Phone	Email	Notes
60th Street Association Water System	Exhibit 4	60th Street Association Water System	5836 Hidden Trail Road	Rosamond, Ca 93560			unknown email
Adams Bennett Investments, LLC	Exhibit 4	Adams Bennett Investments, LLC	200 S. Main St Suite 200	Corona, CA 92882		mye@rrmca.com;	
Alegre, Juan & Celdy	New Production	Juan and Celdy Alegre	4001 East Avenue E	Lancaster, Ca 93535			
Ambriz, Juan	New Production	Juan Ambriz	PO Box 382	Pearblossom, Ca 93553	(661) 713-3443		
Antelope Park Mutual Water Company	Exhibit 4	Antelope Park Mutual Water Company	P.O. Box 1712	Lancaster, CA 93539		apmw615@yahoo.com; greydog1835@yahoo.com;	
Antelope Valley Joint Union High School District	Exhibit 4	Antelope Valley Joint Union High School District	44811 Sierra Hwy	Lancaster, CA 93534	661-952-2287	mhavens@avhsd.org;	Mel Havens
Antelope Valley Mobile Estates	Exhibit 4	Antelope Valley Mobile Estates	6101 E Marita Street	Long Beach CA, 90816	310-871-8516	Jeanetteso@aol.com	Jeanette Kolar - Co-Owner
Antelope Valley Resource Conservation District	Unauthorized Pumper	Antelope Valley Resource Conservation District	10148 West Avenue I	Lancaster, CA 93536			
Antelope Valley Water Storage LLC	Exhibit 4	Antelope Valley Water Storage LLC	4700 Wilshire Blvd	Los Angeles, CA 90010		mbeuhler@wswaterbank.com; zahing@[illegible]mgroup.com;	
Aqua-J Mutual Water Company	Exhibit 4	Aqua-J Mutual Water Company	P.O. Box 4718	Lancaster, CA 93539	(661) 733-8147	kgirdles@gmail.com;	Kent Girdlestone
Arklin, Philip	Over Pumping Small Pumper	Philip Arklin	P.O. Box 900697	Palmdale, CA 93590			
AV Solar Ranch 1, LLC	Exhibit 4	AV Solar Ranch 1, LLC	300 Exelon Way, Suite 330	Kennett Square, PA 19348		stanley.teheejr@exeloncorp.com;	
AVEK	Exhibit 4	AVEK	6500 W Avenue N	Palmdale, CA 93551		dchisam@avek.org;	
Averydale Mutual Water Company	Exhibit 4	Averydale Mutual Water Company	P.O. Box 191 Lancaster, CA 93584	Lancaster, CA 93584		bbraman1@msn.com; averydale@verizon.net;	
Besner, William	Unauthorized Pumper	William Besner c/o Aaron DeFranco	48745 3 Points Road	Lake Hughes, CA 93532	909-583-4045	a.defranco@kw.com	
Baxter Mutual Water Company	Exhibit 4	Baxter Mutual Water Company	46163 125th Street East	Lancaster, CA 93535		kencowfam@gmail.com;	
Big Rock Mutual Water Company	Exhibit 4	Big Rock Mutual Water Company	32810 165th St E	Llano, CA 93544			unknown email
Bleich Flat Mutual Water Company	Exhibit 4	Bleich Flat Mutual Water Company	P.O. Box 1307 46410 Kings Canyon Rd	Lancaster, CA 93584	661-724-9012	cassidy.skelton@yahoo.com; bfwaterco@gmail.com; sandmruge@aol.com;	
Blum, Sheldon R. Blum, Trustee of the 1998 Family Trust	Exhibit 4	Sheldon R. Blum, Trustee of the 1998 Family Trust	2242 Camden Ave. Suite 104	San Jose, CA 95124		blumlaw@sbcglobal.net;	
Bolthouse Properties LLC c/o Brad DeBranch	Exhibit 4	Bolthouse Properties LLC c/o Brad DeBranch	PO Box 20157	Bakersfield, CA 93390		bdebranch@bolthouseproperties.com; dyurosek@bolthouseproperties.com;	
Bookman: Thomas and Julie Bookman 2007 Trust	Exhibit 4	Thomas and Julie Bookman 2007 Trust	46806 120th St. E	Lancaster, CA 93535		tom@speerconstruction.com;	
Boron Community Services District	Exhibit 3	Boron Community Services District	PO Box 1060	Boron, CA 93596		boroncsd@yahoo.com	
Bridwell, James & Elizabeth	Exhibit 4	James & Elizabeth Bridwell	9363 Colley Pl.	Littlerock, Ca 93543			unknown email
Brittner, George	Exhibit 4	Brittner Family Trust	P.O. Box 720173	Pinon, CA 92372	760-669-8792	brittnerwaterdelivery2015@yahoo.com;	Brittner Water Delivery
Burrows/200 A40 H LLC	Exhibit 4	Burrows/200 A40 H LLC	PO Box 802948	Santa Clarita, CA 91380		bruce@remingtonwater.com;	unknown email
C. Louise R. Close Living Trust	Exhibit 4	C. Louise R. Close Living Trust					unknown email
Calandri Water Company, LLC.	Exhibit 4	Calandri Water Company, LLC.	P.O. Box 8010	Lancaster, CA 93539		connie@calandrisonriseafarms.com; brad@calandrisonriseafarms.com;	
California Department of Corrections and Rehabilitation	State of California	California Department of Corrections and Rehabilitation	9838 Old Placerville Road, Suite B-2	Sacramento, CA 95827	(916) 255-3029	SBDVBEAdvocate@CDCR.ca.gov	
California Department of Military	State of California	California Department of Military	Joint Force Headquarters 9800 Goethe Road	Sacramento, CA 95827	(916) 854 – 3000		
California Department of Parks and Recreation	State of California	California Department of Parks and Recreation	15101 Lancaster Road	Lancaster, CA 93536	(916) 653-6995	info@parks.ca.gov	
California Department of Transportation	State of California	California Department of Transportation	1120 N Street MS 49	Sacramento, CA 95814	(916) 654-7287	Assistant.to.Budgets@dot.ca.gov	
