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TECHNICAL MEMORANDUM

A REVIEW OF ALTERNATIVES TO IMPROVE THE RELIABILITY OF CCWA'S STATE WATER PROJECT SUPPLY

PREPARED FOR

CENTRAL COAST WATER AUTHORITY

PREPARED BY

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SECTION 1 INTRODUCTION

1.1 Purpose of the Study

The water demand and supply conditions of California have changed in recent years and will continue to change in the future. This change is due in part to the increasing water demands which are reflective of the increasing population of the state and the increasing in-stream demands which have been promulgated by environmental, fish and wildlife preservation concerns. The in-stream demands have and will continue to be met by the reallocation of what was once considered municipal and agricultural water supplies. These changing supply and demand conditions, compounded by the recurrence of drought events in the state's hydrological cycle have, and will continue to affect the level of reliability of the State Water Project (SWP) water supply which is available for municipal and agricultural use.

In 1991, the residents of Santa Barbara County voted to import water from the SWP. Following the voter mandate, the Central Coast Water Authority (CCWA) was formed as the agency which would represent the purveyors and other water users in the financing, construction, management and operation of regional treatment facilities and of Santa Barbara's portion of the SWP water supply facilities. The project participants, through CCWA, have a total SWP water supply entitlement of 42,986 acre-feet per year (ac-ft/yr).

Each project participant's entitlement is different and is based on the projected supplemental water needs of the participant. CCWA's project participants originally contracted for a total SWP entitlement of 39,078 ac-ft/yr. However, in order to firm-up the reliability of the SWP water supply, the project participants, through CCWA, contracted with the Department of Water Resources (DWR) to retain an additional 3,908 ac-ft/yr which could be used to firm-up the original contract entitlement. The goal of the project participants was to utilize this additional 3,908 ac-ft/yr as part of their source supply or as a backup supply which could be used to makeup deficiencies or reductions in the SWP water deliveries. This 3,908 ac-ft/yr is hereinafter referred to as the drought buffer. Table 1-1 presents a listing of the project participants and their respective shares of the CCWA SWP entitlement.

Table 1-1
CCWA Project Participants
Allocation of SWP Entitlement

Project Participant	Original Contracted SWP Entitlement (ac-ft)	% Share of SWP Entitlement (ac-ft)	Drought Buffer Share of SWP Entitlement (ac-ft)	Total SWP Entitlement (ac-ft)
Buellton, City of	578	1.48%	58	636
Carpinteria C.W.D.	2,000	5.12%	200	2,200
Goleta W.D.	4,500	11.52%	450	4,950
Guadalupe, City of	550	1.41%	55	605
La Cumbre M.W.D.	1,000	2.56%	100	1,100
Montecito W.D.	2,700	6.91%	270	2,970
Morehart Land Co.	200	0.51%	20	220
Sta. Barbara, City of	3,000	7.68%	300	3,300
Sta. Barbara Rsrch. Ctr.	50	0.13%	5	55
Santa Maria, City of	16,200	41.46%	1620	17,820
Sta. Ynez River WCD, ID #1	500	1.28%	50	550
Solvang, City of (1.)	1,500	3.84%	150	1,650
So. California W.C.	500	1.28%	50	550
Summerland W.C.	300	0.77%	30	330
Vandenberg A.F.B.	5,500	14.07%	550	6,050
TOTALS	39,078	100%	3,908	42,986

(1.) The city of Solvang has not contracted with CCWA for a SWP entitlement; rather it has entered into an agreement with Santa Ynez ID#1 to receive 1,500 ac-ft/yr of its SWP entitlement.

1.2 Scope of Work and Authorization

Bookman-Edmonston Engineering, Inc. (B-E) was retained by the CCWA to perform an assessment, at a reconnaissance level, of the reliability of the SWP supply and also to identify opportunities for the utilization of the drought buffer as part of the process to firm-up the reliability of the SWP water supply. Authorization for this work was made pursuant to CCWA Board of Director's approval of Resolution No. 94-15 on February 24, 1994, as later amended by Resolution 94-65 on September 22, 1994.

The work plan for this assignment consists of a two phase approach which is hereinafter referenced as Phases "A" and "B". The Phase "A" Scope of Work generally consisted of the following tasks:

- Conduct investigations, at a reconnaissance level, and perform the necessary analysis to formulate an assessment of the level of reliability of the State Water Project (SWP) water supply and the possible impact, in terms of reliability, to CCWA's entitlement and deliveries from the SWP.

- Conduct a reconnaissance-level feasibility study to identify opportunities available to CCWA for increasing the reliability of the SWP water supply and deliveries.

- Prepare a Technical Memorandum which summarizes the reliability of future SWP water supplies, the programs or opportunities available for increasing CCWA's reliability of its portion of the SWP water supply and provide recommendations for a preferred program alternative.

This report generally outlines the work conducted under Phase "A" and discusses the findings thereof. The Phase "B" work was not approved by the CCWA Board of Directors as that work could only be defined subsequent to the completion of the Phase "A" work. The Phase "B" work would consist of providing assistance to CCWA in the implementation of the preferred program alternative.

SECTION 2 ASSESSMENT ON THE RELIABILITY OF THE SWP SUPPLY

2.1 Reliability of the SWP Water Supply

The availability of future SWP water supplies will vary with the hydrologic cycles of the state. During wet years, the SWP will be able to deliver sufficient water to meet most or all of the SWP delivery requests. In the future, during extended dry year conditions, such as that period from 1986 to 1992, the SWP will be able to deliver only a portion of the requested deliveries. As an example, in 1991, agricultural water contractors were allocated no SWP water and deliveries to municipal water contractors were reduced. Reductions to municipal water agencies varied but averaged 20% of their SWP contract entitlement. As an example in 1991, the Metropolitan Water District of Southern California, which is the largest SWP contractor and has a total SWP entitlement of 2,011,500 ac-ft/yr, received only 381,070 ac-ft (18.9%) of its entitlement. Metropolitan was able to secure an additional 225,000 ac-ft that year through purchases from the State Water Bank.

Results of a statistical model were used to assess the reliability of future SWP water supplies. This model is based on the 71 year hydrologic record of the SWP; these are the same records which the DWR uses to establish annual supply availability. Adjustments were made to the water supply data to reflect future water supply availability impacts which will be caused by the implementation of the provisions of the NMFS Winter-Run Salmon, biological opinion of the State and Federal wildlife resources agencies, Delta-Smelt biological opinion and EPA Water Quality criteria. These analyses and Figure 1 were completed in July and August of 1994 and therefore reflect water supply data available at the time.

Using DWR projected Year 2005 SWP demands, the statistical model was used to develop probability of exceedance factors for the respective SWP supply availability. The probability of exceedance factors were then correlated to the CCWA SWP entitlement and that portion of the entitlement which is referred to as the CCWA SWP Drought Buffer supply.

On December 15, 1994, federal and state officials joined agricultural and municipal water users in signing an agreement to provide environmental protection for the Bay-Delta. This agreement and the Monterrey Agreement which was signed in early December, 1994, will change the projections for future SWP water deliveries. As of the date of this report, the State had not yet released its analysis detailing the impact of these two agreements.

However, preliminary numbers released prior to the finalization of the December 15, 1994 agreement, indicated that the reliability of supplies could be expected to improve by as much as 5%. More recent information received from the state suggests that the increase might be between 5% to 10%.

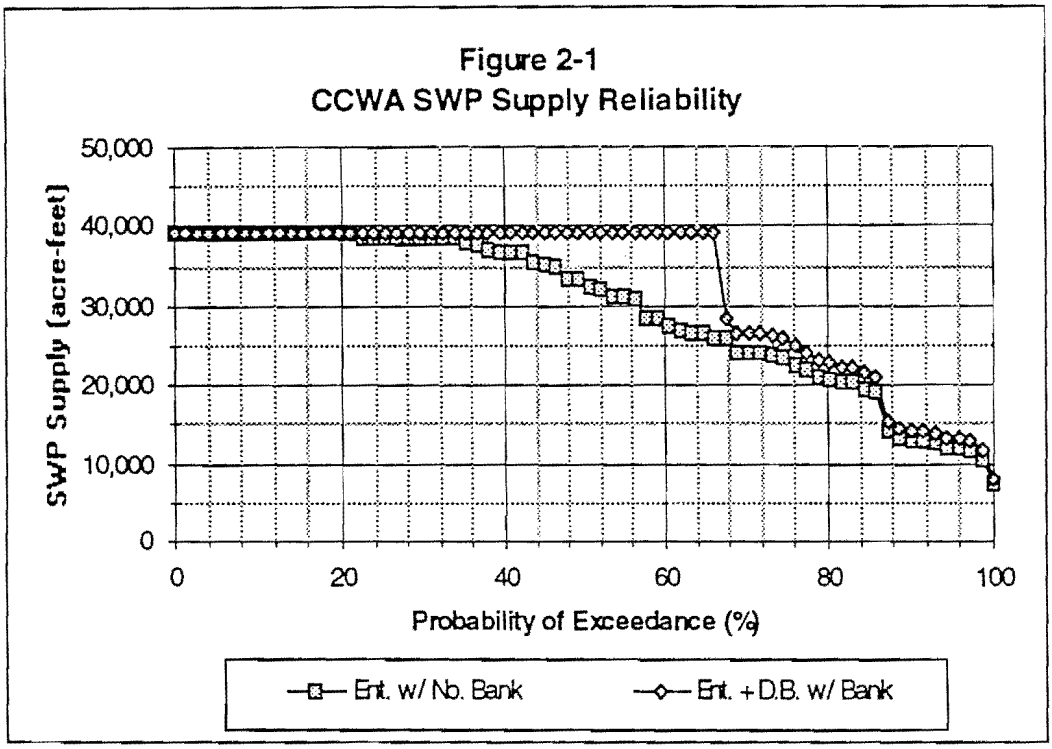
2.2 Reliability of CCWA's Allocation of the SWP Supply

The analysis results suggests that if CCWA requests 39,078 ac-ft every year, that 100% of this amount will be available for delivery by the SWP about 35% of the time. Another interpretation of this is that if CCWA orders 39,078 ac-ft/yr, CCWA can expect to receive an amount less than this delivery request amount about 65% of the time. If CCWA desires to receive or have available a SWP water supply amount equivalent to 39,078 ac-ft/yr on a more consistent basis, it can do so by ordering the full entitlement of 42,986 ac-ft/yr. In years when the full order is delivered or when any amount in excess of the 39,078 ac-ft/yr is made available, CCWA and the project participants could store (or bank) the surplus amount. Once the water is in storage, CCWA would be able to call upon the stored supplies when reductions in its SWP deliveries occur and thereby increase the availability of its SWP water supply over time. Using this scenario, the analysis results suggests that CCWA would be able to increase the reliability of the SWP supply to about 65%; that is, an amount equal to the SWP entitlement less the Drought Buffer amount or 39,078 ac-ft/yr, would be available about 65% of the time. Also under this scenario, an amount less than 39,078 ac-ft/yr could be expected to be made available about 35% of the time. On an overall average basis, this is equivalent to 77% deliveries year in and year out. Figure 2-1 presents the probability of exceedance of CCWA's SWP supply and also illustrates how the level of reliability can be increased by storing surplus imported water when available and using the stored supplies to supplement the imported supplies during deficiencies in SWP deliveries.

