SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (SLOCFCWD)

PASO ROBLES GROUNDWATER BASIN SUPPLEMENTAL SUPPLY OPTIONS STUDY

TECHNICAL MEMORANDUM NO. 3 POTENTIAL SUPPLY OPTIONS AND POINTS OF DELIVERY FOR STATE WATER

FINAL
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TABLE OF CONTENTS

Page No.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

AFB	Air Force Base
AFM	acre-feet per month
AFY	acre-feet per year
CCWA	Central Coast Water Authority
CFS	cubic feet per second
CSD	Community Services District
CVP	Central Valley Project
Delta	Sacramento-San Joaquin Delta
District	San Luis Obispo County Flood Control and Water Conservation District
DWR	California Department of Water Resources
EDV	Energy Dissipating Valve
MWC	Municipal Water Company
Paso Basin	Paso Robles Groundwater Basin
PPWTP	Polonio Pass Water Treatment Plant
SBCFCWCD	Santa Barbara County Flood Control and Water Conservation District
SWP	State Water Project
SWRCB	State Water Resources Control Board
TM	Technical Memorandum
USD	Unified School District
WD	Water District
WSA	Water Service Agreements
WSRA	Water Supply Retention Agreements

POTENTIAL SUPPLY OPTIONS AND POINTS OF DELIVERY FOR STATE WATER

This technical memorandum (TM) was originally developed in January 2015 and select portions of the TM were updated in October 2016. It has been used to inform the Supply Options Team and the San Luis Obispo County Flood Control and Water Conservation District (District, SLOCFCWD) about availability and procurement methods for State Water Project (SWP) water for the Paso Robles Groundwater Basin (Paso Basin). Since the TM was originally developed, ongoing drought conditions have caused local water purveyors to look for opportunities to improve their water supply portfolios to provide additional water supply reliability. For example, the Oceano Community Services District recently, November 2016, entered into an agreement with the District to increase its SWP supplies by obtaining an additional 750 acre-feet per year (AFY) of drought buffer. While this additional purchase of water by the Ocean Community Services District, does not significantly impact the analysis of SWP availability presented in this report, other SWP subcontractors may also want to increase their drought buffer supplies, which could reduce the District's "Excess Allocation" of SWP water and the amount of SWP water that could be available for the Paso Basin. The background information, procurement methods, and overall structure of the SWP presented within this TM continue to be representative of SWP supplemental supply opportunities for the Paso Basin. With respect to water availability, the most updated information can be found in the Paso Robles Groundwater Basin Supplemental Supply Options Feasibility Study (Feasibility Study).

1.0 PURPOSE

This TM is one of three TMs evaluating supply options in the Paso Basin as part of the Paso Basin Supplemental Water Supply Options Study. The three supply options are: 1) Nacimiento Project Water (TM No. 2); State Water Project (SWP) Water (TM No. 3); and Recycled Water (TM No. 4). The goal of the Supply Options Study is to determine the quantity, quality, cost, and points of transfer of supplemental water options, infrastructure needs at transfer points, and the terms and/or conditions under which a Paso Basin entity[1] could procure it (e.g., contractual issues/negotiations/"transfer terms").

The purpose of this TM is to investigate SWP opportunities (i.e., SWP supplies or use of SWP infrastructure to deliver other potential supplemental supplies) that could benefit the Paso Basin. This TM identifies the following:

[1] Paso Basin entities are the target audience for this study, and these entities could be, but are not limited to, the ultimate Groundwater Sustainability Agency or Agencies responsible for meeting the requirements of the Sustainable Groundwater Management Act, a Paso Basin Water District, community water system decision makers, individuals within the Basin or any combination thereof.

- Availability of SWP supplies, seasonally and on a wet/dry year basis, based on historical deliveries.
- Capacity limitations in the conveyance and/or treatment facilities that may prevent access to the available SWP supplies.
- Contractual, jurisdictional or technical issues that would need to be overcome to procure the available SWP supplies.

This TM will evaluate the supply availability, delivery constraints, and contractual/technical issues related to each of the SWP supply options. The primary goal of use of the SWP water in the Paso Basin would be to help stabilize and potentially recover groundwater levels in the basin over time. Although the evaluation of the specific end uses within the Paso Basin is beyond the scope of this TM, it is anticipated that the computer model for the basin will be used to quantify the amount of water needed over time to stabilize levels in various parts of the basin. This information can then be used in the next phase of work to compare the proximity of, and quantity and quality of the water available at, each transfer point to develop strategies to achieve the highest benefit. The purpose of the evaluation of options in this TM is to identify which options associated with the use of the SWP water should be evaluated in the next phase and which should be deferred in accordance with specific criteria.

The Paso Basin Supply Options Subcommittee and other stakeholders will be able to provide input and comment to the draft TM. A town hall style public meeting will be held to solicit comments and input prior to moving into the next phase of work. During the next phase, additional details will be developed as needed, including further discussions and investigations into contractual, institutional, and environmental issues. Proposed strategies will be compared and ranked resulting in a prioritized list and recommended plan for the procurement of preferred supplemental water supplies. The results of the next phase will then be summarized into a report that will be distributed to the public for comment and eventually be presented to the County Board of Supervisors.

2.0 SUMMARY OF FINDINGS/RECOMMENDATIONS

The major findings and recommendations for this TM are as follows:

- **SWP Supplies** – There is currently unused SWP water that could be put to beneficial use in the Paso Basin. The District's Excess Allocation of 15,273 acre-feet per year (AFY) of unsubscribed Table A Allocation provides the greatest opportunity for a supplemental SWP supply. Taking into account the California Department of Water Resources (DWR) predicted future availability of the water from the SWP the Excess Allocation could provide 8,858 AFY of water for the Paso Basin (1).

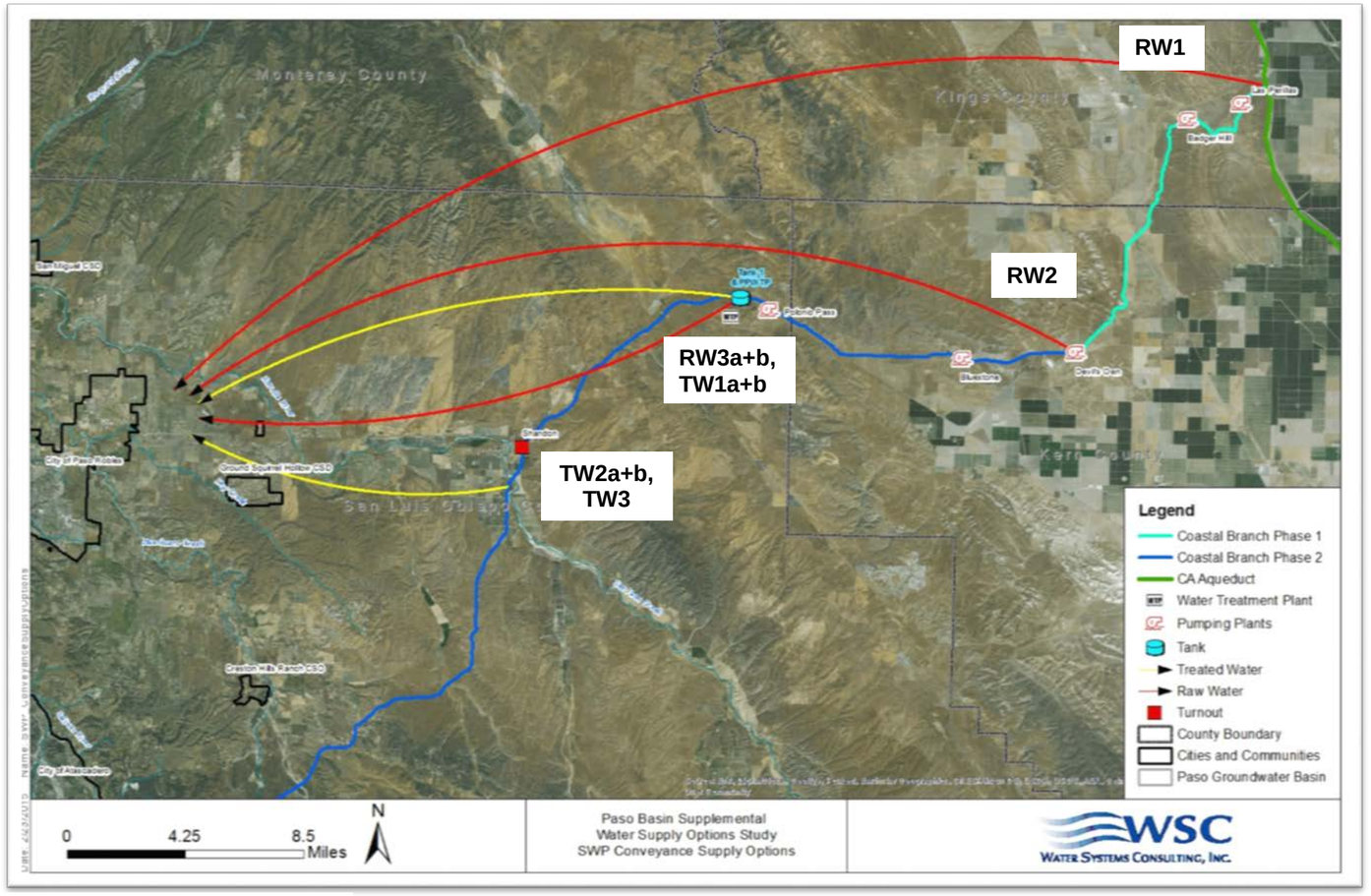
- **Coastal Branch Capacity** – Significant unused capacity within the Coastal Branch of the California Aqueduct (Coastal Branch) could be utilized to deliver SWP or other supplemental water supplies to the Paso Basin. The average unused capacity, 2005 to 2014, within the Coastal Branch ranges from 1,457 to 20,010 AFY, depending on the point of delivery and the associated delivery constraints. However, the Master Water Treatment Agreement, which limits the District's capacity to 4,830 AFY, will have to be re-negotiated if additional treated water is needed. Options to delivery additional water, without treating it, may not require renegotiation of the Master Water Treatment Agreement but may require renegotiation of other agreements associated with the project. The District's conveyance capacity in Reach 1 of the Phase II Coastal Branch is limited to 7.17 cfs or 342 acre-feet per month (AFM) and renegotiation of the Master Water Supply Agreement with the Department of Water Resources will be necessary.

  The District has provided this TM to the District SWP subcontractors and Central Coast Water Authority (CCWA) for review and will be initiating discussions with the CCWA and SWP subcontractors regarding opportunities to optimize the use of capacity within the existing SWP infrastructure.

- **Cooperative Programs** – The storage capacity of the Paso Basin and the variable supply availability of the SWP system provide significant opportunities to develop cooperative agreements with existing SWP subcontractors and other water providers. These agreements could provide supplemental water to recharge the basin and improve reliability for collaborating agencies.

The SWP supply options found most viable and recommended to be further evaluated are summarized on the following one-page fact sheets. The options will be evaluated for possible integration opportunities with other water supply option categories (i.e., Nacimiento and Recycled Water) to identify further flexibility in the next phase of the study. More detailed consideration of the SWP supply options are included in the following sections.

Supply Option: District "Excess Allocation"



Deliverable Amount of Water

Scenario	Point of Delivery	Deliverable Amount of Water (AFY)[1]
RW1	Phase I Turnout	8,858
RW2	Devil's Den	8,858
RW3a	PPWTP	8,858
RW3b	PPWTP	8,858
TW1a	PPWTP	8,858
TW1b	PPWTP	8,858
TW2a	Reach 2 Turnout (Shandon)	8,858
TW2b	Reach 2 Turnout (Shandon)	8,858
TW3	Reach 2 Turnout (Shandon)	1,045

[1]Deliverable Amount of Water represents the amount District "Excess Allocation" that could have been delivered using unused capacity within the Coastal Branch pipeline.

Basin Benefit Strategy: Purchase of District's 15,273 AFY of Table A "Excess Allocation" and delivery to the Paso Basin. Delivery of raw or treated water to the Paso Basin from the various points of delivery along the existing Coastal Branch Pipeline.

Potential Yield:
Average Available Supply – 8,858 AFY.
Average Deliverable Amount of Raw Water – 8,858 AFY.
Average Deliverable Amount of Treated Water - 1,045 to 8,858 AFY.

Level of Treatment/Water Quality:
Raw – Raw water from CA Aqueduct.
Treated – Potable water treated at the Polonio Pass Water Treatment Plant (PPWTP).

Points of Delivery:
Raw - Phase I Turnout, Devil's Den Pumping Plant, PPWTP.
Treated – PPWTP, Turnout on Reach 2 (e.g., Shandon).

Suitable End Uses:
Potable water offset, Irrigation (Urban or Ag), Groundwater Recharge.

Potential Capital Cost/Components:
- SWP & Coastal Branch Infrastructure buy-in costs.
- Transmission pipeline.
- Distribution piping to end users.
- Recharge or percolation facilities (depending on end use).

Operations & Maintenance Cost Components:
- Treatment Costs (labor, chemicals, energy, replacement costs).
- Conveyance Costs (labor, energy, replacement costs).

Implementation Issues:
Physical: Capacity limitations of Phase I, Phase II, PPWTP, Reach 2 Turnout.
Contractual: CA Aqueduct and Phase I peaking limits outlined in DWR contract. 4,830 AFY Master Water Treatment Agreement limitation.
Key Partner(s) interest: DWR, CCWA, existing District and CCWA SWP subcontractors.
Public acceptance/opposition: Concerns about reliability of SWP system and the potential physical connection between the Basin and the SWP system.

Implementation Duration/Timeline:
Mid-Term (5-10 Years): Requires negotiations for additional Phase II capacity.
Permanent: Ability to develop long-term agreements for "Excess Allocation."

Supply Option: Purchase Permanent Table A Allocation from Coastal Subcontractor

Basin Benefit Strategy: Permanently purchase Table A SWP allocation and associated capacity from an existing District or CCWA subcontractor.

