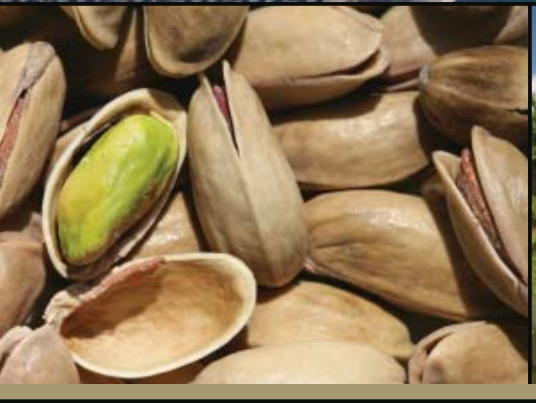
POSO CREEK

Integrated Regional Water Management Plan



Public Draft | June 2007

Poso Creek Integrated Regional Water Management Plan

Management Group

Poso Creek Integrated Regional Water Management Plan – July 2007

Synopsis

The purpose of the Poso Creek Integrated Regional Water Management Plan (July 2007) is to provide a framework for (1) coordinating groundwater and surface water management activities through *regiona*l objectives, and (2) implementing the measures necessary to meet those objectives.

While the Plan includes a number of findings, the overriding conclusion is that surface water supplies available to the Region will be significantly reduced in the future (relative to historical conditions) and that there will be a corresponding decline in groundwater levels as groundwater is used to make up the reduction in surface water supplies if actions are not taken. This decline will result in an increase in the use of power and energy resources to pump groundwater, creating both an environmental and economic burden. This economic burden will be felt by all uses that rely in whole or in part on pumped groundwater --- whether agricultural, municipal, or industrial. While the *common groundwater basin* is the reason that all overlying uses will feel the impact, it is also the reason that anything that is done to mitigate declines in water levels, such as projects identified in the Plan, will benefit all uses. As a generalization, the Plan contemplates projects, both structural and non-structural, that will allow the agencies within the Region to maximize the use of their contract water supplies and other supplies that may be available from time to time. In particular, these projects provide the means for coordinating the assets, needs, and operations of the agencies within the Region, with the end result being improved *water supply reliability*.

Each of the Boards of Directors of the districts that make up the Regional Management Group adopted the Plan in its current form, which is represented by the Plan objectives, and the findings and conclusions.

- ✓ The Plan *objectives* include …
  - o Maintain and improve water supply reliability;
  - o Maintain groundwater levels at economically viable pumping lifts;
  - o Protect the quality of groundwater and enhance where practical;
  - o Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the area;
  - o Enhance monitoring activities to meet groundwater level and water quality goals;
  - o Maintain and/or enhance environmental resources within and outside of the study area; and
  - o Enhance flood control in the study area.
- ✓ The *findings and conclusions* include …
  - o The Region has a water supply problem (with the long-term average annual reduction in surface water supplies projected to be on the order of 100,000 acre-feet).
  - o By working together, the problem can be mitigated but not eliminated, at least with currently available supplies.
  - o The Regional Management Group is the right forum for working together, which includes ...
    - ▪ Cawelo Water District
    - ▪ Delano-Earlimart Irrigation District
    - ▪ Kern-Tulare and Rag Gulch Water Districts
    - ▪ North Kern Water Storage District
    - ▪ North West Kern RCD
    - ▪ Semitropic Water Storage District (lead agency)
    - ▪ Shafter-Wasco Irrigation District

- Priority should be given to enhancing conveyance between districts within the Region.
- Both structural and non-structural measures are required.
- Non-structural measures include …
  - An organizational structure and environmental compliance framework that allows for exchange, transfer, and banking approvals to be in place to take advantage of unregulated and unscheduled water supplies that are available from time to time, often on short notice.
  - The necessary approvals to move water from different sources around within the Region as required to maximize the utility of the Region's assets and thereby maximize water supply and reliability to the Region.
  - A means of maintaining equity as between districts within the Region, in terms of water and/or dollars.
- Structural measures include one or more connections between …
  - The Calloway and Lerdo canals.
  - North Kern and Shafter-Wasco.
  - Shafter-Wasco and Semitropic.
  - The Calloway and Cross Valley canals.

✓ To implement the structural and non-structural measures, grant funds will be pursued to supplement local monies, where specific projects would be proposed and where cost sharing among the members of the Group would have to be developed.

Finally, it is noted that the Plan should be considered to be a *living document*, which will change in response to new information, changed conditions, or other factors.

Add this to the end of the Synopsis, on page 3.

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Abbreviations and Acronyms

AB 255	Assembly Bill 255
AB 3030	Groundwater Management Act
Absorptive capability	Capability to divert and use surface water when available
ac-ft	acre-feet
ac-ft/day	acre-feet per day
af	acre-feet
af/y	acre-feet per year
Agency	Kern County Water Agency
AEWSD	Arvin-Edison Water Storage District
Arvin-Edison	Arvin-Edison Water Storage District
BMOs	Basin Management Objectives
BMPs	Best Management Practices
Buena Vista	Buena Vista Water Storage District
CA Water Plan	California Water Plan Update 2005
CALFED	State/federal cooperation formalized in June 1994 with the signing of a Framework Agreement by the state and federal agencies with management and regulatory responsibility in the Bay-Delta Estuary
California Water Plan	California Water Plan Update 2005
CAP water	Central Arizona Project water
Cawelo	Cawelo Water District
CEQA	California Environmental Quality Act
cfs	cubic feet per second
Consultant	GEI Consultants, Inc. Bookman-Edmonston Division
Corcoran or “E” Clay	Lacustrine diatomaceous clay unit that underlies much of the subbasin
Corps	U.S. Army Corps of Engineers
CVC	Cross Valley Canal
CVP	Central Valley Project
DEID	Delano-Earlimart Irrigation District

Delano-Earlimart	Delano-Earlimart Irrigation District
Delivery Reliability Report	The State Water Project Delivery Reliability Report 2005
Delta	Sacramento-San Joaquin River Delta
DWR	California Department of Water Resources
EIR	Environmental Impact Report
ET	Evapotranspiration
"Excess" lands	Under federal reclamation law, lands not eligible to receive federal water
FKC	Friant-Kern Canal
Friant-Kern	Friant-Kern Canal
GIS	Geographic Information System
gpm	gallons per minute
Groundwater Monitoring Committee	Semitropic Groundwater Monitoring Committee
G-W	Groundwater
ID-4	Kern County Water Agency Improvement District No. 4
IRWMP	Integrated Regional Water Management Plan
ITRC	Irrigation Training and Research Center
JPA	Joint Powers Authority
kaf	thousand acre-feet
KCWA	Kern County Water Agency
Kern-Tulare	Kern-Tulare Water District
kWh/year	kilowatt-hours per year
KNWR	Kern National Wildlife Refuge
M&I	Municipal and Industrtial
MAF	million acre-feet
MHI	Median Household Income
MOU	Memorandum of Understanding
MVA	megavolt ampere
MW	megawatt
MWD	Metropolitan Water District of Southern California

NEPA	National Environmental Policy Act
North Kern	North Kern Water Storage District
NPS	Non-Point Source
NRCS	Natural Resources Conservation Service
NRDC	Natural Resources Defense Council
NWKRCD	North West Kern Resource Conservation District
PG&E	Pacific Gas and Electric
PID	Pixley Irrigation District
Poso Creek RMA	Poso Creek Regional Management Area
ppm	parts per million
Program	Semitropic Groundwater Banking Program
PWRPA	Power and Water Resources Pooling Authority
Rag Gulch	Rag Gulch Water District
RCD	Resource Conservation District
Region	Poso Creek IRWMP Region
RGRCP	Rubber Gasket Reinforced Concrete Pipe
RMA	Regional Management Area
RMG	Poso Creek Regional Management Group
RRA	Reclamation Reform Act of 1982
RWQCB	Regional Water Quality Control Board
Rosedale-Rio Bravo	Rosedale-Rio Bravo Water Storage District
SB 1672	Senate Bill 1672 - Integrated Regional Water Management Planning Act of 2002
SB 1938	Senate Bill 1938 - Groundwater Management Planning Act of 2002
SCADA	Supervisory Control and Data Acquisition
SEBAL	Surface Energy Balance Algorith for Land
Semitropic	Semitropic Water Storage District
Shafter-Wasco	Shafter-Wasco Irrigation District
SJR Restoration	San Joaquin River Restoration
SJR Settlement	San Joaquin River Settlement
SSJMUD	Southern San Joaquin Municipal Utility District
Southern San Joaquin MUD	Southern San Joaquin Municipal Utility District

SWP	State Water Project
SWRCB	State Water Resource Control Board
SWRU	Stored Water Recovery Unit
TDH	Total Design Head
TDS	Total Dissolved Solids
TMDLs	Total Maximum Daily Loads
USACE	United States Corps of Engineers
USBR	United States Bureau of Reclamation
USCID	United States Committee on Irrigation Drainage
USGS	U.S. Geological Survey
Water Bank	Semitropic Groundwater Bank
WEPS	West East Pintail Slough
WSR	Water Supply Reliability

1 Introduction and Overview

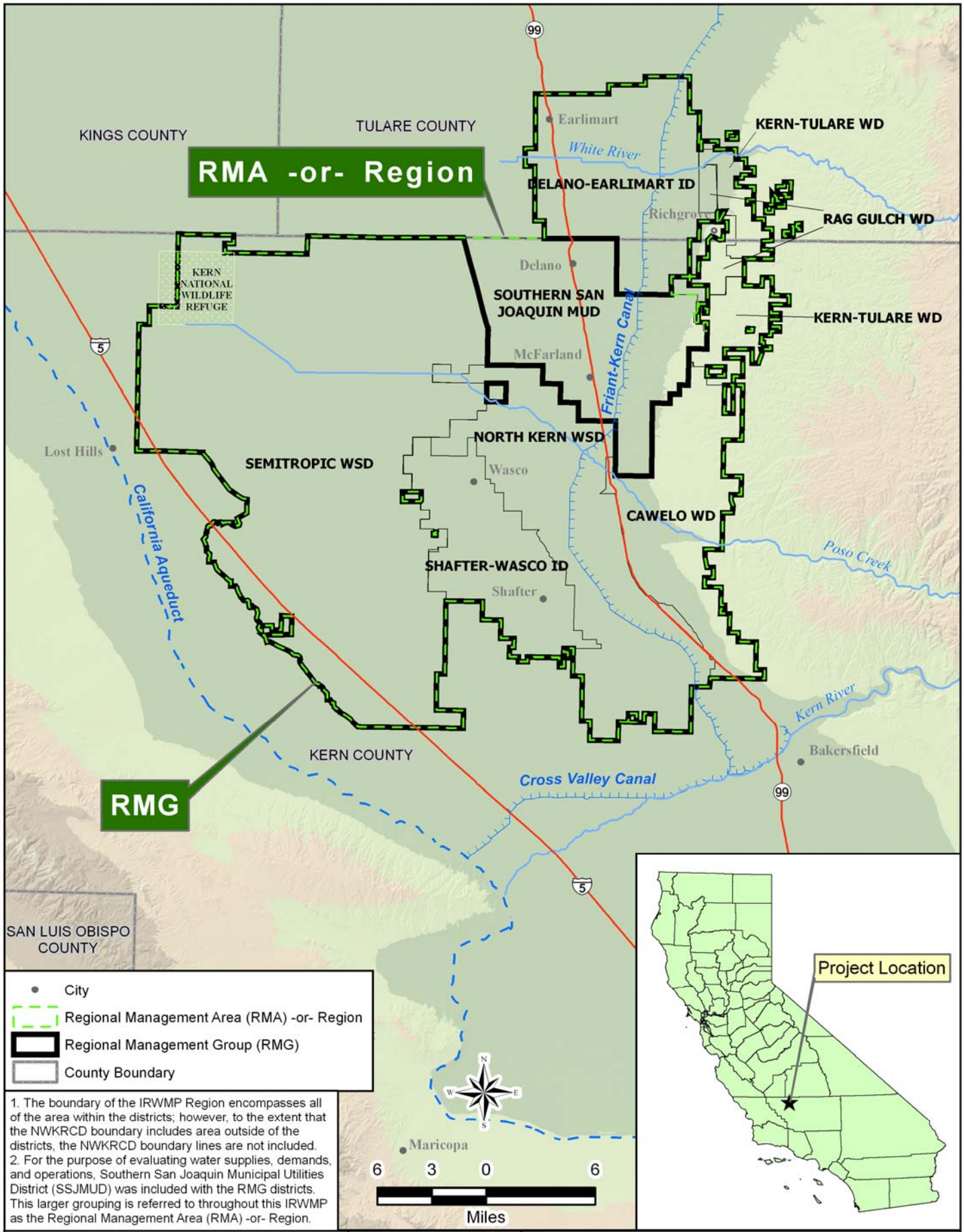
1.1 Poso Creek Regional Management Group

The Poso Creek Regional Management Group (Regional Management Group or RMG) that formulated and ultimately adopted this Poso Creek Integrated Regional Water Management Plan (IRWMP or Plan) is comprised of seven agricultural water districts and one resource conservation district listed below.

- Semitropic Water Storage District – Lead Agency (Semitropic)
- Cawelo Water District (Cawelo)
- Delano-Earlimart Irrigation District (Delano-Earlimart)
- Kern-Tulare Water District (Kern-Tulare)
- North Kern Water Storage District (North Kern)
- Rag Gulch Water District (Rag Gulch)
- Shafter-Wasco Irrigation District (Shafter-Wasco)
- North West Kern Resource Conservation District (NWKRCD)

These districts overlie that portion of the groundwater basin in the Tulare Lake Basin Hydrologic region, which is located in the northerly portion of Kern County and southerly portion of Tulare County. Figure 1-1 shows the Poso Creek IRWMP Region (Region) and the RMG boundaries. These boundaries of the RMG and Region encompass all of the area within the water districts; however, to the extent that the NWKRCD boundary includes area outside of these districts, the NWKRCD boundary lines are not included. For the purpose of evaluating water supplies, demands, and operations, Southern San Joaquin Municipal Utilities District (SSJMUD) was included with the RMG districts. This larger grouping is referred to throughout this IRWMP as the Regional Management Area (RMA) – or - Region.