California Department of Veteran Affairs	State of California	California Department of Veteran Affairs	P.O. Box 942895	Sacramento, CA 94295	(916) 653-1961	phil.mcallister@calvet.ca.gov	
California Department of Water Resources	State of California	California Department of Water Resources	P.O. Box 1187	Pearblossom, Ca 93553	(916) 653-5791		
California Highway Patrol	State of California	California Highway Patrol	601 North 7th Street	Sacramento, CA 95811	(916) 843-3000		
California State Lands Commission	State of California	California State Lands Commission	100 Howe Avenue, Suite 100 South	Sacramento, CA 95825	(916) 574-1900	Brian.Bugsch@slc.ca.gov	
California Water Services Company	Exhibit 3	California Water Services Company	5015 West Avenue L-14 Suite #2	Quartz Hill, CA 93536		jojeda@calwater.com	
Castillo, Juan	New Production	Juan Castillo	1534 East Lingard Street	Lancaster, Ca 93535			
Chavez, Effren	Exhibit 4	Effren Chavez	17340 High Acres Ave.	Palmdale, CA 93591			unknown email
City of Lancaster	Others with Rights to Produce	City of Lancaster	44933 Fern Avenue	Lancaster, CA 93534			
City of Los Angeles, Department of Airports	Exhibit 4	City of Los Angeles, Department of Airports	6053 W. Century Blvd., Suite 400	Los Angeles, CA 90045		RDOMASH@lawa.org; spowell@kmtg.com; freeman@lawa.org;	
Clan Keith Real Estate Investments, LLC dba Leisure Lake Mobile Home Park	Supporting Land Owners	Clan Keith Real Estate Investments, LLC	2320 West Ray Street, Suite 3	Chandler, AZ 85224	(213) 891-8532	lucas.quass@lw.com	
Collins, Raymond & Maryam	New Production	Raymond & Maryam Collins	1865 Greenfield Avenue, #201	Los Angeles, Ca 90025	(661) 639-9449		
Colorado Mutual Water Co.	Exhibit 4	Colorado Mutual Water Co.	P.O. Box 482	Lancaster, CA 93584		showtimeranch@msn.com;	
Connelly, Myles	New Production	Myles Connelly	PO Box 1816	Simi Valley, Ca 93062			
Cookson, William	Known Small Pumper	William Cookson	5848 105th Street West	Rosamond, Ca 93560		wcpokson54@gmail.com	
Cooper, Ronald	New Production	Ronald J. Cooper	1155 W 104th Street	Los Angeles, Ca 90044	(760) 388-4907	carrieskorn@gmail.com	
Copa De Oro Land Company	Exhibit 4	Copa De Oro Land Company	9250 Wilshire Blvd, Suite 300	Beverly Hills, CA 90212		elliot@southbrookequities.com	
Corona, Gilardo	Qualified Small Pumpers	Gilardo R. Corona	8715 Favorito Ave.	Rosamond, CA 93560	(661) 256-3168		
County Sanitation Districts of Los Angeles 14 & 20	Exhibit 4	County Sanitation Districts of Los Angeles 14 & 20	1955 Workman Mill Rd.	Whittier, CA 90601		erikabensch@lascsd.org;	
Crystal Organic LLC/Grimmway/Lapis	Exhibit 4	Crystal Organic LLC/Grimmway/Lapis	P.O. Box 81498	Bakersfield, CA 93380		cvoss@grimmway.com;	
Dayan, Benjamin & Flor	Unauthorized Pumper	Benjamin & Flor Dayan	449 N. Laurel	Los Angeles, CA 90048			
Del Carmen Vala, Maria	New Production	Maria Del Carmen Vala	2131 Ivanhoe Avenue	Oxnard, Ca 93030			
Del Sur Gardens, LLC, (RV Park)	Non Party	Del Sur Gardens, LLC	9020 West Avenue J	Lancaster, CA 93535			
Del Sur Ranch LLC	Exhibit 4	Del Sur Ranch LLC	16633 Ventura Blvd. Suite 1040	Encino, CA 91436		george@haggargroup.com;	
Derrick, Olin	Over Pumping Small Pumper	Becki Derrick	8847 East Avenue G-12	Lancaster, CA 93535			
Desert Breeze MHP, LLC	Supporting Land Owners	Desert Breeze MHP, LLC	c/o Daniel Epstein P.O. Box 17482	Encino, CA 91416	(661) 256-4577		
Desert Lake Community Services District	Exhibit 3	Desert Lake Community Services District	12200 Del Oro Street	Boron, CA 93596		desertlakecsd@gmail.com	
Dickey, Randall & Billie	Exhibit 4	Randall and Billie Dickey	P.O. Box 894	Pearblossom, CA 93553			unknown email
Edwards Air Force Base	Supporting Land Owners	412 CE/CENP – FIS2AA	255 N. Rosamond Blvd Bldg 3500	Edwards, AFB, CA 93524	(661) 277-4695	gerald.boetsch.1@us.af.mil	
Lockheed Martin		Steven Chov	1011 Lockheed Way, MZ 6454	Palmdale, CA 93599			
El Dorado Mutual Water Company	Exhibit 4	El Dorado Mutual Water Company	PO Box 900519	Palmdale, CA 93590		eldmwc@gmail.com;	
eSolar Inc.; Sierra Sun Tower, LLC	Exhibit 4	eSolar Inc.; Sierra Sun Tower, LLC	P.O. Box 10189	Burbank, CA 91510			unknown email
eSolar Inc.; Tumbleweed Suntower LLC	Exhibit 4	eSolar Inc.; Tumbleweed Suntower LLC	3355 W. Empire Ave. Suite 200	Burbank, CA 91504			unknown email
eSolar Inc.; Red Dawn Suntower LLC	Exhibit 4	eSolar Inc.; Red Dawn Suntower LLC	3355 W. Empire Ave. Suite 200	Burbank, CA 91504			unknown email
Esparza Jimenez, David	New Production	David Esparza Jimenez	2330 East Avenue J-8 #39	Lancaster, Ca 93535			
Espinoza, Leticia	New Production	Leticia Espinoza	1805 La France Drive	Bakersfield, Ca 93307			
Estrada, Jesus	New Production	Jesus Estrada	109 Buckthorn Apt 1	Inglewood, Ca 90301	310-292-3349		
Estrada, Juan & Mayra	New Production	Juan & Mayra Estrada	PO Box 2071	Littlerock, Ca 93543	(770) 496-1893		