In the early years of project operation, a higher level of reliability can be achieved since demand will not yet exist for the total contract entitlement of 39,078 ac-ft/yr. By banking both the Drought Buffer amount and the unneeded portion of the 39,078 ac-ft contract entitlement, CCWA's project participants could potentially increase the overall reliability to 90% or better.

The conclusion which can be drawn from this analysis is that CCWA and its project participants would benefit, in terms of increasing the reliability of the SWP Water Supply, by ordering the full amount of the SWP entitlement (42,986 ac-ft/yr), storing the drought buffer portion of the entitlement or any other unused portion of the entitlement, and drawing on the stored supplies when interruptions or reductions in the SWP deliveries occur. The analysis and Figure 2-1 only depict the scenario where an amount equal to the

drought buffer share of the SWP entitlement (3,908 ac-ft) is banked. It should therefore be noted that if the amount which is banked exceeds this amount, then the reliability of the SWP entitlement would increase as well. The increase in the reliability would be a function of how much more additional water is banked.



2.3 Reliability of the Project participant's' SWP Entitlement

The reliability of the SWP entitlement allocation for each project participant will be reflective of the reliability of the SWP water supply, how much of the SWP entitlement allocation the project participant uses, how much of the SWP entitlement allocation is ordered, how the SWP supply is used, and whether the SWP water supply is used in a conjunctive use program with other local supplies. In some cases, the project participant's SWP entitlement allocation may not be fully allocated to meet specific system demands. Under such a case, the project participant will utilize only a portion of its SWP entitlement

allocation. During shortfalls in the SWP water supply, the project participant may use its unused allocation and its share of the drought buffer to obtain the amount that it needs.

The reliability of each project participant's combined sources of supply will also vary from agency to agency. This is due to the fact that each project participant may have other sources of supplies available in addition to the SWP supply. Some participants have groundwater basins which are in overdraft conditions. For these participants, the SWP will be more heavily relied upon, not only as the primary source of supply, but also to replenish the groundwater basins and correct the overdraft conditions.

SECTION 3 ALTERNATIVES AVAILABLE FOR FIRMING-UP THE CCWA SWP WATER

As previously mentioned, there will be years when the SWP water supply will be sufficient to meet all delivery requests and, due to the hydrologic cycle and increasing in-stream and normal demands, there will be other years when the SWP water supply will be able to deliver only a portion of the delivery requests. There are three alternatives which CCWA may pursue to achieve a more reliable SWP water supply. Two of these alternatives involve implementing some type of storage or banking program and the third relies on possible CCWA purchases from the DWR Water Bank to offset significant deficiencies in the SWP water supply and deliveries. The banking or storage alternative may be achieved through the implementation of either In-County or Out-Of-County Banking programs. These three alternatives are discussed in the following subsections.

3.1 In-County Banking

The In-County Banking alternative has two possible alternatives. First, each project participant could undertake its own storage program and thereby manage and control the resource independent of other CCWA project participants. The second alternative could involve one or more project participants which would utilize one agency's groundwater basin (or surface reservoir). Either approach would involve some type of conjunctive use program. The principle of a conjunctive use program is to use local surface and groundwater supplies in conjunction with imported supplies to maximize the use of all available supplies. This is accomplished by using or storing surplus imported water, when available, and drafting local or stored imported supplies when imported water is short.

The placement of water into storage may be achieved through one or combination of two available methods. These two methods consist of direct or indirect processes. In the case of groundwater basins, water may be placed into storage through direct methods which might include some type of artificial recharge such as spreading basins or injection wells. Indirect placement of water into storage in a groundwater basin could be achieved through an in-lieu process. In this method, an agency substitutes direct deliveries of imported water for groundwater production. The groundwater which would have otherwise been produced would remain in storage and would be accounted for in a storage account. In the case of surface reservoirs, water could be placed into storage through similar means. Direct placement of water into storage would involve the physical placement of imported water

into the reservoir, whereas the indirect method could be accomplished through an in-lieu process as described above.

Facilities (groundwater basin and surface reservoirs) and facility capacity in terms of storage, conveyance and extraction required to implement an In-County Banking program must be evaluated. The capacity requirements of each one of these components is determined by the volume of water which will be required to be stored. The rate at which water is placed into storage and taken out of storage will also determine the adequacy of the storage facility. Other factors which might affect the use of the facility include potential adjudication of the facility, existing or proposed management plans and the physical limitations of the facility. An example of physical limitations of a groundwater basin might be the recharge restrictions imposed by the transmissivity rates of the groundwater strata. A very low transmissivity rate might preclude the direct recharge of the groundwater basin and therefore limit the amount of water which can be placed into storage through direct methods. Additional issues in the development of a storage program include the accountability of the water in storage and water quality. Through the placement of water in storage, some losses will occur. In the case of surface reservoirs, one might experience seepage, evaporation and phreatophyte consumption losses. In the case of a groundwater basin, one might experience subsurface outflow losses or transmissivity losses. In addition, several of the groundwater basins currently yield water of lower quality than that of the water which will be received from the SWP. If the SWP water is placed into storage in one of these basins, then the average quality of extracted water will be lower than that of the SWP water. This might prohibit the introduction of this water into the CCWA conduit at points downstream of the treatment plant unless the quality of the water is brought to an acceptable level through treatment.

The key to a successful banking program is proper management. In the case of groundwater basins, basin management is necessary for the protection of the water supply (quantity and quality), monitoring, accounting and controlling the rate at which the water goes in and out of storage, accounting for storage losses, water quality monitoring and, in the case of adjudicated basins, monitoring and controlling who has the right to pump and how much is produced from the basin. Basin management and other institutional constraints currently exist for most in-county banking opportunities. Such constraints must be eliminated to ensure that banked water is available for extraction and exportation when it is called upon.

3.2 Out-Of-County Banking

The concept of out-of-county banking is similar to the in-county banking programs described above except that the banking would occur outside the service area of CCWA. There are several water agencies in the San Joaquin Valley and in Southern California which have been identified as having the physical and institutional capabilities to provide banking opportunities. The water agencies which have been identified to date include:

- Semitropic Water Storage District
- Wheeler Ridge - Maricopa Water Storage District
- Arvin-Edison Water Storage District

Each one of these water agencies would provide the banking services through a negotiated agreement. The process through which the water would be banked and recovered is as follows:

- The project participant through CCWA would order its full entitlement and drought buffer.
- The portion of SWP water required to meet demands would be delivered to the project participant and the drought buffer portion, and any other unused portion of the entitlement for that year would be delivered to the Banking Agency. For this example, we will use the Semitropic Water Storage District (SWSD).
- Semitropic would bank (store) the water in its system either through direct recharge or through an in-lieu process. The amount of water which would be banked in any one year or the total cumulative amount to be banked would be determined by the project participant and would be in accordance with the provisions of the agreement.
- At this point, the cost to the project participant would consist of the conveyance cost of the SWP water from the Delta to SWSD and SWSD's fee for banking the water.
- During periods when the project participant experiences shortfalls in the SWP deliveries and the need arises, the project participant may call on the banked water supply at SWSD. The quantities of and when the water will be conveyed from SWSD to the project participant will be determined by the project participant.
- When the banked water at SWSD is called on by the project participant through CCWA, the banked water would be returned to the project participant by diverting an equal portion from the state aqueduct. If SWSD diverts a portion of its own entitlement, SWSD will make-up that amount by pumping groundwater and making that pumped water available to its member agencies in lieu of the SWP water. If SWSD diverts a portion of another SWP contractor's delivery, SWSD

would extract the stored water from its groundwater basin and physically put the pumped water back into the aqueduct, thereby replacing the diverted water.

- At this point in the process, the additional cost which would be incurred by the project participant would include the extraction cost incurred by SWSD, the aqueduct conveyance cost to the CCWA turnout as well as the normal treatment, pumping and conveyance cost incurred in the delivery of entitlement water through the CCWA system to the project participant.

For simplicity's sake, the above process is described as a direct transaction between the CCWA project participant and the bank agency (SWSD). In actuality, CCWA would represent the CCWA project participant(s) in such a program, combining individual project participant's out-of-County banking requests into one overall program.

Out-of-County Banking offers the benefit that the water can be placed in and taken out of storage with fewer restrictions. In addition, the storage program contract could include performance provisions relating to water quality criteria. Other benefits would include the large volume of water which could be placed into storage and the ease of accounting for the water in storage. This type of program could take advantage of surplus water in wet years which would not otherwise be available to CCWA because the CCWA system conveyance and treatment capacity is limited.