Potential Yield[1]:
Water Service Amount (Supply and Capacity):
District – 0 to 4,830 AFY.
CCWA – 0 to 42,986 AFY.

Level of Treatment/Water Quality:
Treated – Potable water treated at the Polonio Pass Water Treatment Plant (PPWTP).

Points of Delivery:
Turnout along Reach 2 (e.g., Shandon).

Suitable End Uses:
Potable water offset, Irrigation (Urban or Ag), Groundwater Recharge.

Potential Capital Cost/Components:
- Negotiated purchase price.
- SWP water costs.
- Transmission pipeline.
- Distribution piping to end users.
- Recharge or percolation facilities (depending on end use).

Operations & Maintenance Cost Components:
- Treatment Costs (labor, chemicals, energy, replacement costs).
- Conveyance Costs (labor, energy, replacement costs).

Implementation Issues:
Physical: None - Ability to use purchased existing capacity.
Contractual: Purchase agreement with existing District or CCWA subcontractor.
Key Partner(s) interest: District, DWR, CCWA, existing District and CCWA SWP subcontractors.
Public acceptance/opposition: Concerns about reliability of SWP system and the potential physical connection between the Basin and the State system.

Implementation Duration/Timeline:
Short (0-5 Years): Does not require negotiations for Phase II capacity.
Permanent: Ability to take over long-term agreement for SWP water from existing Coastal Branch subcontractor.

[1]The potential yield estimate includes all available supply and capacity of the existing SWP subcontractors. Actual interest amongst the existing SWP supply contractors for participating in such a program is yet to be determined. Additionally, current SWP contracts prohibit the one-time sale of water and only allow for permanent exchanges.

Subcontractor Water Service and Drought Buffer Amounts

District Subcontractor	Water Service Amount (AFY)	Drought Buffer (Supply[2]) (AFY)
Morro Bay, City of	1,313	2,290
California Men's Colony	400	400
County Operations Center	425	425
Cuesta College	200	200
Pismo Beach, City of	1,240	1,240
Oceano CSD	750	-
San Miguelito MWC	275	275
Avila Beach CSD	100	-
Avila Valley MWC	20	60
San Luis Coastal USD	7	7
Shandon	100	-

CCWA Subcontractor	Water Service Amount (AFY)	Drought Buffer (Supply + Capacity[2])	Drought Buffer Amount (Supply Only[2]) (AFY)
City of Guadalupe	550	55	
City of Santa Maria	16,200	1,620	
Southern California Water Co.	500	50	
Vandenberg AFB	5,500	550	
City of Buelton	578	58	
Santa Ynez ID No.1	2,000	200	
Carpinteria CWD	2,000	200	
Goleta Valley WD	4,500	450	2,500
La Cumbre MWC	1,000	100	
Montecito WD	3,000	300	
Morehart Land Co.	200	20	
Santa Barbara Research Center	50	5	
City of Santa Barbara	3,000	300	

[2]Supply Drought Buffer can only be delivered in proportion to a reduction in Annual Allocation of Water Service amounts. Supply + Capacity Drought Buffer can be delivered in a full Annual Allocation year.

3.0 INTRODUCTION

The purpose of this section is to provide background and setting information on the Paso Basin, the SWP and the Coastal Branch.

3.1 Background/Setting

The Paso Basin is located in the upper portion of the Salinas River watershed and is the primary water source for North San Luis Obispo County. The basin is approximately 505,000 acres (790 square miles) and all the communities within the basin rely on the basin's groundwater. Rural residences, urban development, vineyards, and other agricultural uses all pump water from the underground basin for potable and non-potable uses. The basin has one sub-basin and several sub-areas for study and planning purposes.

The San Luis Obispo County Flood Control and Water Conservation District (District) has spent several years studying the basin hydrogeology and the demand and supply of the basin's groundwater. The various studies have concluded that pumping from the groundwater basin is approaching or has exceeded its perennial yield. The 2014 Basin Computer Model Update has estimated that from 1981 to 2011 annual outflows exceed the inflows of the basin by 2,400 AFY. These exceedances have manifested in groundwater level declines and are depicted in Figure 3.1 for the period 1997-2013. This imbalance is further aggravated under future year simulations, highlighting the need to identify supply alternatives and/or demand reduction to offset further pumping of the basin groundwater.

3.2 Overview of SWP and Coastal Branch

The SWP is a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants that extend for more than 600 miles from northern to southern California. Its main purpose is to divert and store surplus water during wet periods and distribute it to areas in Northern California, the San Francisco Bay area, the San Joaquin Valley, the Central Coast, and Southern California. It is also used to provide recreation opportunities, control floods, generate power, protect fish and wildlife, and manage water quality in the Sacramento-San Joaquin Delta (Delta). One of the key features of the SWP is the California Aqueduct, which conveys water from the Delta to central and southern California. The SWP project, including the California Aqueduct, is operated by the California Department of Water Resources (DWR).

The Coastal Branch of the SWP, which connects to the California Aqueduct approximately 11 miles south of Kettleman City, extends for 160 miles through Kings, Kern, San Luis Obispo, and Santa Barbara Counties and terminates in Northern Santa Barbara County. An overview of the California Aqueduct and the Coastal Branch of the SWP system is shown in Figure 3.2.

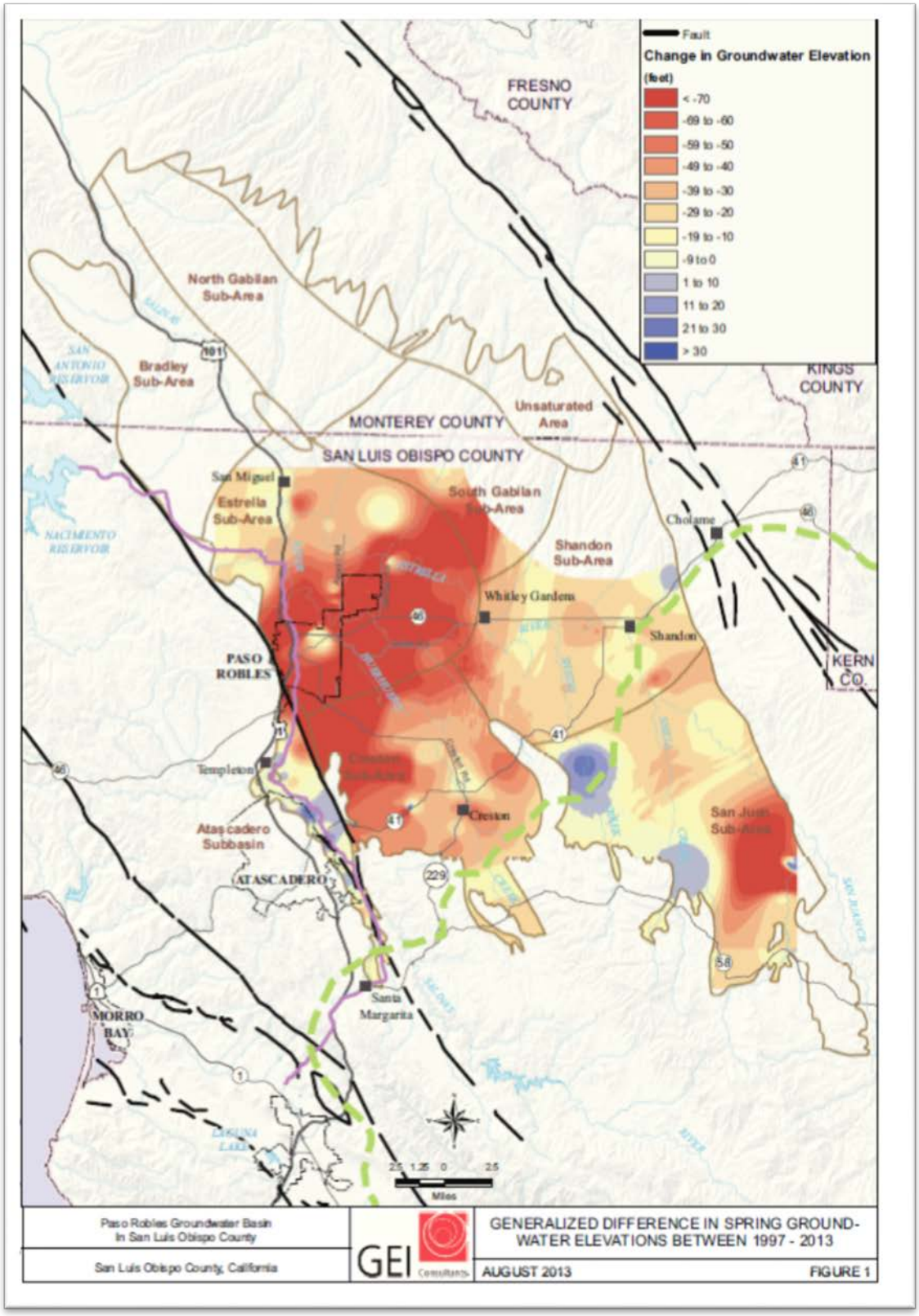


Figure 3.1 Generalized Difference in Spring Groundwater Elevations (1997-2013)

Figure 3.2 California Aqueduct Overview

DWR has contracts with two of the 29 SWP Contractors - the Santa Barbara County Flood Control and Water Conservation District (SBCFCWCD) (via the Central Coast Water Authority (CCWA), a Joint Powers Authority), and the District - to deliver SWP water through the California Aqueduct and the Coastal Branch. These SWP Contractors then have Water Supply Agreements with individual subcontractors to deliver SWP water to users.

The Coastal Branch was constructed in several phases. Completed in 1968, Phase I was designed to provide 57,700 AFY for SBCFCWCD and 25,000 AFY for the District and includes 15 miles of aqueduct and two pumping stations (Las Perillas and Badger Hill). Phase II was designed to provide 42,986 AFY for the SBCFCWCD and 4,830 AFY for the District, consisting of 101 miles of pipeline, and was completed in 1997. Phase II extends the Coastal Branch from the terminus of Phase I to Tank 5, located in Northern Santa Barbara County, and includes three pumping stations (Devils Den, Bluestone, and Polonio Pass) and the Polonio Pass WTP. In addition to Phase II, CCWA built a 42-mile extension from Tank 5 to Lake Cachuma.

4.0 SWP CONTEXT AND CONSTRAINTS

The purpose of this section is to provide information on the contractual agreements and programs that govern the SWP and Coastal Branch. Additionally, included is an analysis of SWP availability and excess delivery capacity within the Coastal Branch.

4.1 Types of SWP Water

There are several different classifications for SWP water. These classifications are described in the following section in order to provide background information about the different SWP supply options that are being evaluated for the benefit of the Paso Basin later in this TM.

4.1.1 Table A

The contracts between DWR and the 29 SWP contractors define the terms and conditions governing the water delivery and cost repayment for the SWP. SWP Table A is an exhibit to these contracts that serves as a basis for allocating some of the costs among the 29 SWP water contractors. The current maximum Table A contract amount for all the contractors is 4,172,000 acre-feet per year, with 4,133,000 acre-feet available for delivery from the Delta.[2] All water-supply related costs of the SWP are paid 100 percent by the contractors, with each contractor's Table A amount serving to proportion annual costs. In addition, SWP Table A Amount plays a key role in the annual allocation of available supply among contractors. When the SWP was being planned, the total capacity requested by the

[2] Nearly 70% of the 4.17 million acre-feet of Table A contract is allocated to just two SWP contractors: the Metropolitan Water District of Southern California, and the Kern County Water Agency. The two Central Coast SWP contractors' Table A reflects less than 2% of the total SWP contracted quantity.

contractors was 4,172 thousand acre-feet (taf) per year. This was referred to as the maximum project yield, and it was recognized that in some years the project would be unable to deliver that amount and in other years project supply could exceed that amount. The SWP Table A amount was used as the basis for apportioning available supply to each contractor and as a factor in calculating each contractor's share of the project's costs. Other contract provisions permit changes to an individual contractor's SWP Table A under special circumstances.

Every year, DWR conducts modeling studies of the SWP system to determine the annual allocation, or percentage of the amount of Table A that can be delivered by the SWP system. This allocation is revised throughout the year as hydrologic conditions and other factors change. Currently, there are two large-scale plans that are under development that could affect future SWP delivery capability: the Delta Plan and the Bay Delta Conservation Plan (BDCP). These plans will help provide a basis for issuing endangered species permits for the operation of the SWP and CVP (2).

4.1.1.1 Subcontractor "Drought Buffer"

Drought buffer is a term used to identify a source of supply for District and CCWA subcontractors that acts to provide a higher level of reliability during times of drought. There are two forms of drought buffer that are utilized by subcontractors on the Coastal Branch:

- **Acquire or maintain a higher Table A amount than pipeline flow capacity (supply only).** By having a higher Table A amount than the pipeline capacity, DWR annual allocation process will not impact pipeline delivery operations until DWR allocation is reduced to a level where available Table A is equal to pipeline capacity. This is the technique currently in use by the District subcontractors, as the District possess 25,000 AFY in Table A amount and a pipeline conveyance capacity of only 4,830 AFY. Additionally, the Goleta Valley Water District, one of CCWA's member agencies, has 2,500 AFY of this type of drought buffer.

- **Acquire or maintain higher Table A amount and pipeline capacity (supply and capacity).** This essentially is increasing both supply and conveyance as a method of providing reliable annual water deliveries. This is the technique primarily utilized by CCWA subcontractors, as they have 42,986 AFY in Table A amount (not including the Goleta Valley Water District's 2,500 AFY of supply only drought buffer) and 42,986 AFY in pipeline conveyance capacity.

4.1.1.2 District Excess Allocation

The difference between the District's Table A amount and current subscribed allocation plus drought buffer represents 15,273 AFY of unsubscribed SWP allocation, commonly referred to as the District's "Excess Allocation." In 2003, the District developed a series of Excess Entitlement Policies that state:

> "Prior to transferring the excess entitlement for any other use, contractors of state water entitlement with capacity in Phase II of the Coastal Aqueduct shall have the first right to utilize the excess entitlement for "drought buffer" (reliability) purposes under the terms of a drought buffer agreement."