The land use consists predominately of agricultural lands within the Region's boundary. The rich soils, climate, and irrigation water make it possible to grow a variety of high-value, permanent crops with a gross annual value of nearly $2.0 billion. The largest value commodities – almonds, grapes, citrus, pistachios, and vegetables – are sold worldwide. A discussion of the management responsibilities related to water for each member agency and other agencies involved in the planning process is contained in Section 2.3.



Poso Creek Integrated Regional Water Management Plan

Poso Creek Regional Management Group

GEI Consultants
Bookman-Edmonston Division

Poso Creek IRWMP Region

JUNE 2007

FIGURE 1-1

1.1.1 Purpose and Scope

The purpose of the Poso Creek IRWMP is to provide a framework for – (1) coordinating groundwater and surface water resource management activities into a cohesive set of regional water management objectives, and (2) implementing the actions necessary to meet those objectives. In particular, this Plan emphasizes resolving the Region's water supply challenges through an integrated water resource planning approach.

The focus of the RMG is to improve water supplies throughout the Region in a manner that addresses individual district needs. Anticipating the need for funding assistance when it comes to implementation, this Plan has also been prepared in satisfaction of eligibility requirements for grant funding under monies administered by the state.

1.1.2 Regional Stakeholders, State and Federal Agencies, and Legislative Contacts

In formulating the Plan, the RMG conducted monthly meetings that included participation by the regional stakeholders, state and federal agencies, and legislative contacts listed below. The RMG and stakeholders, shown in Figure 1-2, share a common interest in managing the surface water and groundwater resources of the Region.

Regional Stakeholders:
Buena Vista Water Storage District
Lost Hills Water District
Rosedale-Rio Bravo Water Storage District
Southern San Joaquin Municipal Utility District
Kern County Water Agency
Friant Water Users Authority
Kern County Board of Supervisors
City of Delano
City of McFarland
City of Shafter
City of Wasco
Lost Hills Utility District
Kern National Wildlife Refuge

State and Federal Agencies:
California Department of Fish and Game
California Department of Water Resources
U.S. Bureau of Reclamation

Legislative Contacts:
Congressman Kevin McCarthy
Congressman Jim Costa
Congressman Devin Nunes
Senator Dean Florez
Senator Roy Ashburn
Assembly Member Nicole Parra
Assembly Member Jean Fuller
Assemblyman Bill Maze

Poso Creek Integrated Regional Water Management Plan

Poso Creek Regional Management Group

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Regional Stakeholders and Related Districts

June 2007

Figure 1-2

- City
- River, Creek, etc.
- State Hwy
- Interstate
- Canal, Aqueduct, etc
- Kern River
- Kern County Recharge Facilities
- County Boundary
- ANTELOPE VALLEY-EAST KERN W.A.
- Kern National Wildlife Refuge
- ARVIN-EDISON WSD
- BELRIDGE WSD
- BERRENDA MESA
- BERRENDA MESA WD
- BUENA VISTA WSD
- CAWELO WD
- CITY OF TEHACHAPI WSA
- DELANO EARLIMART ID
- DEVILS DEN WD
- GOLDEN HILLS CSD
- HENRY MILLER WD
- IMPROVEMENT DISTRICT 4
- KEENE WD
- KERN DELTA WD
- KERN WATER BANK
- KERN-TULARE WD
- LEBEC COUNTY WD
- LOST HILLS WD
- MCALISTER RANCH ID
- NORTH KERN WSD
- OLCESE WATER DISTRICT
- PIONEER CENTRAL
- PIONEER NORTH
- PIONEER SOUTH
- QUAIL VALLEY WD
- RAG GULCH WD
- ROSEDALE RANCH ID
- ROSEDALE-RIO BRAVO WSD
- SEMITROPIC WSD
- SHAFTER WASCO ID
- SOUTHERN SAN JOAQUIN MUD
- STALLION SPRINGS CSD
- TEHACHAPI-CUMMINGS CO WD
- TEJON-CASTAC WD
- WEST KERN WD
- WHEELER RIDGE-MARICOPA WSD

6 3 0 6
Miles

SOURCE: Water agency boundaries, Kern National Wildlife Refuge boundary, Kern County Recharge Facilities, and alignments of canals, aqueducts, etc. from Kern County Water Agency, 2006; except Antelope Valley-East Kern WA from USBR, 2006 and SWRU East-West Conveyance from GEI Inc, 2006.

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1.2 Region Description

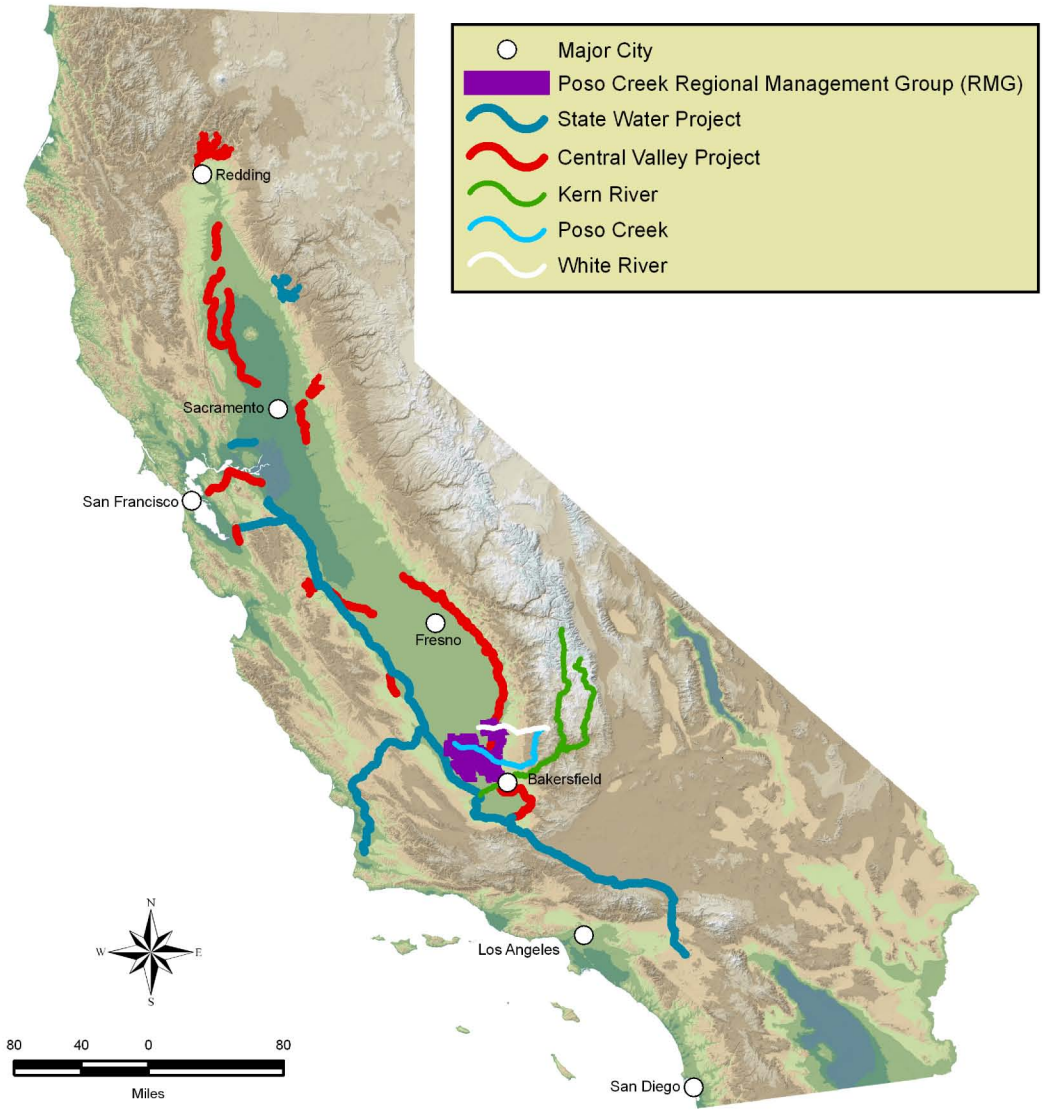
1.2.1 Project Setting

In the San Joaquin Valley portion of Kern and Tulare counties, large quantities of water are utilized for commercial agriculture, for industrial purposes (many of which are related to agriculture), and for the commercial and domestic purposes normal to any community. The general character of the landscape is agricultural, for which the soils and climate are well suited. Thus, the economic fiber of the area depends on water, which was historically developed by diverting limited, variable stream flow and pumping groundwater.

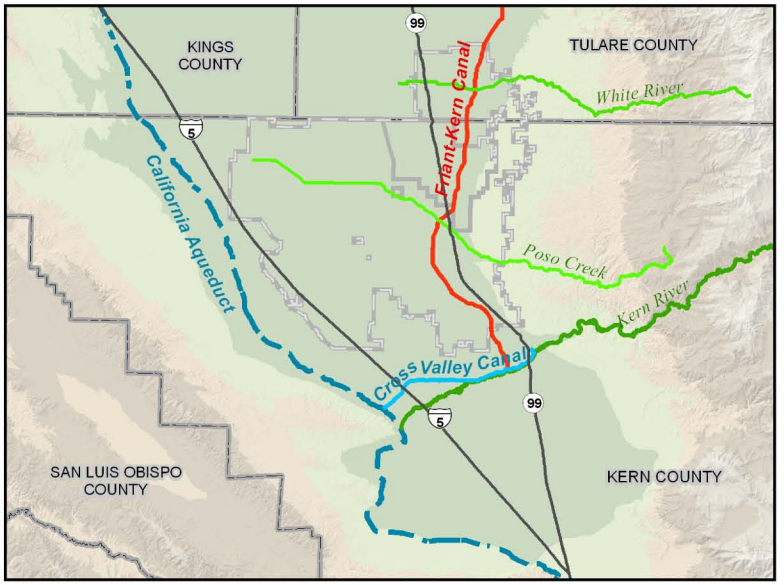
The Region's agricultural development was initiated with livestock grazing which utilized irrigation water supplies from the Kern River for flooding pasture lands. In the 1920s, more intensive irrigated agriculture developed utilizing the river water supplies and also through increasing extraction and use of water from the extensive groundwater body underlying much of the valley lands. Subsequently, the irrigation interests developed measures to supplement irrigation supplies and enhance the naturally occurring recharge of the stored groundwater with water supplies from the Kern River and other local streams, and eventually with water supplies from imported sources.

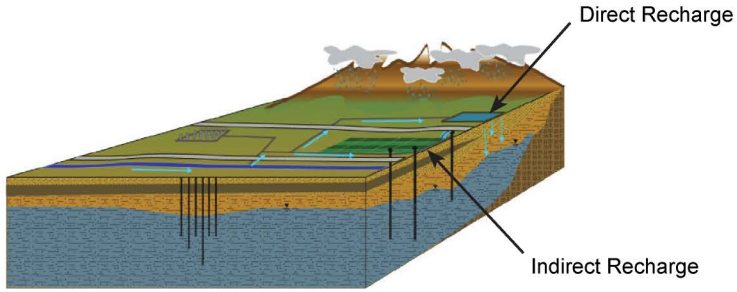
Today, locally occurring water supplies are supplemented with water imported by the State of California through its State Water Project (SWP) and by the Federal government through the U.S. Bureau of Reclamation's Central Valley Project (CVP), as shown in Figure 1-3. Accordingly, the managed resources in the Region include water supplies from:

- State Water Project via the California Aqueduct
- Central Valley Project via the California Aqueduct
- Central Valley Project via the Friant-Kern Canal
- Kern River
- Poso Creek and other minor streams
- Common groundwater basin



The proximity of the Regional Management Group to the California Aqueduct, Friant-Kern Canal, Kern River, Poso Creek and groundwater banking facilities, combined with large conveyance and absorptive capacity, provides an ideal setting for expanded conjunctive use operations.





The Region has large conjunctive use operations and significant groundwater storage capacity.