3.3 California Drought Water Bank

The DWR successfully operated a drought water bank in 1991 and 1992. Subsequently, Governor Wilson directed that operation of a drought water bank would be limited to years of extreme droughts and that the DWR would not perform the function of a water broker during years of relatively normal water supplies. In 1994, Governor Wilson rescinded his earlier decision and has authorized DWR to resume the on-going operation of the DWR Water Bank. The cost of purchasing water from the Drought Water Bank in 1991 and 1992 ranged from $60 to $175 per acre foot (at the Delta Pumping Plant). Since the recent reopening of the Bank, there have been few transactions and cost data are limited. It appears, however, that the cost of any transaction which occurs in normal water supply years will be substantially different from transactions which occur during years of water shortage. This is due to the fact that during a dry or water-short year, the demand and competition for the water is higher which tends to drive the cost of the water up. This means that if CCWA opts to purchase water from the DWR Water Bank during a short supply year or during a severe drought year, the cost of the water will be no less and perhaps substantially more than the cost observed during the 1991 - 1992 period. These costs will be over and above CCWA's conveyance cost (from the Delta to the project

participant), treatment cost and pumping cost which are incurred under any delivery condition.

3.4 Alternative Program Costs

Under the in-county and the out-of-county water banking programs, the project participant would pay its normal costs for the unused portion of the entitlement and the drought buffer which is made available for banking. In the case of in-county banking, the primary additional costs would include the bank agency's fees and the energy cost incurred in the extraction of the groundwater when the call on the banked water supply is made. Similarly, out-of-county banking additional cost would include the banking fees imposed by the banking agency (SWSD as used in the example above), energy cost incurred in the extraction of the groundwater when the call on the banked water supply is made, and any additional SWP conveyance cost incurred from the SWSD to the CCWA turnout. The cost for purchases from the DWR Water Bank are expected to be between $60 to $175 per acre-foot at the Delta Pumps. This purchase cost will be in addition to the normal conveyance, treatment and distribution cost.

Table 3-1 presents a summary comparison of the cost which can be expected through the In-County Banking, Out-Of-County Banking, and DWR Water Bank Purchase alternatives.

TABLE 3-1
CCWA- SWP WATER SUPPLY
COST COMPARISON OF ALTERNATIVES FOR INCREASING THE SWP SUPPLY RELIABILITY

IN - COUNTY BANKING		OUT- OF COUNTY BANKING (AT SEMITROPIC WSD)		DWR DROUGHT BANK PURCHASE	
ASSOCIATED COST ITEMS	COST / A.F.	ASSOCIATED COST ITEMS	COST / A.F.	ASSOCIATED COST ITEMS	COST / A.F.
SWP Water Purchase Cost (1.)	$0	SWP Water Purchase Cost (1.)	$0	SWP Water Purchase Cost (1.)	$60 - $170
		Conveyance Cost - Delta to Semitropic	$12		
Banking Cost (4.)	0$	Banking Cost at Semitropic	$130		
		Withdrawal/Pumping Cost at Semitropic (3.)	$45		
Conveyance Cost - Delta to CCWA Turnout (2.)	$95	Conveyance Cost - Semitropic to CCWA Turnout (2.)	$85	Conveyance Cost - Delta to CCWA Turnout (2.)	$95
Treatment Cost (2.)	$40	Treatment Cost (2.)	$40	Treatment Cost (2.)	$40
Pumping Cost - Santa Ynez Pumping Plant (2.)	$40	Pumping Cost - Santa Ynez Pumping Plant (2.)	$40	Pumping Cost - Santa Ynez Pumping Plant (2.)	$40
Withdrawal/Pumping Cost-in-County Project participant (3.)	$50 - $150				
TOTAL COSTS FOR NORTH-COUNTY AND SANTA YNEZ AGENCIES	$185 - $285	TOTAL COSTS FOR NORTH-COUNTY AGENCIES	$285	TOTAL COSTS FOR NORTH-COUNTY AGENCIES	$185 - $305
TOTAL COST FOR SOUTH COAST AGENCIES	$225 - $325	TOTAL COST FOR SOUTH COAST AGENCIES	$325	TOTAL COST FOR SOUTH COAST AGENCIES	$235 - $345

(1.) The SWP water supply cost is $0 for delivery amounts which are less than or equal to the total entitlement amount.
(2.) Cost which would be incurred if full entitlement amount had been delivered.
(3.) Deferred cost which is subsequently expended when banked water is pumped.
(4.) Assumes banking is done in own agency's facility. If another agency facility is utilized, additional banking fees could add between $50 to $150 per ac-ft to the total cost. Additionally, if facilities are required as part of the banking program, the cost of these facilities would be included in the banking cost.

The cost comparison presented in Table 3-1 suggests that the initial costs of out-of-County banking are potentially no more than and may be even less than the initial costs of in-County banking because treatment and Coastal Branch pumping costs are avoided. An out-of-County water banking program, therefore, may be a more cost-effective program to the project participants due to thee avoided costs, particularly in the early years of project operations. Higher costs in the later years when banked water must be extracted are less of a problem due to greater revenues the purveyors will be receiving at the time.

SECTION 4 STATUS/PROPOSED UTILIZATION OF PROJECT PARTICIPANTS' SOURCES OF SUPPLY

During the July 14, 1994 Operating Committee meeting, representatives from B-E presented their preliminary findings on the availability of the SWP water supply. B-E also discussed the before mentioned alternatives which may be used to firm-up the reliability of the SWP deliveries. The conclusion of B-E's preliminary findings suggested that CCWA and its project participants could benefit, in terms of increasing the level of reliability of the SWP supply, through the implementation of a banking or storage program. Cost data provided for the various alternatives also suggested that In-County banking could perhaps provide the least cost method for increasing the level of reliability of the SWP water supplies.

B-E followed-up the presentation with telephone interviews with representatives from most of the CCWA project participants. In the interview, the project participants were asked to express their degree of interest in participating in a storage or banking program, what type of program they would be interested in (collective, individual, In-County area, Out-of-County area, etc.) and what level of reliability in the SWP supply did the participant want to achieve.

The following subsections provide a general summary of each project participant's available local sources of supply, the participant's proposed utilization of its SWP entitlement, and if provided by the participant, the participant's interest with respect to their participation in a water banking program.

4.1 City of Guadalupe

The City of Guadalupe's sole source of water is the Santa Maria Groundwater Basin. The City currently produces approximately 600 ac-ft/yr from the basin. This basin is currently in an overdraft condition with an annual overdraft in excess of 20,000 ac-ft/yr. The City of Guadalupe's portion of the SWP entitlement is 550 ac-ft/yr plus a drought buffer amount of 55 ac-ft/yr for a total SWP entitlement of 605 ac-ft/yr. The City intends to utilize as much of its SWP entitlement as possible. The City has a CCWA flow capacity allocation of 0.82 cfs. In so much as this amount is not sufficient to meet the system's peak demands, the City will retain and use its existing groundwater production capacity to supplement the imported water and to meet peak demands. The City of Guadalupe's projected annual water use is 700 ac-ft for 1998.

The City estimates 5 to 6 years before its system demand will be great enough to require it to take its portion of the drought buffer. The City estimates a similar time span before it will have the need to participate in any type of banking or storage program. If in the future it decides to participate in a banking program, it believes that a suitable program would consist of banking in the eastern portion of the Santa Maria Groundwater Basin either independently or in conjunction with the City of Santa Maria. The portion of the basin from which the City produces its groundwater supply has a high Total Dissolved Solids (TDS) content. Current levels are estimated to be 950 mg/l and these levels appear to be increasing. Therefore, banking in the western portion of the Santa Maria Groundwater Basin is not a preferred alternative due to the poor quality of the groundwater unless some type of blending program or groundwater water treatment program is implemented in conjunction with the banking program.

4.2 City of Santa Maria

The City of Santa Maria's sole source of supply is groundwater pumped from the Santa Maria Groundwater Basin. The City of Santa Maria pumps approximately 12,000 ac-ft/yr of groundwater from its ten water wells. The City anticipates increasing its groundwater production by 2.5 percent per year until 1997 when SWP water becomes available. By 1998 the City hopes to decrease its groundwater production by as much as 70 percent to about 4,000 ac-ft/yr and use 10,000 ac-ft/yr of imported water. The City of Santa Maria's projected annual water use is about 14,000 ac-ft for 1998. The City's portion of the SWP entitlement is 16,200 ac-ft/yr plus a drought buffer amount of 1,620 AF/yr for a total SWP entitlement of 17,820 ac-ft/yr.

As previously indicated, the Santa Maria Groundwater Basin is currently in an overdraft condition. The estimated safe yield of the basin is about 80,000 ac-ft/yr and currently has an estimated annual production of 106,000 ac-ft/yr. Based on these estimates, the annual overdraft of the basin is estimated to be in excess of 20,000 ac-ft/yr. Agricultural interests are the largest pumpers with an estimated annual production of 85,500 ac-ft/yr. The Santa Maria Groundwater Basin is not currently adjudicated or managed on a basin wide level. There are, however, ongoing discussions with respect to the development of a groundwater basin management plan. These efforts are being led by the Santa Maria Valley Water Conservation District, a predominantly agricultural interest agency. The City of Santa Maria staff is seeking to actively participate in any plan developed for this basin.

Two current problems will inhibit the City's continued use of the Santa Maria Groundwater Basin. The first is the basin's overdraft condition as discussed above. The second relates the water quality of the basin. As in the case of the City of Guadalupe, the water which the City of Santa Maria produces ranges in TDS from 800 mg/l in the eastern portion of the

basin to 2,400 mg/l in the western portion of the basin. Based on information received from the various groundwater producers, the TDS appears to be increasing. In some areas of the basin, the increase in the TDS has been as much as 10 mg/l per year.

To help resolve those problems, the City proposes to utilize as much of its SWP entitlement as possible. The City has a CCWA flow capacity entitlement of 29.86 cfs. Its CCWA turnout is a 36-inch diameter turnout and can accommodate their portion of the SWP entitlement (16,200 ac-ft/yr), the City's drought buffer amount (1,620 AF/yr), and an additional 2,288 ac-ft/yr which is an amount equivalent to the remainder of the total CCWA project participants' drought buffer. In so much as this amount is not sufficient to meet the system's peak demands, the City will retain and use its existing groundwater production capacity to supplement the imported water and to meet peak demands. To the extent that the City of Santa Maria uses local groundwater in the future, the City proposes to construct a "blending station" whereby most or all of the groundwater produced will be blended with SWP water prior to being placed into the City's distribution system.