The Excess Entitlement Policies defines Excess Entitlement as:

> "The District State Water Project "Excess" Entitlement is the portion of the District's total entitlement that is not contracted to others for their deliverable or drought buffer uses" (3).

4.1.1.3 District SWP Allocation and Drought Buffer

The District has an agreement with DWR for 25,000 AFY of State Water Allocation (Table A amount). In 1993, the Phase II Coastal Branch was designed to provide the District with 4,830 AFY of conveyance capacity and 4,830 AFY of capacity was secured for treatment via the Master Water Treatment Agreement. This capacity was subsequently subcontracted to the District subcontractors via ten water supply agreements. The District has also instituted a formal supply-only drought buffer program with its subcontractors. Certain subcontractors have subscribed for an additional 4,897 AFY of the District's Table A water with no associated flow capacity in the Phase II Coastal Branch pipeline. The District's SWP allocations are summarized in Table 3.1 (4).

4.1.1.4 SB County Allocation and Drought Buffer

The SBCFCWCD has an agreement with DWR for 45,486 AFY of SWP Allocation. Currently, 39,078 AFY of the total allocation is subscribed among 14 CCWA subcontractors. In addition, there are 3,908 AFY of supply and capacity and 2,500 AFY of supply only drought buffer to partially firm up the reliability of those entitlements. Santa Barbara County's allocations are summarized in Table 3.2.

4.1.1.5 SB County Suspended Table A

The SBCFCWCD executed a Water Supply Contract with DWR in 1963 to fund the construction of the SWP and the Coastal Branch. DWR constructed Phase I of the Coastal Branch to deliver 57,700 AF to the SBFCWCD. Phase II of the Coastal Branch was not immediately constructed and was delayed by SBCFCWCD. In 1979, a bond measure to secure funds to construct Phase II of the Coastal Branch was voted down. Following the failed bond measure, many people in Santa Barbara County questioned whether it should continue to make payments under the SWP Contract. A number of water purveyors concluded it would be prudent for the County to continue to retain its Table A Amount (formerly referred to as "entitlement" which is named for "Table A" in each SWP Contractor's Water Supply Contract) and make payments to DWR. The County was willing to retain the Table A Amount, but only if the associated costs were shifted from the countywide tax base to the ratepayers in those jurisdictions that wanted to keep the option to join the SWP. Beginning in 1982, SBCFCWCD entered into a series of Water Supply

Retention Agreements (WSRAs) with various water purveyors for the purpose of shifting responsibility for such SWP payments from the County taxpayers to individual purveyors and their ratepayers. Through the WSRAs, 45,486 AF of SWP water were retained. The remaining 12,214 AF was suspended by DWR and no additional payments were made by SBCFCWCD. This remaining unallocated SWP water is referred to as Suspended Table A Water. In 1987, DWR granted SBCFCWCD the right to reacquire the suspended water through payment of suspended costs plus interest for any portion of reacquired allocation.

Table 3.1 District SWP Allocation Summary
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

SWP Sub-Contractor	SWP Allocations (AFY)		
	Water Service Amount	Drought Buffer (Supply)	Total Reserved
Chorro Valley Turnout			
Morro Bay, City of	1,313	2,290	3,603
California Men's Colony	400	400	800
County Operations Center	425	425	850
Cuesta College	200	200	400
Subtotal 1	**2,338**	**3,315**	**5,653**
Lopez Turnout			
Pismo Beach, City of	1,240	1,240	2,480
Oceano CSD	750	-	750
San Miguelito MWC	275	275	550
Avila Beach CSD	100	-	100
Avila Valley MWC	20	60	80
San Luis Coastal USD	7	7	14
Subtotal 2	**2,392**	**1,582**	**3,974**
Shandon	100	-	100
Subtotal 3	**100**	**-**	**100**
Total	**4,830**	**4,897**	**9,727**
SLO County Table A Allocation			25,000
Excess Allocation			15,273

Table 3.2 SBCFCWCD SWP Allocation Summary (4)
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

SBCFCWCD Subcontractor	SWP Allocations (AFY)			
	Water Service Amount	Drought Buffer (Supply + Capacity)	Drought Buffer (Supply)	Total Reserved
City of Guadalupe	550	55		605
City of Santa Maria	16,200	1,620		17,820
Southern California Water Co.	500	50		550
Vandenberg AFB	5,500	550		6,050
City of Buelton	578	58		636
Santa Ynez ID No.1	2,000	200		2,200
Carpinteria CWD	2,000	200		2,200
Goleta Valley WD	4,500	450	2,500	7,450
La Cumbre MWC	1,000	100		1,100
Montecito WD	3,000	300		3,300
Morehart Land Co.	200	20		220
Santa Barbara Research Center	50	5		55
City of Santa Barbara	3,000	300		3,300
Total	**39,078**	**3,908**	**2,500**	**45,486**

In 2010, CCWA requested that SBCFCWCD initiate the process with DWR to reacquire 12,214 AFY of Suspended Table A Water. DWR requires this action to be requested by SBCFCWCD, rather than CCWA because the SBCFCWCD is still officially the SWP contractor. According to meeting minutes from the January 14, 2010 CCWA Board meeting, all of the CCWA member agencies supported the reacquisition of the Suspended Table A Water at that point in time (5). To participate in the reacquisition, all CCWA member agencies would have to seek approval from their governing bodies and the CCWA Board would have to adopt a policy that would allow member agencies to participate. Additionally, the other SWP Contractors would need to approve the reacquisition. As described in the January 19, 2010 presentation to the Santa Barbara County Board of Supervisors by CCWA, all other SWP Contractors and DWR indicated that they would consent to the reacquisition at that point in time (6).

Under this reacquisition scenario the Suspended Table A Water would be owned by CCWA. The CCWA agencies who chose to opt in to the reacquisition would have been responsible for a portion of the costs and would receive a corresponding portion of the benefits. Past costs were expected to be financed through CCWA issuing a 30-year bond to

participants and future costs would have been paid on a pro-rata basis. In 2005, it was estimated that to reacquire the Suspended Table A Water it would cost approximately $890/AF and the pro-rata reduction in the amount of credit due to SBCFCWCD under Amendment #9 would be approximately $544/AF for 10 years following reallocation (7).

The transfer of SWP water from a CCWA member agency to a buyer outside Santa Barbara County is governed by both the 1991 Water Service Agreements (WSA) and by the 1963 Water Supply Contract with the State of California. There has never been a transfer of SWP water outside of Santa Barbara County, although the WSAs do provide for it. Before a water transfer outside Santa Barbara County can take place, it must first be offered to the other CCWA member agencies under the same terms and conditions. Additionally, the Water Supply Contract stipulates that DWR must also agree to the transfer (5).

4.1.1.6 Ventura Unused Table A

The City of Ventura (City) currently possesses 10,000 AFY of SWP Table A water, however, the City does not have facilities to deliver SWP water into its distribution system. According to the 2013 Comprehensive Water Resource Report, the City is evaluating the existing policy on SWP water and the City's options related to short term and long term lease of its SWP supplies (8).

4.1.1.7 Carryover Water

Pursuant to the long-term water supply contracts, contractors have the opportunity to carry over a portion of their allocated water approved for delivery in the current year for delivery during the next year. The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the contractors to use or lose the water by December 31 of each year. The water supply contracts state the criteria for carrying over SWP Table A water from one year to the next. Normally, carryover water is water that has been exported during the year from the Delta, but has not been delivered to the contractor during that year, and remains stored in the SWP share of San Luis Reservoir to be delivered during the following year. Storage for carryover water no longer becomes available to the contractors if it interferes with storage of SWP water for project needs or the reservoir spills. Once this occurs, the carryover water is converted to Article 21 water at a defined rate, linked to the production rate of the Banks Pumping Plant, and made available to the SWP contractors.

4.1.1.8 Article 21 Water

Article 21 of the SWP contracts describes water that SWP contractors may receive on a short-term basis in additional to their Table A water, should they request it (1). Article 21 Water is available under specific conditions. SWP Article 21 water is apportioned to those contractors requesting it in the same proportion as their SWP Table A – with the District's proportion being about ½ of one percent of the total Table A, if all of the contractors were

requesting the water. All Article 21 water must be used and cannot be stored within the SWP system.

4.1.1.9 Turnback Pool Water

Contractors may choose to offer their allocated SWP Table A water in excess of their needs to other contractors through two turnback pools in February and March. Contributing contractors receive a reduction in charges, and taking contractors pay extra. Turnback Pool Water is apportioned to those contractors requesting it in the same proportion as their SWP Table A amount.

4.1.1.10 Multi-Year Program Water

In mid-2013, DWR established the 2013 – 2014 Multi-Year Water Pool Demonstration Program (Multi-Year Program) to improve water management flexibility within the SWP. The Multi-Year Program was intended to test new water management strategies in 2013 and 2014 in response to continued dry conditions with the goal of establishing a similar program in water short years.

The Multi-Year Program allowed SWP contractors to purchase SWP water from other willing SWP contractors, for two consecutive years, at a cost that was negotiated with DWR. This program was conducted, in part, due to the lack of participation in the single year Turnback Pool program due to the limited incentive for contractors to sell at a low price. This program did not proportion water according to a contractor's SWP Table A amount, creating greater opportunity for the District to purchase or sell water supplies when compared to the Turnback Pool.

4.2 Contractual Agreements

4.2.1 DWR Contracts

In 1963, the District and SBCFCWCD developed water supply contracts with DWR for the delivery of SWP water through the Coastal Branch. These contracts and subsequent amendments provide the District and CCWA, via the SBCFCWCD, with 25,000 and 45,486 AFY of Table A SWP supply, respectively. They also outline costs that must be repaid to DWR for financing, building and operating the SWP system including the CA Aqueduct and Phase I and Phase II of the Coastal Branch.

The District's contracts with DWR provide for 25,000 AFY of delivery capacity through the Coastal Branch Aqueduct and Phase I of the Coastal Branch. However, the Phase II Coastal Branch design and the Master Water Treatment Agreement with CCWA limits the District's capacity within Phase II to only 4,830 AFY for Reaches 1-5a (i.e., Devils Den Pumping Plant to Lopez Turnout) and the PPWTP, respectively.

For operation of the treated water portion of the Coastal Branch pipeline, DWR and CCWA entered into an Operations and Maintenance Agreement (9) whereby CCWA would be responsible for the operations and maintenance of DWR pipeline from the PPWTP outlet to Tank 5.

4.2.2 Master Water Treatment Agreement

In 1992, the District and CCWA entered into a Master Water Treatment Agreement for treatment capacity in the PPWTP. The Master Water Treatment Agreement identifies that CCWA shall treat the District's SWP Allotment, equal to the water supply contract between DWR and the District (8,038 AFY), at the PPWTP (10). The Master Water Treatment Agreement was later amended in 1993 to correspond to the updated Table A amount contracted by District Subcontractors from the District of 4,830 AFY (11).

4.2.3 District SWP Subcontractor Agreements

The water supply agreements between the District and their subcontractors identify the amount of Table A that each subcontractor is allocated out of the District's 25,000 AFY of Table A Allocation ("Water Service Amount"). Subsequent agreements between the District and select District Subcontractors were developed to allocate portions of the District's Table A Allocation to the subcontractors as supply only drought buffer. For additional information on drought buffer see Section 4.1.1.1.

4.2.4 Variability of SWP Supply

Available SWP supply or Annual Allocation varies annually based on rainfall, snowpack, runoff, reservoir storage, pumping capacity from the Delta, and legal and environmental constraints. The percent of supply available to District has ranged from 5 to 100 percent from 2004 to 2016. Table 3.3 and Figure 3.3 summarize the historical Annual Allocations that the District and CCWA have received.

Table 3.3 Annual SWP Available Allocation Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District			
Year	**Annual Allocation (%)**	**Available District SWP Allocation (AF)**	**Available CCWA SWP Allocation (AF)**
2004	65	16,250	29,566
2005	90	22,500	40,937
2006	100	25,000	45,486
2007	60	15,000	27,292
2008	35	8,750	15,920
2009	40	10,000	18,194
2010	50	12,500	22,743
2011	80	20,000	36,389
2012	65	16,250	29,566
2013	35	8,750	15,920
2014	5	1,250	2,274
2015	20	5,000	9,097
2016	60	15,000	27,292

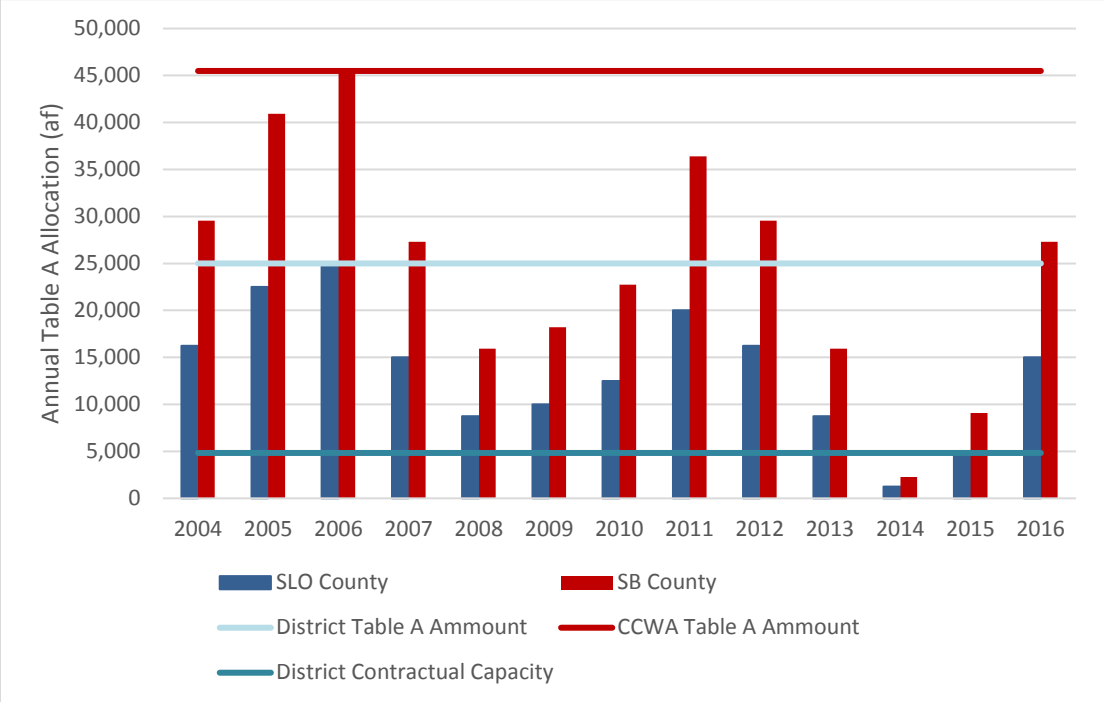


Figure 3.3 Annual Variability in Available SWP for SLO and SB Counties

4.3 Delivery Capacity Analysis

The purpose of the analysis in this section is to identify the amount of unused capacity or excess delivery capacity within the SWP and the Coastal Branch. In Section 5, the results of this analysis were incorporated with the amount of available supply for each of the different SWP supply options to identify the amount of water that could be delivered to the Paso Basin.