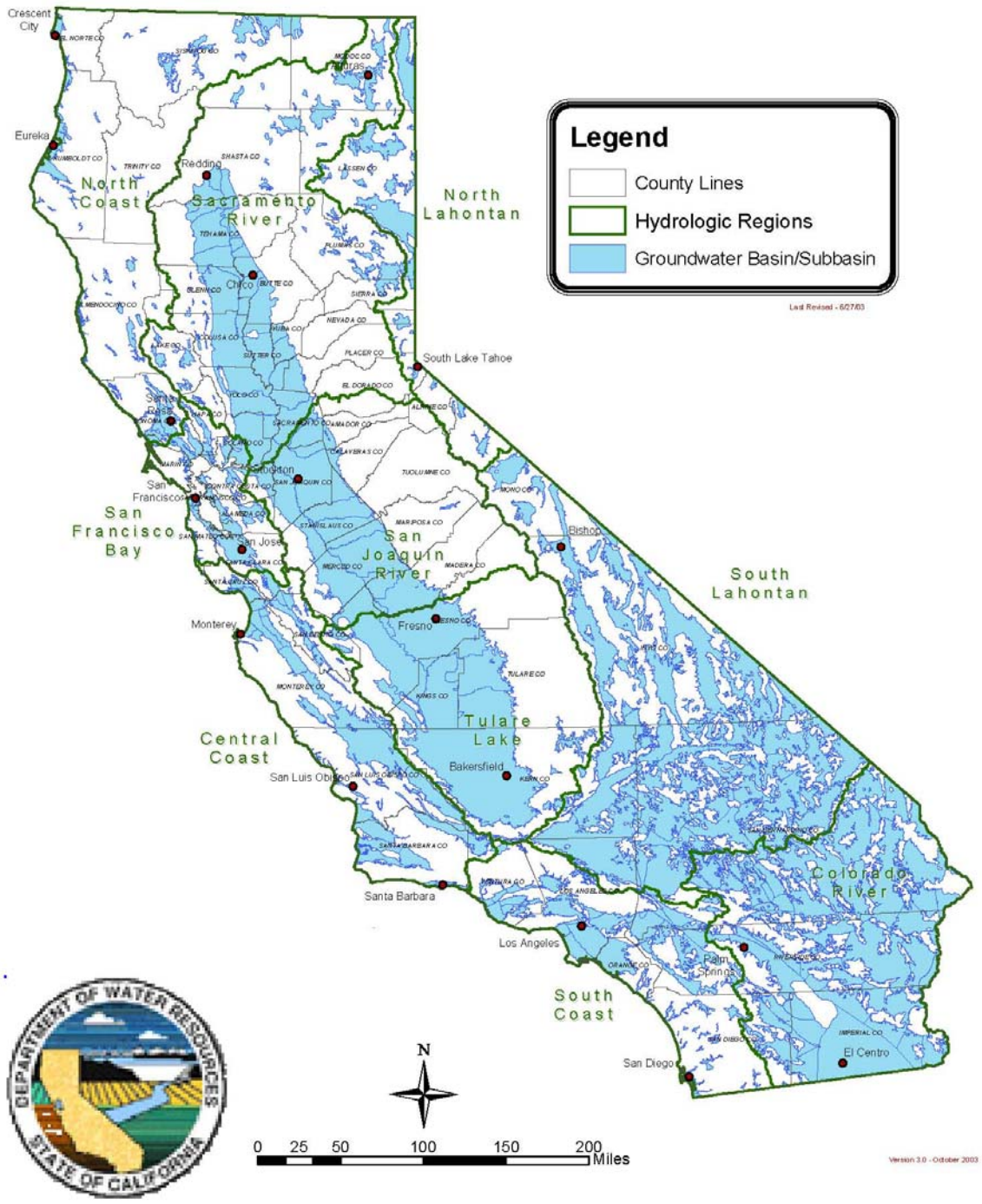
Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Water Supply, Conveyance and Groundwater Storage
Poso Creek Regional Management Group	JUNE 2007	FIGURE 1-3

Numerous public agencies, formed under the laws of the State of California, were established to develop, regulate, and distribute local water supplies and supplies imported from outside the Region by the SWP and the CVP. For decades, water agencies in both Kern and Tulare counties have given much attention, effort, and funding to the effective planning, control, and utilization of their water resources.

Notwithstanding the high degree of water resource management that has evolved, there are water supply challenges ahead which require that water resources management in the Region be taken to a new level. In simple terms, there are several things which either will or could serve to reduce the water supplies historically available to the Region. Given that, at best, it could be argued that groundwater levels over the Region have been "stable" over recent history, it is clear that any reduction in historically available water supplies will translate to a decline in water levels. Accordingly, it is incumbent on the Region to identify and implement measures which will mitigate the anticipated reduction in water supply reliability in order to maintain the economy which has built up in reliance on those supplies. In particular, these measures would facilitate an increase in the Region's capability to recharge water supplies when available, through both in-lieu and direct means. The groundwater basin common to the Region is the Tulare Lake Basin (DWR No. 5-22.14) as identified in California's Groundwater Bulletin 118, as shown on Figure 1-4.

The agriculture-based economy of the Region depends on an adequate water supply from several sources; however, increasing competition for California's water resources, principally for urban and environmental uses, is pointing toward an integrated regional water management approach to resolve water resource issues in the Region.

Groundwater Basins in California



Source: California Department of Water Resources. 2003. Map of Groundwater Basins in California. http://www.dpla2.water.ca.gov/publications/groundwater/bulletin118/maps/correct_statewide_basin_map_V3.pdf

Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Tulare Lake Basin
Poso Creek Regional Management Group		June 2007 Figure 1-4

1.2.2 Water Delivery System Assets of Kern County

The San Joaquin Valley portion of Kern County is uniquely positioned with assets, both natural and man-made, to enable regional solutions to its challenges of balancing surface water and groundwater supplies through an integrated water planning approach. Among these assets are:

- The Region is served by two major aqueducts, the California Aqueduct of the State Water Project and the U.S. Bureau of Reclamation's Friant-Kern Canal of the Federal CVP. These two canals are linked near Bakersfield by the locally-operated Cross Valley Canal, which allows water to be exchanged between the aqueducts of the SWP and the CVP.

- Corps of Engineer's Isabella Dam and Reservoir provides storage capacity for Kern River water. While used primarily as a flood control reservoir, Isabella Reservoir provides significant conservation benefits through the regulation of stream flows for delivery to irrigation and groundwater recharge basins.

- The existence of a vast groundwater basin with significant dewatered storage capacity.

- An extensive network of pipelines and canals which deliver water to irrigated lands and to dedicated water spreading areas, thereby providing recharge to the underlying groundwater reservoir.

- An existing institutional structure, consisting of numerous public water entities, the area-wide Kern County Water Agency, and the member districts of the Poso Creek RMG, which collectively have governance, local water rights, and established contractual relationships necessary for implementation of measures required for an integrated solution to the challenges of the Region's water supply.

Through the formulation of this Plan, the RMG has selected and prioritized water management strategies and provided a framework for implementing them. An integral part of these management strategies is the implementation of projects which involve expanding the Region's already extensive capability to conjunctively manage the available surface water and groundwater supplies. The RMG is uniquely positioned and well equipped to function as a *region* for management and implementation of the Plan.

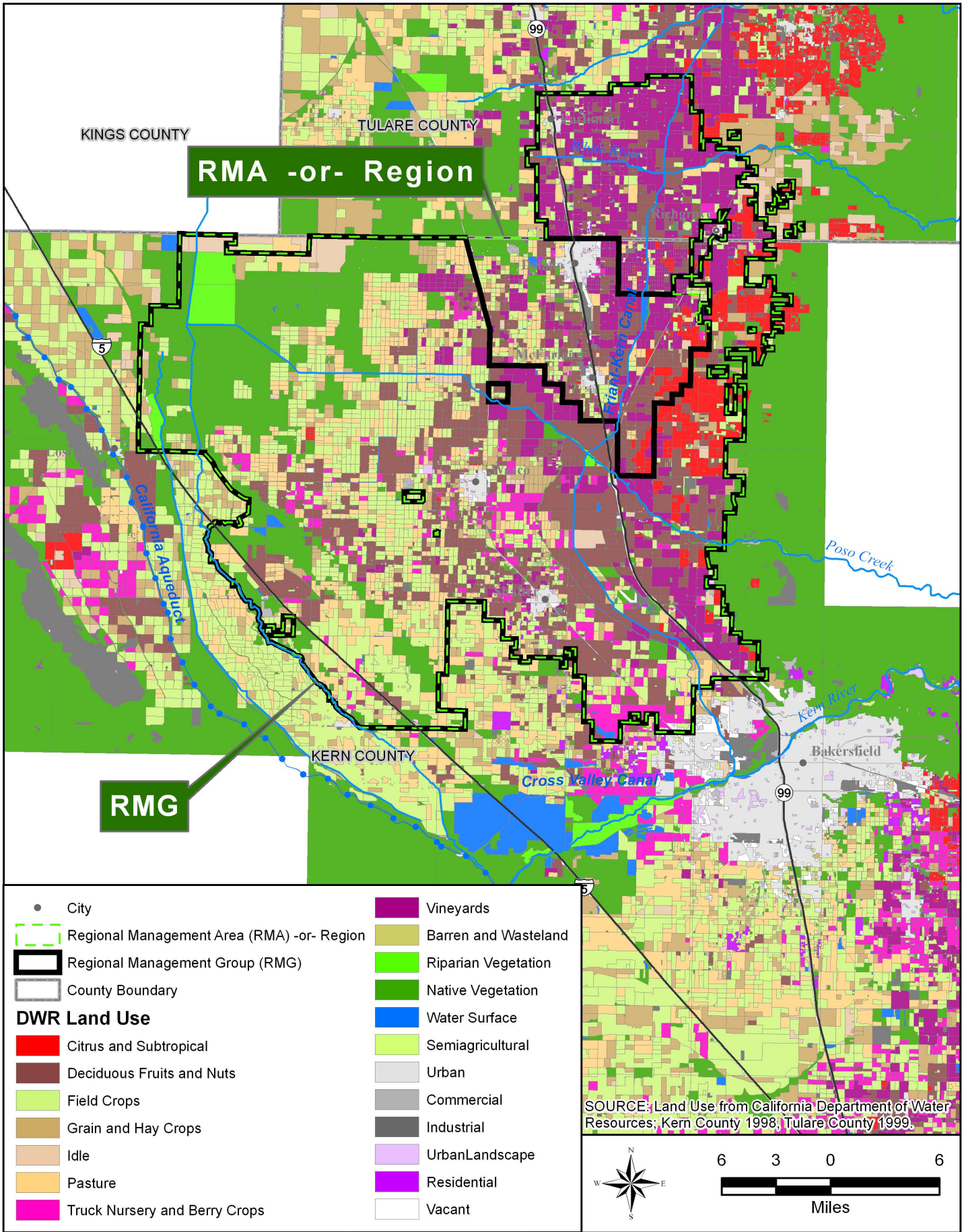
The group's attributes in this respect include the following:

- The RMG and stakeholders who include *economically-disadvantaged* communities share a common groundwater basin and overlies an area largely characterized by good quality groundwater.
- The Region is uniquely located to use, store, and transfer water from three major sources of surface supplies – (1) the State Water Project, (2) the Friant-Kern Canal of the Federal CVP, and (3) the Kern River.
- Agencies of the RMG have operated their localized areas of the groundwater basin conjunctively with available surface supplies for decades.
- Agencies of the RMG have the ability to enter into arrangements for storage and transfer of water for other areas in California.
- The Kern National Wildlife Refuge and various duck clubs provide wildlife enhancement opportunities within the Region.
- Agencies of the RMG are committed to working cooperatively to implement regional solutions.

1.2.3 Presently Irrigated Lands and Crop Types

The Region contains some of the richest agricultural production land in the southern San Joaquin Valley, with about 346,540 acres of irrigated cropland out of a gross area of about 499,770 acres. Figure 1-5 shows the land use within the Region, based on the recent data readily available from the California Department of Water Resources (DWR) land use database. DWR's land use data for Kern County reflects 1998 conditions, whereas Tulare County reflects 1999 conditions. During the past 25 years, cropping patterns on agricultural land have steadily migrated towards high-value permanent crops with a commensurate reduction in annual crop types. Irrigation methods have also changed, with an increase in the use of low-volume systems for water application. Table 1-1 shows the irrigated land for each district, based on each district's 2005 crop survey information. For the Region, about 67 percent of the irrigated land is planted to permanent crops, with some individual districts having 80 to nearly 100 percent of their irrigated land in permanent crops. By comparison, about 40 percent of the irrigated land in the Region was planted to permanent crops 25 years ago.

It is noted that all of the districts in the Region were organized to serve irrigation water; accordingly, most do not provide domestic or residential water within their boundaries. However, all of the districts have groundwater management responsibilities and several have management agreements with *economically-disadvantaged* communities.



Poso Creek Integrated Regional Water Management Plan

Poso Creek Regional Management Group

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Bookman-Edmonston Division

DWR Land Use

JUNE 2007

FIGURE 1-5

Table 1-1 summarizes the irrigated acreage in 2005 for each district within the Poso Creek RMA.

Table 1-1

Irrigated Area in the Poso Creek RMA for 2005

District	Total Area (acres)	Irrigated Area (acres)	Permanent Crops (acres)
Cawelo	44,970	33,700	32,900
Delano-Earlimart	56,500	47,950	44,820
Kern-Tulare	17,100	12,550	12,550
North Kern	61,050	51,280	35,520
Rag Gulch	5,950	4,650	4,650
Semitropic	222,120	120,720	47,110
Shafter-Wasco	34,140	30,290	16,830
SSJMUD	57,940	45,400	36,680
Subtotal*	499,770	346,540	231,060

Irrigated land acreages were derived from the 2005 land use crop acreages for each agency, excluding idle acreages.

1.2.4 Importance of Region's Agriculture-Based Economy

Kern County ranks among the leading five counties in the United States in the value of its agricultural products. The gross value of all agricultural products from the County in 2006 exceeded $3.5 billion according to the Kern County Crop Report. Since the permanent crop irrigated area of the portion of the Region in Kern County is over 45 percent of the permanent crop irrigated area of Kern County, and because the RMA contains at least 67 percent of high-value permanent crops, it is estimated that the RMA annually produces at least $2 billion in agricultural commodities.

Maintenance of the economy of the Region requires a long-term solution to its water supply challenges. Part of the solution, as outlined herein, is attainable but will require concerted positive actions by the RMG, in cooperation with other entities in the State facing similar long-term water reliability issues. These actions include both non-structural and structural water management measures that are addressed in this Plan. The consequences of failing to

take positive actions are increased pumping lifts with a commensurate increase in production costs to all users, and ultimately, the economic loss, both direct and indirect, associated with the loss of agricultural production.