In the initial years, the City projects that it will have some 5,000 to 6,000 ac-ft/yr of its SWP entitlement (exclusive of the drought buffer) which will not be used to meet its demands. With the addition of its portion of the drought buffer, the total unused portion of its entitlement might be as high as 7,600 ac-ft/yr. The City is currently discussing with Southern California Water Company the possibility of developing a joint localized banking program using its unused SWP water. The City has also conducted some preliminary investigations to determine the feasibility of recharging additional amounts through in-lieu and direct means. The direct methods which the City has investigated, on a preliminary basis, entails converting its production wells to be used also as injection wells. While the City is very much interested in banking a good portion of its unused SWP entitlement in its underlying basin, staff has nevertheless expressed reservations in that the City does not want to be the only basin producer who is taking action to correct the basin overdraft condition. On this basis, the City is very much interested in participating in the development of a groundwater management plan.

4.3 Southern California Water Company (California Cities Water)

The sole source of supply for the Southern California Water Company (SCWC) is groundwater produced from the Santa Maria Groundwater Basin with a current production estimated between 8,500 to 9,000 ac-ft/yr. SCWC's high year groundwater production occurred in 1990 when it produced almost 9,900 ac-ft. SCWC's portion of the SWP entitlement is 500 ac-ft/yr plus a drought buffer amount of 50 ac-ft/yr for a total SWP entitlement of 550 ac-ft/yr. SCWC has an interconnection with the City of Santa Maria and

the entities have ongoing discussions with respect to potentially using this connection to wheel some of Santa Maria's unused SWP entitlement to SCWC.

SCWC has a CCWA system and flow capacity of 0.74 cfs and has an 8-inch diameter CCWA turnout. SCWC proposes to utilize all of its SWP entitlement and drought buffer and in doing so, bank through in-lieu means, the drought buffer portion of its entitlement. SCWC believes that the Santa Maria Groundwater Basin could be used for additional substantial banking. However, before this can occur, SCWC suggests that certain issues first need to be addressed, perhaps in the proposed groundwater management plan. These issues include setting production limits, the need for participation in the basin overdraft corrective action by all producers, and the need to address the accountability and responsibility for storage losses that might occur by increased subsurface outflow due to the storage of additional water in the basin.

4.4 Vandenberg Air Force Base

The Vandenberg Air Force Base (VAFB) sole source of supply is groundwater produced from three well fields in two basins. VAFB currently produces about 120 ac-ft/yr from wells located in the South Vandenberg Well Field (Lompoc Terrace Basin). The water quality from this basin is generally good and requires only chlorination for potable use. VAFB also currently produces about 700 ac-ft/yr from its wells located in the Santa Ynez Well Field (Lompoc Groundwater Basin). The water quality from this basin is high in TDS (>1000 mg/l) and is softened. The third well field is the San Antonio Well Field (San Antonio Groundwater Basin) from which VAFB produces about 3,300 ac-ft/yr. The water from this basin is of generally good quality but is sand filtered. Although, VAFB produces about 4,000 ac-ft/yr its groundwater production capacity is estimated at 5,100 ac-ft/yr.

VAFB currently has a system demand of about 4,000 ac-ft/yr and esitmates that its 1998 demand might be 4,500 ac-ft/yr or higher due to possible base expansion. VAFB's portion of the SWP entitlement is 5,500 ac-ft/yr plus a drought buffer amount of 550 ac-ft/yr for a total SWP entitlement of 6,050 ac-ft/yr. VAFB proposes to retain its groundwater production capacity from the South Vandenberg and San Antonio Well Fields while abandoning production from the Santa Ynez Well Field. VAFB proposes to utilize as much of its SWP entitlement as possible and, to the extent needed, will utilize the groundwater to supplement the imported supply and to meed peak demands.

VAFB estimates that during the early years, it will be able to use only 3,000 to 3,500 ac-ft/yr of SWP water because of the limited peaking capacity in the CCWA conduit. VAFB currently has a CCWA system flow capacity of 8.17 cfs and has a 14-inch diameter CCWA turnout. VAFB believes that its groundwater basins are in good shape with respect to the

quantity and quality of water in storage. Therefore, VAFB does not see an immediate need to participate in a banking or storage program. VAFB will have 2,500 ac-ft/yr (inclusive of its portion of the drought buffer) of unused SWP entitlement. VAFB wishes to reserve this amount for future growth which it may experience but, in the interim, VAFB is willing to consider making this unused entitlement available for sale to other CCWA project participants.

4.5 City of Buellton

The City of Buellton currently has two sources of water supply: groundwater pumped from the Buellton Upland Groundwater Basin (400 ac-ft/yr) and an appropriation to pump water from the underflow of the Santa Ynez River (1,385 ac-ft/yr). Studies provided to the City indicate that the Buellton Upland Groundwater Basin is in an overdraft condition. The total extent of the overdraft is not known. The City's portion of the SWP entitlement is 578 ac-ft/yr plus a drought buffer amount of 58 ac-ft/yr for a total SWP entitlement of 636 ac-ft/yr. The City of Buellton plans to use its SWP entitlement (578 ac-ft/yr) first along with underflow of the Santa Ynez River and handle peaking with groundwater pumped from the Upland Basin. Buellton's projected annual water use in 1998 is 1,386 ac-ft/yr. Buellton, at this time, does not have a need to participate in a banking program and will order its drought buffer as needed to firm up deliveries of its 578 ac-ft entitlement.

4.6 Santa Ynez River Water Conservation District - Improvement District No. 1

The Santa Ynez River Water Conservation District - Improvement District No. 1 (Santa Ynez ID#1) currently has three sources of water supply: groundwater pumped from the Santa Ynez Uplands Groundwater Basin (3,750 ac-ft/yr), underflow of the Santa Ynez River (6,100 ac-ft/yr) and surface water from the United State Bureau of Reclamation's (USBR) Cachuma Project (2,360 ac-ft/yr). These sources of supply total about 11,700 ac-ft/yr. The current system demand is estimated to be about 6,500 ac-ft/yr and the projected 1998 demand is estimated at 6,800 ac-ft/yr. Santa Ynez ID#1's appropriative water rights allow the District to extract from the Santa Ynez River underflow on annual basis. However, the amount which can be actually extracted on an annual basis varies with hydrologic conditions and by water rights permit restrictions on the maximum flow which can be taken at any particular time.

Santa Ynez ID#1's portion of the SWP entitlement is 2,000 ac-ft/yr plus a drought buffer amount of 200 ac-ft/yr for a total SWP entitlement of 2,200 ac-ft/yr. Santa Ynez ID#1 has entered into agreements with the City of Solvang to share with it a portion of this entitlement. Based on this agreement, Santa Ynez ID#1 will retain 550 ac-ft/yr of SWP

entitlement which includes a 50 ac-ft/yr drought buffer. The City of Solvang, by agreement, will acquire 1,650 ac-ft/yr of the Santa Ynez ID#1's SWP entitlement which includes a 150 ac-ft/yr drought buffer. To meet the District's 1998 projected demands of approximately 6,550 ac-ft/yr, Santa Ynez ID#1 indicated that it will produce some 2,600 ac-ft/yr from the Santa Ynez River underflow, 2,500 ac-ft/yr from the Cachuma Project, 950 ac-ft/yr from the Santa Ynez Upland Groundwater Basin, and utilize 500 ac-ft/yr of SWP water. By reducing its production from the Santa Ynez Upland Groundwater Basin it will, through in-lieu recharging, correct some of the basin overdraft and, if needed, use this source of supply to offset future shortfalls in SWP deliveries.

4.7 City of Solvang

The City of Solvang has three sources of supply: groundwater pumped from the Santa Ynez Uplands Groundwater Basin (300 ac-ft/yr), groundwater production from the underflow of the Santa Ynez River (1,100 ac-ft/yr), and purchased water from Santa Ynez ID#1(600 ac-ft/yr). The total current source of supply is about 2,000 ac-ft/yr. The City of Solvang is not a CCWA project participant; however, by separate agreement with Santa Ynez ID#1, the City will acquire 1,650 ac-ft/yr of Santa Ynez ID#1's SWP entitlement. This amount includes a 150 ac-ft/yr drought buffer. The City, through this agreement, acquired a 6-inch diameter CCWA turnout and has a CCWA system capacity of 2.23 cfs which can be delivered through its turnout or wheeled through Santa Ynez ID#1's system and the interconnection which exists between the two systems.

Projected 1998 demand for the City of Solvang is a about 1,990 ac-ft/yr. The City proposes to use its full 1,500 ac-ft State Water Project entitlement in addition to some 490 ac-ft/yr which it will produce from the underflow of the Santa Ynez River to meet this demand. Projections indicate that no additional water, other than the SWP water, will be purchased from the Santa Ynez ID#1 to meet future demands.

4.8 Carpinteria County Water District

Carpinteria CWD has two sources of supply: groundwater which is pumped from the Carpinteria Basin, and water produced from the Cachuma Project. The District's current demand is about 5,700 ac-ft/yr. This demand is met by 2,800 ac-ft/yr from the Cachuma Project and the remainder from the groundwater basin. The District's portion of the SWP entitlement is 2,000 ac-ft/yr plus a drought buffer amount of 200 ac-ft/yr for a total SWP entitlement of 2,200 ac-ft/yr. The District proposes to use its entire SWP entitlement (2,200 ac-ft/yr), its Cachuma Project entitlement (2,800 ac-ft/yr), and reduce its groundwater production to about 1,000 ac-ft/yr. The District proposes to use these sources of supply under a conjunctive use program whereby it will make optimal use of all its sources of

supply. Through the conjunctive use of the available sources of supply, the District will rely on the groundwater supply less during normal SWP delivery years and more when shortfalls are experienced in the SWP water supply.