To determine the capacity of the Coastal Branch infrastructure to deliver water to the Paso Basin, a delivery model was developed using historical SWP delivery data (2005-2014) for the District and CCWA subcontractors. Included in the model were the physical and contractual constraints for the California Aqueduct, Phase I, and Phase II of the Coastal Branch, the PPWTP and for additional delivery capacity at the Shandon Turnout. These constraints are summarized in Table 3.4, further described in Appendix A. Figure 3.4 shows the key physical features that were included in the model. The model was used to calculate the delivery capacity to the Paso Basin at several locations along the Coastal Branch pipeline. Available delivery capacity for the month of November was assumed to be zero as the Coastal Branch is typically shut-down this month for maintenance activities.

Table 3.4 Delivery Capacity Constraints
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

Facility/Reach	Physical Constraints	Contractual Constraints
California Aqueduct	Maximum channel capacity of 13,100 cfs (9,483 TAFY)	DWR not obligated to deliver flow greater than: 35 cfs (25,339 AFY) to the District 63 cfs (45,610 AFY) to CCWA
Phase I	Designed to convey 350 cfs (253,388 AFY) but historic data suggest hydraulic capacity limitations	DWR not obligated to deliver flow greater than: 35 cfs (25,339 AFY) to the District 63 cfs (45,610 AFY) to CCWA
Phase II- Reach 1	Maximum pumping capacity 100 cfs or (72,397 AFY) with 24 hr/day pumping (on-peak pumping) or 51,252 AFY with 17 hr./day pumping (off-peak pumping)	DWR not obligated to deliver flow greater than: 7.17 cfs (5,191 AFY) to the District 63 cfs (45,610 AFY) to CCWA
Polonio Pass Water Treatment Plant	Maximum capacity of 75.6 cfs (54,732 AFY)	Master Water Treatment Agreement between the District and CCWA limit District's capacity to 4,830 AFY
Phase II - Reaches 2-6	Maximum excess capacity of 10,810 AFY, above design value, to deliver to the Shandon or other nearby turnout	District's contractual capacity for Reaches 2-4 reduced to 7.17 cfs (5,191 AFY) Reach 5A1 and 5A2 to 3.56 cfs (2,577 AFY) CCWA capacity is 63.82 cfs (46,204 AFY)

Figure 3.4 SWP Coastal Branch Overview

4.3.1 Raw Water Delivery

One of the potential options for delivering water to the Paso Basin includes construction of a raw water pipeline. This pipeline could connect to the existing SWP system at several locations, which are described further in Section 4.3.2, and deliver water without the need to utilize portions of the existing SWP infrastructure. The primary benefit of a raw water pipeline is that it could eliminate the need for the agency representing the Paso Basin to negotiate with the existing District and CCWA subcontractors for capacity within the Coastal Branch, however, additional legal analysis may be needed.

The Phase II design and Master Water Treatment Agreement provides the District with 4,830 AFY of capacity within Phase II of the Coastal Branch. However, for Phase I the District possesses 25,000 AFY of capacity, of which a significant portion could be utilized to deliver water to a newly constructed raw water pipeline. Obtaining this capacity would require the agency representing the Paso Basin to negotiate with the District, but not require approval from all of the District and CCWA subcontractors.

4.3.2 Points of Delivery

The amount of water that can be delivered to the Paso Basin depends on the point of delivery, the delivery constraints associated with these locations and the treatment level of the water. Table 3.5 shows the points of delivery along the existing Coastal Branch that were evaluated for raw and treated water scenarios. The different point of delivery locations included in the analysis are shown in Figure 3.5.

Table 3.5 Points of Delivery
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

	Quality of Water	Point of Delivery
RW1	Raw	Phase I Turnout
RW2	Raw	Devil's Den Pumping Plant
RW3	Raw	PPWTP
TW1	Treated	PPWTP
TW2	Treated	Reach 2 Turnout (Shandon)
TW3	Treated	Reach 2 Turnout (Shandon)

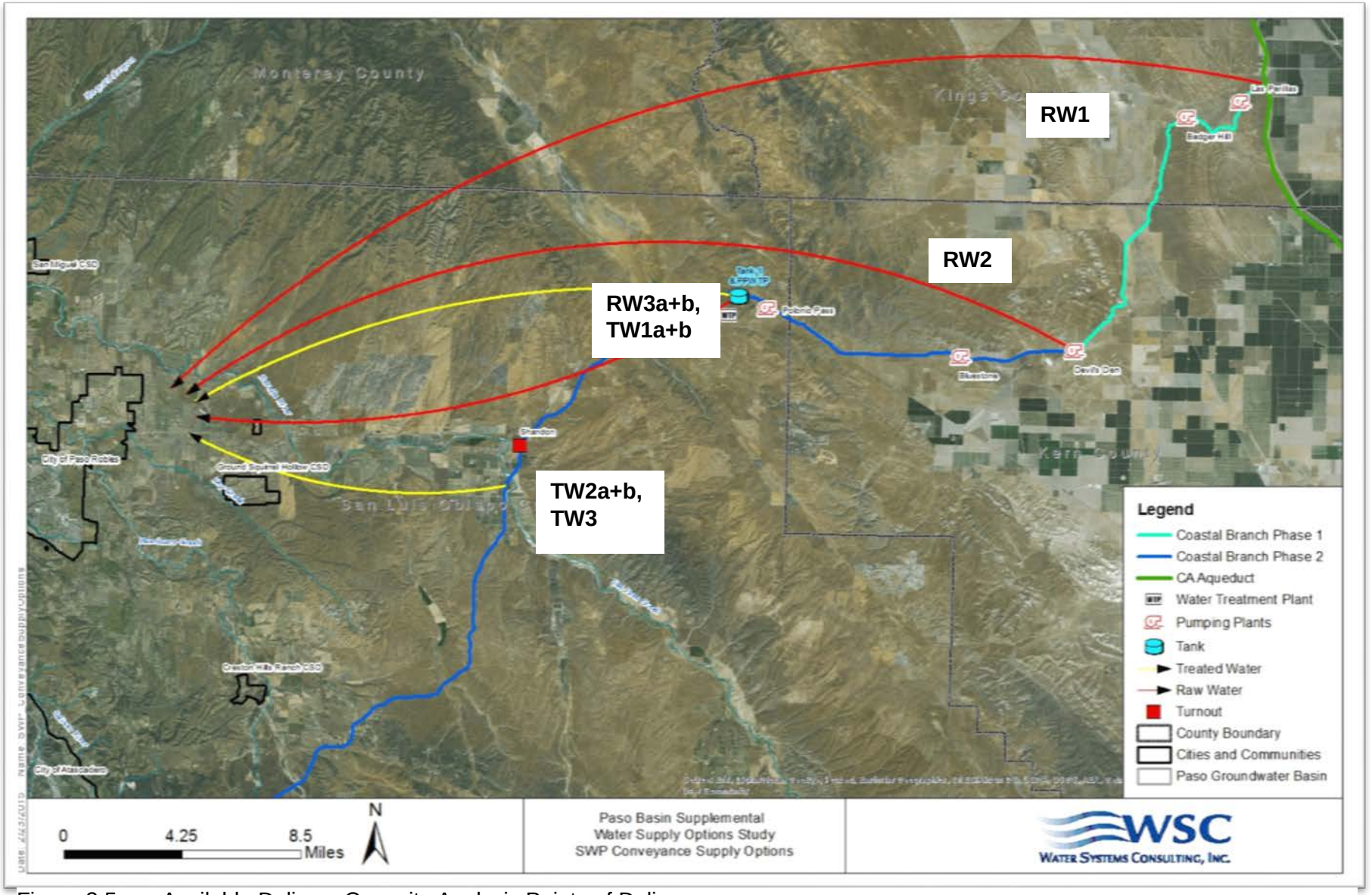


Figure 3.5 Available Delivery Capacity Analysis Points of Delivery

4.3.3 Delivery Scenarios

Nine delivery scenarios were developed for analyzing the available delivery capacity of the existing SWP infrastructure, which are described in Table 3.7. The capacities for each of these delivery scenarios focus on identifying the unused capacity within the Coastal Branch and do not include supply availability limitations. Delivery results, including supply availability limitations, are included in Section 4.4.

Estimates of unused delivery capacity were developed by comparing the capacity, either physical or contractual, for different reaches of the California Aqueduct and the Coastal Branch against historical deliveries, either District and/or CCWA on a monthly time step. The specific assumptions utilized for reach capacity and deliveries are outlined in Table 3.6. The reach with the smallest amount of unused capacity was then identified and the amount of unused capacity for that reach was selected to represent the amount of unused capacity for that point of delivery for that month. The monthly estimates of unused capacity where then averaged together for different time periods (e.g., 10 yrs., 5 yrs., etc.) and shown in Table 3.7. These results represent the amount of unused capacity within the Coastal Branch, without exceeding the District's 25,000 AFY of capacity for Phase I of the Coastal Branch.

The results indicate that there is significant available delivery capacity within the Coastal Branch pipeline without impacting deliveries to the existing SWP subcontractors. As there are fewer physical and contractual constraints, there is more capacity to deliver raw water to the upstream points of delivery. However, delivery of raw water to the Paso Basin would require significant additional infrastructure compared to the downstream points of delivery. Scenario TW3, which incorporates the District's delivery capacity constraint of 4,830 AFY from the Master Water Treatment Agreement, results in significantly reduced available delivery capacity.

4.3.4 Seasonal Capacity Availability

Average monthly SWP deliveries to the District and CCWA subcontractors for 2005-2014 are shown in Figure 3.6. The highest deliveries occur during the summer months, with deliveries peaking in August, indicating that subcontractors are utilizing the Coastal Branch supplies to help meet peak seasonal demands. November deliveries were most likely limited due to the annual pipeline outage for maintenance.

The seasonal available delivery capacity varies inversely with District and CCWA subcontractor deliveries. The average monthly delivery capacities for each of the delivery scenarios are shown in Figure 3.7. Unused capacity peaks in the winter months, and is lowest in the summer months, May through September. Delivery opportunities in November were not included due to pipeline maintenance activities that typically occur during this month. Opportunities to utilize unused deliver capacity within the Coastal Branch may require shoulder or wet weather month deliveries.

Table 3.6	**Delivery Capacity Analysis Scenarios Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District**	
Scenario	**Point of Delivery**	**Description**
RW1	Phase I Turnout	Considers the District's capacity limitation to deliver water through the California Aqueduct. Instantaneous limitation of 35 cfs or 2,110 acre-feet per month (AFM). Capacity to the Phase I Turnout accounts for deliveries to District subcontractors.
RW2	Devil's Den Pumping Plant	Considers the District's capacity limitation to deliver water through the Phase I. Instantaneous limitation of 35 cfs or 2,110 AFM. Capacity for RW2 accounts for deliveries to District subcontractors.
RW3a (off-peak pumping)	PPWTP	Considers RW2 constraints and the off-peak pumping constraint for Reach 1 (4,271 AFM). Phase I off-peak capacity accounts for deliveries to both District and CCWA Subcontractors.
RW3b (on-peak pumping)	PPWTP	Considers RW2 constraints and the on-peak pumping constraint for Reach 1 (6,030 AFM). Phase I on-peak capacity accounts for deliveries to both District and CCWA Subcontractors.
TW1a (off-peak pumping)	PPWTP	Considers constraints of RW3a (off-peak) as well as the PPWTP physical constraints (4,585 AFM). PPWTP capacity accounts for deliveries to both District and CCWA Subcontractors.
TW1b (on-peak pumping)	PPWTP	Considers all constraints of RW3b (on-peak) as well as the PPWTP constraint (4,585 AFM). PPWTP capacity accounts for deliveries to District and CCWA Subcontractors.
TW2a (off-peak pumping)	Reach 2 Turnout (Shandon)	Considers all constraints of TW1a in addition to the available capacity at the Shandon Turnout without impacting downstream subcontractors (893 AFM).
TW2b (on-peak pumping)	Reach 2 Turnout (Shandon)	Considers all constraints of TW1b in addition to the available capacity at the Shandon Turnout without impacting downstream subcontractors (893 AFM).
TW3	Reach 2 Turnout (Shandon)	Considers all constraints of TW2b in addition to the Master Water Treatment Plant capacity constraint set as 4,830 AFY. Master Water Treatment Plant capacity accounts for deliveries to District subcontractors.