Appendix L Notice List

Producer A-Z	Party	Producer Name	Street Address	City, State and Zip	Phone	Email	Notes
Evans, Lawrence Dean and Susan	Exhibit 4	Lawrence Dean Evans, Jr. and Susan Evans	P.O Box 560	Pearblossom, Ca 93553		susieg4522@me.com;	
Evergreen Mutual Water Company	Exhibit 4	Evergreen Mutual Water Company	4646 Lumbar Street	Lancaster, CA 93535		todd_lemen@msn.com;	
Eyherabide Sheep Co., Eyherabide Land Co., LLC	Supporting Land Owners	Eyherabide Sheep Co., Eyherabide Land Co., LLC	5284 Kent Drive	Bakersfield, CA 93306			
Felder, William	Over Pumping Small Pumper	William Felder	5859 East Avenue F	Lancaster, CA 93535	661-609-9866		
Findley, Ruth	Exhibit 4	Ruth Findley	8383 Colley Pl.	Littlerock, CA 93543			unknown email
First Mutual Water Company	Exhibit 4	First Mutual Water Company	5848 Gobi Avenue	Rosamond, Ca 93560		papa@global.net;	
FS Land Holdings First Solar Development	Exhibit 4	FS Land Holdings, First Solar Development	2049 Century Park East, Suite 3550	Los Angeles, CA 90067		BHerrera@bhfs.com; mark.osterholt@firstsolar.com;	
First Solar, Inc.	Exhibit 4	First Solar, Inc.	135 Main Street, 6th Floor	San Francisco, CA 94105		Jack.Pigott@firstsolar.com;	
Fong, Alma	New Production	Alma Fong	PO Box 989	Littlerock, Ca 93543			
Foroughi Family LLC	*Non Party*	*Foroughi Family LLC*	*268 Loch Lomond Road*	*Rancho Mirage, CA 92270*			
Frankenburg, Leah	Exhibit 4	Leah Frankenberg	PO Box 99	Littlerock, Ca 93543	661-823-3197	leah.frankenberg@gmail.com	
French, Christopher & Nancy	New Production	Nancy & Christopher French	4800 50th Street West	Rosamond, Ca 93560			
Garcia, Ervin & Espina, Caroline	New Production	Ervin Garcia & Caroline Espina	PO Box 456	Littlerock, Ca 93543		alegre4321@aol.com	
Godde: Steve Pam and Gary	Exhibit 4	Steve, Pamela & Gary Godde c/o Rife Silva & Co LLC	22 State Route 208	Yerington, NV 89447		g_godde@msn.com;	
Gorrindo Resourceful LLC	Exhibit 4	Gorrindo Resourceful LLC	P.O. Box 341	Minden, NV 89423		bob@gorrindo.com;	
Granite Construction Company (Big Rock Facility)	Exhibit 4	Granite Construction Company *(Big Rock Facility)*	213 East Avenue M	Lancaster, CA 93535		William.taylor@gcinc.com; James.Sauder@gcinc.com	
Granite Construction Company (Little Rock Sand and	Exhibit 4	Granite Construction Company (Little Rock Sand and	213 East Avenue M	Lancaster, CA 93535		William.taylor@gcinc.com; James.Sauder@gcinc.com	
Griffin, Laura	Exhibit 4	Laura Griffin	48009 70th Street East	Lancaster, CA 93535		hidesertjimbo@verizon.net;	
H & N Development Co. West Inc.	Exhibit 4	H & N Development Co. West Inc.	P.O. Box 1496	Santa Cruz, CA 95061		jeremy@rtsag.com;	
Healy Enterprises, Inc.	Exhibit 4	Jane Healy and Healy Enterprises Inc.	2460 Waldemar Drive	Thousand Oaks, CA 91361	661-724-7813	jhhstep12@gmail.com;	
Hemme, John	Over Pumping Small Pumper	John Hemme	43719 Sierra Highway	Lancaster, CA 93534			
Hernandez, Luis	Exhibit 4	Luis Hernandez	2096 Alta Pesa Drive	Altadena, CA 91001		scrip2nite@aol.com;	
High Desert Dairy	Exhibit 4	High Desert Dairy	9753 East Avenue F-8	Lancaster, CA 93535		vandamgairy@gmail.com; avfarming@yahoo.com;	
Hounanian, Masis	New Production	Masis Hounanian	10909 Woodward Ave	Sunland, Ca 91040			
Hyde, Richard	Qualified Small Pumpers	Richard L Hyde	43827 Colony Drive	Lancaster, CA 93536			
Irma Ann Carle Trust, Irma-Anne Carle, Trustee	Exhibit 4	Irma Ann Carle Trust, Irma-Anne Carle, Trustee	30701 Longview Rd	Pearblossom, Ca 93553		iicarle@icloud.com;	
40th Street East Water Group (previous name 40th St. Mutual Water Company)	Defaulted Party	40th Street East Water Group	43031 40th Street East	Lancaster, CA 93535	661-946-1976	emac43031@gmail.com	Contact Name: Elaine Macdonald
Joshua Acres Mutual Water Company	Defaulted Party	Joshua Acres Mutual Water Company	38420 41st Street East	Palmdale, CA 93552			
Joshua Memorial Park	Section 5.1.10 Non-Stipulating Party	Joshua Memorial Park	808 East Lancaster Blvd	Lancaster, Ca 93535		Christopher.Twitchell@Dignitymemorial.com.	
Juniper Hills Land Conservation Trust	New Production	Juniper Hills Land Conservation Trust	1634 W. Glencoks Blvd. #254	Glendale, CA 91201			
Korn, Carrie	New Production	Carrie Korn	253 Mountain Avenue	Monrovia, Ca 91016	(661) 944-1384		
Kyle Revocable Living Trust	Exhibit 4	Trustees of The Kyle Revocable Living Trust	12345 E. Ave. J	Lancaster, CA 93535		gltrdunkyle@msn.com;	
La Cosepa (Christ of the Desert)	New Production	La Cosepa Christ of the Desert	3900 East 170th Street	Lake Los Angeles, Ca 93591			
Land Projects Mutual Water Co.	Exhibit 4	Land Projects Mutual Water Co.	6810 W Ave. E8	Lancaster, CA 93536		lpmwc@verizon.net;	
Landale Mutual Water Co.	Exhibit 4	Landale Mutual Water Co.	P.O. Box 5808	Lancaster, CA 93539		landale1948@gmail.com;	
Landaverde, Angela	Qualified Small Pumpers	Angela Landaverde	10503 Alexander Avenue	South Gate, CA 90280			
Lands of Promise Mutual Water Company	Exhibit 4	Lands of Promise Mutual Water Company	P.O. Box 874	Buttonwillow, CA 93506		rhouchin@agcenteraccounting.com	
Lane Family Trust	Exhibit 4	Lane Family Trust	42220 10th St. West Suite 101	Lancaster, CA 93534		mvbs@verizon.net;	G. Lane Family (Frank and Yvonne Lane 1993 Family Trust, Little Rock Sand and Gravel, Inc., George and Charlene Lane Family Trust) [Done not include water pumped on land leased to Granite Construction]
LeClair Robert, Unini Marie	Exhibit 4	LeClair Robert, Unini Marie	PO Box 207	Pearblossom, Ca 93553		uninimia@gmail.com;	
Leer, James and Dianna	Exhibit 4	James and Diana Leer	11850 Nearwood Rd.	Juniper Hills, CA 93543	(661) 265-7788	roe@mail.org;	
Littlerock Aggregate Co., Inc., Holliday Rock Co.	Exhibit 4	Littlerock Aggregate Co., Inc., Holliday Rock Co.	1401 N. Benson Ave.	Upland, CA 91786	909-982-1553 Ext 4219	dbrowning@hollidayrock.com;	Dean Browning
Littlerock Creek Irrigation District	Exhibit 3	Littlerock Creek Irrigation District	35141 87th Street East	Littlerock, Ca 93543		bhogan@avc.edu	
Llano Del Rio Water Company	Exhibit 4	Llano Del Rio Water Company	32810 S. 165th St East	Llano, CA 93544			unknown email
Llano Mutual Water Company	Exhibit 4	Llano Mutual Water Company	32810 S. 165th St East	Llano, CA 93544			unknown email
Long Valley Road LP	Over Pumping Small Pumper	Long Valley Road LP	23475 Long Valley Road	Woodland Hills, CA 91367			
Los Angeles County Waterworks District No. 40	Exhibit 3	Los Angeles County Waterworks District No. 40	PO Box 7508	Alhambra, CA 91802		aarki@dpw.lacounty.gov keskridge@dpw.lacounty.gov	
LV Ritter Ranch	Supporting Land Owners	LV Ritter Ranch	333 South Hope Street 16th Floor	Los Angeles, CA 98071			
Magana, Paul (Woodstone Construction)	New Production	Paul Magana	2332 Oak Crest Avenue	Palmdale, Ca 93550	(661) 713-3443		
Maritorena, Jose	Exhibit 4	Trustees of the Maritorena Living Trust	300 Panama Rd.	Bakersfield, CA 93307		imsheep@aol.com	
McWilliams, Dennis & Diane	*Exhibit 4*	*Dennis & Diane McWilliams*	*15335 E. Ave. G Apt G*	*Lancaster, CA 93535*			unknown email
Mettler Valley Mutual Water Company	Defaulted Party	Mettler Valley Mutual Water Company	28115 West Avenue C-6	Lancaster, CA 93536			
Miner, Richard	Exhibit 4	Richard Miner	9678 Dawn Rd	Rosamond, CA 93560		rhmfarmer@gmail.com;	
Ming, Lin	*New Production*	*Lin Ming*	*425 Keiffer Dr.*	*Rincon, GA 31326*	*(661) 803-7598*		
Molina, Magaly	Over Pumping Small Pumper	Magaly Molina	62 Parc Place Drive	Milpitas, CA 95035			
Moody, Dwight and Kennan	Qualified Small Pumpers	Dwight and Kennan Moody	5062 Balsawood	Irvine, CA 92612			
Mountain Brooks LLC	Over Pumping Small Pumper	Mountain Brooks LLC	PO Box 900697	Palmdale, CA 93590			
Munz: 2014 Revocable Trust, Terry A. & Kathleen M. Munz	Exhibit 4	Barry and Sharon Munz 2014 Revocable Trust, Terry A. & Kathleen M. Munz	129 West Pondera Street	Lancaster, CA 93534		munzranch@msn.com	
Nebeker, Eugene	Exhibit 4	Eugene Nebeker	400 N. Rockingham Ave.	Los Angeles, CA 90049		enebeker@roadrunner.com;	
New Goldensands Investment, LLC	Exhibit 4	New Goldensands Investment, LLC	2478 Stevens Avenue	Rosemead, CA 91770	(661) 946-5900	lotsbabylove@gmail.com;	Christina Penz
North Edwards Water District	Exhibit 3	North Edwards Water District	13525 Fran Street	North Edwards, CA 93523		newd@verizon.net	
Northrop Grumman Systems Corporation	Exhibit 4	Northrop Grumman Systems Corporation	Alston & Bird LLP 333 South Hope Street, 16th Floor	Los Angeles, CA 90071		clynton.namuo@alston.com;	