1.2.5 Projected Supplies and Demands for Long-Term Planning Horizon

Water supplies and water demands have been projected over a long-term planning horizon (20-30 years). Based on information presented in Chapter 4, it is estimated that the long-term average annual availability of surface water supplies to the Region is on the order of 0.7 million acre-feet. This estimate is based on availability at the source of supply and does not reflect consideration of any conveyance or absorptive capability limitations; rather, these limitations are considered in operations studies presented in Chapter 7. The average annual water demand is projected to remain comparable to *present conditions*. Based on information presented in Chapter 5, it is estimated that the long-term average annual applied water demand for the Region is on the order of 1.3 million acre-feet. This includes consideration of agricultural (at 3.5 acre-feet per acre), municipal and industrial, and environmental uses. The difference between the projected demands and supplies, 0.6 million acre-feet annually, represents the minimum gross amount of pumped groundwater on average over the long term. It is the minimum inasmuch as it assumes that *all* of the available surface water supplies can be delivered to meet a coincident demand. While the notion of absorbing *all* of the available surface water supplies is not realistic, this integrated planning effort is, to a large extent, focused on maximizing the use of surface water supplies when they are available, which can be accomplished through implementing both non-structural and structural measures.

1.2.6 Urban and Industrial Lands and Disadvantaged Communities

While the RMA extends into Tulare County, it principally lies within Kern County. The Kern Council of Governments reports[1] the following for Kern County with respect to population, income, and poverty and participation in government programs.

Population: According to the 2000 Census, Kern County's population is 661,645, an increase of 21.7 percent over 1990 Census data. The population of Kern County is 49.5 percent white (non-Hispanic), 38.4 percent Hispanic, 6 percent African-American, 3.4 percent Asian and 1.5 percent Native American. Between 2005 and 2025, Kern County is expected to double its existing population; grow by more than 160,000 new homes; and add 400,000 vehicles to its roadways.

Income: The median income of households in Kern County was $32,942. Eighty percent of the households received earnings and 17 percent received retirement income other than Social Security. Twenty-three percent of the households received Social Security. The

[1] At http://www.kercog.org.

average income from Social Security was $10,902. Some households received income from more than one source.

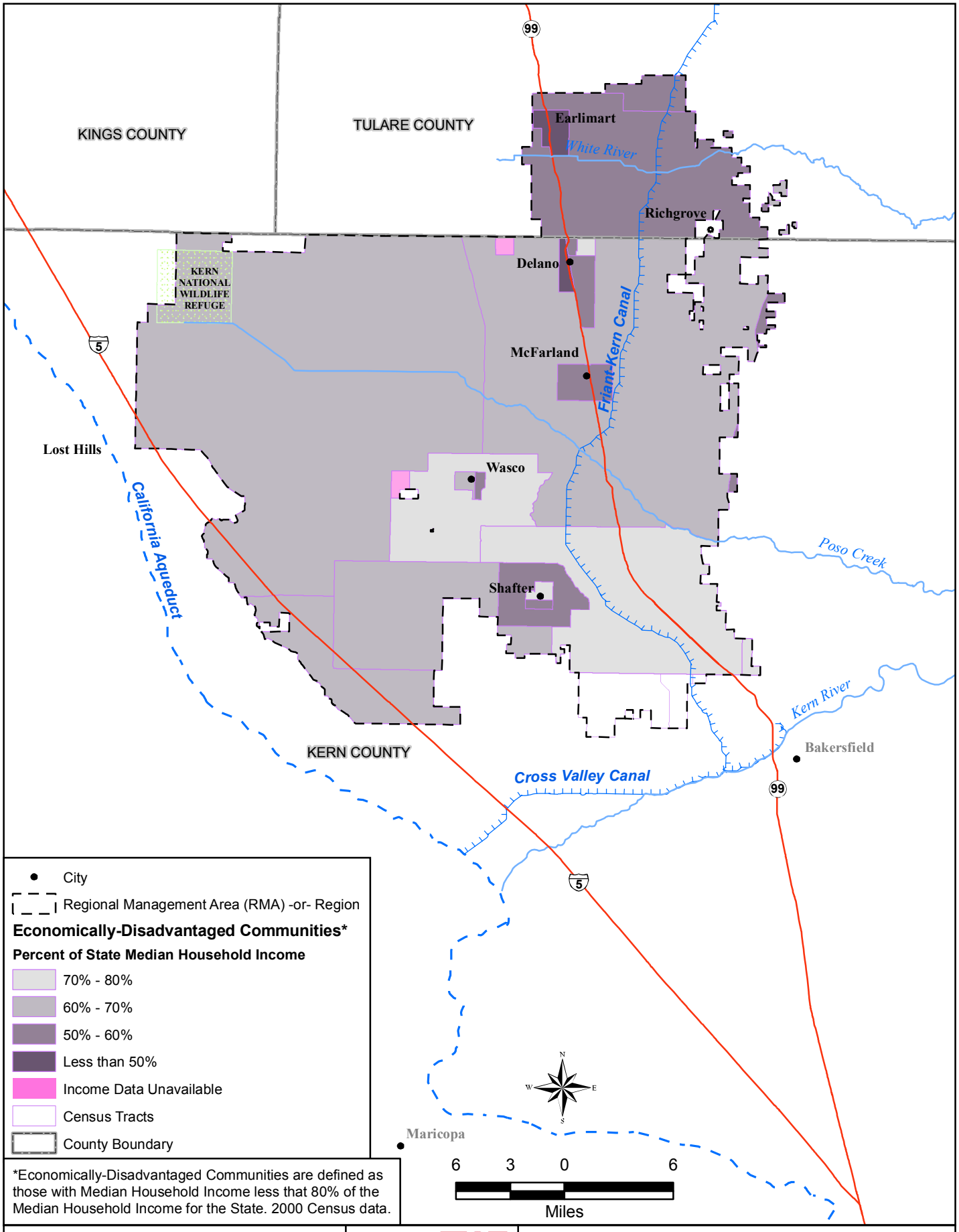
Poverty and Participation in Government Programs: In 2000, 21 percent of people were in poverty. Twenty-six percent of related children under 18 were below the poverty level, compared with 13 percent of people 65 years old and over. Eighteen percent of all families and 38 percent of families with a female householder and no husband present had incomes below the poverty level. Thirty-three percent of the households in Kern County received means-tested public assistance or non-cash benefits.

The largest population center in the southern San Joaquin Valley is the City of Bakersfield, which is located just to the south of and immediately adjacent to the RMA. Several smaller population centers in outlying areas support the two primary industries; agriculture and oil. The communities within the RMA principally provide support to agriculture.

The cities of Delano, McFarland, Shafter, and Wasco, along with the unincorporated communities of Earlimart, Lost Hills, and Richgrove, are located within the Region and are shown on Figure 1-6. Census 2000 population and *median household income* data for each of these communities have been compiled and are presented in the following tabulation. (Note that both population and MHI have been rounded to the nearest 100.)

Cities and Census Designated Places	Census Geography	Census 2000 Population[2]	Census 2000 MHI[3]	Percent of Census 2000 Statewide MHI
Delano	City	33,800[4]	28,100	59
Earlimart	CDP	6,600	21,300	45
Lost Hills	CDP	1,900	31,900	67
McFarland	City	9,600	24,800	52
Richgrove	CDP	2,700	22,900	48
Shafter	City	12,700	29,500	62
Wasco	City	15,100[5]	29,000	61
Poso Creek RMA:		82,400	27,500[6]	58[7]

[2] Source: U.S. Census Bureau (http://factfinder.census.gov)
[3] Source: U.S. Census Bureau (http://factfinder.census.gov)
[4] Does not include institutionalized population.
[5] Does not include institutionalized population.
[6] Population-weighted average for the Poso Creek RMA.
[7] Population-weighted average for the Poso Creek RMA.



Poso Creek Integrated Regional Water Management Plan

Poso Creek Regional Management Group

GEI Consultants
Bookman-Edmonston Division

Economically-Disadvantaged Communities in Poso Creek IRWMP Region

JUNE 2007

FIGURE 1-6

Each of these communities is considered *economically disadvantaged* based on a comparison of the statewide median household income (MHI) with household incomes within these urban areas. In particular, the MHI for each is less than 80 percent of the statewide MHI. On a regional basis, as shown in the tabulation, the population-weighted average MHI is $27,500 for the Poso Creek RMA, or about 58 percent of the statewide MHI, which is significantly lower than the above-stated threshold of 80 percent.

Based on recent published estimates, more than 100,000[8] people presently reside within the Region. The population approximately doubled between 1990 and present, which implies an average growth rate of about 5 percent per year. Assuming that this rate continues, the population of the Region could double in the next 15 to 20 years. Similarly, gross water use can be expected to double, from the current estimate of 40,000 acre-feet, to 80,000 acre-feet, absent additional conservation measures. These numbers reflect the gross use of groundwater inasmuch as all of the communities rely exclusively on pumped groundwater for their water needs. In this regard, it is noted that the groundwater basin is a resource in common with all uses within the basin, including irrigated agriculture, i.e., as a generalization, all groundwater within the Region is hydraulically connected.

The following findings and observations with regard to the RMA are developed later in this Report: (1) groundwater levels have been relatively "stable" over the last 25 years; (2) the demand for water is projected to remain about the same as in the past; and (3) less surface water is projected to be available to the Region in the future, with a commensurate increase in the reliance on pumped groundwater. Accordingly, groundwater levels will decline, with a corresponding increase in the use of power and energy resources, creating both an environmental and economic burden. With a common groundwater basin shared by all uses within the Region, any decline in water levels will be felt by all uses, i.e., there will be an adverse economic effect on both irrigated agriculture and the already *economically-disadvantaged* communities that rely on groundwater in whole or in part. By the same token, anything that is done to mitigate declines in water levels, such as projects identified in this Plan, will benefit all uses. It is noteworthy that not only do these communities rely on the common groundwater resource, but they rely on the viability of irrigated agriculture.

While the RMG has selected *water supply reliability* as the highest priority, affecting all uses in the basin, it is understood that there are drinking water quality issues in the Region. It is further understood that these issues have been manageable to date, but may require more creative and cooperative approaches in the future, with ever more stringent drinking water quality standards. Based on contact with the California Department of Public Health

[8] Source: Population estimates for January 1, 2007 published by the Kern Council of Governments on its website (http://www.kerncog.org). The Kern Council of Governments credits the California Department of Finance, Demographic Research Unit, for these data.

(CDPH), it is understood that the majority of the drinking water quality issues within the Region are related to nitrate or arsenic in the drinking water source. While presented later in this Report, Project No. 29 (which can be found in Appendix D Project Descriptions) was formulated and included to help the *economically-disadvantaged* communities qualify for grant funding by being participants in this regional planning process and to assist them by identifying and informing them of funding opportunities. With the passage of Proposition 84, several funding opportunities are going to be available that were not necessarily available to the *economically-disadvantaged* communities under Proposition 50. Accordingly, additional coordination is planned with these communities as the IRWM planning effort moves beyond Proposition 50 and into Proposition 84. Furthermore, it will also be an advantage to participate in the larger planning effort being formed for the Southern San Joaquin Valley that may help to coordinate the various funding opportunities over several counties.

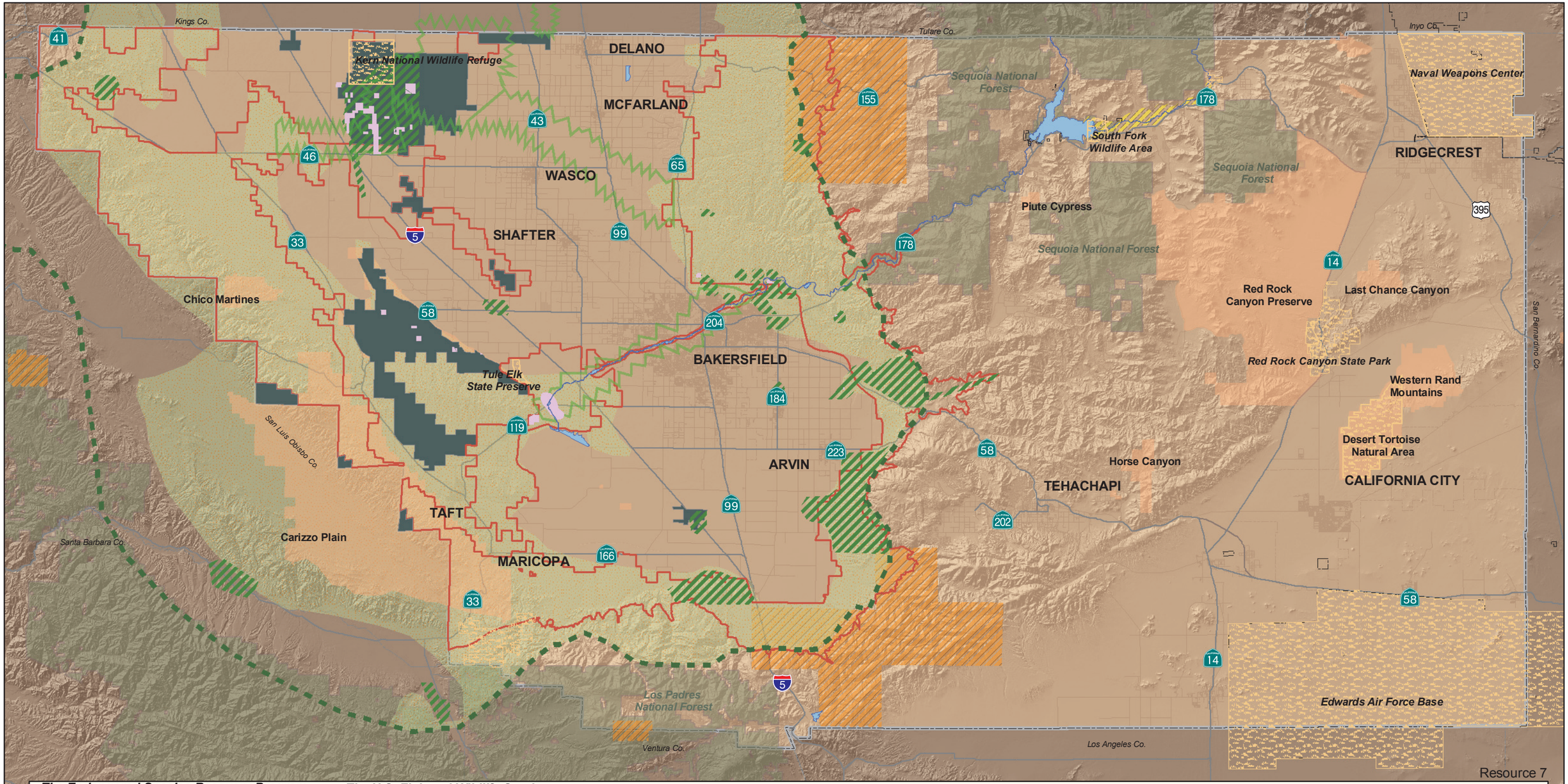
1.2.7 Ecological Processes and Environmental Resources within the Region