Table 3.7 Available Delivery Capacity Analysis Results (AFY) Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District		
	10 Year Average (2005-2014)	**5 Year Average (2010-2014)**
RW1	19,562	19,628
RW2	19,562	19,628
RW3a	17,770	18,619
RW3b	19,562	19,628
TW1a	17,770	18,619
TW1b	18,711	19,340
TW2a	10,475	10,640
TW2b	10,636	10,679
TW3	1,045	1,149

4.4 SWP Procurement Considerations

There are several potential options for procuring SWP water for the Paso Basin, which are outlined in Section 4.4, but generally, there are only two options for entering into an agreement that would allow this SWP water to be delivered through the Coastal Branch infrastructure. The two options, shown in Table 3.8 and further described in the sections below, include purchasing a portion of the District's Excess Allocation or other SWP supply and negotiating with the District, CCWA and existing subcontractors for capacity within the Coastal Branch or contracting with an existing subcontractor to obtain all or a portion of their SWP supply and Coastal Branch capacity.

Table 3.8 SWP Procurement Options Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District			
Procurement Type	**Agreement Type**	**Cost**	**Considerations**
New SWP Subcontractor	Permanent as defined for this study	Likely Higher	Requires buying-in to the Coastal Branch
Purchase from an existing Subcontractor	Permanent as defined for this study	Potentially Lower	Could be accomplished without buying into the Coastal Branch

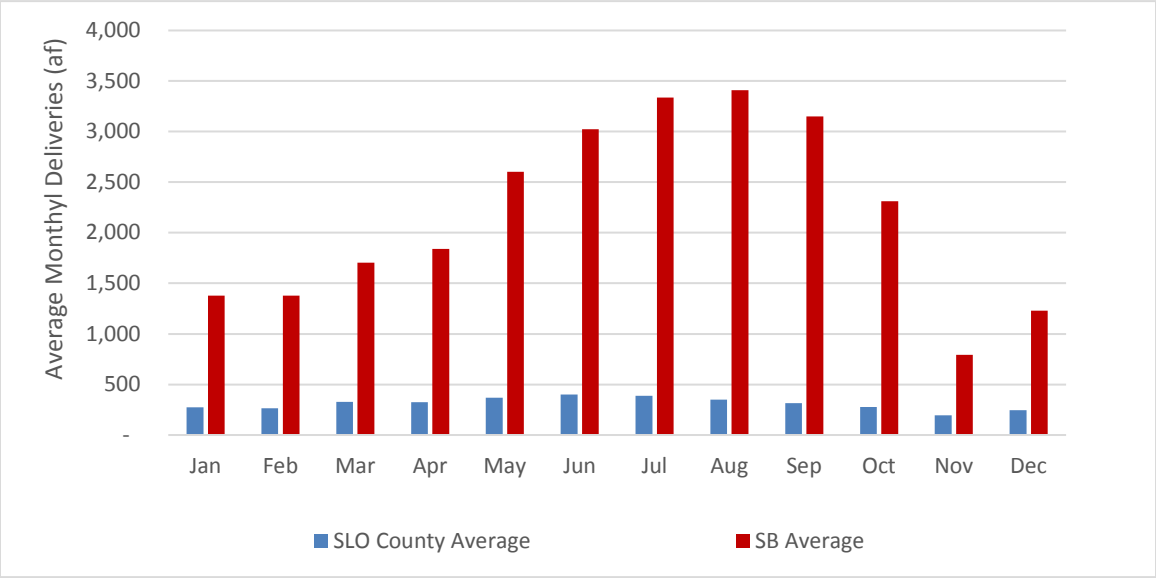


Figure 3.6 Average Coastal Branch Pipeline Deliveries (2005-2014)

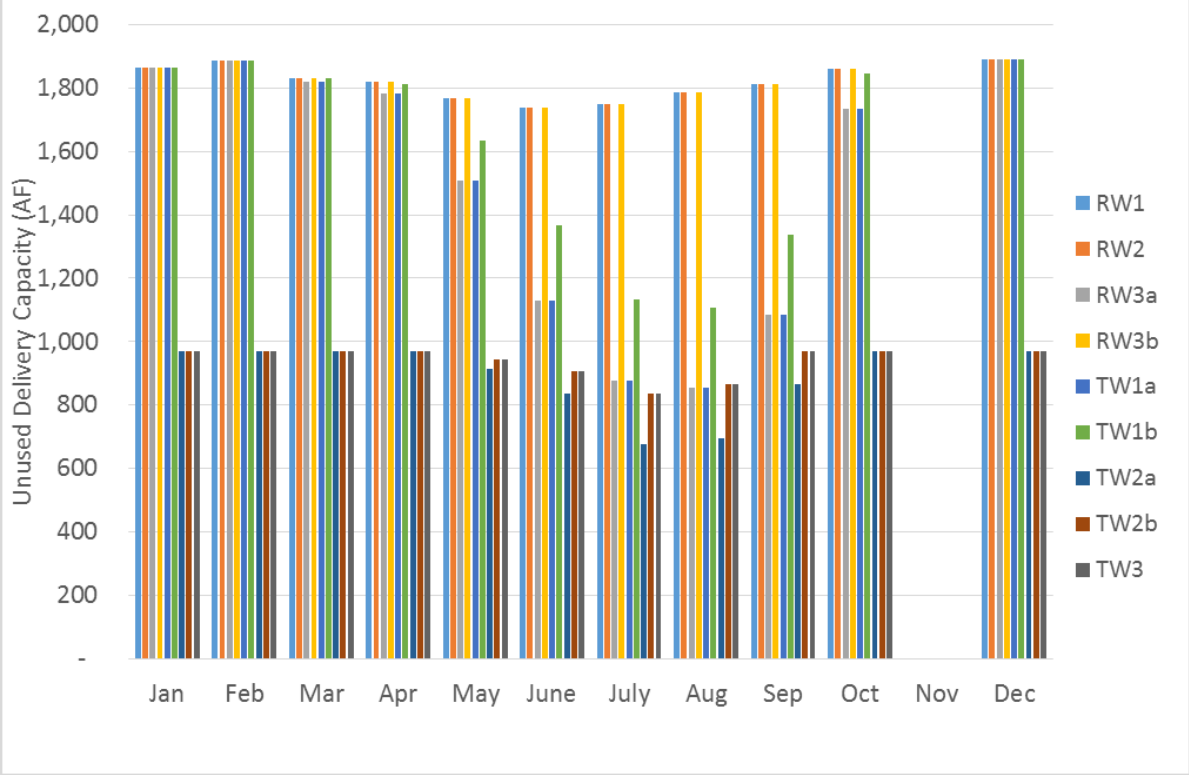


Figure 3.7 Average Monthly Unused Delivery Capacity (2005-2014)

4.4.1 Become a new SWP Subcontractor to the District

Determination of the terms under which the Paso Basin entity would enter into a subcontract with the District will likely be subject to negotiations between the District, the new subcontractor and depending on the point of delivery, potentially the CCWA and the existing subcontractors. New turnouts would need to be approved by DWR as the owner of the infrastructure. If the terms involve a change in the place of use, DWR would also be involved.

To assist a future Paso Basin entity in evaluating supplemental SWP supply options, an analysis of historical and anticipated future costs for the existing SWP subcontractors was developed. This analysis was not intended to represent a final buy-in price for obtaining supply and capacity in the SWP system, but is intended to provide a starting point for potential future discussions between a Paso Basin entity and the District, CCWA, and existing subcontractors.

The estimates of costs were developed by compiling and summarizing historical and anticipated future costs for the existing subcontractors to the District, DWR and CCWA. These included costs from 1992 to 2035 and these costs were adjusted to 2015 dollars using a discounted cash flow model, with an assumed 5 percent discount rate to adjust for the time value of money. Costs paid by the District to DWR prior to 1992 were not included as the existing SWP subcontractors did not reimburse the District for these costs.

The costs for the existing subcontracts were then broken down between fixed (e.g., infrastructure repayment, administration, etc.) and variable (e.g., operations, electrical, etc.) and allocated by pipeline reach and contractual amount (i.e., 25,000 AFY for Phase 1 and 4,830 AFY for Phase II) to allow for the development of estimate cost for each of the delivery scenarios outlined in Section 4.3.3. The fixed costs represent the costs paid by the existing subcontractors for their Table A Allocation and capacity within the SWP and Coastal Branch systems. The variable costs represent the costs associated with the actual delivery of the water and are variable year to year as delivery amounts and delivery costs change.

Figure 3.8 provides an overview of the different cost elements and the process used to develop the estimates of costs for the existing SWP subcontractors. Figure 3.9 provides a summary of the different cost elements associated with the different points of delivery.