4.9 Goleta Water District

The Goleta Water District currently has four sources of supply: the Cachuma Project, groundwater production from the Goleta Basin, a portion of the production from the City of Santa Barbara Desalination Plant, and reclaimed water. The Goleta Basin has an estimated safe yield of 3,700 ac-ft/yr and the District's current well production capacity from this basin is about 2,000 ac-ft/yr. The District's current average annual take from the Cachuma Project is about 8,000 ac-ft. The first phase of Goleta's water reclamation system became operational in late 1993. With current and future extensions, Goleta's reclaimed water system is expected to deliver about 1,000 ac-ft/yr. Goleta also previously entered into an agreement with the City of Santa Barbara to share the cost and capacity of the Santa Barbara Desalination Plant. Based on this agreement, the District may purchase up to 3,069 ac-ft/yr from the project. However, because the desalination plant production cost is high, the plant has not been operated and is expected to remain idle unless severe water supply shortage conditions similar to those experienced in 1991 are experienced again. The District's portion of the SWP entitlement is 4,500 ac-ft/yr plus a drought buffer amount of 450 ac-ft/yr for a total SWP entitlement of 4,950 ac-ft/yr.

The District's projected 1998 demands are estimated at 16,000 ac-ft/yr. To meet these demands, the District proposes to use 2,000 ac-ft/yr of groundwater, 3,700 ac-ft/yr of SWP water, 1,000 ac-ft/yr of reclaimed water, 8,350 ac-ft from the Cachuma Project water, and the balance from other surface water sources. Initially, Goleta is not planning to utilize the full amount of State water because it feels its full entitlement will not be available by 1998. Goleta has, however, made provisions to secure an additional 2,500 ac-ft/yr of SWP water. This supply is not a firm entitlement in that it cannot be delivered in addition to the original contract SWP entitlement. Rather, this amount will be used much like the drought buffer--that is, to firm up the reliability of its 4,500 ac-ft/yr of SWP entitlement.

4.10 La Cumbre Mutual Water Company

La Cumbre Mutual Water Company (Company) has three sources of water supply: groundwater from the Foothill Basin (300 ac-ft/yr), groundwater from the Goleta Basin (1,000 ac-ft/yr), and water purchased from the Goleta Water District (330 ac-ft/yr). The Company's portion of the SWP entitlement is 1,000 ac-ft/yr plus a drought buffer amount of 100 ac-ft/yr for a total SWP entitlement of 1,100 ac-ft/yr. The Company's projected

water demands for 1998 are estimated at 1,980 ac-ft/yr. To meet this demand, the Company proposes to order and utilize all of its SWP entitlement (1,100 ac-ft/yr), produce 550 ac-ft/yr of groundwater, and continue the purchase of approximately 330 ac-ft/yr from the Goleta Water District.

As indicated above, the Company plans to order its full SWP entitlement including 100 ac-ft/yr of the drought buffer. Through in-lieu recharge means, the company plans to bank 750 ac-ft/yr within its groundwater basins. This is an amount equal to the 1,300 ac-ft/yr basin capacity less 550 ac-ft/yr of SWP entitlement. This is expected to occur at least for the first few years after receipt of SWP water. Thereafter, the Company will assess its water supply condition on a periodic basis and manage its sources of supply accordingly.

4.11 Montecito Water District

The Montecito Water District (District) currently has four sources of supply: the Cachuma Project (2,330 ac-ft/yr), surface water diversions from the Upper Santa Ynez River at Jameson Reservoir (2,000 ac-ft/yr), groundwater production from the Montecito Groundwater Basin (700 ac-ft/yr), and a portion of the production from the City of Santa Barbara Desalination Plant. The District previously entered into agreement with the City of Santa Barbara to share the cost and capacity of the Santa Barbara Desalination Plant. Based on this agreement, the District may purchase up to 1,250 ac-ft/yr from the project. However, because the desalination plant production cost is high, the plant has not been operated and is expected to remain idle unless severe water supply shortage conditions similar to those experienced in 1991 are experienced again. The District's portion of the SWP entitlement is 2,700 ac-ft/yr plus a drought buffer amount of 270 ac-ft/yr for a total SWP entitlement of 2,970 ac-ft/yr.

The District's projected 1998 demands are estimated at 6,736 ac-ft/yr. To meet these demands, the District proposes to produce about 800 ac-ft/yr of groundwater, 1,721 ac-ft/yr of its SWP entitlement, about 2,315 ac-ft/yr from the Cachuma Project, and the balance from surface diversions from the Upper Santa Ynez River.

Since the District will not initially be utilizing its entire SWP entitlement, it believes that any reductions in the SWP deliveries can be made up by ordering and utilizing the remainder of its SWP entitlement. The District intends to utilize its available sources of supply under its own conjunctive use program.

4.12 Morehart Land Company

Morehart Land Company (Morehart) has a State Water allocation of 220 ac-ft/yr including a 20 ac-ft/yr drought portion. Since Morehart does not have a CCWA turnout, its State Water allocation will be transferred to it through Goleta Water District's existing facilities. Morehart intends to utilize its entire entitlement although only 147 ac-ft will be used for domestic water use and the balance will be injected into the groundwater basin through existing wells.

4.13 Santa Barbara Research Center

The Research Center projects an annual water use of 90 ac-ft for the next four years. The Center proposes to utilize its 55 ac-ft/yr of SWP entitlement (which includes 5 ac-ft/yr drought buffer) as a supplemental supply for system reliability. The Center will rely on its existing supplies which consists of groundwater production and service connections with Goleta Water District. Therefore, due to the small SWP water entitlement, the redundant supplies, and the small demands of it system, the Center does not anticipate participating in a storage program, at least for the next 4 to 5 years.

4.14 City of Santa Barbara

The City of Santa Barbara currently has five sources of supply; groundwater produced from basins which underlie the City (1,450 ac-ft/yr - a 5 yr average over the period 1989-93), surface water diversions from the Santa Ynez River at Gibraltar Reservoir (5,000 ac-ft/yr), Cachuma Project water (8,277 ac-ft/yr), reclaimed water (900 ac-ft/yr) and a 43% share of the production of its desalination plant (3,181 ac-ft/yr). The desalination facility is shared with the Goleta Water District and the Montecito Water District and is used to produce a supplemental supply during drought periods. The desalination plant has a total production capacity of 7,500 ac-ft/yr. The City's Mission Tunnel infiltration averages 1,000 ac-ft/yr. The City's Gibraltar Reservoir has a current storage capacity of 8,600 ac-ft.

The City's portion of the SWP entitlement is 3,000 ac-ft/yr plus a drought buffer amount of 300 ac-ft/yr for a total SWP entitlement of 3,300 ac-ft/yr. The City's projected 1998 demands are estimated at 13,750 ac-ft/yr. The City has indicated that it would prefer to utilize its local supplies and a very small amount or none of its SWP entitlement in the initial years of project organization. Insofar as it may not utilize any of its entitlement in the initial years after SWP water becomes available, the City of Santa Barbara should consider participation in an Out-of-County Banking program in which it could bank all or most of it SWP entitlement (3,300 ac-ft/yr).

4.15 Summerland Water District

Summerland Water District's (District) sole source of supply is water from the Cachuma Project. Summerland receives about 300 ac-ft/yr from Cachuma. Projected 1998 demands are estimated at about 350 ac-ft/yr. The District's portion of the SWP entitlement is 300 ac-ft/yr plus a drought buffer amount of 30 ac-ft/yr for a total SWP entitlement of 330 ac-ft/yr. To meet its 1998 demands, the District expects to use 228 ac-ft/yr of its SWP entitlement with the remainder coming from its Cachuma Project Supply.

The District will maximize the use of Cachuma Project water, supplementing it with SWP water as needed.

The District is interested in banking or storing the unused portion of its SWP entitlement. As the District does not have a usable underlying groundwater basin, the District would like to see a regional type of banking program developed. Preferred basins for such a banking program would be either the Santa Maria Groundwater Basin or the Carpinteria Basin. The District would have to negotiate a storage agreement with the City of Santa Maria or the Carpinteria County Water District for the storage of its unused SWP entitlement.

4.16 Summary

Once State water comes on line in 1996, the majority of CCWA project participants plan to utilize State water first with any peaking or additional water coming from existing local sources. Most of the agencies that are able, intend to utilize their portion of the SWP entitlement in some type of conjunctive use program with their local supplies.

Table 4-2 provides a summary of the CCWA project participants' respective available sources of supply and their respective interest in participation in a banking program.

Table 4-2
CCWA Project Participants' Available Sources of Supply and Interest In Banking (Storage) Programs

