

BOOKMAN - EDMONSTON ENGINEERING, INC.

SPECIALISTS IN WATER RESOURCES  
100 NORTH BRAND BLVD., SUITE 600  
GLENDALE, CALIFORNIA 91203-2699

TELEPHONE  
(213) 245-1883  
(818) 244-0117  
FAX (818) 242-0480

OFFICES  
GLENDALE, CA  
BAKERSFIELD, CA  
SACRAMENTO, CA  
PHOENIX, AZ  
PROVO/OREM, UT  
WASHINGTON, DC

July 15, 1994

Mr. Doug Jones, General Manager  
Nipomo Community Services District  
261 W. Dana Street  
Nipomo, CA 93444

Subject: Evaluation of Alternative Supplemental Water Supplies

Dear Mr. Jones:

Transmitted herewith is our report entitled, "Evaluation of Alternative Supplemental Water Supplies." This report was prepared pursuant to the agreement between the Nipomo Community Services District and this firm dated February 2, 1994.

The availability and reliability of alternative sources of water from both local and imported supplies were evaluated at an appraisal level. Preliminary estimates of the water cost per acre-foot were also made. Future courses of action for the Nipomo Community Services District are identified in the report, along with our recommendations.

We are pleased to have completed this assignment for you and trust this report will assist you and your Board in providing for the future water needs of the Nipomo Community Services District.

Sincerely,



R. G. Beeby  
Project Manager

Enclosure

**NIPOMO COMMUNITY SERVICES DISTRICT**  
**Nipomo, California**

**EVALUATION OF ALTERNATIVE  
SUPPLEMENTAL WATER SUPPLIES**

**BOOKMAN-EDMONSTON ENGINEERING, INC.**  
**Glendale, California**  
**July 1994**

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## SECTION 1

## INTRODUCTION

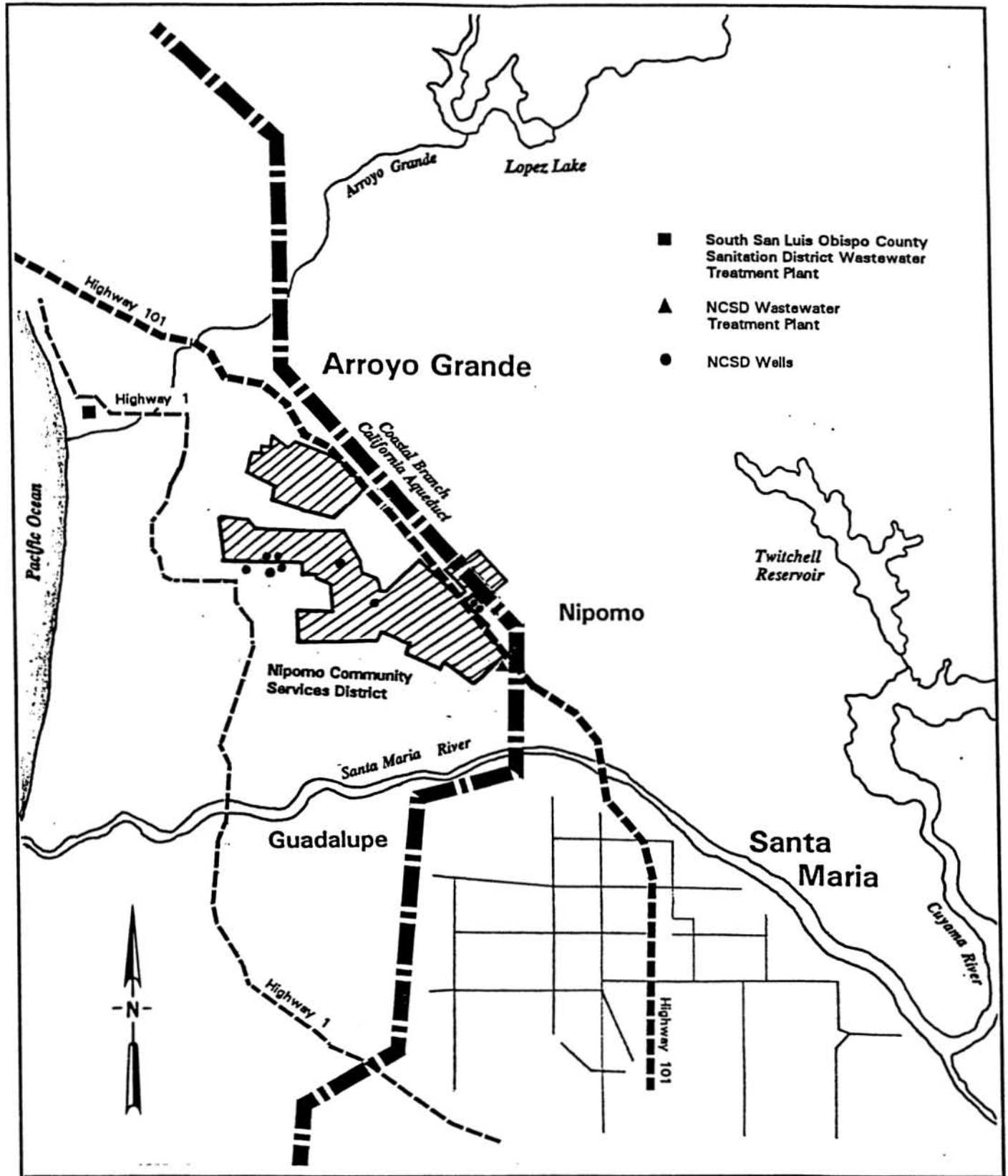
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Nipomo Community Services District (NCSD) is a public agency created in 1965. It is located in the central coast of California approximately seven miles north of the City of Santa Maria in San Luis Obispo County. The service area incorporates over 4,000 acres as shown on Figure 1 and provides service to a population of approximately 8,000 people. The Nipomo service area has experienced a consistent population increase in the past decade. Since this is a very desirable area in which to live, growth is expected to continue well into the next century.