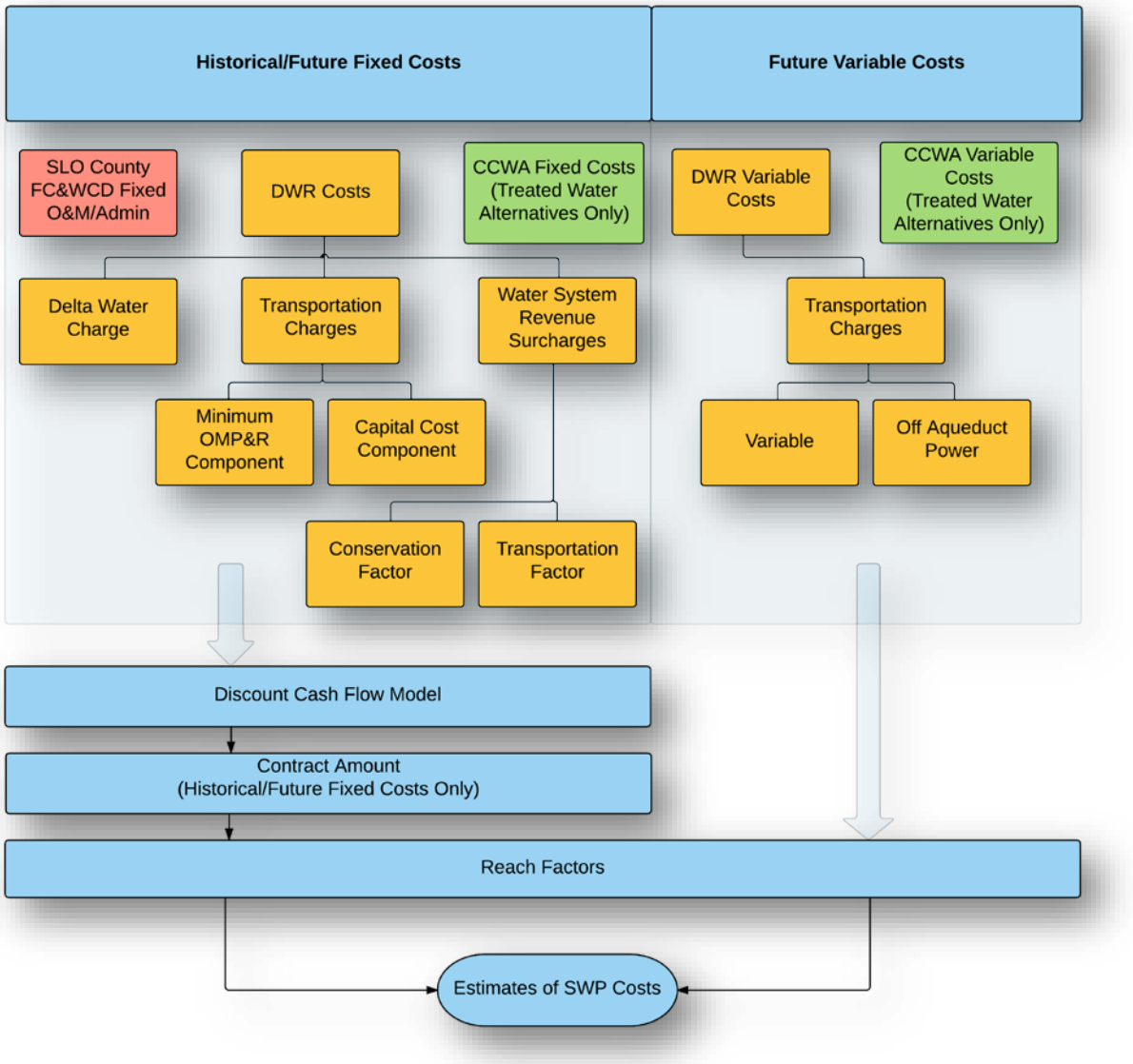


Figure 3.8 SWP Costs Analysis Overview

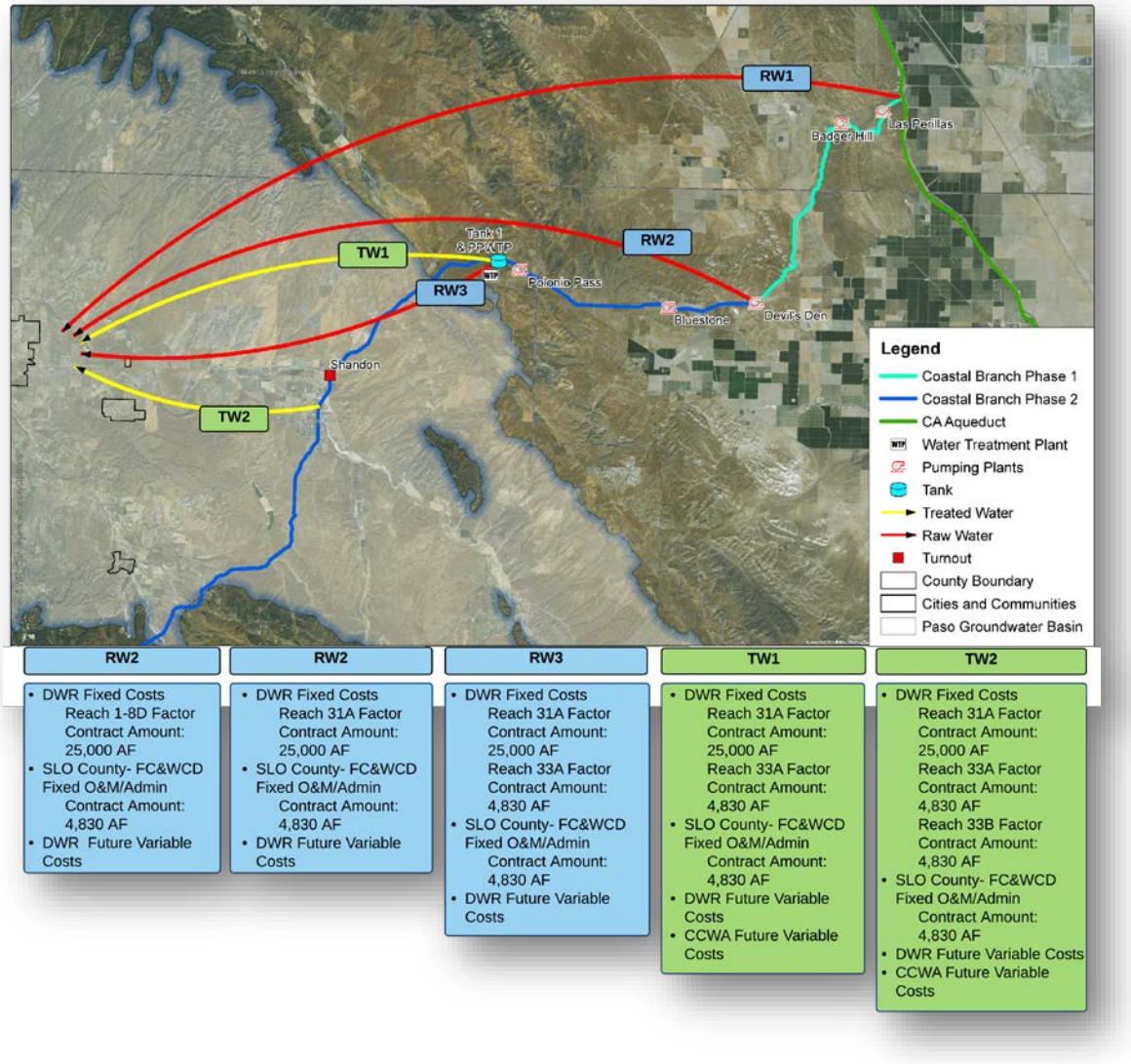


Figure 3.9 SWP Cost Analysis Point of Delivery Alternatives

The historical and future fixed costs represent estimates of the fixed costs paid by the existing SWP subcontractors for their Table A allocation at the respective point of delivery. These costs were then used to develop unit costs (i.e., $/AF) estimates for actual water delivered to each of the points of delivery. To develop the unit costs it was assumed that the operating period for a new subcontractor would be 20 years (i.e., 2015-2030) and that there would be an average future Annual Allocation of 58 percent, which is based on DWR estimates of future SWP reliability (1). Estimated costs for the raw water delivery scenarios range from $467 to $1,793 per AF. Estimated costs for treated water delivery scenarios range from $2,292 to $2,503 per AF. A summary of the results from the cost analysis is presented in Table 3.9.

Table 3.9	Summary SWP Cost Analysis Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District			
Point of Delivery	**Historical & Anticipated Future Fixed Costs for existing Subcontractors ($/AFY)**	**Unit Fixed Cost Estimate ($/AF)[3]**	**Variable Cost Estimate ($/AF)**	**Total Estimated Cost ($/AF)[3]**
RW1	$4,396	$379	$88	$467
RW2	$5,936	$512	$108	$620
RW3	$17,581	$1,516	$277	$1,793
TW1	$22,856	$1,970	$322	$2,292
TW2	$25,302	$2,181	$322	$2,503

4.4.2 Agreement with an existing SWP Subcontractor

There is also the potential for a Paso Basin entity to enter into an agreement to purchase SWP water from an existing SWP subcontractor. Purchasing SWP supply and capacity from an existing subcontractor could be accomplished through negotiations with one of the existing SWP subcontractors and since the point of delivery would be at or prior to the existing SWP subcontractor's turn-out, this option would likely not impact existing subcontractors.

The current SWP contracts differentiate between permanent and non-permanent Table A purchases. Under these contracts, there are provisions for the permanent sale of Table A water from one SWP contractor to another. However, the contracts do not have provisions for the direct non-permanent sale of SWP water between contractors. Currently non-permanent exchanges between contractors are allowed, with approval from DWR, but the exchange price must be based on an operation justification, due to the lack of provisions for selling water from one contractor to another. Though, included in the current SWP contract extension negotiations is a proposal to allow the non-permanent sale of SWP water between contractors.

Additional contacts amongst SWP subcontractors (e.g., Santa Ynez Exchange Agreement, etc.) may limit the ability of existing subcontractors to enter into agreements with an agency representing the Paso Basin.

[3] Includes assumption of a 20 year operating period (i.e., 2015-2030) for a new subcontractor and that there would be an average future Annual Allocation of 58% (1).

5.0 SUPPLY OPTIONS[4]

The purpose of this section is to describe the potential short and long-term SWP supply options that are available to the Paso Basin. The supply options covered are shown in Table 3.10 and further described in the sections below. Each of the supply options was characterized using the following criteria, where applicable:

- Estimate of Volume of Supply Available.
- Implementation Timeline.
- Solution Duration.
- Contractual or Technical Issues Identified.

5.1 SWP Supply Options

5.1.1 Unallocated Table A Purchase

The supply options described in this section include District Excess Allocation, Santa Barbara County Suspended Table A Allocation, and Ventura's Unused Table A Allocation. The deliverable amount of raw and treated water for each of these supply options is summarized in Table 3.11 and described in detail in the following sections.

5.1.1.1 Option 1: District Excess Allocation

The potential amount of water that could be delivered to Paso Basin utilizing the District's Excess Table A Allocation of SWP water is described under this option. The District's Excess Allocation is 15,273 AFY of Table A SWP water. However, when applying DWRs future predicted long term average annual allocation of 58 percent, the average amount of water actually available is approximately 8,858 AFY and this does not take into consideration the delivery constraints of the existing infrastructure and additional annual supply needs of the existing District subcontractors under Article 10 of the Local Water Supply Contracts (1). The delivery model described in Section 4.3 was used to calculate the deliverable amount of water to the Paso Basin (i.e., amount of water available for the Paso Basin considering supply and delivery constraints). Additional information on the delivery constraints is included in Section 4.3.3 and Appendix A.

[4] Refer to Section 4.1.1 for the description of the supply types of SWP covered in this section.

Table 3.10 SWP Supply Options Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District			
Supply Option	**Category**	**Option Title**	**Option Description**
Option 1	Table A	District Excess Allocation	Utilize District's 15,273 AFY of Excess Allocation Table A water.
Option 2		SBCFCWCD's Suspended Table A	Purchase SBCFCWCD's Suspended 12,214 AFY Table A Allocation.
Option 3		Ventura's Unused Table A	Purchase Ventura's unused 10,000 AFY.
Option 4		Purchase Permanent Table A Allocation from Coastal Subcontractor	Purchase Table A Allocation and delivery capacity from Coastal Branch subcontractor.
Option 5		Infrastructure Funding Agreement	Infrastructure funding in exchange for Table A Allocation to provide replacement water for seller or other seller-desired benefit.
Option 6	Non-Table A	Article 21	Purchase Article 21 water when available.
Option 7		Turnback Pool	Purchase Turnback Pool water when available.
Option 8		Multi-Year Program	Purchase Multi-Year Program water when available.
Option 9	Non-SWP	CVP Water purchase	Purchase CVP water for delivery through Coastal Branch.
Option 10		Non-CVP/Non-SWP Water purchase	Purchase Non-CVP or Non-SWP water for delivery through Coastal Branch.
Option 11	Groundwater	Outside Basin Groundwater Purchase	Private party would pump groundwater from Central Valley basin and deliver to the CA Aqueduct (direct or through exchange with westside partner).

Table 3.11 Deliverable Amount for Unallocated Table A Purchase Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District				
Scenario	**Point of Delivery**	**District Excess Allocation (AFY)**	**SBCFCWCD Suspended Allocation (AFY)**	**City of Ventura Unused Allocation (AFY)**
RW1	Phase I Turnout	8,858	7,084	5,800
RW2	Devil's Den	8,858	7,084	5,800
RW3a	PPWTP	8,858	7,084	5,800
RW3b	PPWTP	8,858	7,084	5,800
TW1a	PPWTP	8,858	7,084	5,800
TW1b	PPWTP	8,858	7,084	5,800
TW2a	Reach 2 Turnout (Shandon)	8,858	7,084	5,800
TW2b	Reach 2 Turnout (Shandon)	8,858	7,084	5,800
TW3	Reach 2 Turnout (Shandon)	1,045	1,045	1,045

Depending on the point of delivery and the associated delivery constraints, the average amount of District Excess Allocation that could be delivered to the Paso Basin each year is 8,858 AFY for raw water and ranges from 1,045 to 8,858 AFY for treated water. Additionally, DWR has developed modeled future Table A Annual Allocation predictions for wet and dry periods. DWR estimates the average Table A allocation will be 77 percent for a future 6-year wet period and an average allocation of 26 percent for a future 6-year dry period (1). The estimates of deliverable amount of water for average, wet and dry future conditions are shown in Table 3.12.

The timeline to implement the District Excess Allocation supply option is considered medium (5 to 10 years) because negotiations between the Paso Basin entity and the District, DWR, CCWA and existing subcontractors would need to be completed to allow the Paso Basin entity to utilize the Coastal Branch to deliver water to the Paso Basin. This supply option is considered permanent due to the ability to develop long-term agreements for the District's Excess Allocation.

Table 3.12 Deliverable Amount for District Excess Allocation DWR Future Wet and Dry Periods Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District				
Scenario	**Point of Delivery**	**Future Average Condition (AFY)**	**Future Wet Condition (AFY)**	**DWR Dry Condition (AFY)**
RW1	Phase I Turnout	8,858	11,760	3,971
RW2	Devil's Den	8,858	11,760	3,971
RW3a	PPWTP	8,858	11,760	3,971
RW3b	PPWTP	8,858	11,760	3,971
TW1a	PPWTP	8,858	11,760	3,971
TW1b	PPWTP	8,858	11,760	3,971
TW2a	Reach 2 Turnout (Shandon)	8,858	10,475	3,971
TW2b	Reach 2 Turnout (Shandon)	8,858	10,636	3,971
TW3	Reach 2 Turnout (Shandon)	1,045	1,045	1,045

Contractual and technical issues identified include[5]:

- Coastal Branch Capacity Negotiations – To implement this supply option, the Paso Basin entity would need to negotiate with the District, DWR, CCWA and existing subcontractors to become a new District subcontractor and be allowed to utilize the Coastal Branch to deliver the Excess Allocation water. Currently, the design of Phase II Coastal Branch and the Master Water Treatment Agreement limits the amount of water that District can deliver through Phase II of the Coastal Branch pipeline. These negotiations could include identifying reimbursement costs for existing SWP subcontractors for debt service and other fees paid to DWR, CCWA, and the District to cover infrastructure debt service and other associated costs.

- Carryover water Considerations - Purchase of the District's Excess Allocation would limit the amount of SWP carryover Water generated and held in San Luis Reservoir by the District. Reduced District carryover Water would likely limit the amount water available to the existing District subcontractors during periods of drought, as

[5]Contractual or technical issues common to multiple supply options are described initially in the first applicable supply option description and then referred to in "title only" in the subsequent supply options descriptions.

historically, the District has made carryover Water generated from its Excess Allocation available to District subcontractors during drought periods. Additional information on carryover water is provided in Section 4.1.

- Competition from other District SWP contractors - Before entering into a contract to sell its Excess Allocation water to a Paso Basin entity, the District will need to review its SWP Excess Allocation policies to determine who can purchase the water. The availability and the pricing of water for this supply option will likely be impacted by the number of other agencies that are also interested in obtaining this supply. At this point, interest by other entities in the water supply options described in this report has not been evaluated. Evaluation of interest by existing subcontractors to purchase additional SWP will be completed in the next phase of the project.

5.1.1.2 Option 2: SBCFCWCD's Suspended Table A

The potential amount of water that could be delivered to the Paso Basin utilizing the SBCFCWCD's Suspended Table A Allocation is described under this option. The total amount of SBCFCWCD's Suspended Table A SWP Water is 12,214 AFY. However, when applying DWRs future predicted long term average annual allocation of 58 percent, the average amount of water actually available is approximately 7,084 AFY. This amount of water does not take into consideration the delivery constraints of the existing infrastructure. Depending on the point of delivery and the associated delivery constraints, the average amount of SBCFCWCD's Suspended Table A Allocation that could be delivered to the Paso Basin each year equals approximately 7,084 AFY for raw water and ranges from 1,045 to 7,084 AFY for treated water. Additional information on the delivery constraints is included in Section 4.3.3 and Appendix A.

The timeline to implement the SBCFCWCD's Suspended Table A Allocation supply option is considered medium (5-10 years) due to the time needed to change the contractual agreements and to construct the necessary delivery infrastructure. This supply options is considered permanent due to the ability to develop long-term agreements for the SBCFCWCD's Suspended Table A Allocation.

Contractual and technical issues identified include:

- The CCWA is currently in negotiations with DWR to purchase the SBCFCWCD's Suspended Table A Allocation and it has yet to be determined if the CCWA will purchase or be allowed to re-purchase the SBCFCWCD's Suspended Table A supply.

- The CCWA subcontractors have first right of refusal for SWP water being offered outside of Santa Barbara County and there is significant interest amongst the CCWA subcontractors for the Suspended Table A water.

- Coastal Branch Capacity Negotiations.
- Competition from other SWP contractors.

5.1.1.3 Option 3: Ventura Unused Table A

The potential amount of water that could be delivered to the Paso Basin utilizing the City of Ventura's Unused Table A Allocation is described under this option. The total amount of Ventura's Unused Table A SWP Water is 10,000 AFY. However, when applying DWRs future predicted long term average annual allocation of 58 percent, the average amount of water actually available is approximately 5,800 AFY. This amount of water does not take into consideration the delivery constraints of the existing infrastructure. Depending on the point of delivery and the associated delivery constraints the average amount of Ventura's Unused Table A Allocation that could be delivered to the Paso Basin each year equals approximately 5,800 AFY for raw water and ranges from 1,045 to 5,800 AFY for treated water. Additional information on the delivery constraints is included in Section 4.3.3. and Appendix A.