Appendix L Notice List

Producer A-Z	Party	Producer Name	Street Address	City, State and Zip	Phone	Email	Notes
NRG Energy Inc. / Alpine LLC. / Clearway Energy (bought NRG)	Exhibit 4	NRG Energy Inc	Attn. PPS Billing 4900 N. Scottsdale Rd, Suite 5000	Scottsdale, AZ 85251	(661) 528-1798	susan.jackson@clearwayenergy.com	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		Randy.Sharp@sympatico.ca	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		pete@palmranchid.com	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Piute Mutual Water Company	[illegible]	[illegible]	[illegible]	[illegible]			
Pool, Noel	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
Quartz Hill Water District	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
R and M Ranch Inc.	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
Radcast Investments	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
Rancho Sierra Properties, LLC (Rancho Sierra Golf Course)	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]					[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
Rosamond High School	[illegible]	Rosamond High School	[illegible]	Rosamond, CA 93560		[illegible]	
Rosamond Mobile Home Park Milana VII LLC	[illegible]	Rosamond Mobile Home Park Milana VII LLC	[illegible]	Tustin, CA 92781	[illegible]		
Rose Villa Apartments	[illegible]	Rose Villa Apartments	[illegible]	Rancho Palos Verdes, CA 90275		[illegible]	
Sahara Nursery and Farm	[illegible]	Sahara Nursery and Farm	[illegible]	Lancaster, CA 93535		[illegible]	
Saint Andrew's Abbey, Inc.	[illegible]	Saint Andrew's Abbey, Inc.	[illegible]	Valyermo, CA 93563		[illegible]	
Schilling 1992 Family Trust	[illegible]	Trustees of the L&M Schilling 1992 Family Trust	[illegible]	Lancaster, CA 93535		[illegible]	
Selak Family Trust	[illegible]	TTEE; Barbara Aznarez Decd Trust and Selak, Mabel	[illegible]	Pasadena, CA 91103	[illegible]	[illegible]	
Service Rock Products, L.P.	[illegible]	Service Rock Products, L.P.	[illegible]	San Bernardino, CA 92408		[illegible]	
SGS Antelope Valley Development, LLC (Sempra)	[illegible]	SGS Antelope Valley Development, LLC	[illegible]	San Diego, CA 92101	[illegible]		[illegible]
Shadow Acres Mutual Water Company	[illegible]	Shadow Acres Mutual Water Company	[illegible]	Palmdale, CA 93590		[illegible]	
Sheep Creek Water Co.	[illegible]	Sheep Creek Water Co.	[illegible]	Phelan, CA 92329		[illegible]	
Siebert, Jeffery and Nancee	[illegible]	Jeffrey and Nancee Siebert	[illegible]	Oakdale, CA 95361		[illegible]	
Silva, Ruben & Maria	[illegible]	Ruben & Maria Silva	[illegible]	Hacienda Heights, VA 93745			
Sonrise Ranch, LLC	[illegible]	Sonrise Ranch, LLC	[illegible]	Lancaster, CA 93535		[illegible]	
Southern California Edison Company	[illegible]	Southern California Edison Company	[illegible]	Rosemead, CA 91770		[illegible]	
Sundale Mutual Water Company	[illegible]	Sundale Mutual Water Company	[illegible]	Lancaster, CA 93539		[illegible]	
Sunnyside Farms Mutual Water Company, Inc.	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	
Tejon Ranchcorp and Tejon Ranch Co.	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]son@tejonranch.com; glopez@tejonranch.com;	
Terrazas, Gloria	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
The 50th District Agriculture Association	State of California	[illegible]	[illegible]	[illegible]	[illegible]		
Tierra Bonita Mutual Water Company	Exhibit 4	[illegible]	[illegible]	[illegible]		tierrabonitawater@yahoo.com;	
Tierra Bonita Ranch	Exhibit 4	[illegible]	[illegible]	[illegible]		[illegible]	
Torres, Tomas and Irma	Qualified Small Pumpers	[illegible]	[illegible]	[illegible]			
Trang, Sroy	New Production	[illegible]	[illegible]	[illegible]			
Triple M Property Co.	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]soffice@gmail.com	
[illegible]ono, Peter	Qualified Small Pumpers	[illegible]	[illegible]	[illegible]			
[illegible]	Exhibit 4	[illegible]	P.O. Box 1016	[illegible], CA 935[illegible]		grahamcrx@gmail.com;	
U.S. Borax	Exhibit 4	U.S. Borax	14486 Borax Rd.	Boron, CA 93516		[illegible].francis@riotinto.com;	
Ugonwa, Bonaventure	New Production	Bonaventure Ugonwa	2156 Avenida Del Mar	Lancaster			
Van Dam, Craig and Marta	[illegible]	Craig and Marta Van Dam	7316 W. Ave. D8	[illegible], CA 93536		avfarming@yahoo.com;	
Van Dam, Gary	[illegible]	Gary Van Dam	9711 East Avenue F-8	Lancaster, CA 93535			
Van Dam, Nick and Janet	Exhibit 4	[illegible] and Janet Van Dam	7263 East Avenue F-8	Lancaster, CA 93535			[illegible]
Vulcan Materials Co., Vulcan Lands Inc.,	Exhibit 4	Vulcan Materials Co., Vulcan Lands Inc.,	405 North Indian Hill Blvd.	Claremont, CA 91700	[illegible]	ksage@irmwater.com;	[illegible] Sage
WAGAS Land Company LLC	[illegible]	WAGAS Land Company LLC	906 Indianola Way	La Canada, CA 91011			
WDS California II, LLC	Exhibit 4	WDS California II, LLC	113 S. LaBrea Avenue 3rd Floor	Los Angeles, CA 90036		andrewwerner@westerndev.com;	
Weatherbie, Michael & Dolores	[illegible]	Michael and Dolores A. Weatherbie	9950 Cima Mesa Rd	Littlerock, Ca 93543		mikew@qnet.com;	
Webster, Anthony	[illegible] Production	Anthony Webster	11757 Satcoy Street, Apt # 101	North Hollywood, Ca 91605			
West Side Park Mutual Water Co.	[illegible] 4	West Side Park Mutual Water Co.	40317 11th St West	Palmdale, CA 93551		info@westsideparkmutual.com;	
West Valley County Water District	Exhibit [illegible]	West Valley County Water District	25315 West Ideal Avenue	Lancaster, CA 93536		wvcwd@verizon.net	
White Fence Farms Mutual Water Co.	[illegible]	White Fence Farms Mutual Water Co.	41901 20th St. West	Palmdale, CA 93551		wffmutual@gmail.com;	
White Fence Farms MWC #3	Supporting Land Owners	White Fence Farms MWC #3	P.O. Box 3411	Quartz Hill, CA 93586			
William Fisher Memorial Water Company C/o McMor	Exhibit 4	William Fisher Memorial Water Company	4700 District Blvd.	Bakersfield, CA 93313		grisner@mcmorchlor.com;	
Willow Springs Co.	[illegible]	[illegible]	[illegible] Manly Rd. 2568	Rosamond, CA 93560		willow.springs@mindspring.com;	
Wilson, Donna	[illegible]	Donna Wilson	18130 West Avenue F	Lancaster, CA 93536			[illegible]
Wilsona Gardens Mutual Water Company	Defaulted Party	Wilsona Gardens Mutual Water Company	17001 East Avenue N, Suite L	Lancaster, CA 93535			
Witmyer: The Donald Witmeyer Trust (Wendy Rudisill)	New Production	The Donald Witmeyer Trust	6399 Vineyard Avenue	Ann Arbor, MI 48108			
Zaghian, Roben	[illegible] Production	Roben Zaghian	9220 West Avenue I	Lancaster, CA 93536			

From Watermaster Administrative Staff May 28, 2020 plus 2 contacts update in June.

Appendix M

M-1. Delinquent Assessments

M-2. List of Parties with Incomplete Annual Production Reporting

Appendix M−1 Delinquent Assessments (includes Administrative Assessments, Variable Assessments, and Replacement Water Assessments)

Antelope Valley Watermaster

A/R AGING SUMMARY

As of June 25, 2020

	CURRENT	1 - 30	31 - 60	61 - 90	91 AND OVER	TOTAL
1000 Non-Overlying Production Rights						$0.00
California Water Services Company		165.45				$165.45
Los Angeles County Waterworks District No. 40		69,373.70				$69,373.70
Total 1000 Non-Overlying Production Rights		**69,539.15**				**$69,539.15**
1100 Overlying Production Rights						$0.00
60th Street Association Water System	3,169.28					$3,169.28
AVEK		4,112.70				$4,112.70
Baxter Mutual Water Company		17.33			173.27	$190.60
Bolthouse Properties LLC c/o Brad DeBranch		7,481.70				$7,481.70
C. Louise R. Close Living Trust		0.50			23.26	$23.76
c/o George Brittner		636.54			6,365.32	$7,001.86
eSolar Inc.; Sierra Sun Tower, LLC		1.50			77.82	$79.32
Gailen W. Kyle and Julie Kyle, Trustees of The Kyle Revocable Living Trust		-2.25				$ -2.25
Gloria Terrazas		0.50			5.00	$5.50
Granite Construction Company (Big Rock Facility)		0.40				$0.40
Granite Construction Company (Little Rock Sand and Gravel)				-104.05		$ -104.05
H & N Development Co. West Inc.		4,213.55				$4,213.55
Irma Ann Carle Trust, Irma-Anne Carle, Trustee					-0.50	$ -0.50
James and Elizabeth Bridwell		0.50			5.50	$6.00
John A. Calandri		6,756.65				$6,756.65
John and Adrienne Reca		-3.00				$ -3.00
Leah Frankenberg		0.50			5.00	$5.50
Randy Turk					-8.60	$ -8.60
Rose Villa Apartments					-0.32	$ -0.32
Ruth C. Findley		0.50			6.90	$7.40
SGS Antelope Valley Development, LLC		28.50			1,322.69	$1,351.19
Sonrise Ranch, LLC		97.30				$97.30
Tejon Ranchcorp and Tejon Ranch Co.		1,981.85				$1,981.85
Tierra Bonita Ranch		250.00			2.25	$252.25
Triple M Property Co.		7.50			389.09	$396.59
U.S. Borax		2,284.25				$2,284.25
Vulcan Materials Co.		771.25				$771.25
WAGAS Land Company LLC		290.00			2,900.00	$3,190.00
Total 1100 Overlying Production Rights	**3,169.28**	**28,928.27**		**-104.05**	**11,266.68**	**$43,260.18**
1300 Small Pumpers						$0.00
Charlie Tapia					137,365.00	$137,365.00
Johnny Zamrzla					273,165.00	$273,165.00
Total 1300 Small Pumpers					**410,530.00**	**$410,530.00**
1500 State of California						$0.00
California Department of Corrections and Rehabilitation		1.50			31.50	$33.00
California Department of Military		1.50			16.50	$18.00

Antelope Valley Watermaster

A/R AGING SUMMARY

As of June 25, 2020

	CURRENT	1 - 30	31 - 60	61 - 90	91 AND OVER	TOTAL
California Department of Transportation		23.50			1,119.07	$1,142.57
California State Lands Commission		0.51			5.13	$5.64
Total 1500 State of California		**27.01**			**1,172.20**	**$1,199.21**
1650 Phelan Pinon Hills						$0.00
Phelan Pinon Hills CSD		3,011.48			1,191,063.34	$1,194,074.82
Total 1650 Phelan Pinon Hills		**3,011.48**			**1,191,063.34**	**$1,194,074.82**
1675 Supporting Landowners (Formerly 2000)						$0.00
Dba Leisure Lake Mobile Home Park Clan Keith Real Estate Investments, LLC	5,620.11					$5,620.11
Total 1675 Supporting Landowners (Formerly 2000)	***5,620.11***					***$5,620.11***
1950 New Production						$0.00
40th Street Mutual Water Company	18,151.26					$18,151.26
Piute Mutual Water Company		19,008.32				$19,008.32
Total 1950 New Production	**18,151.26**	**19,008.32**				**$37,159.58**
Class 1350 - Known Small Pumpers		-4.00				$ -4.00
TOTAL	**$26,940.65**	**$120,510.23**	**$0.00**	**$ -104.05**	**$1,614,032.22**	**$1,761,379.05**