In 1991, the Board of Directors (Board) of NCSD approved entering into an agreement with San Luis Obispo County to obtain a permanent entitlement of San Luis Obispo County's portion of its contract with the California Department of Water Resources (DWR) to receive water from the State Water Project (SWP). The Board called for an election and a slight majority voted against contracting for SWP water. After considerable discussion, the Board decided that this was an administrative decision and decided to proceed with actions to obtain a SWP supply. However, in 1992, an initiative passed which opposed any actions by the Board to obtain a SWP contract and the Board ceased any activities to obtain a SWP water supply.

On February 2, 1994, NCSD entered into a Professional Services Agreement with Bookman-Edmonston Engineering, Inc. (B-E). The essence of the agreement is that B-E would make the necessary studies on supplemental water supply sources, conveyance facilities, storage facilities, and funding, so as to prepare a final report that would outline a plan for acquiring supplemental water supplies, delivering those supplies to NCSD, and funding the Project costs.

FIGURE 1



**NIPOMO COMMUNITY SERVICES DISTRICT**

**SERVICE AREA AND RELATED WATER FACILITIES**

## SECTION 2

## WATER SUPPLY

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Nipomo obtains its water supply through wells located on the Nipomo Mesa. The DWR has considered the Nipomo Mesa to be a subarea of the Arroyo Grande Area of the Santa Maria Groundwater Basin. DWR is currently engaged in making studies and planning to prepare a report on the Arroyo Grande Area that would update its 1979 report entitled "Groundwater in the Arroyo Grande Area." The earlier studies show that the principal supply of water to the Nipomo Mesa is from deep percolation of precipitation. Subsurface seepage, irrigation, and urban return flow provide the balance of inflow to the groundwater basin. The major outflows are subsurface, flowing in a southerly direction to the Santa Maria Valley and consumptive use from agriculture and urban use. NCS D currently pumps approximately 1,500 acre-feet per year (AFY). It also operates a sewage treatment plant and its treated effluent infiltrates into the groundwater basin.

The DWR 1979 report indicates that there is a confining layer in Nipomo Mesa that creates a two-aquifer system. However, the cross sections show that the confining layer ends at Highway 1, so that recharge easterly of Highway 1 would recharge water into the aquifer that is used for NCS D's water supply. The Nipomo Mesa groundwater basin is not adjudicated or managed. Nipomo's rights may be determined at some future date if an adjudication process is commenced. Its rights will depend upon a number of factors including a definition as to whether the Nipomo Mesa is considered a separate groundwater basin or is part of some larger groundwater basin. This report does not attempt to analyze this situation.

The water is a good quality water and meets all federal and state drinking water standards. The average total dissolved solids (TDS) in 1993 was 320 parts per million but has historically reached a high of 890 ppm. The water is hard and the amounts of iron may cause problems. Currently there is no indication that any sea water intrusion has occurred in the Nipomo groundwater basin.

## SECTION 3

## WATER DEMANDS

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San Luis Obispo County has issued a draft report that includes information on projections of the South County planning area. Their projections for the year 2020 indicates a population of approximately 23,000 in the Nipomo urban area. Currently, NCSD serves about 57 percent of this area, and the California Cities Water Company about 43 percent of this area. The draft report indicates a greater dwelling density in the portion of the South County planning area that is served by NCSD and that 15,000 people would be in the area to be served by NCSD in year 2020. These figures thus indicate that the future demand in the Nipomo area would be approximately 3,600 AFY. This is an increase of slightly more than 2,000 AFY over the current water use. Since continued increases in pumping from the groundwater basin may at some time result in litigation, the District commenced seeking an additional imported supply several years ago.

This report presents analyses of various potential water supply programs on the basis of obtaining a future supply of 2,000 AFY. Also presented is an analysis of the possibility of NCSD combining with adjacent areas for a total supply requirement of up to 10,000 AFY.

Water agencies in Southern California needing to obtain additional water supplies have invested considerable effort and money in implementing programs to reduce demand and thus minimize the amount of required imported supplies. NCSD established a water conservation program several years ago and adopted a water conservation ordinance. Now that NCSD is considering a major program to obtain a supplemental water supply, it should review its conservation program and consider ways of further reducing its demand by methods that have become fairly well established in the past decade. These include:

1. Audit of its water system to reduce leaks.
2. Installation of ultra-low-flow toilets in homes.
3. Installation of other devices such as low-flow shower heads and bubblers.
4. Public relations campaign to educate citizens and commercial establishments on the need and methods to conserve water.
5. Educating restaurants to serve water only upon request and placing signs in restaurants to indicate to customers the reason for this action.

Agencies in Southern California in recent years have established programs whereby the water districts subsidize the installation of low-flow toilets. A number of communities in Southern California currently pay customers between \$50 and \$100 for each low-flow toilet



installed in their home. They also furnish free low-flow showerheads, bubblers for water faucets, and bags to reduce water used for the flushing of toilets. Information is also available that will allow establishment of an effective public relations program. New homes being constructed are currently required by California law to install ultra-low-flow toilets, and other low-flow devices so the emphasis on conservation devices would be the retrofitting of existing homes and businesses.

The effects of water conservation efforts in other areas has been quite variable with savings generally ranging from 10 to 20 percent of deliveries. This is probably due to the wide range of water use practices prior to the implementation of water conservation programs. Quantification of potential water savings that might be realized in NCS D is outside the scope of this investigation.

Any reduction in demand will most likely be less costly than bringing in imported water supplies. It would also increase public confidence that the maximum amount had been accomplished to conserve water prior to going outside the service area to obtain an expensive imported water supply.