The timeline to implement the Ventura's Unused Table A Allocation supply option is considered medium (5-10 years) due to the time needed to change the contractual agreements and to construct the necessary infrastructure. This supply option is considered permanent due to the ability to develop long-term agreements for the Ventura's Unused Table A Allocation.

Contractual and technical issues identified include:

- The City of Ventura is currently not interested in selling its SWP water.
- Coastal Branch Capacity Negotiations.
- Competition from other SWP contractors.

5.1.2 Allocated Table A Purchase

The following supply options include the purchase of different types of SWP water from an existing SWP subcontractor on a permanent (i.e., take over the contract for the amount of water and become a participant) basis.

5.1.2.1 Option 4: Purchase Permanent Table A Allocation from Coastal Branch Subcontractor

This supply option includes purchase of SWP water, including delivery capacity, from an existing District or Santa Barbara subcontractor on a permanent basis. This option could include cooperative exchange agreements that provides water for the Paso Basin under certain circumstances (e.g., wet years) and reserves water for the partnering agency under other circumstances (e.g., dry years). Analysis of historical subcontractor deliveries identified that there are years when the existing subcontractors do not take full delivery of

their SWP supplies. These agencies may be interested in cooperating with a Paso Basin entity to cooperatively exchange portions of their SWP supply.

To develop preliminary estimates of the amount of water that could potentially be available under this supply option, calculations of average amount of undelivered water service amount and drought buffer for the existing District and CCWA subcontractors from 2005 to 2014 were developed and are shown in Table 3.13. These estimates do not account for water that may not have been requested to be delivered by the subcontractors so that it could be used to generate storage in San Luis Reservoir. Storing water in San Luis Reservoir provides the District and CCWA subcontracts with the ability to carry over water from year to year and is an important component of many agencies water supply management strategies. However, this carryover water is lost if San Luis Reservoir spills, therefore, District and CCWA subcontractors are evaluating alternative storage measure (e.g., groundwater storage) to improve water supply reliability. To identify opportunities for cooperative agreements, additional stakeholder outreach is needed to determine the level of interest of the existing subcontractors.

Table 3.13 Undelivered SWP Calculations
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

	Average Undelivered Water Service Amount (AFY)	Average Undelivered Drought Buffer (AFY)
District Subcontractors	245	1,908
CCWA Subcontractors	4,883	23

The timeline to implement this supply option is considered short (0-5 years) because there is the potential that an existing agency or landowner could purchase this water from an existing subcontractor. This supply option would come with contractual capacity within the existing infrastructure and the purchaser could take delivery of this water in the very near term. However, if the purchasing agency is yet to be developed, then the timeframe for this supply option would be considered medium or long term. This supply option is considered permanent because current SWP contracts prohibit the temporary sale of SWP from one contractor to another. Under this option, an agency representing the Paso Basin would negotiate with an existing Coastal Branch subcontractor to take over all or a portion of their SWP Table A amount and associated SWP and Coastal Branch capacity. This option would require involvement by the District, CCWA and DWR.

Contractual and technical issues identified include:

- Existing SWP subcontractors may want input into the terms and conditions of the sale of SWP supply and capacity.

- Coastal Branch Capacity Negotiations.
- Competition from other SWP contractors.

5.1.2.2 Option 5: Infrastructure Funding Agreement

This supply option includes investing in a water supply project for another entity in exchange for an equitable amount of SWP water from the entity benefitting from the water supply project. For example, an agency representing the Paso Basin could participate funding a recycled water or desalination project for one of the existing District subcontractors and receive SWP water in exchange. Estimates of the amount of water that could be made available for the Paso Basin through an infrastructure funding agreement have not been developed at this point. Additional outreach to potential partnering agencies is required to develop more defined estimates of available supply. Additionally, the District Board of Supervisors directed staff on May 19, 2015 to evaluate desalination opportunities in San Luis County. The results of this study and resulting projects may provide additional opportunities for infrastructure funding exchange opportunities for the Paso Basin in the future.

The timeline to implement this supply option is considered long (10 to 15 years) because of the need to identify a SWP contractor willing to exchange SWP water for infrastructure funding and the time needed to complete the project. This supply option is considered permanent because the purchaser would most likely take over the applicable SWP contract for the water.

Contractual and technical issues identified include:

- Need to identify SWP contractor with viable water supply project.
- Development of contractual agreements for infrastructure funding and SWP water exchange.

5.1.3 Option 6: Article 21

This supply option includes purchasing Article 21 SWP water when made available by DWR. DWR's models for future predictions estimate that on average there will be 62,000 AFY of Article 21 SWP water available. Article 21 Water is made available to the SWP contractors at a ratio equal to their percentage share of the total SWP Table A Allocation (1). For the District, this portion equals approximately 0.6 percent (if all contractors are requesting the water). Table 3.14 outlines the average amount of Article 21 Water that DWR predicts will be available and the potential amount that would be available to the District.

Table 3.14 Future Article 21 Water Availability Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District	
Supply Type	**Long Term Average-Future Conditions (AFY)**
Article 21 Total for Entire SWP	62,000
District Portion (0.6%)	372

The timeline to implement this supply option is considered medium (5-10 years). Although there is an existing program within DWR to make water available, negotiations between the Paso Basin entity and the District, CCWA and existing subcontractors would need to be completed to create a new subcontractor and obtain capacity to delivery this water to the Paso Basin through the Coastal Branch. This supply option is considered temporary due to the variable availability of Article 21 Water.

Contractual and technical issues identified include:

- Very infrequent availability due to current regulatory limits on San Luis Reservoir and Delta Export operations.
- Limited Proportional Share – This water supply is made available to all SWP contractors at a ratio equal to their percentage share of the total SWP Table Allocation. For the District this ratio equals 0.6 percent to the total amount of water made available, assuming all of the SWP contractors are requesting the water.
- Coastal Branch Capacity Negotiations.

5.1.4 Option 7: Turnback Pool

This supply option includes purchasing Turnback Pool SWP water when made available. Table 3.15 outlines the average amount of Turnback Pool Water that has been historically made available. Information obtained from DWR indicates that Turnback Pool Water will be less or unavailable in future years (12). The Turnback Pool water was developed because historically SWP supplies were not being fully utilized and the Turnback Pool provided a mechanism for that water to be made available to agriculture at economical rates. Additionally, Turnback Pool Water is made available to the SWP contractors at a ratio equal to their percentage share of the total SWP Table A Allocation (i.e., District portion equals approximately 0.6 percent). Therefore, the portion of the Turnback Pool that would be available for the Paso Basin is very limited.

Table 3.15 Average Turnback Pool SWP Availability (AFY) Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District		
Supply Type	**10 Year Average (2002-2012)**	**5 Year Average (2008-2012)**
Turnback Pools for Entire SWP	662	473
District Portion	4	3

The timeline to implement this supply option is considered medium (5-10 years). Although this is an existing program within DWR to make water available, negotiations between the purchasing agency and the existing subcontractors would need to be completed to obtain capacity to deliver this water to the Paso Basin. This supply option is considered temporary due to the variable availability of Turnback Pool Water.

Contractual and technical issues identified include:

- Very infrequent availability due to limited participated by SWP contractors in the pool.
- Limited Proportional Share.
- Coastal Branch Capacity Negotiations.

5.1.5 Option 8: Multi-Year Program

This supply option includes purchasing Multi-Year Program water when made available. The 2013-14 Multi-Year Water Pool Demonstration Program was implemented as a trial program to improve water management flexibility within the SWP system. The amount of water available through a future Multi-Year Program is not available at this point. The timeline to implement this supply option is considered medium (5 to 10 years). The first multi-year program was only a trial and negotiations between the purchasing agency and the existing subcontractors would need to be completed to obtain capacity to deliver this water to the Paso Basin. This supply option is considered temporary due to the variable availability of water through a future Multi-Year Program.

Contractual and technical issues identified include:

- Variable Availability.
- Coastal Branch Capacity Negotiations.
- Competition from other SWP contractors.

5.2 Non-SWP Supply Options

The following supply options consider obtaining water from sources other than the SWP system and delivering those to the Paso Basin through existing SWP infrastructure. There are numerous examples/precedents of water from outside sources being transferred/conveyed through SWP infrastructure and delivered to SWP contractors, many of which are single-year transfers. However, every circumstance has historically been unique. Thus, any proposed short or long-term lease or outright purchase of water from sources other than the SWP that will require conveyance in the SWP system will need to be evaluated on a case-by-case basis. While these options are contractually complicated, especially when occurring for multiple years in a row, they could provide opportunities for short-term water supply for the basin while a more permanent solution is developed.

5.2.1 Option 9: Central Valley Project (CVP) Water Purchase

This supply option would include purchasing CVP water for delivery through the SWP and Coastal Branch. Estimates for the amount of CVP Water that could be obtained are not available at this point. Additional outreach is required to develop estimates of availability. The timeline to implement this supply option is considered medium (5-10 years). Agreements with CVP contractors would need to be developed and negotiations between the purchasing agency and the existing subcontractors would need to be completed to obtain capacity to deliver this water to the Paso Basin. This supply option is considered permanent due to the ability to develop long-term agreements for CVP water.

Contractual and technical issues identified include:

- Obtaining approval from U.S. Bureau of Reclamation to deliver CVP water outside of the CVP place of use.
- DWR Approval Required – To convey water from outside the SWP through the SWP system, DWR must approve that the transfer of the water does not injure another party and that sufficient capacity is available.
- SWRCB Approval - This supply option requires obtaining approval from the State Water Resources Control Board (SWRCB) to change the characteristics of the underlying water right being purchased (with the exception of pre-1914 water rights).
- Coastal Branch Capacity Negotiations.
- Competition from others seeking available water supplies.

5.2.2 Option 10: Non-CVP/Non-SWP Water Purchase

This supply option would include purchasing Non-CVP/Non-SWP water for delivery through the SWP and Coastal Branch. Estimates for the amount of Non-CVP/Non-SWP that could be obtained are not available at this point. Additional outreach is required to develop

estimates of availability. The timeline to implement this supply option is considered medium (5-10 years). Agreements with Non-CVP/Non-SWP water right holders would need to be developed and negotiations between the purchasing agency and the existing subcontractors would need to be completed to obtain capacity to deliver this water to the Paso Basin. This supply option is considered permanent due to the ability to develop long-term agreements for Non-CVP/Non-SWP water.

Contractual and technical issues identified include:

- DWR Approval Required.
- SWRCB Approval.
- Coastal Branch Capacity Negotiations.
- Competition from others seeking available water supplies.

5.2.3 Option 11: Outside Basin Groundwater Purchase

This supply option would include purchasing groundwater from outside of the Paso Basin for delivery to the Paso Basin through existing SWP and Coastal Branch infrastructure. Estimates for the amount of outside basin groundwater that could be obtained are not available at this point. Additional outreach is required to develop estimates of availability.

The timeline to implement this supply option is considered medium (5-10 years). Agreements with groundwater rights holders outside of the basin would need to be developed. Negotiations between the purchasing agency and the existing subcontractors would need to be completed to obtain capacity to deliver this water to the Paso Basin. This supply option is considered permanent due to the ability to develop long-term agreements for outside of the basin groundwater.

Contractual and technical issues identified include:

- Potentially obtaining other regulatory approvals, including permissions to export groundwater from existing groundwater basins that may be governed by a county, water management entity, or a new Groundwater Sustainability Agency as defined under the recently adopted Sustainable Groundwater Management Act.
- DWR Approval Required.
- SWRCB Approval.
- Coastal Branch Capacity Negotiations.
- Competition from others seeking available water supplies.

6.0 PRELIMINARY EVALUATION OF OPTIONS

This purpose of this section is to evaluate the identified SWP water supply options or other supply options that would utilize SWP infrastructure and determine whether they should be deferred due to one or more of the criteria below or if they are appropriate for further evaluation in more detail in the next phase of the study. This evaluation also identifies any potential fatal flaws with the options. The criteria for the evaluation include:

- Institutionally/contractually/financially complicated compared to other options.
- Other option would need to be implemented first (not an independent project).
- Not sufficient water supply available.
- Potential key partner not interested.
- Strong opposition at this time.

6.1 SWP Supply Option and Evaluation

The results of the preliminary evaluation are shown in Table 3.16 and the resulting recommendations for placement are shown in Table 3.17.

7.0 SUMMARY OF FATAL FLAWS ANALYSIS AND RECOMMENDATIONS FOR FURTHER CONSIDERATION

The purpose of this section is to summarize the results of the SWP supply options evaluation and describe the next steps for the project.

7.1 Pass to Rough Screening

Based on the results of the Fatal Flaw/Deferred Option screening, the following SWP Supply Options are recommended for the next step in the evaluation process and to be included in the Rough Screening list of Supply Options:

- Utilize the District's Excess Allocation of Table A water.
- Permanent purchase of SWP water from a Coastal Branch Subcontractor.

Table 3.16 Comparison of SWP Supply Options Evaluation – Fatal Flaw Analysis Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District

Option	Supply Option	Uncomplicated[1]	Independent[2]	Sufficient[3]	Partner Support[4]	Public Support[5]
1	District Excess Allocation	●	◗	●	●	◗
2	SBCFCWCD's Suspended Table A	○	◗	●	○	◗
3	Ventura's Unused Table A	●	◗	●	○	◗
4	Purchase Permanent Table A Allocation from Coastal Subcontractor	◗	●	●	◗	◗
5	Infrastructure Funding Agreement	○	○	●	◗	◗
6	Article 21	●	◗	○	◗	◗
7	Turnback Pool	●	◗	○	◗	◗
8	Multi-Year Program	●	◗	○	◗	◗
9	CVP Water purchase	○	◗	●	◗	◗
10	Non-CVP/Non-SWP Water purchase	○	◗	●	◗	◗
11	Outside Basin Groundwater Purchase	○	◗	●	◗	◗

Notes: ● = positive (meets criteria); ◗= neutral; ○ = negative (does not meet criteria).