Appendix M-2 List of Parties with Incomplete Annual Production Reporting

last updated 7/22/20

Blank/dashed values indicate missing production

Party	Transferees	Production Right (AFY)	Annual Production Reporting (AFY)			
			2016	2017	2018	2019
Exhibit 4 - Overlying Producers						
Bahlman: Gene Bahlman	*Hernandez: Luis Hernandez; property sale (2017)*	5.00		0.00	1.00	
Baxter Mutual Water Company		35.02	37.06	37.80	35.50	
Benz: Mark W. And Nancy L. Benz	Terrazas: Gloria Terrazas; property sale (2015)	1.00				
Bridwell: James and Elizabeth Bridwell		1.00				
Burrows/200 A40 H LLC		295.00				
Cardile: Sal and Connie Cardile	Pool: Noel Pool; property sale (2015)	1.00			0.50	0.16
Chavez: Effren Chavez		44.00	41.50		48.00	
Close: C. Louise R. Close Living Trust		1.00				
eSolar Inc.; Sierra Sun Tower, LLC		3.00				
eSolar Inc.; Tumbleweed Suntower LLC		0.00				
Findley: Ruth C. Findley		1.00				
Healy: Jane Healy and Healy Enterprises Inc.		700.00				0.00
Lands of Promise Mutual Water Company		613.54			27.07	
Munz: 2014 Revocable Trust, Terry A. & Kathleen M. Munz		5.00	2.10	2.10		
Rose Villa Apartments		7.62				
SGS Antelope Valley Development, LLC		57.00				
Triple M Property Co.		15.00	4.00	4.00	4.00	
WAGAS Land Company LLC		580.00			682.90	
Weatherbie: Michael and Dolores A. Weatherbie	Graves: Thomas; property sale (2020)	1.00	0.00	0.00	0.00	
William Fisher Memorial Water Company		4.53				
State of California						
Department of Water Resources		104.00				
Department of Parks and Recreation		9.00			0.08	
Department of Transportation		47.00				
State Lands Commission		3.00				
Department of Corrections and Rehabilitation		3.00				
Department of Veteran Affairs		3.00			0.00	0.00
Highway Patrol		3.00				
Department of Military		3.00				
Supporting Landowners						
Juanita Eyherabide, Eyherabide Land Co., LLC and Eyherabide Sheep Company		12.00				
LV Ritter Ranch, LLC.		0.00				

List does not include missing production reporting from a few other entities including Small Pumpers known or suspected to have produced over 3 AFY and New Production Parties. Appendix B-3 and B-4 tables provide status of annual production reporting for these other entities.

Appendix N

List of Forms

Appendix N. List of Forms

The following forms are available on the Watermaster website: https://avwatermaster.net.

Requests:

- Request for Information
- Parcel Location Request

Reporting:

- Annual Water Production Report
- Annual Water Storage and Recovery Report
- Monthly Flowmeter Reporting

Well Applications:

- Small Pumper Qualifying Documentation
- Replacement Well Application
- Non-Production Well Application (e.g., monitoring wells, test wells, etc.)
- New Point of Extraction Application
- Use of Production Right at a New Location
- New Production Application
- Water Conservation Form

Transfers:

- Transfer Request Form
- Transfer Bulletin Board Request Form
- Transfer Bulletin Board Withdraw Request Form

Appendix O

Financial Analysis Study for Replacement Water Assessment

ANTELOPE VALLEY
STATE WATER CONTRACTORS ASSOCIATION

Financial Analysis Study for Replacement Water Assessment

Final Report / March 6, 2019

RAFTELIS

RAFTELIS

March 6, 2019

Mr. Matthew Knudson
General Manager
Antelope Valley State Water Contractors Association
2029 East Avenue Q
Palmdale, CA 93550

Subject: Financial Analysis Study for Replacement Water Assessment

Dear Mr. Knudson,

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to provide this Financial Analysis Study for Replacement Water Assessment Report (Report) for the Antelope Valley State Water Contractors Association (AVSWCA). The primary objective of the study was to perform a financial analysis of the imported water costs associated with AVSWCA's groundwater basin recharge, and to develop Replacement Water Assessment fees to be assessed to property owners or agencies outside of AVSWCA's service area.

This Report summarizes the key findings and recommendations related to the financial analysis conducted as part of the study. It has been a pleasure working with you, and we thank you and other key staff from Antelope Valley-East Kern Water Agency, Littlerock Creek Irrigation District, and Palmdale Water District for the support provided during the course of this study.

Sincerely,
Raftelis Financial Consultants, Inc.

Sudhir Pardiwala
Executive Vice President

Charles Diamond
Consultant

445 S. Figueroa Street, Suite 2270
Los Angeles, CA 90071
www.raftelis.com

Table of Contents

List of Tables

List of Figures

Introduction

The Antelope Valley State Water Contractors Association (AVSWCA) is a joint powers authority created in 1999 to optimize the use of water resources and to protect surface water and groundwater storage within the Antelope Valley. AVSWCA's three member agencies include the Antelope Valley-East Kern Water Agency (AVEK), Littlerock Creek Irrigation District (LCID), and Palmdale Water District (PWD). Each of the member agencies has a contract with the California Department of Water Resources for entitlement to and delivery of imported water from the State Water Project (SWP).

The AVSWCA's service area lies within the adjudicated Antelope Valley Groundwater Basin. As part of the adjudication judgement, the Antelope Valley Watermaster is tasked with determining the amount of imported Replacement Water from the SWP to be used to recharge the groundwater basin in order to ensure that that the basin's Total Safe Yield is not exceeded. Imported SWP water to be utilized as Replacement Water will be purchased from AVSWCA's member agencies or other entities. AVSCWA is therefore interested in determining the per acre-foot (AF) cost for Replacement Water Assessments to be charged to groundwater producers within and surrounding its service area who do not have any entitlement in the SWP or rights in the Groundwater Basin.

Property owners subject to the proposed Replacement Water Assessments that reside within the service areas of AVSCWA's three member agencies contribute to the recovery of SWP capital costs through property taxes. However, property owners outside of the three member agencies' service areas (herein referred to as "Outside Users") do not own any entitlement rights and do not contribute to SWP costs. Therefore, it is appropriate for Replacement Water Assessments to be charged to Outside Users who are not SWP members or own rights in the Groundwater Basin. Although AVSWCA has preliminarily set the Replacement Water Assessment fee for groundwater users within its member agencies' service areas at $415 per acre-foot for 2018, Replacement Water Assessment fees for Outside Users have to be developed.

The AVSWCA engaged Raftelis Financial Consultants, Inc. (Raftelis) in 2018 to conduct a Financial Analysis Study for Replacement Water Assessment (Study). The primary objective of the Study was to conduct financial analyses necessary to develop the proposed Replacement Water Assessments for Outside Users related to AVSWCA's groundwater recharge activities. This Financial Analysis Study for Replacement Water Assessment Report (Report) details the analysis performed by Raftelis as well as all results and recommendations.

Methodology & Assumptions

METHODOLOGY

Based on discussions with staff from each of AVSWCA's member agencies, Raftelis recommends establishing Replacement Water Assessment fees for Outside Users based on fixed cost payments made by each member agency to the California Department of Water Resources for the importation of SWP water as well as the variable cost associated with delivering Replacement Water. The member agencies and the property owners within their service areas continue to fund the fixed costs associated with importing SWP water. Therefore, if any SWP water entitlement of the three member agencies is utilized as Replacement Water by Outside Users, it is reasonable and equitable for the Outside Users to pay a Replacement Water Assessment based in part on the investments of the SWP members. AVSWCA's member agencies have been paying the capital costs of the SWP since the 1960s. The present value of those investments in the SWP should be accounted for in determining a fair price for the Replacement Water.

The primary steps required to calculate the proposed Replacement Water Assessment to charge to Outside Users are outlined below:

1. Calculate the unit rate designed to recover SWP fixed costs:
    a) Determine the present value of SWP fixed costs through 2017 (delivery data, used in the analysis, was available through 2017) for all three member agencies as defined in Tables A, C, D, E, F, and G of each member agencies' water supply contract with the California Department of Water Resources. The SWP fixed costs included are the Capital Cost Component of the Transportation Charge, the Minimum OMP&R Component of the Transportation Charge, Delta Water Charges, Water System Revenue Bond Surcharge and Off-Aqueduct Power Facilities costs. The capital costs in each year is then converted to 2018 dollars using an average cost escalation factor of 3.9 percent which is equal to the average annual increase in the Consumer Price Index (CPI) between 1962 and 2017 as shown below in Table 1.