## SECTION 4

## POTENTIAL ADDITIONAL WATER SUPPLIES

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The key elements in evaluating a water supply are adequate quantity, acceptable quality, reliability, and cost of the supply. The reliability must be related to the demand requirements. Fortunately, NCSD pumps from a groundwater basin which currently allows it to pump as much good quality water as needed. The use of any imported water supply obtained would be coordinated with NCSD's use of its groundwater supply.

The following potential water supplies have been considered:

1. State Water Project.
2. Purchase of water from a SWP Contractor.
3. Purchase of water from a Federal Central Valley Project Contractor.
4. Desalting of sea water.
5. Wastewater for use by landscaping and agriculture.
6. California Drought Water Bank.
7. Water from fractured rock.

All potential water supplies were analyzed for demands of 2,000 AFY. Items 2 and 3 were also analyzed for demands of 10,000 AFY and Item 5 was also analyzed for demands of 4,000 AFY. NCSD's timing for commencement of delivery of an imported water supply will depend upon a future determination of when overdraft will commence (or has commenced) in the Nipomo Mesa groundwater basin and the amount of water determined to be the amount that can be annually pumped by NCSD. NCSD's annual increase in demand to meet the increased population needs is projected to average about 80 AFY. Table 1 shows the estimated costs for the various alternatives.

### STATE WATER PROJECT

Although NCSD's Board has decided not to contract for a portion of San Luis Obispo County's SWP water supply, it was considered useful to describe the current situation with respect to contracting for a SWP supply. San Luis Obispo County was one of the original SWP contractors, contracting for a total entitlement of 25,000 AFY. However, only 4,830 AFY was contracted for within the County. Since the design of the SWP's Coastal Branch, which delivers water to San Luis Obispo and Santa Barbara counties, has been finalized, San Luis Obispo County is in the process of selling the remaining 20,170 AFY of entitlement in equal

**Table 1**  
**NIPOMO COMMUNITY SERVICES DISTRICT**  
**ESTIMATED COSTS OF SUPPLEMENTAL WATER SUPPLIES**  
**DELIVERED TO NCSD**  
**Alternatives for a 2,000 acre feet per year Supply**

Potential Water Supplier	California Aqueduct Reach	Capital Cost <sup>(a)</sup> for one AFY	Amortization of Capital Cost <sup>(b)</sup> \$/AF	Total Fixed Cost <sup>(c)</sup> \$/AF	Total Variable Cost <sup>(d)</sup> \$/AF	Total Fixed and Variable Cost \$/AF	Availability Factor <sup>(e)</sup>	Total Adjusted Cost <sup>(f)</sup> \$/AF
1. SWP Contractor	(a) Berrenda Mesa WD	9	81	485	140	625	0.75	786
		31A	81	484	140	624	0.75	785
	(b) Wheeler Ridge-Maricopa WSD	14C min.	6	455	165	620	0.75	771
		max.	19	467	165	632	0.75	788
		15A min.	6	459	175	634	0.75	786
		max.	19	471	175	646	0.75	804
		16A min.	6	465	194	659	0.75	813
		max.	19	477	194	671	0.75	831
	(c) Lost Hills WD	10A						786 <sup>(g)</sup>
	(d) Belridge WD	11B						786 <sup>(g)</sup>
2. Federal Central Valley Project Contractor	min.	0	45	456	142	598	1	598
	max.	0	250	661	142	803	1	803
3. Desalting:	(a) Exchange at Santa Barbara						1	600+
	(b) New Plant at Nipomo							1,900 <sup>(h)</sup>
4. Wastewater for use by landscaping and agriculture								400+
5. Water from fractured rock No data available								

4-2

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- (a) Estimated fixed cost of acquiring one AF of annual entitlement from the Federal or State project.
- (b) Amortization of Capital Cost at 7% for 30 years.
- (c) Total Fixed Cost is capital cost plus minimum OMP&R for both California Aqueduct and the Coastal Branch.
- (d) Total Variable Cost is variable OMP&R cost for both California Aqueduct and Coastal Branch plus treatment cost for Polonio Pass Water Treatment Plant.
- (e) Over long term period, water from the State Water Project for agricultural contractors is estimated to be available 75% of the time.
- (f) The total fixed cost is divided by the Availability Factor and added to the total variable cost to obtain the total adjusted cost of water delivered to NCSD.
- (g) Same cost as Reach 9 of Berrenda Mesa W.D.
- (h) Cost based on project estimates for similar or comparative desalting plants.

amounts to the following five SWP contractors in Southern California: Coachella Valley Water District, Palmdale Water District, Castaic Lake Water Agency, Antelope Valley East Kern Water Agency, and Desert Water Agency. Thus, there is no opportunity for NCSO to obtain a portion of San Luis Obispo County's SWP supply unless one of the contractors that has a share of the 4,830 AFY would be willing to sell a portion of their share. The City of Pismo Beach and the City of Morro Bay have more than half of the entitlement, and the balance is split between nine other entities.

#### **PURCHASE OF WATER FROM A SWP CONTRACTOR**

The only purchase of SWP water to date has been the 1988 purchase of all the lands in the Devil's Den Water District located in Kings and Kern counties by the Castaic Lake Water Agency (Castaic) located in Los Angeles County. The purchase price included equipment and 7,000 acres of farm land with 12,700 AF of SWP agricultural water entitlement. The land is leased by the Agency and is currently farmed. Amortization of the cost is about \$31 per AF. In addition, Castaic will pay all state water charges.

During the past decade, due to the combination of high water charges, lowered farm income and other factors a significant number of farmers in some of the agricultural member units of Kern County Water Agency (KCWA) experienced severe financial problems. As a result, starting in 1985 agricultural member units of KCWA have been attempting to sell a portion of the water supply they receive through the KCWA agreement with DWR for SWP water. Until December, 1993, KCWA opposed the delivery of any of its entitlement water outside the boundaries of Kern County.