The Endangered Species Recovery Program, founded by the US Fish and Wildlife Service, presents an ecosystem approach to species recovery. A significant component of species recovery is establishing a network of conservation areas and reserves that include terrestrial and riparian natural areas in the San Joaquin Valley. The intent of the Endangered Species Recovery Program is to maintain or enhance species habitat values. In this regard, the US Fish and Wildlife Service published a decision in the Federal Register in 1976 which designated nine critical habitat areas for the California Condors. Also, in 1996, the US Fish and Wildlife Service published a proposed rule in the Federal Register establishing critical, habitat areas for the southwestern willow flycatcher. As part of their efforts to conserve species recovery in the San Joaquin Valley, the Metro Bakersfield Habitat Conservation Plan (HCP) and the Kern Valley Floor HCP were have established endangered species recovery programs in the San Joaquin Valley to promote species recovery. See Figure 1-7 for a map of the habitat conservation areas as defined for the San Joaquin Valley. The RMG will make a concerted effort in their implementation of the Plan to safeguard the ecological processes and environmental resources within their boundaries.

1.2.8 Water-Related Recreation Land Use

Lakes for water recreation in Kern County include Isabella Reservoir, Lake Woollomes adjoining the Friant-Kern Canal, Ming Lake on the Kern River easterly of Bakersfield, and the Buena Vista Aquatic Recreation Area adjacent to the California Aqueduct. These are multi-purpose facilities including water supply and recreation. While there are some evaporation losses that are attributable to recreation, these are relatively small compared to other uses. In addition, there are some water demand requirements in the Kern National Wildlife Refuge for grain irrigation and for flooding ponds for waterfowl, duck clubs belonging to the Semitropic Wildlife Improvement District, and some private duck clubs.

Figure 1-7 Kern Council of Government Habitat Conservation Map



Resource 7

The Endangered Species Recovery Program

The Endangered Species Recovery Program, founded by the US Fish and Wildlife Service, presents both an ecosystem approach to recovery and a community-level strategy for recovery. A central component of species recovery is to establish a network of conservation areas and reserves that represent all of the pertinent terrestrial and riparian natural communities in the San Joaquin Valley. Habitat protection does not necessarily require land acquisition or easement. The most important aspect of habitat uses maintain or enhance species habitat values.

The U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service published a final rule in the Federal Register (1976) designating nine critical habitat areas for the California Condor. Also, the U.S. Fish and Wildlife Service published a proposed rule in the Federal Register proposing the establishment of critical habitat for the southwestern willow flycatcher(1996).

Local Habitat Conservation Plans

Included in this map are data from the Metro Bakersfield Habitat Conservation Plan (HCP) and the Kern Valley Floor HCP (pending adoption).

Metro Bakersfield HCP

- Planned Habitat Acquisition

Endangered Species Recovery Program San Joaquin Valley

- Species Recovery Area
- Proposed Wildlife Linkages
- Proposed Speciality Preserves
- Wildlife Compatible Farmland

Kern Valley Floor HCP *(Pending Adoption)*

- Conserved
- Corridor

U.S. FWS Critical Habitat Areas

- California Condor
- Southwestern Willow Flycatcher
- BLM Areas of Critical Concern
- Existing Preserves, Natural Areas, etc.

Habitat Conservation

0 2.5 5 10 15 Kilometers

0 2.5 5 10 15 Miles

Kern Council of Governments

Kern Master Environmental Assessment Resource - 2004

1.2.9 Appropriateness of the Region for an IRWMP

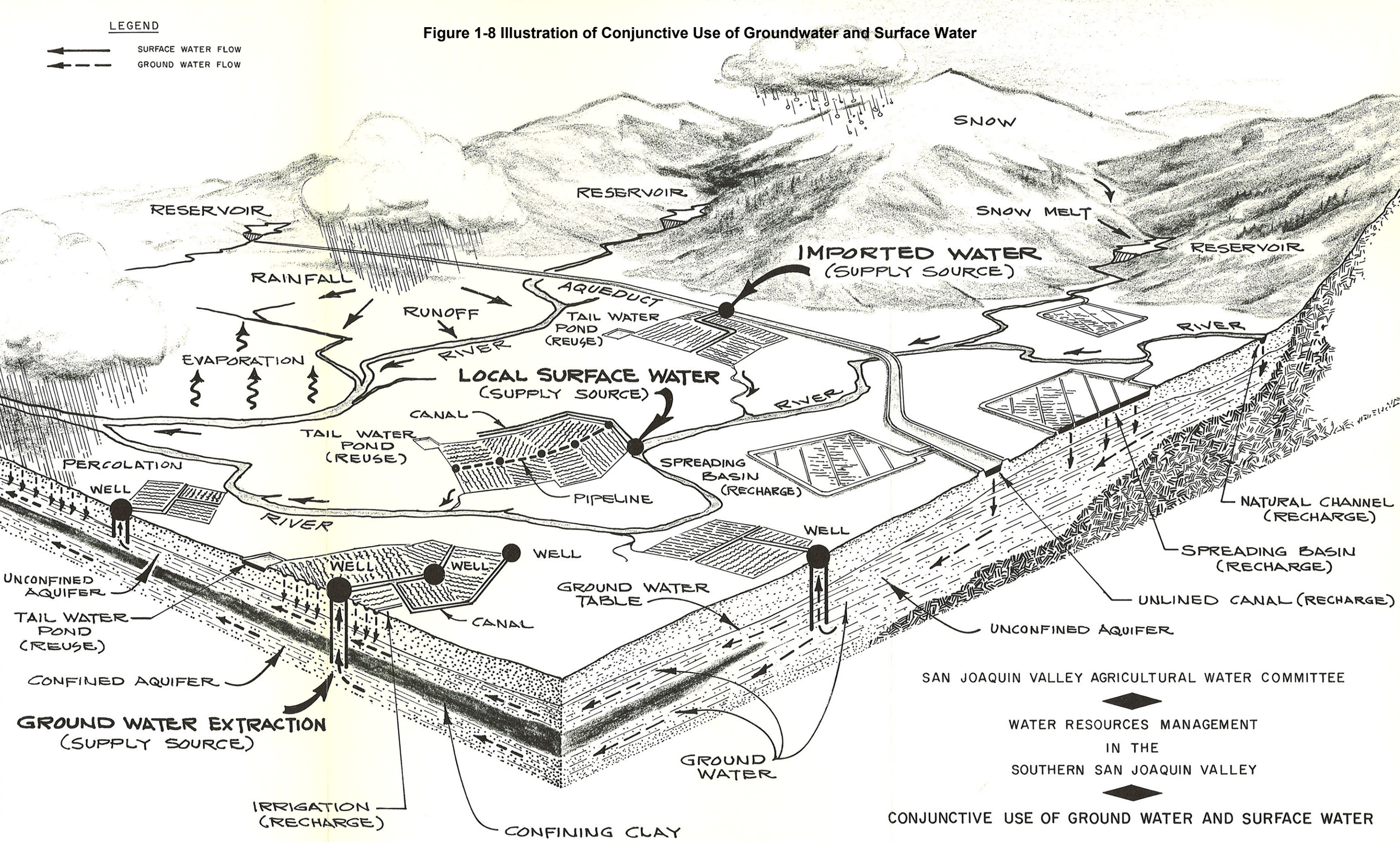
For decades, the agencies within the RMG have operated portions of the common groundwater basin conjunctively with the available surface supplies described in Chapter 4. The illustration dating back to 1979, shown in Figure 1-8, is an example of how conjunctive use of the groundwater and surface water have been a part of the water resources management planning practices in the San Joaquin Valley for many years. Therefore, it was logical for the RMG to form and focus on the potential for increasing conjunctive use of limited surface water and groundwater supplies through regional cooperation and planning. The Region is located at the interchange of the California Aqueduct, Friant-Kern Canal, and the Kern River. The Region's assets --- state, federal, and local water supplies; proximity to major conveyance facilities of statewide importance; significant dewatered groundwater storage capacity; and significant absorptive capability that can be reached with surface water --- have made it an ideal location to regulate surface supplies conjunctively with groundwater to the benefit of the agriculture-based economy of the Region and the State. In addition to their geographical, hydrological, and institutional attributes, the RMG's operational knowledge proved essential when formulating the Plan. Moreover, the Plan provides this Region with the opportunity to contribute to the local and state-wide improvement of water supply reliability, provide drought protection, to assist economically disadvantaged communities, to assist in the management of water-related aspects of the Sacramento River Delta, and to facilitate satisfaction of the environmental water needs of the recent San Joaquin River Settlement.

1.3 Regional Objectives and Needs of the Plan

As stated previously, the purpose of the Plan is to provide a framework for coordinating groundwater and surface water management activities into a cohesive set of selected management strategies and implementing the actions necessary to meet the Plan's objectives. Significant water issues facing the Region include maintaining a reliable water supply and balancing the use of surface water and groundwater supplies within the basin. The needs associated with the management of surface water and groundwater supplies, as identified by each member of the RMG during the formulation of this Plan, are discussed in Chapter 3.

The Plan's planning objectives are listed below. The planning objectives, water management strategies, and proposed actions to meet these objectives are discussed in more detail in Chapter 6.

Figure 1-8 Illustration of Conjunctive Use of Groundwater and Surface Water



SAN JOAQUIN VALLEY AGRICULTURAL WATER COMMITTEE

WATER RESOURCES MANAGEMENT
IN THE
SOUTHERN SAN JOAQUIN VALLEY

CONJUNCTIVE USE OF GROUND WATER AND SURFACE WATER

BOOKMAN - EDMONSTON ENGINEERING, INC.
JANUARY 1979

1.3.1 Regional Water Management Planning Objectives

Overarching themes of the planning objectives are strengthening local and statewide water supply reliability; protecting regional groundwater levels and quality; providing operational flexibility that will facilitate efficient, effective water management; providing water for environmental purposes; and controlling water supply costs within the Region.

The RMG adopted seven planning objectives, which are listed following:

1. Maintain and improve water supply reliability;
2. Maintain groundwater levels at economically viable pumping lifts;
3. Protect the quality of groundwater and enhance where practical;
4. Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Region;
5. Enhance monitoring activities to meet groundwater level and water quality goals;
6. Maintain and/or enhance environmental resources within and outside of the Region; and
7. Enhance flood control in the Region.

Planning objectives 1 through 5 were selected by the RMG based on a consensus reached during a pre-application meeting held on April 20th, 2005. Subsequently, during the kick-off meeting for the Plan held on January 5, 2006, the RMG added planning objective 6, and, based on stakeholder input during monthly meetings held in 2006, planning objective 7 was added.

1.4 Reference to Previous Reports and Organization of this Report

The investigation for this report on the Plan makes use of information presented in earlier regional reports, including the following.

1. *"Water Resources Management in the Southern San Joaquin Valley, California" – A Study of the Physical and Institutional Management Practices for Surface and Ground Water Utilization, Bookman-Edmonston Engineering, January 1979.*

2. *"Report on Investigation of Optimization and Enhancement of the Water Supplies of Kern County", Associated Engineering Consultants, January 1983.*

3. *"Kern County Water Agency – Initial Water Management Plan", Kern County Water Agency, October 2001.*

Included in this Plan is an evaluation of the present and future utilization of the surface water and groundwater resources of the seven districts (listed under Section 1.5) which comprise the RMG. The RMG will formulate implementation proposals based on the proposed structural and non-structural solutions presented in Chapters 6, 7, and 8.

The remainder of this report has been organized as follows:

- Chapter 2 – Planning Activities, Regional Management Group Members' Conveyance Systems, and Water Management Roles and Responsibilities
- Chapter 3 – Water Management Assets, Issues, and Needs of the Poso Creek IRWMP Management Group Members
- Chapter 4 – Historical and Projected Water Supplies
- Chapter 5 – Historical Water Use and Projected Water Demand
- Chapter 6 – Planning Objectives, Regional Priorities, and Integration of Water Management Strategies
- Chapter 7 – Water Supply Operations Studies
- Chapter 8 – IRWMP Formulation and Regional Benefits
- Chapter 9 – Poso Creek IRWMP Implementation
- Chapter 10 – Stakeholders and Public Involvement

1.5 Acknowledgements

The analyses and the preparation of this report were possible only because of the wholehearted support of the eight member agencies of the RMG for the Poso Creek IRWMP, and the personal contributions by members of their staff. Particular mention is made of the following individuals –

- Semitropic Water Storage District (Paul Oshel, District Engineer)
- Cawelo Water District (David Ansolabehere, General Manager; and Scott Hamilton, Director)
- Delano-Earlimart Irrigation District (Dale Brogan, General Manager)
- Kern-Tulare Water District (Steve Dalke, General Manager)
- North Kern Water Storage District (Dana Munn, Engineer-Manager)
- Rag Gulch Water District (Steve Dalke, General Manager)
- Shafter-Wasco Irrigation District (Jerry Ezell, General Manager)
- North West Kern Resource Conservation District (Brian Hockett, District Manager)

Knowledge and experience of GEI Consultants, Inc. Bookman-Edmonston Division in the development of groundwater management programs in the San Joaquin Valley and California in general were important in developing the plans recommended in this report.