(1) Less institutionally/contractually/financially complicated compared to other options.
(2) Independent project, not reliant on implementation of other project first.
(3) Greater water supply available compared to other options.
(4) Potential key partner(s) are interested.
(5) Anticipated public support for project at this time.

Table 3.17 Comparison of SWP Supply Options – Summary Table
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

Supply Option	Supply Option Title	Estimated Average Annual Deliverable Amount of Water (AFY)	Timeline/ Duration[(1)]	Criteria Triggered	Placement
Option 1	District Excess Allocation	1,045 – 8,858	M/P	None	Pass to Rough Screening
Option 2	SBCFCWCD's Suspended Table A	1,045 – 7,084	M/P	Institutionally/contractually/ financially complicated	Deferred
Option 3	Ventura's Unused Table A	1,045 – 5,800	M/P	Potential key partner not interested	Deferred
Option 4	Purchase Permanent Table A Allocation from Coastal Subcontractor	0 – 7,059	S/P	None	Pass to Rough Screening
Option 5	Infrastructure Funding Agreement	TBD	L/P	Institutionally/contractually/ financially complicated	Deferred
Option 6	Article 21	372	M/T	Not sufficient water supply available	Fatal Flaw
Option 7	Turnback Pool	4	M/T	Not sufficient water supply available	Fatal Flaw
Option 8	Multi-Year Program	TBD	M/T	Institutionally/contractually/ financially complicated	Deferred
Option 9	CVP Water purchase	TBD	M/P	Institutionally/contractually/ financially complicated	Deferred
Option 10	Non-CVP/Non SWP Water purchase	TBD	M/P	Institutionally/contractually/ financially complicated	Deferred
Option 11	Outside Basin Groundwater Purchase	TBD	M/P	Institutionally/contractually/ financially complicated	Deferred

Notes:
(1) Short-term (S), Medium-Term (M) or Long-Term (L) / Temporary (T) or Permanent (P).

7.2 Fatal Flaw List

Based on the preliminary evaluation of potential SWP water supply projects, the following options were screened out due to insufficient water being available:

- Purchase of Article 21 water, when available.
- Purchase Turnback Pool water, when available.

7.3 Deferred List

Based on the preliminary evaluation of potential SWP water supply projects, many options were contractually or institutionally complicated. Therefore these options were not top ranked and are to be considered at a later date:

- Purchase SBCFCWCD's Suspended Table A Allocation.
- Purchase Ventura's unused Table A Allocation.
- Infrastructure funding in exchange for Table A Allocation to provide replacement water for seller or other seller-desired benefit.
- Purchase Multi-Year Program water when available.
- Purchase CVP water for delivery through Coastal Branch.
- Purchase Non-CVP or Non-SWP water for delivery through Coastal Branch.
- Outside Basin Groundwater Purchase.

7.4 Next Steps – Strategy Development

This initial phase of work has identified supply options from each of the supply types (Nacimiento, SWP and Recycled Water) available to supplement the Paso Robles Basin in terms of quantity, suitable uses, transfer points and implementation issues. In the next phase of work, the options that passed this initial screening will be carried forward into a more detailed strategy development process. The options will be further evaluated as to the reliability of supply (quantity and quality), potential costs, environmental impacts, schedule for implementation, time of use, regulatory/legal/permitting approvals, public acceptance, and technical complexity.

Additional tasks to be completed in the next phase include:

- Using the computer model of the Paso Basin to identify the potential benefits that may be gained from implementation of one or more of these options.

- Evaluate the potential to combine options for additional cost effectiveness and greater benefit.
- Investigate interest amongst the existing SWP subcontractors in participating in cooperative exchange programs with the Paso Basin.

8.0 WORKS CITED

1. Department of Water Resources. *Final Delivery Reliability Report 2013.* 2013.
2. *The State Water Project Final Delivery Capability Report 2015.* 2015.
3. Supervisors, San Luis Obispo County Flood Control & Water Conservation District Board of. *State Water Project Excess Entitlement Policies.* 2003.
4. Central Coast Water Authority. The State Water Project in Santa Barbara County. *CCWA website.* [Online] http://www.ccwa.com/history/index.html.
5. Authority, William J. Brennan. Executive Director of Central Coast Water. Answers to Supervisor Farr's questions regarding the reacquisition of 12,214 acre-feet of State Water for CCWA grought buffer purposes. January 15, 2010.
6. Authority, Central Coast Water. Presentation to Santa Barbara County Board of Supervisors- Building a Better Drought Buffer. January 19, 2010.
7. Stubchaer, Jim. Questions and Answers Regarding CCWA Reacquisition of Relinquished State Water Project Entitlement,Prepared for the Central Coast Water Authority. March 2005.
8. RBF. *2013 Comprehensive Water Resources Report.* 2013.
9. Joint Exercise of Powers Agreement Between State of California and the Central Coast Water Authority, relating to the Operations and Maintenance of the Coastal Branch, Phase II. October 1, 1996.
10. Master Water Treatment Agreement. 1992.
11. Ammendment 1 - Master Water Treatment Agreement Between the Central Coast Water Authority and the San Luis Obispo County Flood Control and Water Conservation District. March 1, 1992.
12. Trombly, Craig. *State Water Project Analysis Office.* September 22nd, 2014.
13. Brady, John. *Deput Director, Operations and Engineering.* June 12, 2015.
14. Department of Water Resources. Department of Water Resources. *California State Water Project Today.* [Online] [Cited: November 14, 2014.] http://www.water.ca.gov/swp/swptoday.cfm.
15. Brady, John. *Deputy Director, Operations and Engineering.* October 9, 2014.

16. Department of Water Resources. Contract Between the State of California Department of Water Resources and the San Luis Obispo County Flood Control and Water Conservation District for a Water Supply. s.l. : DWR, 1963.

17. Contact between the State of California Department of Water Resources and the Santa Barbara County Flood Control and Water Conservation District for a Water Supply. 1963.

18. *California State Water Project Atlas.* 1999.

19. Provost & Pritchard. *Coastal Aqueduct Capacity Preliminary Study.* 2009.

20. Water Systems Consulting, Inc. *Capacity Assessment of the Coastal Branch, Chorro Valley & Lopez Pipelines.* 2011.

APPENDIX A – SWP DELIVERY CONSTRAINTS

APPENDIX A – SWP DELIVERY CONSTRAINTS

1.0 DELIVERY CONSTRAINTS

This appendix describes in detail the various physical and contractual delivery constraints that govern the operation of the Coastal Branch pipeline system. These constraints were incorporated into a delivery model and utilized to develop estimates of available delivery capacity and the deliverable amount of water for the various supply options evaluated in this report.

1.1 California Aqueduct

The California Aqueduct travels 444 miles from the Banks Pumping Plant, in the California Delta, to Southern California (14).

1.1.1 Physical Constraints

The California Aqueduct is a trapezoidal shaped open channel conduit that is as wide as 100 feet and as deep as 32.8 feet in certain locations and has a maximum channel capacity of 13,100 cubic feet per second (cfs) or 9,483,967 acre-feet per year (AFY). While there are capacity limitations within the aqueduct, conversations with CCWA staff have indicated that the aqueduct has not been a limiting constraint for operation of the Coastal Branch (15).

1.1.2 Contractual Constraints

The District's contract with DWR indicates that DWR shall not be obligated to deliver water to the agency through all delivery structures at a combined instantaneous rate of flow exceeding 35 cfs (25,339 AFY) (16). CCWA's contract with DWR originally identified an instantaneous capacity limitation of 83 cfs (60,089 AFY), however, the contract was amended in 1964 to reduce the limit to 80 cfs (57,917 AFY) and further reduced by amendment to 63 cfs (45,610 AFY) in 1981 (17).

1.2 Phase I

Phase I of the Coastal Branch, which was placed into operation in 1968, connects to the California Aqueduct, south of Kettleman City near Interstate 5, and conveys water though a 15-mile long canal through Kings and Kern Counties to the Devil's Den Pumping Plant forebay (18). Included in Phase I are two pumping plants: Las Perillas and Badger Hill.

1.2.1 Physical Constraints

Phase I was designed to convey 450 cfs (325,785 AFY) with a freeboard of 1.5 ft. However, based on review of historic field data, it does not appear that the designed flow can be achieved. A capacity study completed in 2009 by Provost & Pritchard determined that there

are currently capacity limitations that limit DWR's ability to safely operate Phase I at full capacity. The study provided several operational and maintenance recommendations that should be implemented before further study was conducted on the Phase I hydraulic capacity limitations (19).

1.2.2 Contractual Constraints

The District's and CCWA's contractual constraints for Phase I are outlined in the contracts with DWR for the delivery of SWP water. The most current amended versions of these contracts state that DWR shall not be obligated to deliver a flow rate greater than 35 cfs (25,339 AFY) and 63 cfs (45,610 AFY) to the District and CCWA, respectively.

Phase I of the Coastal Branch was constructed prior to the District finalizing its schedule for SWP Allotments with its subcontractors, therefore, it was designed to provide conveyance for the District's full Table A Amount of 25,000 AFY with an instantaneous flow rate limit of 35 cfs.

1.3 Phase II

The Coastal Branch is divided into seven different reaches of varying diameters. Table A.1 outlines the diameters, lengths and design capacities for each of the reaches. The hydraulic analysis performed as part of the Coastal Branch Capacity Assessment identified excess capacity in Reaches 1 – 6 (20).

Table A1 Coastal Branch Pipeline Reaches
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County and Water Conservation District

Pipeline Section	Owner	Type	Pipe Diameter (in)	Length (miles)	Design Capacity (cfs)(1)	Design Capacity (AFY)
Reach 1	DWR	Steel	48	16.2	71	51,402
Reach 2	DWR	Steel	48	16.55	71	51,402
Reach 3	DWR	Steel	48	13.14	71	51,402
Reach 4	DWR	Steel	51	6.99	71	51,402
Reach 5A1	DWR	Steel	42	8.99	68	49,230
Reach 5A2	DWR	Steel	42/39	9.02	68	49,230
Reach 5B	CCWA	Steel	42	11.25	64	46,334
Reach 6	CCWA	Steel	42	16.82	33	23,891

Notes:
(1) Pipeline design capacity after CCWA's purchase of an additional 10% of supply and capacity, which occurred prior to final design and construction of the pipeline. Design capacity was obtained from the Coastal Branch Treated Water Aqueduct Operations manual, which differs slightly from the Santa Barbara County State Water Supply Contract, Table B-1 and B-2 (Amendment 18) (17).

1.3.1 Reach 1

Reach 1 consists of approximately 16.2 miles of pipeline and three pumping plants; Devil's Den; Bluestone; and Polonio Pass. Each pumping plant is equipped with six identical pumps. Five of the pumps are designed to pump at one time, with the sixth unit as reserve.

1.3.1.1 Physical Constraints

Based on analysis completed for the Coastal Branch Capacity Assessment, it was estimated that the maximum capacity of the pumping plants along Reach 1 was approximately 100 cfs (72,397 AFY). This capacity estimate significantly exceeds the design capacity because the design capacity includes an off-peak electrical period pumping limitation. Reach 1 was designed to be able to deliver the necessary water to meet the District's and CCWA's peak demands while only pumping during off-peak electrical periods or 17 out 24 hours per day. However, if necessary, pumping could occur 24 hours per day.

1.3.1.2 Contractual Constraints

Under CCWA's contract with DWR for SWP Water, DWR is not obligated to deliver an instantaneous flow rate greater than 63 cfs (45,610 AFY) to CCWA. However, due to the off-peak pumping design considerations CCWA and the District receive delivery of water at a higher instantaneous flow rate than outlined in the contract.

The District's contractual capacity for Reach 1 is reduced to 7.17 cfs (5,191 AFY) according to Table B of the SBCFCWCD's contract with DWR (17). Presumably, this is because the District only participated in funding for 4,830 AFY of capacity for Phase II of the Coastal Branch.

1.3.2 Polonio Pass Water Treatment Plant

The PPWTP treats water at the end of Reach 1 through a treatment process that includes flash mixing, coagulation/flocculation, sedimentation, filtration and disinfection.

1.3.2.1 Physical Constraints

Analysis completed for the Coastal Branch Capacity Assessment determined that the maximum capacity of the PPWTP was 75.6 cfs (54,732 AFY) . This capacity assessment allows for downtime of the filtration system to allow the plant to sustain this production rate (20).

1.3.2.2 Contractual Constraints

The Master Water Treatment Agreement between the District and CCWA limits the District's treatment capacity at the PPWTP to 4,830 AFY, corresponding to the District's water supply contracts with the District Subcontractors (11).

1.3.3 Reaches 2 - 6

Reaches 2 - 6 consist of 84 miles of gravity flow pipeline, four storage tanks (i.e., Tank Site 2, Tank Site 5), and a flow control structure (i.e., Energy Dissipating Valve (EDV)). Reaches 2-6 are owned by DWR, but operated by CCWA.

1.3.3.1 Physical Constraints

Analysis of the capacity of Reaches 2 – 6 completed for the Coastal Branch Capacity Assessment determined that there was significant excess capacity to deliver water above its design value, especially for the turnouts north of the EDV (i.e., Shandon, Chorro Valley). Specifically, there was approximately 10,810 AFY or 893 AFM of additional capacity to deliver water to the Shandon turnout without affecting the capacity of the existing subcontractors (20).

1.3.3.2 Contractual Constraints

The District's contractual capacity for Reaches 2 – 4 is reduced to 7.17 cfs (5,191 AFY) and 3.56 cfs (2,577 AFY) for Reach 5A1 and 5A2 according to Table B of the SBCFCWCD's contract with DWR. CCWA's capacity for those reaches is 63.82 cfs (46,204 AFY) (17).