In December 1993, five member units entered into an agreement with Westlands Water District located in Fresno and King counties to deliver an amount of water that would vary depending upon the percent that the final 1994 State allocation of water is to the KCWA annual entitlement. For example if 60 percent of KCWA's entitlement would have been available in 1994, between 24,000 and 33,000 AF would have been delivered and if 100 percent were available, 185,000 AF would have been delivered. The price ranged from \$61 per AF if 100 percent of the allocation were available up to \$96 per AF if 60 percent were available. The member units would be responsible for paying all costs to the State for delivering water to Westlands at turnouts between Reaches 4 and 9 of the California Aqueduct. The five districts that signed the agreement are:

Berrenda Mesa Water District (BMWD)

Wheeler Ridge-Maricopa Water Storage District (WR-MWSD)

Lost Hills Water District (LHWD)

Belridge Water Storage District (BWSD)

Tejon-Castaic Water District (T-CWD)

There was considerable discussion in Kern County concerning the agreement with Westlands and in December 1993, the KCWA adopted a policy for temporary out-of-county water transfers. This is a significant change from the KCWA's previous position of opposing any out-of-county delivery. The policy defined "temporary" as a non-permanent supply for a term of one to ten years. It provides that any proposed water transfer must be first offered to water districts in Kern County under substantially the same terms and conditions as offered to an out-of-county entity. It also provides that after approval by the member unit, the transfer must be approved by KCWA and the DWR. The agreement states that additional approvals may be required by the State Water Resources Control Board, the United States Bureau of Reclamation (USBR) and other governmental agencies.

In February 1994, KCWA approved the Westlands agreement subject to several conditions approved by the signature member units. The agreement was not implemented because it was a very dry year and DWR Director David Kennedy said that DWR will not approve or disapprove any requests for transfers in 1994. He said that a number of issues had been raised concerning transfers and that the DWR will focus on these issues and take some time to study it and set policy with respect to water transfers.

Another important water transfer issue has recently been raised. BMWD is in the final stages of negotiations with the Dublin San Ramon Community Services District located in northern California. B-E understands that the draft agreement calls for a sale of between 2,500 and 3,500 ac-ft per year with right of first refusal for another 5,000 ac-ft per year. This agreement will likely be submitted to KCWA for approval within the next couple of months. The 1993 Westlands-KCWA member units agreement resulted in KCWA adopting a policy on temporary water transfers and the DWR reviewing this issue so as to establish a policy on water transfers. The proposed Berrenda Mesa-Dublin San Ramon agreement could result in the establishment of water policy for permanent transfers of SWP water.

BMWD, WR-MWSD, LHWD and BWSD are agricultural water districts and T-CWD is an urban water district. We contacted these five districts. The agriculture districts are interested in the sale of water and T-CWD is not interested in a sale of water.

**A. Berrenda Mesa Water District**

The District representative stated that they are interested in the sale of water and their price would be a one-time payment of \$1,000 per AF of annual entitlement and the annual payment of SWP costs associated with the delivery of their entitlement supply. The \$1,000 per AF of annual entitlement water is stated to represent the capital investment made by the farmers to receive and distribute water from the SWP. Amortization of the \$1,000 for an entitlement of one AFY is about \$81 per AF based on an interest rate of 7 percent and a 30-year term. In addition, the DWR charges to KCWA for delivery to BMWD would have to be paid by NCSD. These include the Delta Water Charge and the transportation costs through the California Aqueduct to the BMWD turnouts as estimated by DWR in their Bulletin 132-93. The total estimated payments to BMWD for the SWP entitlement are estimated to be \$125 per AF. In addition to the payments described above, there would be the costs of transporting the water from the California Aqueduct through the Coastal Branch, treating it and delivering it to NCSD. After use of the Availability Factor described in the subsection Reliability of the State Water Project, Table 1 shows the estimated cost per AF of water projected to be delivered through the SWP to NCSD.

**B. Wheeler Ridge-Maricopa Water Storage District**

A representative of the District stated that they would need a one time payment of at least the bond debt obligation incurred by their farmers which ranges from about \$200 per acre for portions of the district service area that were constructed some time ago to approximately \$600 per acre for areas that were recently constructed. Assuming an entitlement use of 2.5 AF per acre, this would result in a one-time minimum charge of between \$80 and \$240 per AF of entitlement. In addition, the buyer would have to pay current SWP annual costs associated with the entitlement being purchased, as the case with respect to the BMWD proposal. The one-time payment indicated by WR-MWSD is significantly lower than that of BMWD. This advantage is reduced by higher fixed costs required to deliver water to the more southerly areas in WR-MSD. These costs would have to be paid by any buyer even though the more southerly stretches of the California Aqueduct would not be utilized for delivery to NCSD. Table 1 shows that the total minimum cost of water from WR-MWSD is lower than the cost of water from BMWD and the other WR-MWD costs are higher than that of WR-MWD.

**C. Lost Hills Water District**

The district representative stated that their district and BWSO together had developed a type of water transfer program that would sell water at a total cost of approximately \$125 per AF delivered to the Coastal Branch. This includes all of the costs shown for BWSO and WR-MWD. LHWD is apparently proposing a fixed sales price in which they would take the risk of paying more if future variable costs are higher than shown in 1993 and would gain if future variable costs are lower than in 1993.

**D. Belridge Water Storage District**

Their district representative stated that the district is interested in entering into a long-term contract and they would be flexible in developing terms and conditions to meet the interests of both parties. BWSO is apparently in agreement with LHWD on attempting to develop an agreement that would result in a stable annual cost to a buyer.

**Reliability of the State Water Project**

The dependable annual supply of the SWP was estimated to be 4,230,000 AFY when DWR signed its first contract in the early 1960s. This amount is defined as the "minimum project yield" and is the amount the DWR contracted for with 30 SWP contractors.