2 Planning Activities, Regional Management Group Members' Conveyance Systems, and Water Management Roles and Responsibilities

2.1 Water Management Planning Activities

2.1.1 Historical Water Management Planning Related to the Region

A major water management planning effort was undertaken by a consortium of Kern County water districts in 1983. This effort followed an earlier (1979) study entitled "Water Resources Management in the Southern San Joaquin Valley, California". The resulting "Optimization Report"[1] described a thorough investigation of the status of development and water requirements as of 1980, as well as measures that could be taken to increase Kern County's absorptive capacity[2] in order to take better advantage of wet year supplies. The Optimization Report also evaluated the feasibility of securing additional water supplies from other northern California non-State Water Project sources.

The primary recommendations of the Optimization Report were – (1) to increase groundwater recharge capability (mainly in the Kern Fan area near Bakersfield, California), (2) to construct groundwater banking arrangements to protect west side agriculture in the San Joaquin basin of Kern County, (3) to investigate additional opportunities to engage in west and east water exchanges (to avoid energy consumption for pumping), and (4) to construct additional west-to-east conveyance. Many of the recommendations contained in the Optimization Report have since been implemented.

Even though the Optimization Report is about 25 years old, it is still an important resource for water managers to measure their long-term progress and an example of how Kern County and Southern San Joaquin Valley agencies have had a history of working together to solve the area's water needs. During the past 25 years, actions taken based on these early water management plans have led to stabilized groundwater levels. In this regard, recommendations found in previous water related reports were an important starting place in formulating the Poso Creek IRWMP. Where appropriate, such information is included or referenced in this Poso Creek IRWMP.

[1] "Report on Investigation and Optimization and Enhancement of the Water Supplies of Kern County", Prepared by Associated Engineering Consultants, Bakersfield, California, January 1983.

[2] Absorptive capacity is the sum of the consumptive use of agricultural crops plus the infiltration to the groundwater basin.

2.1.2 Recent Water Management and Planning Activities in the Region

Water management in the Region is governed by a web of water exchange agreements, banking arrangements, and local agency agreements and relationships. Management actions are driven by agricultural water use in the Region and influenced by the overall water supply issues of the State of California. Urbanization in areas located in other parts of California and environmental water needs located outside of the Region are causing changes in how water is managed in the Region.

Subsequent to the Optimization Report, during the late 1980s, the State Department of Water Resources proposed development of the Kern Water Bank, which was conceived as being comprised of the Kern Fan Element (a direct recharge and recovery project straddling the Kern River) and several "local elements" (direct and/or in-lieu recharge projects within surrounding water districts). The primary objective of the Kern Water Bank was to develop additional storage and State Water Project yield. While the State did not proceed with the Kern Water Bank, local agencies have proceeded with implementation for the benefit of Kern County and water agencies having water management agreements with Kern County water districts. In particular, a consortium of local water agencies has implemented the Kern Fan Element which is known today as the Kern Water Bank.

It is noteworthy that the planned "local elements" of the Kern Water Bank from the State's planning efforts of the late 1980s and early 1990s were not limited to the area of the Kern fan. In particular, during this period of time, Cawelo, North Kern, and Semitropic each prepared and submitted (to the State) a pre-feasibility study for an in-lieu recharge project within its area. The Semitropic Element of the Kern Water Bank is now known as the Semitropic Water Bank. To the extent that they have not already been implemented, some of these same concepts are included herein.

In the mid 1990s, Semitropic commenced implementation of a large water banking project, which brought neighboring water agencies together in the form of a Groundwater Monitoring Committee. This Committee continues to operate and provides a forum for exchange of information and dialogue between agencies. Under Semitropic's water banking project, large areas which were solely reliant on pumped groundwater now have the infrastructure in place to take delivery of surface water supplies when available. Also during the 1990s, a physical interconnection between Semitropic (an SWP contractor) and Shafter-Wasco (a CVP contractor) was constructed to facilitate better water management.

In 2001, KCWA adopted an Initial Water Management Plan under guidelines of the Agricultural Water Management Council. While this effort included the entire San Joaquin Valley portion of Kern County, it provided valuable information for the Poso Creek Region. This report states that KCWA objectives include:

- Assure the availability of adequate water supplies of suitable quality to meet the needs for water in Kern County.
- Promote the optimal and equitable management of water resources within Kern County.
- Assure that SWP water supplies are provided at an affordable cost.
- In coordination with affected local entities, advocate and defend water interests in Kern County in political, legislative, legal and regulatory arenas.
- Maintain and facilitate effective communications among the Agency, the Member Units, other water interests and the public.
- Conduct Agency operations in an effective, efficient and fiscally responsible manner.

Over the last five years, a number of actions have taken place which are increasing coordination between and among water agencies in the Region, and thereby furthering water resource management. While year-to-year actions are too numerous to mention, those that have resulted in long-term arrangements include implementation of a water banking relationship between North Kern, Kern-Tulare, and Rag Gulch; and development of a water banking project by Cawelo, which included construction of over 500 acres of spreading ponds. Also during this time period, while not limited to the Poso Creek Region, KCWA created a forum for open discussion of groundwater management issues in the San Joaquin Valley portion of Kern County.

2.2 Operational Relationship Between Regional Management Group Members

2.2.1 Common Interests

It was considered logical and beneficial for Semitropic and the other members of the RMG to undertake the Poso Creek IRWMP in view of their common local, regional, and statewide water-related issues consisting of agricultural economic interests, similar water issues of limited surface water and groundwater supplies, and the common interest to maximize their available water resources by conjunctive use of groundwater and available surface waters. The RMG can most effectively utilize available water supplies on a regional basis through the coordinated use of existing and proposed infrastructure and the further development of banking and exchange opportunities between RMG members. Inasmuch as the Regional Management Group shares a common groundwater basin, there is potential for more effective management through joint modeling and monitoring efforts. Further, the Regional Management Group members have a long history of working together through a variety of water management strategies, as discussed in Chapter 6 of this Poso Creek IRWMP report.

2.2.2 Conjunctive Use of Surface Water and Groundwater

The Regional Management Group is well situated to provide additional conveyance for water exchange, banking, and conjunctive use projects. The key to these opportunities is the

location of the basin and groundwater storage capability. The Region is located adjacent to the California Aqueduct of the SWP and the Friant-Kern Canal of the CVP. Surface water supplies come from the USBR's CVP project, the SWP, the Kern River, and occasionally, Poso Creek.

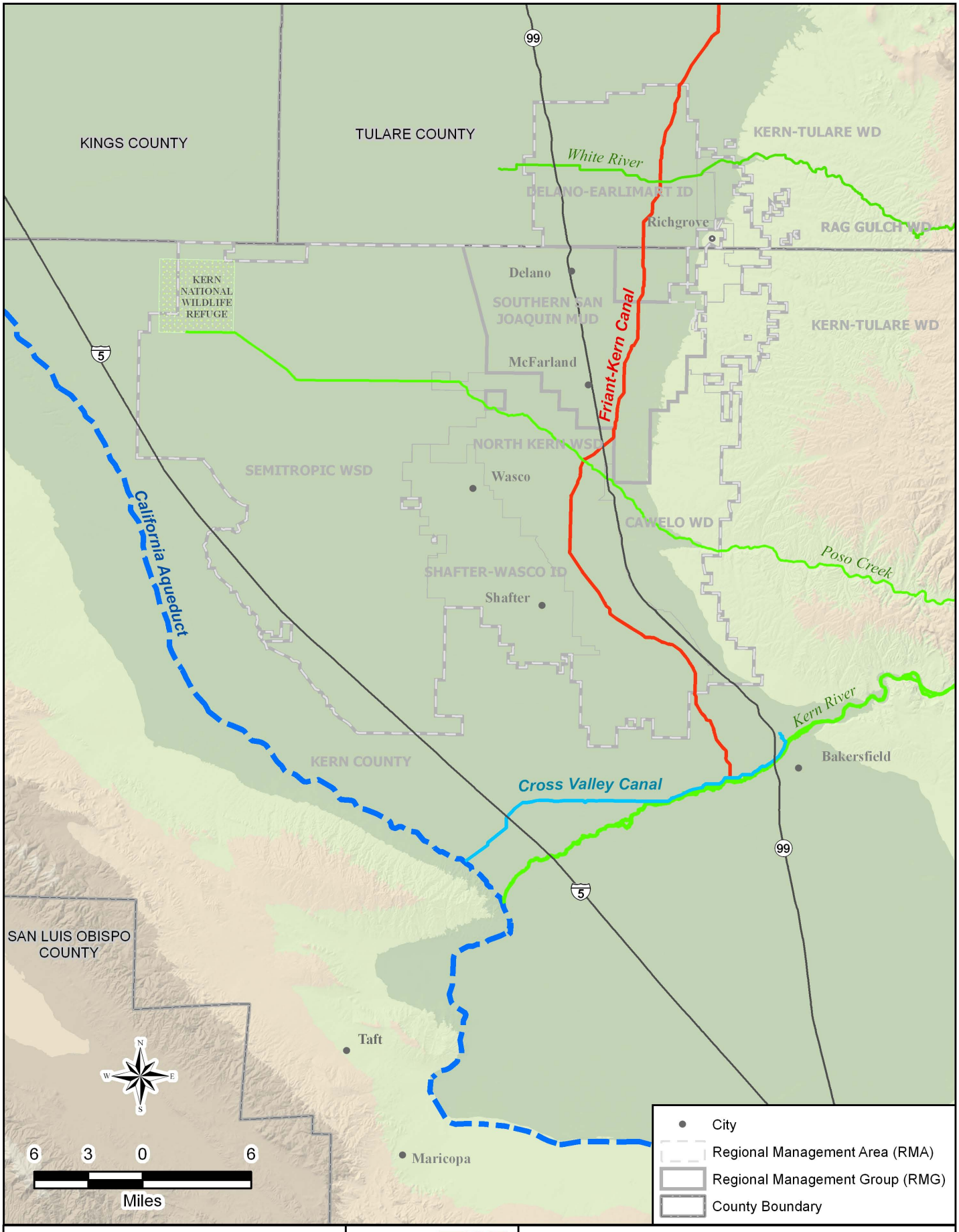
The long-standing cooperation between Regional Management Group members exists because of their shared groundwater supplies and common interests. In 1995, Semitropic commenced implementation of a groundwater bank for one million acre-feet. At the end of 2006, almost one million acre-feet was in groundwater storage. The amount of storage available for water banking has since been increased to 1.65 million acre-feet. In this regard, it is noted that the storage capacity of the groundwater basin is substantially larger than the amount that has been earmarked for water banking.

Because this operation has an effect on water levels in adjacent areas, a Groundwater Monitoring Committee was formed to oversee the groundwater operations. In addition to Semitropic, members are surrounding districts, including North Kern and Shafter-Wasco (which are members of the Regional Management Group), Buena Vista Water Storage District, Rosedale-Rio Bravo Water Storage District, and Southern San Joaquin Municipal Utility District. This committee has hired an independent consulting hydrogeologist to oversee the groundwater monitoring and to biennially produce a report on hydrologic conditions. All members of the committee provide data for that report.

2.2.3 Water Exchange Capability

A key element of water management in the Southern San Joaquin Valley is providing exchange capacity between districts in order to match available regulated and unregulated supplies with agricultural demands and make use of direct groundwater recharge facilities. Proposed modifications to the existing facilities will enhance conveyance of water between the Friant-Kern Canal and the California Aqueduct to allow for additional exchange capacity between districts that is to the benefit of the agricultural community, the environment, and economically disadvantaged communities within the Region, as well as outside of the Region. The IRWMP evaluated operating water conveyance facilities, including the Cross Valley, Calloway, and Lerdo canals, and increasing operational flexibility by enhancing district facilities through interconnections. Since the Region includes an operational history of groundwater banking, conjunctive use, and water exchanges between districts, the added flexibility created by the active development or enhancement of facilities in this regional area will provide opportunities for increasing the reliability of water supplies of not only the Regional Management Group, but also agencies located outside of the Region. In this regard, major municipal water providers in both southern and northern California who participate in water banking projects in the Region are in a position to benefit from any added flexibility and reliability.

The Kern County Water Agency operates the Cross Valley Canal, a 22-mile conveyance canal which connects the California Aqueduct with areas east, including the urban Bakersfield area. The Poso Creek IRWMP evaluated the feasibility of constructing interties between the member agencies and the Calloway and Lerdo canals. This information is presented in Chapter 6. Figure 2-1 schematically depicts the geographic relationship of water conveyance features in the Region and the canals location to each other.