Table 1: Annual Cost Escalation

Key Assumption	Value	Notes
Annual Cost Escalation	3.90%	*Average CPI from 1962 to 2017*

    b) Calculate the fixed payment per acre-foot by dividing the result from Step 1a by total SWP deliveries received through 2017 across all three member agencies. This number represents the value of the SWP delivered water in dollars per acre-foot. This would represent the approximate value of purchasing SWP water entitlement and the corresponding deliveries.

2. Calculate the unit rate designed to recover variable water costs:
    a) Take the existing Untreated Water Availability Charge rate in dollars per acre-foot for agricultural water delivered under terms of water service agreements through AVEK-owned facilities and adjust to account for 10% water loss due to leakage.

3. Add the SWP fixed cost unit rate from Step 1 and the variable cost unit rate from Step 2 to determine the Replacement Water Assessment for Outside Users to be charged by AVSWCA.

The following key inputs were utilized to calculate the proposed Water Replacement Assessment fees presented in this Report. Firstly, total SWP deliveries through 2017 to each member agency are shown below in **Error! Reference source not found.**. AVEK and LCID first began receiving SWP water in 1972, while PWD began receiving SWP water in 1985. Information on SWP deliveries was provided to Raftelis by member agency staff.

Table 2: Total SWP Deliveries through 2017 in Acre-Feet

Member Agency	SWP Deliveries
AVEK	2,242,419 AF
LCID	13,310 AF
PWD	338,659 AF
Total	**2,594,388 AF**

Analysis & Results

This section outlines the calculation of the proposed Replacement Water Assessment for AVSWCA. Table 3 below shows the determination of the present value of total annual SWP fixed cost payments for each member agency through 2017. As stated previously, SWP fixed costs included in this analysis are the Capital Cost Component of the Transportation Charge, the Minimum OMP&R Component of the Transportation Charge, Delta Water Charges, Water System Revenue Bond Surcharges, and Off-Aqueduct Power Facilities costs. Each of these annual costs in nominal USD are contained in Tables A, C, D, E, F, and G of each member agency's Water Supply Contract with the California Department of Water Resources. Raftelis then converted these costs into 2018 USD assuming annual cost escalation of 3.90% (as shown previously in **Error! Reference source not found.**). Table 3 below shows a summary of total SWP fixed cost payments through 2017 for each member agency in both nominal and 2018 USD. Please refer to Appendices A, B, and C for detailed SWP fixed costs by year and category for AVEK, LCID, and PWD respectively.

Table 3: Present Value of SWP Fixed Costs

Member Agency	Total SWP Fixed Cost Payments (Nominal)	Present Value of Total SWP Fixed Cost Payments (2018 USD)
AVEK	$518,309,936	$1,110,446,654
LCID	$8,009,081	$17,901,835
PWD	$77,201,475	$160,873,533
Total	**$602,520,492**	**$1,289,222,022**

Table 4 below shows the development of SWP fixed cost payments per acre-foot of delivery for AVSWCA's member agencies. The present value of total SWP fixed cost payments (from Table 3) is simply divided by the SWP entitlements in acre-feet (from Table 2) to arrive at unit cost per acre-foot. This result represents the unit rate to recover SWP fixed costs as described previously in Step 1b on page 2. The SWP fixed cost unit rate constitutes the first of two rate components used to determine the proposed Replacement Water Assessment.

Table 4: Calculation of Unit Rate to Recover SWP Fixed Costs

Line	Description	Amount	Notes/Source
1	Present Value of Total SWP Fixed Cost Payments	$1,289,222,022	Table 3
2	Total SWP Deliveries	2,594,388 AF	Table 2
3	**SWP Fixed Cost Unit Rate**	**$496.93 / AF**	**= [Line 1] / [Line 2]**

The second of the two rate components used to determine the proposed Replacement Water Assessment is the variable cost unit rate. This unit rate is designed to recover the variable cost of Replacement Water and is determined by taking the 2019 Untreated Water Availability Charge rate of $406 per AF for agricultural water delivered under terms of water service agreements through AVEK-owned facilities and adjusting to account for an assumed 10% of water loss due to the recharge process. This calculation is shown in Equation 1 below.

$$\textbf{Equation 1: } Variable\ Cost\ Unit\ Rate = \frac{\$406/AF}{100\% - 10\%} = \$451.11/AF$$

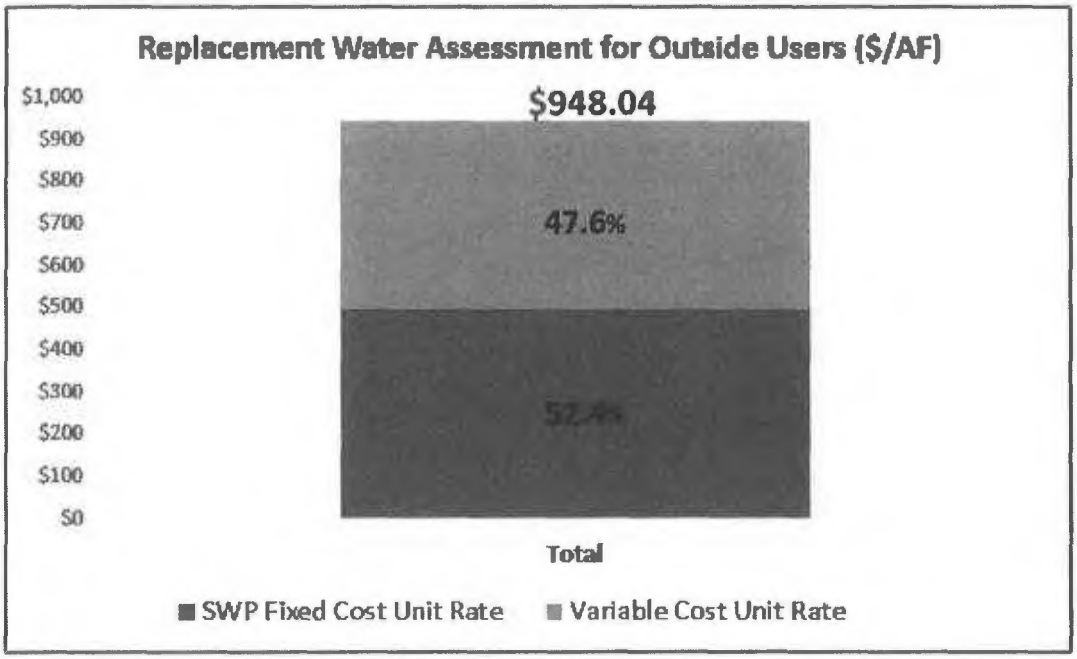
The proposed Replacement Water Assessment for Outside Users is determined by simply adding the SWP fixed cost unit rate (from Line 3 in Table 4) to the variable cost unit rate shown in Equation 1. The proposed Replacement Water Assessments for Outside is shown below in Table 5.

Table 5: Proposed Replacement Water Assessment for Outside Users

Line	Description	Amount	Notes/Source
1	SWP Fixed Cost Unit Rate	$496.93 / AF	Table 4
2	Variable Cost Unit Rate	$451.11 / AF	Equation 1
3	Proposed Replacement Water Assessment	$948.04 / AF	= [Line 1] + [Line 2]

Figure 1 shows the proposed Replacement Water Assessment per acre-foot, as determined above in Table 5. The proposed Replacement Water Assessment of $948.04 per acre-foot is split relatively evenly between the SWP fixed cost unit rate (52.4%) and variable cost unit rate (47.6%).