The SWP is beset by many difficulties in attempting to meet its contractual water deliveries. Other than the increase in water supply due to increased pumping capacity resulting from the completion of the installation of all units in the Delta Pumping Plant in 1993, there has been no construction of facilities that increase the Project's water supply. Until recently, it was estimated the "Project conservation facilities" (projects that result in a water supply for the SWP) are sufficient to supply a firm yield of 2.4 million ac-ft per year during a dry period, or slightly more than one-half of the minimum project yield originally estimated. Under the SWP criteria, firm yield is defined as the average annual amount of water the project is capable of delivering, including agricultural deficiencies, to contractors during a repeat of the 1928-1934 seven-year dry period. In the past two decades the SWP has experienced severe dry periods. The 1976-1977 period was drier than any previous two-year period and the six-year 1987-1992 period was the longest extended dry period since the SWP began operation. The current firm yield will be further reduced as a result of pumping restrictions in the Delta to meet proposed EPA standards and to protect threatened and endangered species.

DWR has several projects in various stages of planning. DWR Draft Bulletin 160-93 discusses several projects that the DWR estimates would be completed by 2010. The projects include South Delta water management programs, long-term North Delta water management programs, Kern Water Bank and Los Banos Grande Facilities. If these projects were constructed and operated as planned, DWR estimates that the SWP project yield would be increased by 800,000 AFY. However, in 1992 the State Water Contractors Association, an organization that represents practically all of the SWP contractors, requested the DWR to stop spending money on planning the above proposed projects since threatened and endangered species pumping restrictions from the Delta would reduce the yield of these projects, making them infeasible.

Urban SWP contractors have a limited priority over agricultural contractors. The water shortage provision in the state contract provides that in the event of a shortage "due to drought or other temporary cause" agricultural contractors shall take shortages of up to 50 percent in any one year and 100 percent in any seven consecutive years before deliveries are reduced to all contractors.

Future deliveries of SWP water will fluctuate depending upon the water supply in any year and carryover storage from the previous year. The SWP will be unable to deliver its contract amount on a sustained basis. A purchaser of an agricultural contractor's right on the SWP can expect many years of 50 percent of entitlement deliveries. Overall, B-E estimates that a purchaser of a state agricultural entitlement will receive on the order of 75 percent of the entitlement over a long-term period. This Availability Factor is used in Table 1.

### **Reliability of Water Delivery Through Coastal Branch**

B-E studies of the design of the Coastal Branch and the entitlements of the agencies that have contracts with DWR for delivery of SWP water show that the Coastal Branch will have an unused capacity of four cubic feet per second. This computes to 2,850 AFY. In addition, there may be additional capacity if the actual flow is greater than the design flow. If NCSD were to purchase entitlements from a SWP contractor, the District could adjust its operations so as to take SWP water when it is available and use its groundwater when it is not available. However, considering that NCSD is not a contractor for SWP water and that the Coastal Branch contractors may use more than their entitlements and/or other entities adjacent to the Coastal Branch may enter into agreements with state water contractors, this available capacity is not certain.



**Use of an Existing Pipeline or Construction of a New Pipeline from the California Aqueduct to Serve NCS D and Others.**

B-E investigated the possibility of using an existing pipeline to deliver water from the California Aqueduct directly to the Nipomo area. None was found.

A rough estimate was made of constructing a pipeline for Nipomo and adjacent areas with a total demand of 10,000 AFY. This would involve construction of a 21-inch diameter pipeline 80 miles long with a lift of approximately 3,500 feet. This cost would be prohibitive and there would be many environmental and right-of-way problems. It was not further pursued.

**PURCHASE OF WATER FROM A FEDERAL CENTRAL VALLEY PROJECT CONTRACTOR**

The 1992 Central Valley Project Improvement Act (1992 CVP ACT) allows for purchase of water from contractors of the federal Central Valley Project (CVP). Regulations concerning the transfer of this water are in the process of being developed by the United States Bureau of Reclamation (USBR). The districts with the most reliable CVP water supply are: Central California Irrigation District (CCID), San Luis Canal Co. (SLCC), Firebaugh Canal Water District (FCWD), and Columbia Canal So. (CCC), referred to as the San Joaquin River Exchange Contractors. They are located east of San Luis Reservoir, on the west side of the San Joaquin Valley, and extend both north and south of the Reservoir (in Fresno, Merced, and Stanislaus Counties). These districts have exchanged their San Joaquin River Rights for high priority CVP rights. Combined they have rights to 840,000 AFY that can be reduced by no more than 25 percent in dry years.

The exchange supply available to each entity is shown following for "normal" and "critical" water supply conditions.

Exchange Contractor	Area	CVP Allocation in AF	
		Normal Yr.	Critical Yr.
Central California I.D.	154,100	532,400	423,900
San Luis Canal Co.	50,285	163,600	123,100
Firebaugh Canal W.D.	23,675	85,000	58,000
Columbia Canal Co.	16,560	59,000	45,000
Totals	244,620	840,000	650,000

CCID adopted a water transfer policy in October 1993 that limits water transfers to 20 percent of each landowner's consumptive use. It is understood that the other three exchange contractors have adopted similar water transfer procedures. Water transfers would be accomplished by reducing a farmer's consumptive use and delivering a like amount of water to the California Aqueduct for delivery to the transferee.

The costs shown on Table 1 would consist of payments to farmers for land fallowing, charges by USBR and charges for wheeling the water through the California Aqueduct. An alternative was considered whereby the land would be purchased and the cost amortized over a 30 year period. Based on our discussions with San Joaquin Valley officials, there is a wide range of possible costs for obtaining the use of the land through purchase or land fallowing. This is shown on Table 1 as a minimum of \$45 per AF and a maximum of \$250 per AF.