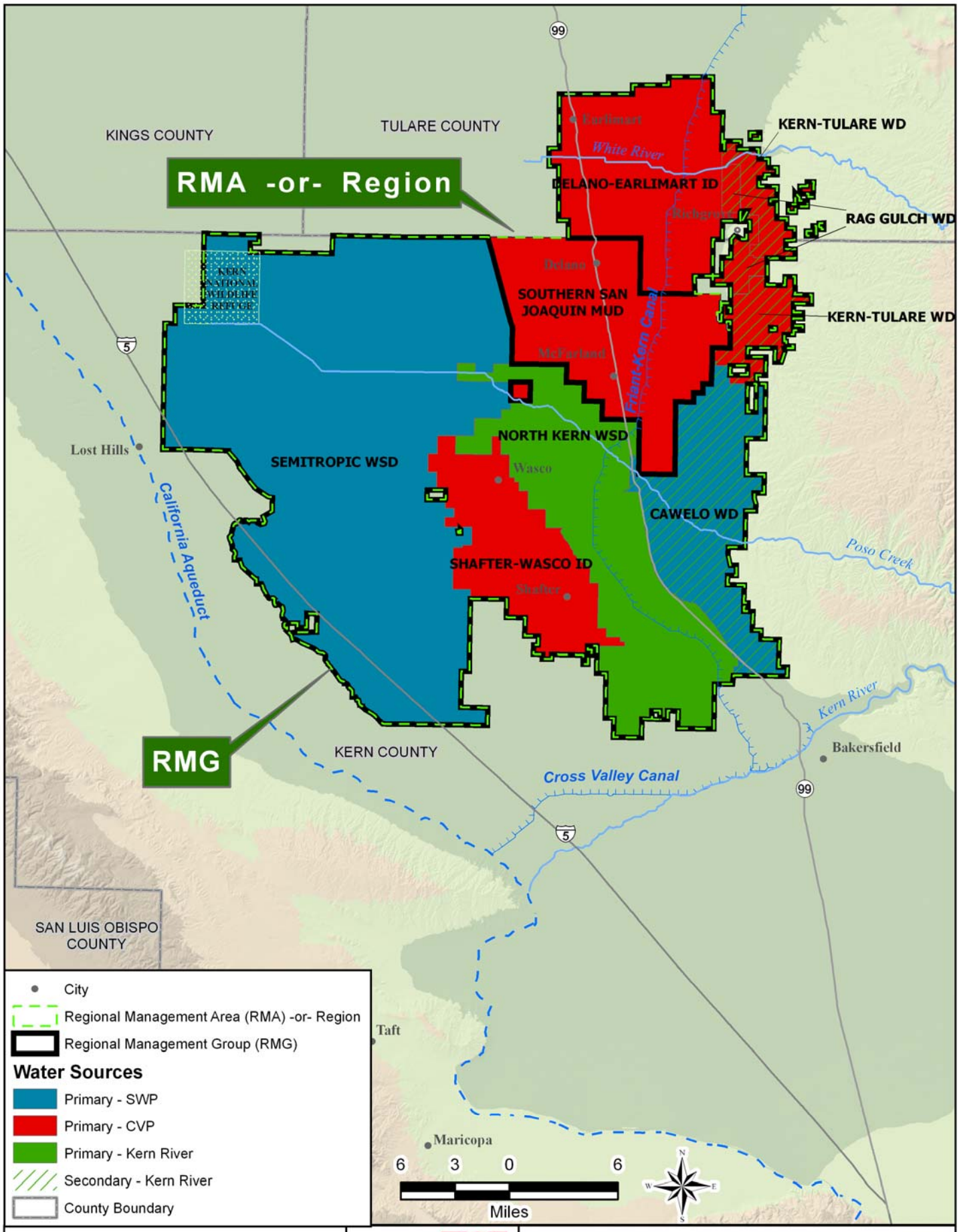


Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Geographic Relationship of Water Conveyance Features
Poso Creek Regional Management Group	JUNE 2007	FIGURE 2-1

2.3 Management Plan Participants and Their Responsibility in Managing the Region's Water Resources

This section provides a description of each member agency of the Regional Management Group and their relationship to regional water management. One member of the Groundwater Monitoring Committee, the Southern San Joaquin Municipal Utility District, elected not to join the Regional Management Group. However, they were stakeholders in the process. Two other members of the Groundwater Monitoring Committee, Buena Vista and Rosedale-Rio Bravo Water Storage Districts, were also stakeholders, but were not members of the Regional Management Group inasmuch as their interests are more closely aligned with the region of the Kern River fan.

The source of surface water supply of each of the member districts that form the Regional Management Group are shown in Figure 2-2 below.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Sources of Surface Water Supply of the Districts within the Region
Poso Creek Regional Management Group	JUNE 2007	FIGURE 2-2

2.3.1 Cawelo Water District

Geographic Setting: Cawelo is located in the north-central portion of Kern County and encompasses an area of nearly 45,000 acres. Cawelo lies between State Highway 99 on the west, State Highway 65 on the east, Oildale on the south and the community of McFarland on the north. Poso Creek traverses Cawelo about midway between the District's northern and southern boundaries.

Cawelo was formed in 1965 for the purpose of obtaining water supplies to supplement the pumping of groundwater for irrigation. Importing surface water has slowed the rate of decline of groundwater levels. If the groundwater supply beneath Cawelo can be increased and stabilized, it will provide a more dependable water supply in years when surface water supplies are limited, such as the drought period of 1988 through 1994 and, more recently, in 2001 and 2002. Conjunctive use of both surface water and groundwater supplies enables the long-term economic survival of irrigated agriculture within Cawelo. Cawelo's efforts in accomplishing these goals have been limited by the high costs of adding distribution system and the unavailability of additional surface water supplies.

Irrigated Land: The total area encompassed by Cawelo is 45,000 acres, of which about 33,700 acres are irrigated. Those lands within the District but outside the surface water service area depend exclusively on groundwater for their irrigation water supply. The crop pattern within the District has changed quite dramatically during the past 25 years, from row crops to permanent plantings. Currently, about 98 percent of the irrigated lands of the District contain permanent plantings, mainly grapes, citrus, deciduous fruits, and nuts.

Water Delivery System: Cawelo's canal and pipeline distribution system and related works were originally completed in 1975, with additional features and enlargements constructed almost annually. The current distribution system now includes three pumping plants, four surface water reservoirs for system regulation, six wells, six miles of distribution canals, and 38 miles of distribution pipelines capable of delivering 250 cfs to the landowners within the service area.

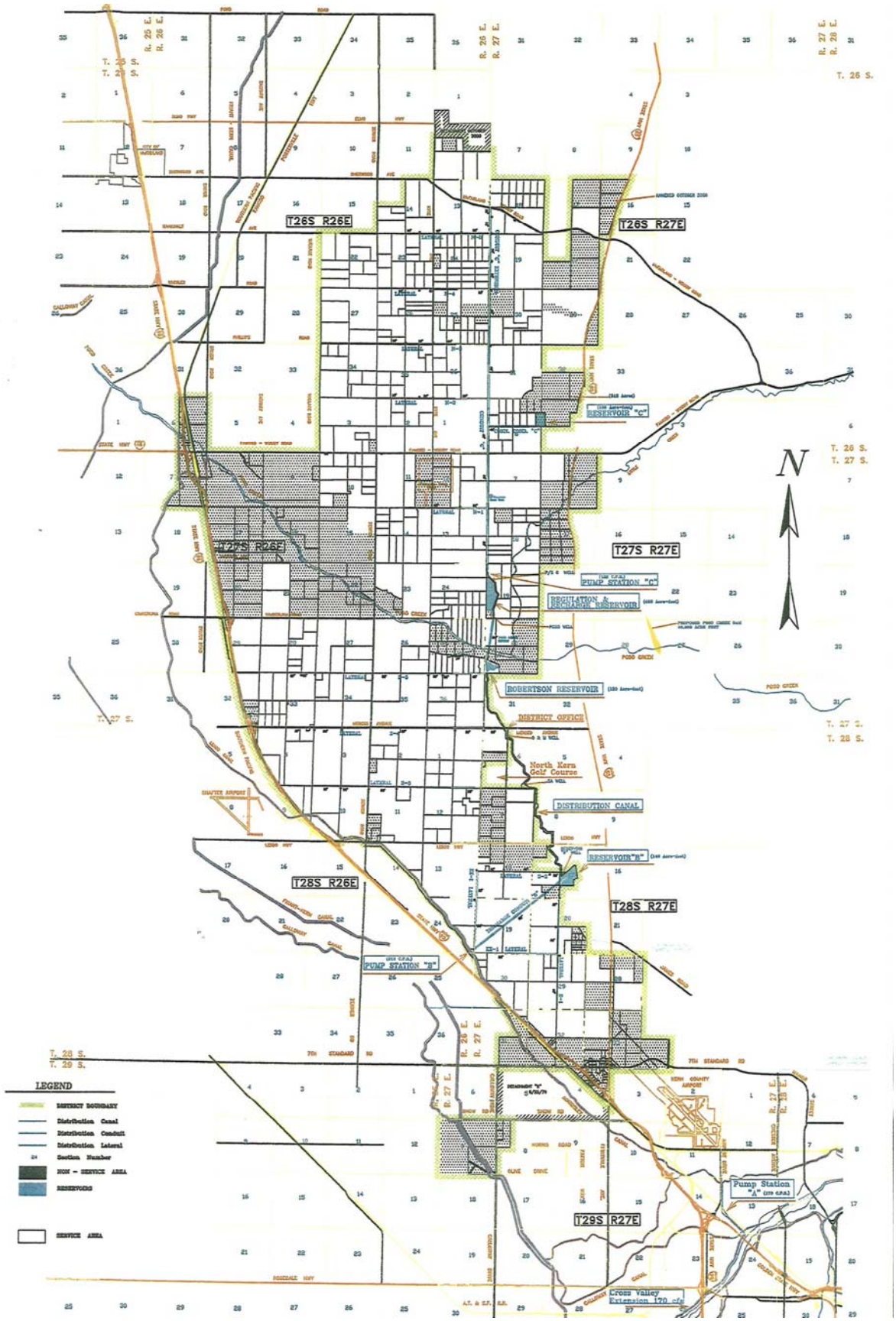
Source of Water Supply: Cawelo's surface water supplies are obtained from the following sources: 1) State Water Project, 2) Central Valley Project 3) Kern River, 4) Poso Creek, and 5) recycled water.

State Water Project: The principal contractual source of surface water supply for Cawelo is firm and surplus water from the SWP. Cawelo contracted with the Kern County Water Agency on September 28, 1972, simultaneously with the construction and operation agreements of the Cross Valley Canal, for the purchase of SWP. The District's annual entitlement under the contract increased yearly until 1990, at which time the maximum deliverable amount reached 45,000 acre-feet per year and it remains at that level until the contract expires in the year 2039. Because of the demand for firm water from the SWP by

the contractors, it is unlikely that the surplus portion of the SWP water supply will be delivered regularly in the future. The contract makes allowances for fluctuations in water supply conditions by permitting Cawelo's entitlement to be adjusted by mutual agreement. Direct delivery of SWP water to Cawelo is currently accomplished by conveyance from the California Aqueduct via the Cross Valley Canal to Pump Station "A", where it is lifted into North Kern's Beardsley Canal (which changes name to the Lerdo Canal at North Kern's southern boundary). Under agreement with North Kern, the water is conveyed in the Lerdo Canal to Cawelo's Pump Station "B", where the water is lifted one more time into Cawelo's service area. It should be noted that from time to time, primarily during the peak irrigation season, Cawelo's delivery of SWP water is limited by the capacity of Pump Station "A", which is 170 cfs and lower than the distribution system's capacity of 250 cfs.

Central Valley Project: Cawelo is not a CVP contractor; however, there are times when flood waters are available in the Friant-Kern Canal. In this regard, Cawelo has entered into temporary contracts for diversion and use of CVP-Friant water, typically available during very "wet" periods. Currently, the plumbing is not in place to allow Cawelo to directly take advantage of these water supply opportunities.

Kern River Water: The other major contractual source of surface water supply is Kern River water purchased from the City of Bakersfield. Cawelo entered into a contract with the City of Bakersfield on May 25, 1976. Under the terms of the contract which became effective on January 1, 1977, the City sells Kern River water to Cawelo at a cumulative average quantity of 27,000 acre-feet per year for 35 years with a provision for extension of the contract on a year-to-year basis and to provide time for delivery of the cumulative total, if necessary. The contract provides for the sale and delivery to Cawelo of miscellaneous water which may become available, from time to time, in addition to the contract commitment.
The contract's basic delivery schedule calls for 2,700 acre-feet per month to be delivered during March and April, and 5,400 acre-feet per month during May through August. Deficiencies are allowed in years of low water yield, with such deficiencies to be made up in subsequent years, or by advance deliveries made during years of high water yield. Deficiency deliveries may be made at maximum rates of 3,200 acre-feet per month in March and April, and 6,400 acre-feet per month in the May-through-August period.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Cawelo Water District Distribution Facilities and Service Area
Poso Creek Regional Management Group		June 2007 Figure 2-3

2.3.2 Delano-Earlimart Irrigation District

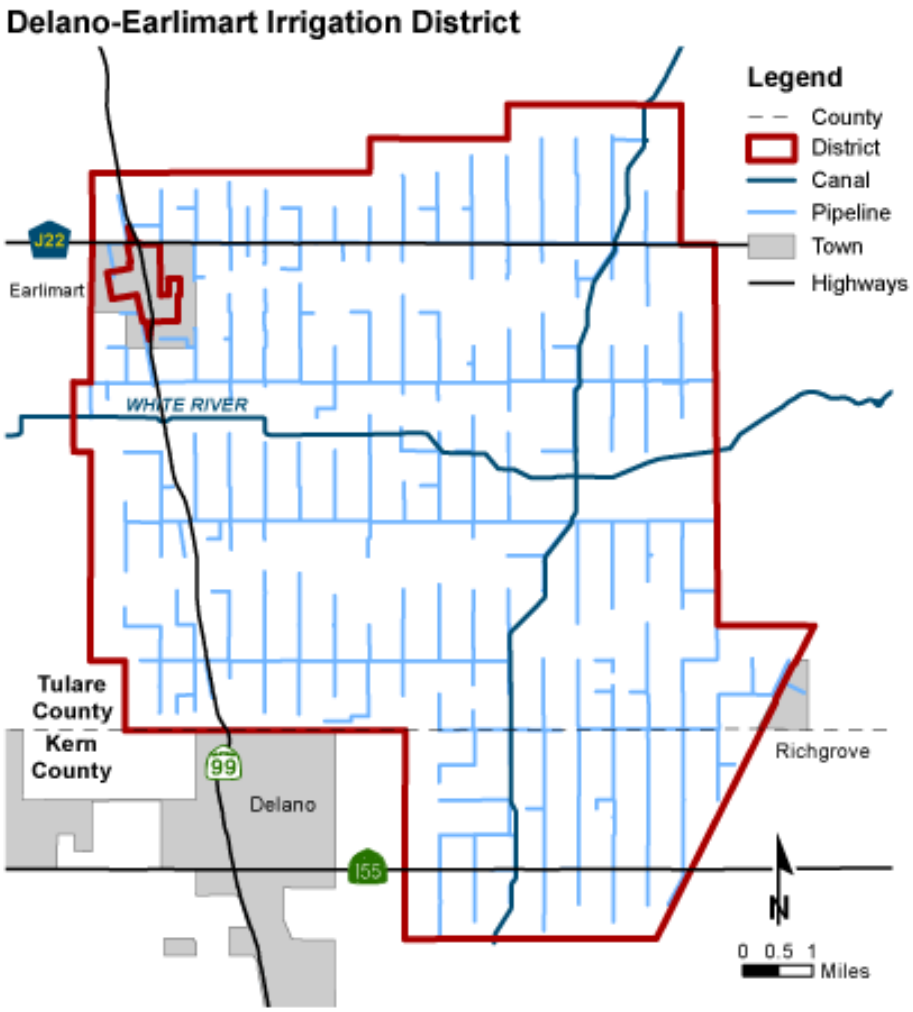
Geographic Setting: Located in southern Tulare County and northern Kern County, and immediately adjacent to and west-northwest of Kern-Tulare and Rag Gulch water districts, Delano-Earlimart was organized in 1938 to address declining groundwater levels. Delano-Earlimart is immediately northeast of the City of Delano and is crossed from north to south by the Friant-Kern Canal. Also extending through the middle of the District in an east-west direction is the White River.