Figure 1: Proposed Replacement Water Assessment for Outside Users



APPENDIX A: SWP FIXED COSTS - AVEK

Tables A, C, D, E, F, and G
of the
Water Supply Contract
between
The State of California
Department of Water Resources
ANTELOPE VALLEY-EAST KERN WATER AGENCY

(in dollars except w here otherw ise noted)

Calendar Year	Transportation Charge			Delta Water Charges	Water System Revenue Bond Surcharge	Off-Aquaduct Power Facilities	RAFTELIS CALCULATED: Total Fixed Payments (Nominal)	RAFTELIS CALCULATED: Total Fixed Payments in 2018 $
	Capital Costs (Table D)							
	Annual Payment of Principal	Annual Interest Payment	Minimum OMP&R Component (Table E & G)					
1960	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-
1963	3,656	46,476	-	-	-	-	50,132	411,121
1964	7,020	75,472	-	-	-	-	82,492	651,106
1965	13,398	47,551	-	-	-	-	60,949	463,010
1966	24,589	178,207	-	-	-	-	202,796	1,482,750
1967	47,671	250,066	-	-	-	-	297,737	2,095,201
1968	77,671	591,387	114,164	-	-	-	783,222	5,304,717
1969	114,658	867,559	88,040	-	-	-	1,070,257	6,976,698
1970	152,774	1,166,566	135,082	-	-	-	1,454,422	9,125,081
1971	188,395	1,053,317	186,373	-	-	-	1,428,085	8,623,524
1972	211,795	1,406,105	377,265	160,756	-	-	2,155,921	12,529,912
1973	227,084	1,734,633	461,155	222,207	-	-	2,645,079	14,795,794
1974	239,569	1,690,415	164,921	279,090	-	-	2,373,995	12,780,972
1975	253,219	1,507,558	574,928	319,822	-	-	2,655,527	13,760,026
1976	266,367	1,481,561	405,268	431,018	-	-	2,584,214	12,887,880
1977	280,012	1,476,986	638,666	469,922	-	-	2,865,586	13,754,693
1978	294,057	1,496,166	693,608	600,180	-	-	3,084,011	14,247,472
1979	309,317	1,480,783	712,340	720,173	-	-	3,222,613	14,328,955
1980	325,592	1,477,558	1,000,550	857,818	-	-	3,661,518	15,669,386
1981	351,120	2,268,109	733,695	1,355,100	-	-	4,708,024	19,391,613
1982	366,401	938,765	1,436,719	1,551,434	-	-	4,293,319	17,019,738
1983	392,086	1,617,658	2,407,048	1,110,994	-	1,083,881	6,611,667	25,226,392
1984	421,808	2,625,413	2,004,478	450,405	-	2,499,848	8,001,952	29,384,923
1985	449,800	1,790,324	1,944,232	565,881	-	3,749,257	8,499,494	30,040,430
1986	475,597	1,745,690	2,206,227	635,066	-	3,159,857	8,222,437	27,970,361
1987	502,492	1,782,829	2,533,025	652,450	-	3,167,759	8,638,555	28,282,844
1988	527,761	1,813,260	2,193,438	711,641	64,266	2,688,113	7,998,479	25,204,253
1989	553,780	1,824,686	3,193,094	2,083,593	205,668	2,357,669	10,218,490	30,991,144
1990	586,519	1,815,427	1,719,784	2,207,667	185,010	2,528,625	9,043,032	26,396,686

Tables A, C, D, E, F, and G
of the
Water Supply Contract
between
The State of California
Department of Water Resources
ANTELOPE VALLEY-EAST KERN WATER AGENCY

(in dollars except where otherwise noted)

Calendar Year	Transportation Charge			Delta Water Charges	Water System Revenue Bond Surcharge	Off-Aquaduct Power Facilities	RAFTELIS CALCULATED: Total Fixed Payments (Nominal)	RAFTELIS CALCULATED: Total Fixed Payments in 2018 $
	Capital Costs (Table D)							
	Annual Payment of Principal	Annual Interest Payment	Minimum OMP&R Component (Table E & G)					
1991	618,476	1,785,880	2,644,074	2,454,678	296,854	1,048,414	8,848,376	24,858,983
1992	653,283	1,773,406	2,998,849	2,804,695	402,015	2,760,199	11,392,447	30,805,003
1993	688,496	1,666,698	2,667,894	2,811,318	424,871	3,559,487	11,818,764	30,758,188
1994	725,604	1,639,187	2,922,011	2,694,116	424,023	3,963,982	12,368,923	30,981,685
1995	763,215	1,652,147	3,088,320	2,883,156	500,084	4,324,009	13,210,931	31,848,649
1996	802,713	1,565,704	3,333,727	2,834,460	606,388	3,572,856	12,715,848	29,504,440
1997	842,729	1,624,187	3,322,103	3,133,957	626,151	3,411,379	12,960,506	28,943,327
1998	886,136	1,605,665	3,270,632	3,155,093	602,091	3,977,988	13,497,605	29,011,332
1999	929,559	1,593,859	4,090,299	3,262,870	826,108	3,696,973	14,399,668	29,788,448
2000	975,533	1,528,659	4,232,460	3,314,278	940,325	2,372,130	13,363,385	26,607,026
2001	1,022,242	1,512,697	4,040,411	3,315,004	925,355	2,680,895	13,496,604	25,863,590
2002	1,078,342	1,658,005	3,949,101	3,437,351	974,814	1,668,457	12,766,070	23,545,395
2003	1,130,557	1,579,003	5,598,522	3,365,016	1,015,056	1,445,148	14,133,300	25,088,621
2004	1,183,761	1,530,822	2,549,377	3,333,008	1,016,092	1,813,317	11,426,377	19,522,086
2005	1,239,565	1,489,361	2,664,386	3,461,814	959,268	2,047,638	11,862,032	19,505,685
2006	1,300,414	1,427,276	4,436,843	3,507,524	1,038,026	2,845,985	14,556,068	23,037,251
2007	1,366,303	1,373,827	4,762,823	3,855,524	666,215	2,990,954	15,015,646	22,872,574
2008	1,434,161	1,334,202	5,654,630	3,943,904	999,433	3,547,772	16,914,102	24,797,301
2009	1,503,269	1,373,641	3,726,039	4,310,140	1,080,062	3,357,450	15,350,601	21,660,342
2010	1,585,038	1,297,433	5,686,181	5,385,764	1,033,467	4,321,133	19,309,016	26,223,130
2011	1,672,991	1,250,140	4,229,644	5,928,431	1,116,181	4,952,954	19,150,341	25,031,412
2012	1,758,667	1,210,162	4,248,790	6,189,558	1,090,934	5,401,397	19,899,508	25,034,310
2013	1,812,060	1,128,915	6,343,556	6,550,942	1,186,869	2,563,236	19,585,578	23,714,509
2014	1,899,283	1,533,728	5,209,033	6,368,143	1,345,233	1,148,978	17,504,398	20,399,023
2015	1,954,611	1,479,091	9,320,182	8,666,793	1,288,246	530,003	23,238,926	26,065,298
2016	1,978,002	1,495,875	7,174,136	10,359,280	1,287,598	153,406	22,448,297	24,233,408
2017	1,906,927	1,461,139	5,510,660	9,976,357	1,186,800	120,731	20,162,614	20,948,956

APPENDIX B: SWP FIXED COSTS – LCID

Tables A, C, D, E, F, and G
of the
Water Supply Contract
between
The State of California
Department of Water Resources
Littlerock Creek Irrigation District
(in dollars except where otherwise noted)

Calendar Year	Transportation Charge			Delta Water Charges	Water System Revenue Bond Surcharge	Off-Aquaduct Power Facilities	RAFTELIS CALCULATED: Total Fixed Payments (Nominal)	RAFTELIS CALCULATED: Total Fixed Payments in 2018 $
	Capital Costs (Table D)							
	Annual Payment of Principal	Annual Interest Payment	Minimum OMP&R Component (Table E & G)					
1960	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-
1964	121	1,249	-	-	-	-	1,370	10,813
1965	227	1,459	-	-	-	-	1,686	12,808
1966	415	3,633	-	-	-	-	4,048	29,597
1967	809	4,875	-	-	-	-	5,684	39,999
1968	1,324	10,347	1,910	-	-	-	13,581	91,983
1969	1,966	15,024	1,474	-	-	-	18,464	120,362
1970	2,713	21,477	2,255	-	-	-	26,445	165,917
1971	3,413	20,231	3,119	-	-	-	26,763	161,609
1972	3,832	27,037	7,548	1,367	-	-	39,784	231,219
1973	4,113	31,568	9,581	2,577	-	-	47,839	267,597
1974	4,336	32,674	2,049	3,721	-	-	42,780	230,316
1975	4,580	28,656	10,631	4,752	-	-	48,619	251,927
1976	4,818	27,596	6,508	6,269	-	-	45,191	225,375
1977	5,063	28,048	11,038	6,861	-	-	51,010	244,846
1978	5,317	28,623	12,422	9,687	-	-	56,049	258,934
1979	5,590	28,167	12,223	11,889	-	-	57,869	257,307
1980	5,880	28,087	17,113	14,256	-	-	65,336	279,604
1981	6,327	42,699	13,032	22,946	-	-	85,004	350,118
1982	6,605	17,926	26,245	26,335	-	-	77,111	305,686
1983	7,051	30,737	41,811	19,002	-	1,250	99,851	380,975
1984	7,564	48,791	34,781	20,719	-	77	111,932	411,039
1985	8,060	33,467	35,571	24,474	-	-	101,572	358,994
1986	8,503	32,529	38,788	27,822	-	15,873	123,515	420,162
1987	8,946	33,733	44,658	29,064	-	95,994	212,395	695,387
1988	9,392	33,704	39,276	32,024	2,154	30,395	146,945	463,043
1989	9,846	34,245	56,576	36,301	3,763	50,948	191,679	581,334
1990	10,411	33,951	31,445	38,438	3,385	110,678	228,308	666,433

Tables A, C, D, E, F, and G
of the
Water Supply Contract
between
The State of California
Department of Water Resources
Littlerock Creek Irrigation District