In June 1994, the Metropolitan Water District of Southern California (MWD) signed the first agreement under the 1992 CVP Act with a farmer, Areias Dairy Farms located in CCID. It provides for a purchase of 32,200 AF, to be delivered at a rate of 4,600 AFY in any seven years of a 15-year period commencing in 1995. The cost is \$175 per AF plus transportation costs to Southern California. The agreement will be reviewed by federal and state regulatory agencies and CCID. Execution of a final agreement incorporating any revisions would follow.

#### DESALTING OF SEAWATER

Seawater desalting plants have been constructed for a number of years to meet demands of isolated urban or industrial areas throughout the world. The application has been limited due to the high cost of nearly \$2,000 per AF. In addition to the cost of the desalting plant,

there is the cost of the delivery and pumping facilities necessary for connection to the existing water system.

The most recent development that would approximate Nipomo's situation is the construction of the 7,500 AFY plant of the City of Santa Barbara. This plant, completed in 1991, produces water at a total cost of about \$1,900 per AF. The fixed cost is \$1,300 per AF and the operating cost is approximately \$600 per AF.

A recent report entitled "Santa Maria Valley Water Resources Report" by Santa Barbara County Water Agency published in April 1994 estimated the cost of a plant to desalt seawater including the cost of 13 miles of pipeline to be approximately \$1,850 per AF.

Information was received from Superstill Technology Inc. (Superstill) that their "package type" units for large plant would desalt seawater for about \$800-\$900 per AF. B-E asked the company's representative for clients that could be contacted and were given the names of Water Factory 21 and San Diego Gas and Electric Company.

Superstill is currently installing a desalting unit at Water Factory 21 in Orange County. This unit will receive wastewater from the a municipal outfall and treat it. Superstill also planned on installing a desalting plant in San Diego for San Diego Gas and Electric and San Diego County Water Authority. B-E was informed by a SDGE representative that the project has been put on hold. The reason given for stopping the project was that as cost estimates became more detailed, the costs increased until the project could no longer be justified. It is B-E's understanding that most of the units that Superstill Technologies, Inc. have installed are being used as final stage water purification units. It is likely that when sea water is the influent, the unit cost of treatment will be significantly higher than the cost of final stage purification. Our estimate is that the cost of desalting for a 2,000 AFY plant will be in the order of \$1,900 per AF.

Another desalting option would be to work out an exchange agreement between Central Coast Water Agency (CCWA), the City of Santa Barbara (Santa Barbara), and NCSD. Under such an agreement, Santa Barbara would produce desalted water for NCSD under an agreed-upon schedule in which Santa Barbara would use desalted water in lieu of receiving water from CCWA. In exchange, CCWA would deliver water that would otherwise have been delivered to Santa Barbara to NCSD at a turnout on the Coastal Branch to be built by DWR in response to NCSD's request. Since the operating cost is approximately \$600 per AF, the cost is shown on Table 1 as \$600 per AF plus, with the "plus" to be determined in negotiations with Santa Barbara and CCWA.

## RECLAMATION OF WASTEWATER FOR USE BY LANDSCAPING AND AGRICULTURE

Absent an alternative source of supply, these entities would pump water from the groundwater basin. In exchange for delivering this water supply to the golf courses, NCSD would obtain groundwater pumping credits to be used in a future groundwater management program. South San Luis Obispo County Sanitation District (SSLOCSD), located five miles north of NCSD, provides secondary treatment to approximately 4,700 AFY of effluent. The firm of John Wallace & Associates (Wallace) prepared a report for SSLOCSD describing a project to supply reclaimed water for the Bjeree and Woodland golf courses and incidental irrigation alongside Highway 101. The project includes expanding the current treatment to include filtration, disinfection, coagulation and clarification at the existing plant. Delivery of 1,625 AFY of effluent would be by pipeline and pumping plant to the golf courses and landscaping areas.

An option for NCSD would be to propose expanding the project by treating and diverting up to an additional 2,000 AFY to be used to meet existing and future water demands for irrigation of golf courses and landscaped areas overlying the Nipomo Mesa groundwater basin.

There may also be some possibilities for spreading water in the Nipomo Mesa groundwater basin for the credit of NCSD. The most recent tests of the SSLOCSD effluent shows a TDS of 1,200 ppm. This high TDS may preclude any groundwater spreading program.

A supplement to the above approach would be to use the treated wastewater to meet some of the irrigation requirements of crops now met by pumping from the Nipomo groundwater basin. In return for delivering this water, NCSD would pump the net amount of water that otherwise would have been used by the farmers. The TDS is too high for the citrus crops in the Nipomo area and any use of the treated wastewater for this purpose would require blending with the water pumped from the groundwater basin.

Wallace estimates the cost of the above-described project to be \$383 per AF. There would be some decrease in unit costs due to the increased size of the project as outlined above and some increase due to the cost of additional distribution pipelines. Table 1 shows the estimated cost to be \$400±. NCSD could join with SSLOCSD in a joint venture for the expanded project or could offer the split the project with SSLOCSD performing the treatment function and NCSD performing the delivery function. Another possible manager would be the future groundwater management district for Nipomo Mesa.

## **CALIFORNIA DROUGHT WATER BANK**

The DWR successfully operated a drought water bank in 1991 and 1992. Subsequently, consideration was given to DWR operating a water bank as a continuing function. Governor Wilson finally 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.

It is clear that under the above policy a state water bank would not be available to provide a long term water supply for NCSO. However, by having a turnout installed in the soon to be built Coastal Branch, NCSO would put itself in the position of being able to receive a water supply from the drought water bank during dry years. It would also be extremely valuable as an emergency connection to the Sacramento-San Joaquin Delta, the location of California's major water source.

## **WATER FROM FRACTURED ROCK**

B-E received a copy of a May 26, 1994 draft agreement between SAMDA Inc. and NCSO which was drafted by SAMDA Inc. The essence of the agreement is that SAMDA would develop a water supply in fractured rock that would not be connected to the Nipomo Mesa groundwater basin. This "new" water would be delivered to NCSO at a fixed cost per AF which was not stated but was likely to be in the range of \$800/AF.