Member Agency	Available Groundwater Sources of Supply (ac-ft/yr)		Other Available Sources of Supply (ac-ft/yr)		Total SWP Entitlement Including Drought Buffer (ac-ft/yr)(2.)	Total Future Supply Available (ac-ft/yr)	Projected 1998 Demands (ac-ft/yr)	Project Participant's Interest In Banking (Storage) Program	
								Amount (ac-ft/yr)	Program Location
Buellton, City of	Sta. Ynez River Underflow Buellton Uplands G.W. Bas.	1,785	N/A	0	636	2,421	1,386	0	None
Carpinteria C.W.D.	Carpinteria G.W. Bas.	2,900	Lake Cachuma (4.)	2,800	2,200	7,900	5,802	1,800	Carpinteria G.W. Basin
Goleta W.D.	Goleta (N.-Cent.) G.W. Bas. Goleta (West) G.W. Bas.	3,700	Lake Cachuma (4.) Reclaimed Water Desalination(Sta. Barb.)	12,069	4,950	20,719	16,000	2000 - 3000	Goleta G.W. Basin
Guadalupe, City of	Santa Maria G.W. Bas.	600	N/A	0	605	1,205	700	0	None Now - Sta. Maria G.W. Basin In Future
La Cumbre M.W.D.	Foothill G.W. Bas. Goleta (N.-Cent.) G.W. Bas. Goleta (West) G.W. Bas.	1,300	Goleta Water District	330	1,100	2,730	1,980	750	Foothill / Goleta G.W. Basin
Montecito W.D.	Montecito G.W. Bas. Toro G.W. Bas.	700	Lake Cachuma (4.) Jameson Desalination(Sta. Bar.)	5,580	2,970	9,250	6,736	0	None
Morehart Land Company	Ellwood to Gaviota G.W. Bas.	60	N/A	0	220	280	147	73	Ellwood to Gaviota G.W. Basin
Santa Barbara, City of	Santa Barbara G.W. Bas. Foothill G.W. Bas.	1,450	Lake Cachuma (4.) Gibraltar Mission Tunnel Reclaimed Water Desalination(Sta.Barb.)	18,358	3,300	23,108	13,750	3,300	Out-of-County
Sta. Barbara Rsrch. Ctr.	N/A	85	N/A	0	55	140	90	0	None
Santa Maria, City of	Santa Maria G.W. Bas.	12,000	N/A	0	17,820	29,820	14,000	5,000-7,600	Santa Maria G.W. Basin
Santa Ynez ID#1	Sta. Ynez River Underflow Sta. Ynez Uplands G.W. Bas.	9,850	Lake Cachuma (4.)	2,360	550	12,760	6,800	0	None
Solvang, City of (1.)	Sta. Ynez River Underflow Sta. Ynez Uplands G.W. Bas.	1,400	Santa Ynez ID#1	0	1,650	3,050	1,990	0	None
So. California W.C.	Santa Maria G.W. Bas.	9,000	N/A	0	550	9,550	9,000	50 - 2500	Santa Maria G.W. Basin - the larger amount is based on utilizing some of Santa Maria's Entitlement
Summerland W.C.	N/A	0	Lake Cachuma (4.)	400	330	730	350	300	Santa Maria or Carpinteria G.W. Basins
Vandenberg A.F.B.	Sta. Ynez River Underflow San Antonio G.W. Bas Lompoc G.W. Bas.	4,120	N/A	0	6,050	10,170	4,500	0	None
SUBTOTALS		48,950		41,897	42,986	133,833	83,231	13,273 - 19,323	N/A
Approximate Overdraft (3.)		20,000		--	--	20,000	--	--	
TOTALS		28,950		41,897	42,986	113,833	83,231	13,273 - 19,323	

(1.) The City of Solvang has not contracted with CCWA for a SWP entitlement; rather it has entered into an agreement with Santa Ynez ID#1 to receive 1,650 ac-ft/yr of its SWP entitlement.

(2.) Total SWP Entitlement assumes best case scenario which is 100% of SWP Entitlement is available.

(3.) Approximate annual overdraft from Table 5-2 (p. 5-3). Assumes that Santa Maria G.W. Basin Municipal production accounts for 20% of overdraft (5,000 ac-ft/yr) with agricultural production accounting for remaining 80%; also excludes Cachuma G.W. Basin.

(4.) Cachuma Project yield is based on best case scenario; i.e. yield is equal to Contract Entitlement (32,000 ac-ft/yr) as compared to the Project perennial yield (23,680 ac-ft/yr).

4.17 Preferred Storage Alternative

The general consensus of the member agency survey is that some type of storage or banking program is needed. All agencies, with one exception, indicated preference to an "In-County Banking Type of Program". The opinions varied with regards to where each agency thought the banking or storage should occur. In general, those agencies which have underlying groundwater basins or have indirect access to a groundwater basin or surface reservoir, implied that they would prefer to be in control of their own storage or banking program. Very few agencies indicated preference to a collective program whereby a single agency with a groundwater basin would provide the banking service to a collective group of project participants. Under such a program, the individual agencies, individually or collectively through CCWA, would enter into an agreement with the banking agency. These agencies did, however, voice concerns with respect to the location of the storage program, the possible compensation which a banking agency might demand for the service, and concerns regarding other possible technical provisions of a storage program which might restrict or limit the put and take of the storage water. Lastly, the City of Santa Barbara indicated that in the initial years of the project, it does not plan to utilize its SWP supply (consumptively) and instead would consider banking its total SWP entitlement, preferably in an Out-of-County Banking Program.

Based on information received from the project participants, there is a general consensus for In-County water banking programs using the agencies' own groundwater basins.

SECTION 5 FEASIBILITY OF PREFERRED ALTERNATIVE PROGRAM

This section presents the results of a reconnaissance level feasibility study of the implementation of an In-County Banking program. Two options, surface reservoirs and groundwater basins, were considered for the storage of imported water within the CCWA service area. These options and the feasibility of utilizing various facilities are discussed in the following paragraphs.

5.1 Feasibility of Storing Imported Water In In-County Surface Reservoirs

There are four surface reservoirs within Santa Barbara County. Three of these reservoirs, Lake Cachuma, Gibraltar, and Jameson Lake, provide water directly to the South Coast and upper Santa Ynez Subareas. Water is also released from Lake Cachuma to the Santa Ynez River to provide replenishment of downstream groundwater basins. A fourth reservoir, Twitchell Reservoir, which is located on the Cuyama River, provides flood control and stores seasonal run-off for subsequent release to replenish the Santa Maria Groundwater Basin. Twitchell Reservoir is not considered a surface supply source since water is not utilized directly for consumption purposes. Water from Cachuma, Gibraltar, and Jameson Reservoirs is conveyed to the South Coast through tunnels which also serve as horizontal wells intercepting groundwater. Table 5-1 presents the estimated capacities and yields of the surface reservoirs.

Table 5-1
Surface Reservoirs In Santa Barbara County

Reservoir Name	Capacity (ac-ft)	Reservoir Yield (ac-ft)	Average Tunnel Yield (ac-ft)	Total Yield (ac-ft)
Cachuma	190,000	23,680	3,000	26,680
Gibraltar	9,000	4,000	1,000	5,000 *
Jameson Lake	5,750	1,000	500	1,500
Total	204,750	28,680	4,500	33,180
Twitchell **	224,000	20,000	N/A	20,200

* Per terms of Upper Santa Ynez River Operations Agreement (USYROA)
** Twitchell is not considered a surface supply source; used primarily for groundwater recharge

Cachuma Reservoir is the only reservoir with sufficient capacity to lend itself to a storage program. Twitchell Reservoir, while large, is not in a location which would make it conducive for direct placement of water into storage and, since the water from this reservoir is not used directly, the storage losses could be far greater than those at Cachuma. Therefore, Cachuma is the only reservoir suitable for long-term storage of imported water.

The capacity of the reservoir is important and plays a vital role in the management of the resource. There are, however, several inherent problems with storing imported water in a surface reservoir. First, in the case of Cachuma Lake, the facility is managed by the U.S. Bureau of Reclamation and the yield from the project is preapportioned. The long-term storage of water in Cachuma would require not only the approval of the Bureau of Reclamation and state and federal fish and game resource agencies, but also of each agency which has contract rights to the project (reservoir) yield. The greatest drawback to using a surface reservoir for long-term storage of imported water is the probability that during a wet season, the reservoir will spill. Such an event occurred as recently as 1991 and 1994. Under such an event, any imported water in storage would be the first to spill. This means that if CCWA has 10,000 ac-ft of imported water in storage in Cachuma Reservoir, and 10,100 ac-ft of water spilled due to heavy rainfall run-off, CCWA's 10,000 ac-ft would be considered as having spilled first and only 100 ac-ft of the local run-off water would be considered to have spilled. Due to the high cost of the imported water and the relatively high frequency of spills from Cachuma, long-term In-County Banking of imported water in surface reservoirs is not recommended without more in-depth analysis by CCWA or the Cachuma Member Units.

5.2 Feasibility of Storing Imported Water In In-County Groundwater Basins

Santa Barbara County contains several groundwater basins which currently yield a water supply for various local municipal and agricultural users. All basins have different physical characteristics and different levels of utilization and management. Table 5-2 provides a listing of the main groundwater basins and provides estimates of the capacity, yield and the entities which currently produce water from each respective basin.

Table 5-2
Groundwater Basins in Santa Barbara County

Groundwater Basin Name	Size (Acres)	Available Storage Capacity (ac-ft)	Estimated Perennial Yield (ac-ft/yr)	Estimated Basin Demand (ac-ft/yr)	Estimated Surplus / (Ovrdrft.) (ac-ft/yr)	Groundwater Basin Producers
Carpinteria	6,000	50,000	3,865	3,535	330	Carpinteria CWD Agriculture
Montecito	4,300	14,400	1,215	1,094	121	Montecito WD
Toro Canyon	700	1,600	270	122	148	Montecito WD Agriculture
Santa Barbara	4,500	15,000	805	424	381	Santa Barbara, City of
Foothill	2,900	5,000	905	837	68	Santa Barbara, City of La Cumbre MWD Goleta WD Agriculture
Goleta (north - central)	5,700	28,000	3,420	4,603	(1,183)	Santa Barbara, City of La Cumbre MWD Goleta WD Agriculture
Goleta (west)	3,500		475	255	220	Santa Barbara, City of La Cumbre MWD Goleta WD Agriculture
Buellton Uplands	16,400	153,800	1,300	2,133	(833)	Buellton, City of Agriculture
Santa Ynez Uplands	83,200	900,000	8,970	10,998	(2,028)	Santa Ynez ID#1 Agriculture
Lompoc	48,600	17,000	21,468	23,386	(1,918)	Vandenberg AFB Lompoc, City of Mission Hills CSD Vandenberg Village CSD Agriculture
San Antonio	70,400	80,000	6,500	15,431	(8,931)	Los Alamos CSD Vandenberg AFB Agriculture
Santa Maria	80,000	800,000	80,000	100,000	(20,000)	Santa Maria, City of Casmalia CSD So. California W.C. Guadalupe, City of Agriculture
Cuyama	81,280	276,000	8,000	36,525	(28,525)	Cuyama CSD Agriculture
Ellwood to Gaviota	105 s.m.	Unk.	Unk.	Unk.	Unk.	Morehart Land Co. Agriculture
Gaviota - Pt. Concepcion	36 s.m.	Unk.	Unk.	Unk.	Unk.	Agriculture
Sta. Ynez River Riparian	12,100	Unk.	Unk.	Unk.	Unk.	Buellton, City of Santa Ynez ID#1 Solvang, City of Agriculture

For the purpose of this analysis, five parameters were used in assessing the suitability of the various basins for use in a groundwater storage program. These parameters are as follows:

- **Basin Storage Capacity:** the aquifer should be of sufficient volume and have sufficient vacant storage capacity to hold 4,000 ac-ft/yr of annual storage plus 10,000 ac-ft of long-term storage. This amount is in addition to the storage which the banking agency will utilize for its own storage of SWP water.
- **Recharge Capacity:** the basin should have sufficient recharge capacity to receive an additional 4,000 ac-ft/yr either through direct or indirect (in-lieu) recharge methods.
- **Extraction Capability:** The basin management agency or the agency which will provide the banking service should have sufficient extraction facilities or other sources of supply to recover an amount equivalent to the 4,000 ac-ft/yr from storage.
- **Water Quality:** the groundwater quality in the basin should meet current state and federal drinking water quality standards (Title 22) or should be of a quality which could be brought to drinking water quality standards with minimum cost.
- **CCWA Facility Capacity:** The agency which will provide the banking service should have sufficient CCWA conduit, turnout and distribution system capacity to allow for the taking of its respective SWP entitlement plus an additional amount for groundwater storage.
- **Basin Access and Management:** the basin should be accessible in terms of jurisdiction and location. Also, the basin should be a managed basin in terms of having the ability to define the hydrologic boundaries, inflow and outflow, total production and consumption, and being able to account for water which is put into and taken from storage.