(in dollars except where otherwise noted)

Calendar Year	Transportation Charge			Delta Water Charges	Water System Revenue Bond Surcharge	Off-Aqueduct Power Facilities	RAFTELIS CALCULATED: Total Fixed Payments (Nominal)	RAFTELIS CALCULATED: Total Fixed Payments in 2018 $
	Capital Costs (Table D)							
	Annual Payment of Principal	Annual Interest Payment	Minimum OMP&R Component (Table E & G)					
1991	10,942	33,591	46,035	40,793	5,236	65,111	201,708	566,687
1992	11,535	32,403	51,225	46,610	7,053	22,891	171,717	464,320
1993	12,141	30,180	48,657	46,720	7,437	60,615	205,750	535,462
1994	12,784	29,831	53,958	44,772	7,431	88,549	237,325	594,452
1995	13,436	30,107	51,919	47,914	8,769	43,892	196,037	472,602
1996	14,123	28,753	59,930	47,104	10,640	31,691	192,241	446,055
1997	14,821	29,517	64,464	52,082	10,972	24,319	196,175	438,097
1998	15,579	29,173	58,055	52,433	10,550	30,365	196,155	421,609
1999	16,340	28,928	81,350	54,224	14,475	18,305	213,622	441,918
2000	17,148	27,846	79,374	55,078	16,486	-	195,932	390,108
2001	17,970	27,200	67,726	55,090	16,224	-	184,210	353,002
2002	18,837	26,960	69,689	55,912	16,724	-	188,122	346,967
2003	19,745	25,148	114,340	54,735	17,415	-	231,383	410,738
2004	20,674	24,263	41,999	54,215	17,432	-	158,583	270,941
2005	21,648	23,526	37,282	56,310	16,457	-	155,223	255,246
2006	22,711	22,435	75,875	57,053	17,809	-	195,883	310,015
2007	23,854	21,500	81,033	62,714	11,413	-	200,514	305,433
2008	25,037	20,813	106,363	64,151	17,175	1,845	235,384	345,090
2009	26,245	20,274	57,372	70,109	18,529	3,269	195,798	276,279
2010	27,659	18,849	107,466	87,605	17,731	177	259,487	352,403
2011	29,173	18,001	88,537	96,432	19,149	407	231,699	302,854
2012	30,653	17,291	72,780	100,679	18,453	495	240,351	302,370
2013	32,195	15,825	116,198	106,557	20,052	3,270	294,097	356,097
2014	32,939	14,645	89,881	101,120	21,838	3,804	264,227	307,921
2015	33,975	13,707	161,605	137,621	20,924	2,214	370,046	415,052
2016	34,483	13,912	114,771	164,497	20,895	746	349,304	377,081
2017	33,301	13,387	92,259	158,416	19,257	658	317,278	329,652

APPENDIX C: SWP FIXED COSTS – PWD

Tables A, C, D, E, F, and G
of the
Water Supply Contract
between
The State of California
Department of Water Resources
PALMDALE WATER DISTRICT
(in dollars except where otherwise noted)

Calendar Year	Transportation Charge			Delta Water Charges	Water System Revenue Bond Surcharge	Off-Aquaduct Power Facilities	RAFTELIS CALCULATED: Total Fixed Payments (Nominal)	RAFTELIS CALCULATED: Total Fixed Payments in 2010 $
	Capital Costs (Table D)							
	Annual Payment of Principal	Annual Interest Payment	Minimum OMP&R Component (Table E & G)					
1960	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-
1964	946	8,222	-	-	-	-	9,168	72,363
1965	1,796	10,440	-	-	-	-	12,236	92,953
1966	3,323	24,593	-	-	-	-	27,916	204,109
1967	6,497	34,366	-	-	-	-	40,863	287,556
1968	10,751	73,446	14,340	-	-	-	98,537	667,385
1969	16,145	110,471	11,056	-	-	-	137,672	897,444
1970	22,300	153,990	16,970	-	-	-	193,260	1,212,518
1971	27,937	147,486	23,402	-	-	-	198,825	1,200,609
1972	31,440	193,968	52,963	13,021	-	-	291,392	1,693,530
1973	33,743	220,289	67,837	26,131	-	-	348,000	1,946,610
1974	35,597	233,427	16,970	39,631	-	-	325,625	1,753,080
1975	37,618	202,360	77,908	50,989	-	-	368,875	1,911,383
1976	39,567	199,484	49,562	67,591	-	-	356,204	1,776,445
1977	41,584	197,159	80,370	77,255	-	-	396,368	1,902,550
1978	43,662	201,374	90,048	98,345	-	-	433,429	2,002,349
1979	45,910	198,167	90,841	117,285	-	-	452,203	2,010,665
1980	48,293	197,299	126,792	138,590	-	-	510,974	2,186,702
1981	52,024	303,742	94,787	211,396	-	-	661,949	2,726,464
1982	54,285	122,914	188,716	235,100	-	-	601,015	2,382,566
1983	59,032	214,456	310,207	163,925	-	-	747,620	2,852,496
1984	63,894	346,012	258,244	174,500	-	-	842,650	3,094,396
1985	68,768	233,039	259,837	200,605	-	157,601	919,850	3,251,098
1986	73,550	225,068	284,701	223,785	-	301,486	1,108,590	3,771,104
1987	78,491	229,358	328,728	228,654	-	258,719	1,123,950	3,679,840
1988	83,316	229,980	270,456	248,146	16,240	126,639	974,777	3,071,650
1989	87,966	231,677	424,450	276,155	27,981	493,424	1,541,653	4,675,602
1990	93,341	228,640	227,818	289,119	24,956	545,342	1,409,216	4,113,513

Tables A, C, D, E, F, and G
of the
Water Supply Contract
between
The State of California
Department of Water Resources
PALMDALE WATER DISTRICT

(in dollars except where otherwise noted)

Calendar Year	Transportation Charge			Delta Water Charges	Water System Revenue Bond Surcharge	Off-Aquaduct Power Facilities	RAFTELIS CALCULATED: Total Fixed Payments (Nominal)	RAFTELIS CALCULATED: Total Fixed Payments In 2018 $
	Capital Costs (Table D)							
	Annual Payment of Principal	Annual Interest Payment	Minimum OMP&R Component (Table E & G)					
1991	97,336	226,192	340,042	306,835	38,641	488,207	1,497,253	4,206,443
1992	101,682	220,395	380,756	350,587	52,160	367,996	1,473,576	3,984,527
1993	106,683	204,334	353,768	351,415	55,045	640,919	1,712,164	4,455,886
1994	112,034	200,467	390,690	336,766	54,968	678,876	1,773,801	4,443,018
1995	117,527	201,835	404,431	360,394	64,852	636,541	1,785,580	4,304,641
1996	123,261	191,420	442,831	354,307	78,696	723,670	1,914,185	4,441,462
1997	129,259	195,880	478,826	391,745	81,146	648,652	1,925,508	4,300,033
1998	135,477	192,722	447,693	394,387	78,028	657,806	1,906,113	4,096,940
1999	141,897	190,165	607,048	407,859	107,060	710,674	2,164,703	4,478,099
2000	148,667	383,992	685,260	510,073	121,898	257,146	2,087,036	4,155,371
2001	155,717	231,130	595,727	510,185	135,581	445,872	2,074,212	3,974,820
2002	163,127	225,450	617,420	517,791	139,071	529,674	2,192,533	4,043,849
2003	170,744	213,868	961,287	506,894	144,812	277,984	2,275,589	4,039,495
2004	178,712	206,574	374,148	502,073	144,960	368,929	1,775,396	3,033,283
2005	187,084	200,581	367,640	521,475	136,853	400,828	1,814,461	2,983,663
2006	196,108	191,376	666,040	528,361	148,089	442,278	2,172,252	3,437,928
2007	205,998	183,285	707,653	580,783	95,550	710,515	2,483,784	3,783,423
2008	216,175	177,549	925,863	594,096	144,009	1,052,126	3,109,818	4,559,219
2009	226,411	173,072	517,546	649,264	154,087	1,154,433	2,874,813	4,056,482
2010	238,646	160,990	889,664	811,293	147,438	810,142	3,058,173	4,153,234
2011	251,751	154,104	642,842	893,038	159,239	551,068	2,652,042	3,466,484
2012	264,471	148,214	624,548	932,373	154,732	1,072,349	3,196,687	4,021,549
2013	277,541	135,890	1,030,792	986,811	168,130	512,798	3,111,962	3,768,010
2014	283,992	125,755	771,792	936,466	183,142	348,413	2,649,560	3,087,706
2015	292,536	117,899	1,383,482	1,274,493	175,577	131,952	3,375,939	3,786,529
2016	297,194	120,323	1,025,625	1,523,381	175,457	29,017	3,170,997	3,423,158
2017	288,693	114,988	786,871	1,467,071	161,746	21,152	2,840,521	2,951,301