B-E was informed that approximately 15 years ago, a well was drilled in the foothills by a rancher that produced an initial flow of 1,200 gpm which diminished over time to about 700 gpm. This information indicates the possibility of developing a long-term water supply. It should be verified, and, if true, appropriate professionals familiar with this area should be retained to advise the District on prospects for drilling a successful well that would provide a long-term water supply. Their analyses should address whether or not the supply is connected to any of the adjacent groundwater basins and would negatively affect other water users.

## **COMMENTS ON POTENTIAL WATER SUPPLIES**

In brief, the positive and negative comments on the potential water supplies are as follows:

### **State Water Project**

All of San Luis Obispo County's entitlements to SWP water have been allocated or are in the process of being sold and the final design of the Coastal Branch is nearing completion. There still may be opportunities to purchase entitlements from existing San Luis Obispo County or Santa Barbara County water contractors.

### **Purchase of Water from a SWP Contractor**

After nearly a decade of trying to sell a portion of its rights to KCWA's SWP entitlement, BMWD is apparently close to obtaining a decision from KCWA on terms and conditions for a sale or long term lease of the entitlements. Whatever decision is made by KCWA would apply to the other KCWA member units that want to dispose of a portion of their entitlements. The four member units of KCWA described earlier in this section are the only entities that are currently offering SWP entitlements for sale.

The positive aspects of this supply is that our analysis shows that after delivering all of the entitlement water contracted for by the Coastal Branch contractors, the Coastal Branch will have sufficient capacity to deliver 2,000 AFY to NCSO. Even if the agencies using the Coastal Branch obtain supplies in excess of their entitlements, NCSO could schedule its use from the Nipomo groundwater basin so as to take delivery from the Coastal Branch whenever capacity and water are available.

A negative aspect is that at this time, any potential buyer of long-term rights to entitlements from a member unit of KCWA faces the opposition from KCWA, the SWP contractor with DWR for those entitlements. Another negative aspect is that since NCSO is not a Coastal Branch contractor, they are in a secondary position on the Coastal Branch and there may be problems that cannot now be foreseen. Other negative factors are the inability of DWR to meet all demands during dry years and the limited priority that SWP urban contractors have over agricultural contractors. There will be years when only half or possibly less of the entitlement will be available. Further, if the DWR obtains clearances to construct the facilities necessary to increase the quantity of water it can deliver to its contractors, required payments by the SWP contractors will increase the cost of this supply.

### **Purchase of Water from Federal CVP Contractors**

The first agreement for sale of CVP water recently between MWD and a CVP farmer was for specific quantities of water, irrespective of whether the year water is to be delivered is wet or dry. This is a more dependable arrangement than the purchase of state water

entitlements which could be significantly cut in dry years. However, other controlling factors that will determine which will be more desirable are the price of water and other terms and conditions.

### **Desalting of Seawater**

The best desalting of seawater option is to work out an exchange agreement between Santa Barbara, CCWA and NCSD for payment to Santa Barbara for operating costs for its desalting plant plus an additional amount to make the exchange attractive to Santa Barbara. The major positive factors are that the desalting plant should produce a reliable supply of water, and most likely that schedule can be developed to meet NCSD's future growth. There is no shortage of seawater, and product reliability of the desalting plant should be satisfactory.

The major negative factor is that because of the energy-intensive element of desalting plants and other factors, operating costs will continue to be high.

### **Reclamation of Wastewater**

The reliability of a wastewater supply physically is almost as good as seawater. A negative factor is the high TDS of the wastewater which results in problems for its use by agriculture and spreading of the effluent into the groundwater basin. The major unknowns are the willingness of SSLOCSO to enter into an agreement with NCSD, the quantity of water to be diverted, and other terms and conditions.

### **California Drought Water Bank**

As previously stated, this supply would only be available during dry years. The positive aspect is that if CCWA and San Luis Obispo contractors did not purchase water from the Water Bank sufficient to equal or exceed their reductions in a dry year for SWP entitlement, water deliveries would be reduced during dry years, and there should be capacity available in the Coastal Branch for NCSD to receive any water purchased from the Water Bank. The cost of a turnout for NCSD on the Coastal Branch would be a small price to pay for this dry year supply. In addition, the turnout would be available to receive water in any emergency situation whereby NCSD loses its supply. It also allows the implementation of the desalting exchange option. There are no negatives, other than the relatively minor cost, to installation of a turnout on the State Aqueduct.

### **Water from Fractured Rock**

The positive factors are: amortizing the cost of a pipeline from the foothills to the NCSD system may be less costly than other alternatives and if the water is there, the quality should be good and it is likely that there will be gravity flow from the source to the NCSD system.

The negative factors are that it is not now known if a long-term dependable supply exists, if there is recharge to the supply, or if development would involve mining water accumulated over geologic time. Nor is it known if the supply is interconnected to a groundwater basin. If the latter is true, it means that if developed, water would be taken away from a supply to existing water users. Also, the cost of development could be high if there are dry holes.



## SECTION 5

## GROUNDWATER MANAGEMENT

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From the discussion of the water supply alternatives it is apparent that each involves the obtaining of a new surface water supply which will involve coordination with and different patterns of use of the Nipomo groundwater basin. The groundwater basin can continue to be used to provide storage for the NCS D system and it is not necessary to build any major above-ground storage. The boundaries of the Nipomo groundwater basin will need to be more accurately determined as well as whether or not it is part of a larger groundwater basin. Groundwater pumping patterns may need to be changed so as to reduce the groundwater outflow from the basin. NCS D will need to coordinate its pumping with other groundwater users. To accomplish the above, it will be necessary to form a groundwater management organization to manage the basin.

The activities involved in forming a groundwater management district should be coordinated with the neighboring Santa Maria Water Conservation District which is in the process of forming a groundwater management district.