The above criteria was used in assessing each basin. Based on this assessment, two basins were identified as having the potential to be used in the development of a water banking program. These basins are the Santa Maria Groundwater Basin and the Santa Ynez Upland Groundwater Basin. The feasibility of utilizing these two basins for an In-County Banking Program is discussed below. Although the two basins may not currently meet all of the above criteria, these two basins show the most potential to be used for a water banking program.

5.2.1 Santa Maria Groundwater Basin

This basin is currently in an overdraft condition with an estimated perennial yield of 76,200 ac-ft, an estimated total annual production of 106,000 ac-ft, and an

estimated overdraft of 20,000 to 24,000 ac-ft/yr. A breakdown of estimated annual production is presented In Table 5-2.

Table 5-2
Major Groundwater Producers In The
Santa Maria Groundwater Basin

Groundwater Producer	Average Annual Production (Ac-ft/yr)	Approximate Percent of Total (%)
Agricultural	85,000	78.56 %
Casmalia CSD	1,600	1.48 %
Guadalupe, City of	600	0.56 %
Santa Maria, City of	12,000	11.09 %
Southern California W.C.	9,000	8.32 %
TOTAL	108,200	100 %

Of the water produced in the Santa Barbara County portion of the Santa Maria Groundwater Basin, about 80% of the production is for agricultural use. The City of Santa Maria is the largest municipal producer in the basin with 11.09% of the production. The city currently operates 10 wells and anticipates increasing its groundwater production by about 2.5% per year until 1997 when State Water Project water becomes available. By 1998, the city intends to utilize mostly SWP water. However, the city will retain most of its groundwater production capacity and probably undertake some form of conjunctive use program.

Water Quality: The water quality of the groundwater basin is moderate to poor. The total dissolved solids (TDS) concentration in the basin ranges from 800 ppm in the eastern portion of the basin to about 2,400 ppm in the western portion. Based on information received from the various producers, the TDS appears to be increasing. The water quality problems may be attributed to the declining groundwater levels of the basin. As indicated before, the basin currently has an overdraft of about 20,000 to 24,000 ac-ft/yr. Since this overdraft condition has existed for some years, the cumulative overdraft is estimated to be in excess of 100,000 ac-ft.

Recharge Capacity: The recharge capacity of the basin is unknown due to the limited amount of published information which exists. Available information

suggests that the average perennial yield of the basin is 76,000 ac-ft/yr; consequently, the natural recharge of the basin is probably in excess of 76,000 ac-ft/yr. The City of Santa Maria has recently investigated the feasibility of recharging the portion of the basin which underlies the City's well field. Preliminary reports from this study have discussed the feasibility of converting existing wells into dual use wells which would allow them to serve as both production and injection wells.

Typically, the rate of injection for a well which also functions as a production well is less than 50% of the production capacity. Based on this assumption and the assumption that the City of Santa Maria's wells have an annual groundwater production capacity of 12,000 ac-ft/yr, then the probable maximum rate of injection and basin recharge using SWP water is approximately 6,000 ac-ft/yr. Alternatively, the City could potentially store an amount equivalent to its annual demand through the in-lieu recharge process. Based on these assumptions, the City of Santa Maria could potentially store up to 18,000 ac-ft/yr. This groundwater banking amount could be achieved with improvements to existing wells. Additional storage might be achieved by increasing artificial recharge through existing or potentially added infiltration basins. This would require the construction of additional pipelines and perhaps recharge basins.

The City of Santa Maria has been discussing with the Southern California Water Company (SCWC) the feasibility of wheeling a portion of its unused SWP entitlement during the initial years of receiving SWP water to the SCWC for recharge. The City currently has an interconnection with SCWC and SCWC also has a CCWA turnout and SWP entitlement of 500 ac-ft/yr (plus 50 ac-ft/yr of drought buffer). SCWC's source of supply is groundwater and therefore, if the City was to wheel additional imported water to SCWC, it is possible to bank even more water in the Santa Maria Groundwater Basin using the in-lieu recharge process.

Extraction Capability: The City of Santa Maria has the well capacity to produce 12,000 ac-ft/yr from the Santa Maria Groundwater Basin. If SCWC is involved in the banking program, its production capacity (6,800 ac-ft/yr) could be made available to the program. The water which is banked by the participating agencies would be made available to them, when needed, by diverting an equivalent amount from the SWP deliveries. During such periods, Santa Maria (and SCWC) would switch to groundwater or a combination of SWP and groundwater. Santa Maria plans to construct a blending station which will blend the SWP water with

groundwater in order to provide water with a lower TDS concentration than that currently being provided.

Basin Access and Management: The location of the Santa Maria Groundwater Basin relative to the location of other CCWA project participants is ideal for a storage program. The benefit of the basin being located on the upstream portion of the Coastal Branch pipeline is the avoided conveyance cost which would otherwise be incurred at the time of storage if the water had to be conveyed and stored in a facility located in the terminus reaches of the CCWA system. Participating agencies, particularly those which are located in the South Coast, would be able to defer some of the conveyance cost until the water is actually recovered from storage and used.

The Santa Maria Groundwater Basin is not currently adjudicated or managed on a basinwide level. However, there are ongoing discussions to develop a groundwater basin management plan. A Resolution and Notice of Intent to prepare a groundwater management plan, under the provisions of AB3030, have been filed by the Santa Maria Valley Water Conservation District. The resolution is the first step to prepare a groundwater management plan. Under AB3030, the filing agency has two years to prepare and adopt a plan once the Resolution is filed. Based on discussions with City of Santa Maria staff, the City has been actively participating in the discussions and plans to be more involved when the development of the plan gets underway. If a banking program is to be implemented in the Santa Maria Groundwater Basin, it would be of benefit to CCWA and its project participants to begin negotiations with the City of Santa Maria so that the city may include provisions for a banking program in the Groundwater Management Plan. The management plan is needed to protect the banked water.

5.2.2 Santa Ynez Uplands Groundwater Basin

Two public agencies, the Santa Ynez River Water Conservation District, Improvement District Number 1 (Santa Ynez ID#1) and the City of Solvang, currently produce water from the Santa Ynez Upland Groundwater Basin. The groundwater basin has an estimated perennial yield of 8,970 ac-ft, average annual production of 11,550 ac-ft/yr and an estimated annual overdraft of approximately 2,028 ac-ft. The main producers in the Santa Ynez Uplands Groundwater Basin and their estimated annual production is presented In Table 5-4.

Table 5-4
Major Groundwater Producers In The
Santa Ynez Uplands Groundwater Basin

Groundwater Producer	Average Annual Production (ac-ft/yr)	Approximate Percent of Total (%)
Agricultural	7,500	64.94 %
Santa Ynez ID#1 - Agricultural	1,350	11.69 %
Santa Ynez ID#1 - Domestic	2,400	20.78 %
Solvang, City of - Domestic	300	2.60 %
TOTAL	11,550	100%

About 77% of the groundwater produced from the Santa Ynez Uplands Groundwater Basin is used for agricultural purposes and 23% is used for domestic purposes. Additional sources of supply for Santa Ynez ID #1 includes Lake Cachuma (2,360 ac-ft/yr) and groundwater produced from the Santa Ynez River underflow (6,100 ac-ft/yr). The City of Solvang also obtains groundwater from the Santa Ynez River underflow (1,100 ac-ft/yr) and purchases approximately 600 ac-ft annually from Santa Ynez ID #1.

Santa Ynez ID #1 has contracted for a SWP entitlement of 2,000 ac-ft/yr and has agreed to sell 1,500 ac-ft/yr of this entitlement to the City of Solvang. It is the intent of the City and the District to utilize the SWP supply to correct, in part, some of the overdraft of the groundwater basin and as a supplemental supply which will be used to increase the reliability of the available water supplies through the conjunctive use of local and imported water. In 1990, Santa Ynez ID #1's peak groundwater production was 5,361 ac-ft/yr. Although current and proposed groundwater production is substantially less than this amount, it appears to be possible for the District to produce this amount. Additionally, surface water recharge basins could increase the usefulness of the basin as a water bank facility.

Water Quality: The quality of the groundwater in the basin is moderate to poor. Overall, available data indicates that the average TDS is between 350 and 800 mg/l and the average Total Hardness is between 200 and 550 mg/l. There have also been reported some nitrate contamination problems in the groundwater basin, particularly in the southern portion of the basin.

Recharge Capacity: Insufficient data exists to determine the recharge capacity of the basin. Estimates provided from several sources indicate that the overall capacity of the basin is about 900,000 ac-ft and the perennial yield of the groundwater basin is about 14,000 ac-ft/yr. An annual overdraft of the basin has existed for some time, but the total unused capacity of the basin is not known. Based on the maximum groundwater production by the District and the City from this basin of about 4,050 ac-ft/yr, and based on the assumption that these wells could be converted to production/injection wells with an assumed injection rate of 50% of production capacity, it is possible that about 2,050 ac-ft/yr of SWP water could be injected into the aquifer. Additional volumes could be stored with the construction of spreading (infiltration) basins and additional injection wells.

Extraction Capability: Based on previous high year ground water production rates which occurred in 1990, it is estimated that the combined agency groundwater production capacity is approximately 4,050 ac-ft/yr. The capacity could be increased through the construction of additional production facilities. A transfer of SWP and Cachuma water is currently proposed between Santa Ynez I.D. #1 and the South Coast agencies. While this proposed transfer is intended to provide operational flexibility to the involved agencies, it could possibly be expanded for the purposes of a water banking program.

Basin Access and Management: There is no basinwide management of the Santa Ynez Upland Groundwater Basin. However, Santa Ynez I.D.#1 has given notice of intention to prepare a management plan under AB3030. Since a substantial amount of the groundwater production is by independent producers for agricultural use, any basinwide plan would require the cooperation and participation of the agricultural producers.

SECTION 6 CONCLUSIONS / RECOMMENDATIONS

The preferred water banking program alternative is made up of two components. The first component is the simplest and least cost alternative and will provide for the majority of the water which will be stored. This first component involves those agencies which have an underlying groundwater basin or surface reservoir and who plan to conduct their own banking program. For these project participants, no CCWA implementation plan is required as each project participant will be responsible for and will individually control how much water is ordered, stored and when and how the water is recovered from storage. This type of program is applicable to participants who will conduct their own independent conjunctive use program or neighboring participants, such as the City of Santa Maria and Southern California Water Company, who share a groundwater basin, have water systems that are interconnected, and could conduct a joint conjunctive use program.

The second component involves those water agencies who desire to participate in an individual or collective type banking program using another participant's groundwater basin (or surface reservoirs). The current volume which is proposed to be banked under this type of program is, by current estimates, less than 1,000 ac-ft/yr. However, many of the project participants are still formulating their strategies with respect to the management of their share of the SWP supply. Therefore, as time progresses and as each participant's system demand increases, the project participants will likely realize a need to store substantially larger amounts of surplus imported water when available. For this reason, negotiations should be initiated with either the City of Santa Maria and the Santa Maria Valley Water Conservation District for a storage program in the Santa Maria Basin or with Santa Ynez I.D. #1 and the City of Solvang for a storage program in the Santa Ynez Uplands Ground Water Basin. Although the City of Santa Barbara has indicated preference for an Out-of County banking program, the City should nevertheless participate in the development of an In-County water banking program in order to have this option in the future and thereby have additional operational flexibility in the management of its SWP supply. The participation of the City of Santa Barbara in this process would not preclude it from pursuing an Out-of-County water banking program.

Assuming that the City of Santa Barbara is included in the development of an In-County banking program, the minimum annual bank capacity which should be considered is 4,000 ac-ft/yr. The long-term storage capacity which would be desirable under this situation would be between 8,000 and 10,000 ac-ft. This volume would allow participants to store an amount equivalent to two years worth of bank water and further increase the reliability of their SWP water supply. Additionally, several participants currently plan to utilize their

underlying basins in their own conjunctive use program. These participants may also wish to participate in the development of a collective In-County banking program in order to have additional operational flexibility in the management of their SWP supply.

6.1. CCWA Involvement

CCWA's involvement in the development of a banking program will vary depending on the type of program as follows:

6.1.1 Out-of-County Banking Program

CCWA, as the SWP contractor representing its project participants, would be directly involved in the development, negotiation, implementation and administration of an Out-of-County banking program. Any transaction or agreement between the banking and bank agencies and between the banking agency and the State, would require that CCWA act as the interface. Additionally, CCWA would be involved in the accounting and administration of the banking agency's storage account as well as the normal administration involved in the treatment and conveyance of the participant's bank water within the CCWA system.

6.1.2 In-County Banking Program

As discussed before, there are three types of In-County banking programs; one in which the Agency conducts its own conjunctive use program independent of other project participants, one in which two neighboring agencies who share an underlying basin or reservoir jointly conduct a conjunctive use program, and one in which a group of participants banks in one project participant groundwater basin which may or may not be located in close proximity to the banking partners. Under the first two types of programs, CCWA's involvement would be limited to treating and delivering the requested volumes of water to the project participants. In the third case, CCWA's role might include participating in the negotiation of an agreement, coordinating between the banking partners and the bank agency for the put and take of water to and from storage, keeping an account of the bank water, fees and payment for the banking services, and in administering and enforcing of the terms of the banking agreement.

6.2 Institutional and Technical Issues of an In-County Banking Program

Several of the concerns raised by the project participants relative to their participation in a banking program were previously discussed. There are additional institutional and technical issues which require discussion or emphasis as follows:

6.2.1 Groundwater Basin Management

Any type of banking or storage requires that the groundwater basin in which the storage is to occur be managed. Basin Management is necessary to protect the quantity and quality of the groundwater in order to assure each basin stakeholder its rightful share of the supply. In the case of a banking program, the Basin Management is necessary for similar reasons in addition to accounting for the bank supply. There are several authorities under which a basin management plan may be developed and implemented. The cost associated with the development of a management plan may be minimal, if the goodwill of the participants is assumed, or it may be disproportionately large if vested interest wish to actively oppose the plan or to contest it through the judicial process. To implement a banking program in a groundwater basin which is managed under some type of joint powers agreement is relatively simple (administratively); whereas, in an adjudicated basin, the judicial process might prove to be extremely cumbersome. In the case of both the Santa Maria and the Santa Ynez Uplands Groundwater Basins, neither basins are currently managed at a basinwide level. However, in both basins, AB3030 plans are currently proposed and such plans can be expected to be developed and adopted within the next two years. Therefore, if the project participants wish to pursue an In-County banking program utilizing either of these two basins, negotiations with either one or both basin management proponents should be initiated in order to include provisions for a banking program in the imminent groundwater basin management plans.

6.2.2 Preservation of Unused Pumping Rights In An Unadjudicated Basin

Several project participants expressed a concern that they wold lose their right to pump from their groundwater basin if they discontinued pumping due to their participation in a banking or conjunctive use program, and the basin became abjudicated subsequent to the discontinuance or reduction of their groundwater production. While this is a concern, there are sections in the California Water Code

which protect the groundwater producer under the conditions described above. Water Code Section 1005 provides that:

> "....Cessation of or reduction in the extraction of ground water by the owner of a right to extract, as the result of the use of an alternate supply of water from a nontributary source, shall be and is deemed equivalent to, and for the purposes of establishing and maintaining any right to extract the ground water shall be construed to constitute, a reasonable beneficial use of the ground water...."

There is also a provision regarding the necessary filing with the State Water Resources Control Board. These provisions may prove helpful in the In-County groundwater banking of SWP water.

6.2.3 Facilities Required For a Bank Program

The most cost effective banking program will be one in which very few or no new facilities are required to implement the banking program. Facilities which are typically required include the following:

- Conveyance facilities to put the water into and take the water out of storage.
- Pumping facilities if different pressure zones are encountered in the various systems involved.
- Artificial facilities are needed if the amount of water which is required to be placed into storage exceeds the amount which the bank agency can store through in-lieu recharge means. Recharge facilities may include spreading basins which are land intensive and possibly very costly or injection wells and appurtenant pipelines which can also be very costly.
- Extraction Facilities are needed to take the water out of storage. The number and size of the facilities needed is contingent upon the size of the bank program.

The adequacy of the existing facilities or the requirement for additional facilities can only be determined through an engineering analysis of system capacity and system

requirements. If additional facilities are required to accommodate the banking program, then the capital and O&M cost of these added facilities will add to the cost of banking the water. Required payment for the cost of these facilities may be a one time up-front payment, or may be spread over the service life of the program or facilities. The latter of these can consist of amortized annual payments or payments tied to the annual units of storage with certain guaranteed annual minimum volumes of storage required. The determination of the facilities required and the terms for the payment for these facilities are negotiable and will be included in the terms of the banking agreements.

6.3 Development of Principles for a Banking Agreement

The first step prior to the initiation of discussions with a potential bank agency should be the development of a set of principles for a banking agreement. These principles should set forth the requirements and goals for the project participants' contracts for an In-County banking program. These principles should include, at a minimum, specific provisions for the following elements of a banking program.

a. **Delivery of Water Into Storage:** This should include principles which set a schedule for delivery of water into storage, guaranteeing a minimum delivery rate, measurement of rates of delivery, conveyance responsibility, and financial responsibilities of the participating entities to this stage.

b. **Water In Storage:** This should include principles which specify who owns or controls the water in storage, the storage capacity to be used, provisions for loss accountability, and how long the water is to or can remain in storage.

c. **Return of Water From Storage:** This should include principles which specify when, how and procedures for returning the water from storage, guarantees for withdraw from storage at specific rates, the quality of the water which is withdrawn, the delivery points, conveyance responsibility and the financial responsibilities for the participating agencies for this stage of the process.

d. **Bank Service Fees and Facilities Fees:** This should include principles which specify the fees and terms for payment of these and all other applicable costs and fees.

6.4 Project Participants' Utilization of Their SWP Entitlement In The Initial Years

A prime concern of the project participants is the utilization of the costlier SWP supply when other less expensive local sources are available. Although cost is and should be a factor, the element of costs should be considered over a broader time period - that is, SWP water which may be banked at a cost of $200 - $300 per acre-foot will be available at almost no cost to the banking agency during dry periods when no other water may be available, or if available, will be required to be purchased at a substantially higher cost. It is therefore necessary to emphasize the benefit to the project participants of utilizing most or all of their full SWP entitlement in the initial years. The benefit of this will be twofold; first the reliability of the SWP supply, over time, will be increased and second, the cost of the project participants' sources of supplies will be reduced over time. All of this can be done by the project participants through their implementation of their own conjunctive use program or through their participation in a collective type of In-County banking program.