## SECTION 6

## FUNDING WATER SUPPLY DEVELOPMENT

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The funding will depend upon the alternative to be finally selected by the Board. Although seven alternatives were described in Section 4, the alternative of obtaining of a contract for a portion of San Luis Obispo County's SWP water supply has already been rejected by the Board and the water to be obtained from the Drought Water Bank would only be available during very dry years.

Thus, five alternatives are identified as long-term water supply developments. Of these, three: purchase from a SWP contractor, purchase from a CVP contractor, and purchase of a supply from Santa Barbara's desalting plant by exchange, would require construction of a turnout from the Coastal Branch of the California Aqueduct. Access to water from the Drought Water Bank would also require construction of a turnout. The turnout is estimated to cost \$225,000.

The transfer of water from Santa Barbara's desalting plant by exchange should not require any capital outlay. Also, it may be possible to negotiate a purchase of water from a SWP contractor or a CVP contractor without any outlay of capital. Constructing a pipeline from the SSLOCSD wastewater treatment plant and distributing it would involve significant capital expenditures. The same is true for developing a water supply from a fractured rock aquifer and delivering it into the NCSD system.

The design and construction of capital facilities for treating and distributing wastewater and the capital facilities for a fractured rock water supply would have to be coordinated with the timing of NCSD's need for a supplemental supply and its ability to arrange for interim sales of unneeded water.

The Board of a community service district has the responsibility to provide service to the people residing in the district and the statutory powers to set rates and charges for water service. It also has the ability to raise capital through revenue-supported tax-exempt bonds. NCSD is empowered to form assessment districts and issue municipal bonds. The District has the power to apply for federal and state grants and low interest loans. NCSD has experience in forming assessment districts, floating different types of bonds and applying for and receiving federal and state grants.

The projected average annual increase in water requirements for NCSD is 80 AFY resulting in an increase in revenue requirements of between \$48,000 and \$66,400 per year, for

purchase of the above two supplies. This would require additional revenue equal to between 3.2 percent and 4.4 percent of the proposed NCSD 1994-95 budget of \$1,506,700.

Arrangements could be made with Santa Barbara and CCWA to deliver water to NCSD to closely match its demand. However, certain fixed costs occur with the purchase of SWP water that would have to be met each year or NCSD would have to sell to others to obtain the costs shown for SWP and CVP water.

If NCSD were to enter into an agreement with SSLOCSD to treat and distribute wastewater, the cost could be in the order of \$400 per AF. However, it would require several million dollars in financing, and temporary sale of unneeded water as in the case of purchasing SWP water. The option of drilling for water in fractured rock would also involve significant capital costs. The three options that could be purchased without any capital investment, desalted water by exchange with Santa Barbara, purchase of water from a SWP contractor, and purchase from a CVP contractor, are in the range of \$600 to \$830 per AF.

## SECTION 7 FINDINGS AND RECOMMENDATIONS

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In brief, B-E finds that:

1. The population within the NCSD service area is projected to increase in the next quarter of a century from the current 8,000 to over 15,000 and a supplemental water supply is needed to meet the increased water requirements.
2. Water requirements are projected to increase from the current 1,500 AFY to 3,600 AFY by the year 2020, an average increase of 80 AFY.
3. There are several supplemental water supplies available to NCSD to meet the increased demands for water.
4. All are considerably more costly than NCSD's current supply and will require negotiations with other entities.
5. The estimated costs of the long-term supplemental water supplies discussed in this report are as follows:

SUPPLY	\$ PER AF
Purchase from a SWP Contractor	771 to 831
Purchase from a CVP Contractor	598 to 803
Desalting of Seawater a. By Exchange from Santa Barbara b. Constructed by NCSD	600 plus 1,900
Treated wastewater for nondrinking purposes	400±
Supply from fractured rock area	No data available

6. A groundwater management district needs to be formed for the Nipomo Mesa groundwater basin to maximize the use of NCSD's current water supply and its future supplemental water supplies.

7. A turnout needs to be constructed for NCSD from the nearby to be constructed Coastal Branch of the California Aqueduct in order to:
  - A. Supply water to NCSD from three of the long-term alternatives;
  - B. Provide access to water from the California Drought Water Bank during very dry years; and
  - C. Provide for an emergency supply in the event of major problems with the existing system.

It is recommended that NCSD:

1. Make arrangements with San Luis Obispo County and DWR to have a turnout for NCSD constructed from the Coastal Branch.
2. Concurrently:
  - A. Commence discussions with the SSLOCSD for an agreement with that district for the diversion of up to 2,000 AFY of treated effluent in addition to the 1,650 AFY project presented to SSLOCSD by their consulting engineer. NCSD could do the expanded project jointly with SSLOCSD or could split the functions with SSLOCSD, with SSLOCSD providing the water treatment and NCSD providing the water delivery facilities, or a future groundwater management district could manage the program. If the discussions are successful, enter into discussions with the management of golf courses, others with large landscaped areas, and farmers with respect to their use of reclaimed water.
  - B. Commence discussions with Santa Barbara and CCWA with respect to an agreement whereby Santa Barbara would produce desalted water for NCSD. An equal amount of water would be delivered by CCWA to NCSD at a to-be-built turnout on the Coastal Branch of the California Aqueduct.
3. Retain competent professionals to determine if there is a long-term dependable supply available in the fractured rock east of Nipomo Mesa.

4. NCSD should not enter into any agreement for a water supply without a competent investigation by its own investigators as to its source, dependability, impact on other water users, life of the water supply, and cost.
5. Depending upon the results of the above discussions and analysis, select one or a combination of the above three alternatives to be implemented.
6. Take leadership in the formation of a groundwater management district for Nipomo Mesa and work cooperatively with the management district being formed by the Santa Maria Water Conservation District.
7. Take necessary actions to maximize water conservation for existing and future development. Modify the NCSD conservation ordinance as necessary.



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