Delano-Earlimart was organized to contract for imported surface water supplies, with particular emphasis on the Friant Division of the CVP. It has the additional responsibility of conjunctively managing surface water and groundwater supplies to ensure an adequate water supply for water users within the District.

Irrigated Land: The total area of Delano-Ealimart is 56,500 acres, of which about 48,000 acres are irrigated. While the irrigated acreage has been relatively stable over the last 25 years, the crop pattern has changed quite dramatically, from largely annual crops to permanent plantings. Currently, over 90 percent of the irrigated lands within the District are planted to permanent crops; primarily almonds, pistachios, and grapes.

Water Delivery System: Delano-Earlimart's distribution system has nine separate turnouts from the Friant-Kern Canal. It is a fully pipelined (closed) and metered system, with essentially no discharges or losses. Delano-Earlimart installed a SCADA-controlled system in 1999 at a cost of $4.5 million and continues to promote use of pressure-compensating float systems for constant flow regulation. Two-thirds of the district is located west (down slope) from the Friant-Kern Canal and these lands are served by gravity delivery; the remaining one-third of the District is located east (upslope) of the Friant-Kern Canal and water deliveries to these lands must be pumped. The District recently completed a $3 million farm turnout renovation project.

Source of Water Supply: Delano-Earlimart has a contract with the U.S. Bureau of Reclamation for CVP water. The source of this surface water supply is the Friant Division of the CVP, which develops its supply from the San Joaquin River, with storage provided by Millerton Lake. The water is transported to the District through the Friant-Kern Canal. The surface water supply is used conjunctively with the underlying groundwater. Delano-Earlimart's contract entitlement consists of 108,800 acre-feet of Class 1 water and 74,500 acre-feet of Class 2 water, for a total of 183,300 acre-feet. The long-term average surface water supply available to the District is estimated at 135,000 acre-feet. The Class 1 water is storable (for use within a given year) and is considered a firm water supply. The Class 2 water supply is non-storable water and must be used when it is available.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Delano-Earlimart Irrigation District Distribution Facilities and Service Area
Poso Creek Regional Management Group		June 2007 Figure 2-4

2.3.3 Kern-Tulare Water District

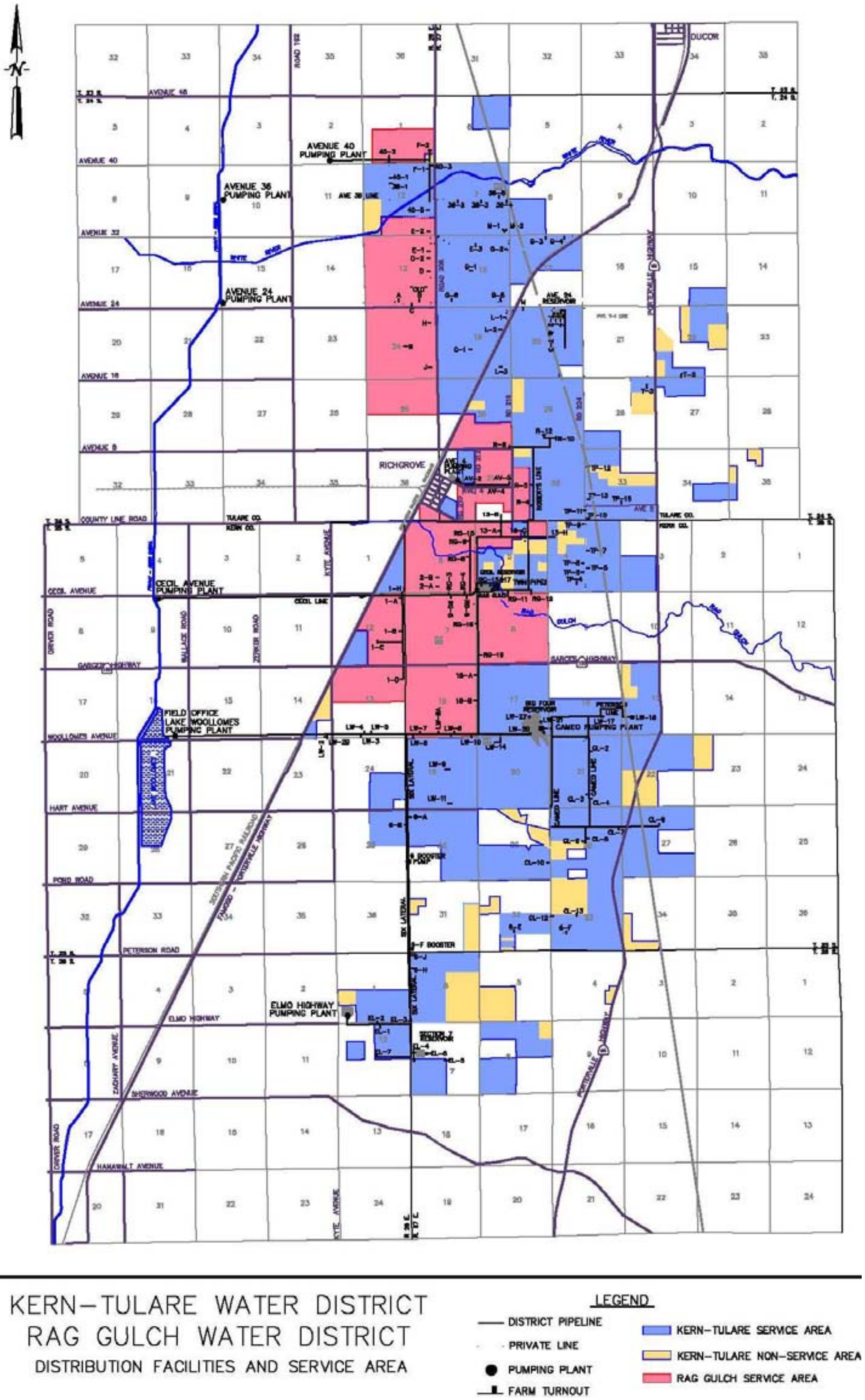
Geographic Setting: Kern-Tulare was organized in 1974. The District now consists of two large areas, with 14 smaller non-contiguous parcels, which collectively total about 17,100 acres in Kern and Tulare counties, extending altogether about 19 miles from north to south and having a maximum width of six miles. Kern-Tulare is approximately eight miles east of Delano and 27 miles north of Bakersfield. The western boundary lies from two to six miles east of and uphill from the Friant-Kern Canal. The District is located generally west of State Highway 65.

While Kern-Tulare and Rag Gulch are managed as separate districts, they share staff and distribution systems. Because these districts get their deliveries indirectly (relative to the source of supply), the following water supply description is included here to help understand their delivery system.

In 1976, Kern-Tulare contracted with the Bureau of Reclamation for an annual supply of 40,000 acre-feet from the CVP, and Rag Gulch for an annual supply of 13,300 acre-feet. Collectively, Kern-Tulare and Rag Gulch contracted with the Bureau of Reclamation for an annual entitlement of 53,300 acre-feet from the CVP, participated in the construction of the Cross Valley Canal, and executed a long-term exchange agreement with Arvin-Edison. Water is wheeled through the California Aqueduct to Tupman to convey the CVP water supply from the Delta, where the CVP water supply originates under contract with the Department of Water Resources. From Tupman, the water is conveyed in the Cross Valley Canal, and delivered to Arvin-Edison. In exchange, Arvin-Edison makes water available to Kern-Tulare and Rag Gulch in the Friant-Kern Canal. In either case, the districts physically divert from the Friant-Kern Canal. In 1976, Kern-Tulare and Rag-Gulch contracted with the City of Bakersfield for 23,000 acre-feet of Kern River water. Kern-Tulare has a contract with the City of Bakersfield for an average annual supply of 20,000 acre-feet of Kern River water. Rag Gulch has a similar contract for an average annual supply of 3,000 acre-feet. Water under these contracts is delivered to the Kern County Water Agency's Improvement District No. 4 in exchange for SWP water. The SWP water is conveyed through the Cross Valley Canal, where it is either delivered to the Friant-Kern Canal or exchanged with Arvin-Edison for a like amount of water available in the Friant-Kern Canal. The current term of these contracts expire in 2012. The districts also contract annually for Section 215 water. The districts also purchase Class 1 and Class 2 Friant water supplies from Friant Contractors on an as-available basis. Occasionally, there are flood flows available from the Friant-Kern Canal, which the districts also purchase.

Irrigated Land: Kern-Tulare encompasses an area of approximately 17,100 acres, of which about 12,600 acres are irrigated and planted to high-value, permanent crops; mainly grapes, citrus, and nuts.

Water Delivery System: As previously noted, both Kern-Tulare physically takes delivery of water from the Friant-Kern Canal and distributes it to landowners through a distribution system consisting of pumping plants and pipelines. All diversions are pumped up-slope from the Friant-Kern Canal. Because the District's distribution system is inadequate to fully satisfy irrigation demands, system capacities must be prorated during the summer months. As a result, water users rely upon privately owned wells, even in the wettest years. The District's high percentage of low-volume (on-farm) irrigation systems results in very high irrigation efficiencies; accordingly, spill or tailwater recovery systems are not required.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants, Bookman-Edmonston Division	Kern-Tulare Water District and Rag Gulch Water District Distribution Facilities and Service Area
Poso Creek Regional Management Group		June 2007 — Figure 2-5

2.3.4 North Kern Water Storage District

Geographic Setting: North Kern was formed in 1935 under the provisions of Division 14 of the California Water Code. It is located north of the Kern River and comprises some 60,000 acres (exclusive of Rosedale Ranch Improvement District) of intensively farmed, highly productive agricultural lands. The District lies between Bakersfield on the south and Delano on the north and between Highway 99 on the east and Wasco and Shafter on the west.

Irrigated Land: The irrigable lands in the District are divided into two classes. Class 1 lands include about one-half of North Kern's total area and they receive a water supply developed almost entirely by the District. North Kern provides its Class 1 landowners with a dependable water supply by coordinating its Kern River water, its use of storage space in Isabella Reservoir, water purchases, and the use of its wells. Class 2 lands, comprised of the remaining half of the district, receive a water supply primarily from wells and pumping plants owned and operated by the landowners themselves that draw water from the underground supply that is replenished by the District. However, North Kern delivers surface water through its facilities to the Class 2 lands on an as-available basis, also referred to as "in-lieu deliveries." The crop pattern within the District has changed significantly from row crops to permanent plantings within the last 25 years. Currently, about 70 percent of the irrigated lands of the District contain permanent plantings; mainly almonds, pistachios, and grapes.

Water Delivery Systems: The District conjunctively uses surface water and groundwater to meet the irrigation water requirements of its landowners. In particular, its highly variable surface supply is regulated, in part, in the underlying groundwater basin. The surface water that is placed in groundwater storage is subsequently pumped as groundwater by both North Kern and its landowners to meet their irrigation water requirements.

North Kern's primary source of surface water is the Kern River, whose waters have been utilized under a schedule of long-standing diversion rights. This supply has been supplemented from time to time by water from Poso Creek, which transverses the northern portion of the District and contributes, primarily through infiltration, to the underlying groundwater supply.

When the District was organized in 1935, the Kern River was unregulated. The construction of the Corps of Engineers' Isabella Dam and Reservoir in the 1950s, and North Kern's purchase of conservation space therein, improved seasonal regulation of the Kern River.

During "wet" years, surface water supplies are sufficient to satisfy irrigation water requirements for the surface water service area and provide substantially larger amounts of spreading water for groundwater storage. Conversely, during the "dry" years, North Kern has been required to pump groundwater to supplement available surface supplies for the

surface water service area. Accordingly, groundwater pumping from District wells has varied from no pumping in "wet" years to 77,000 acre-feet in very "dry" years.

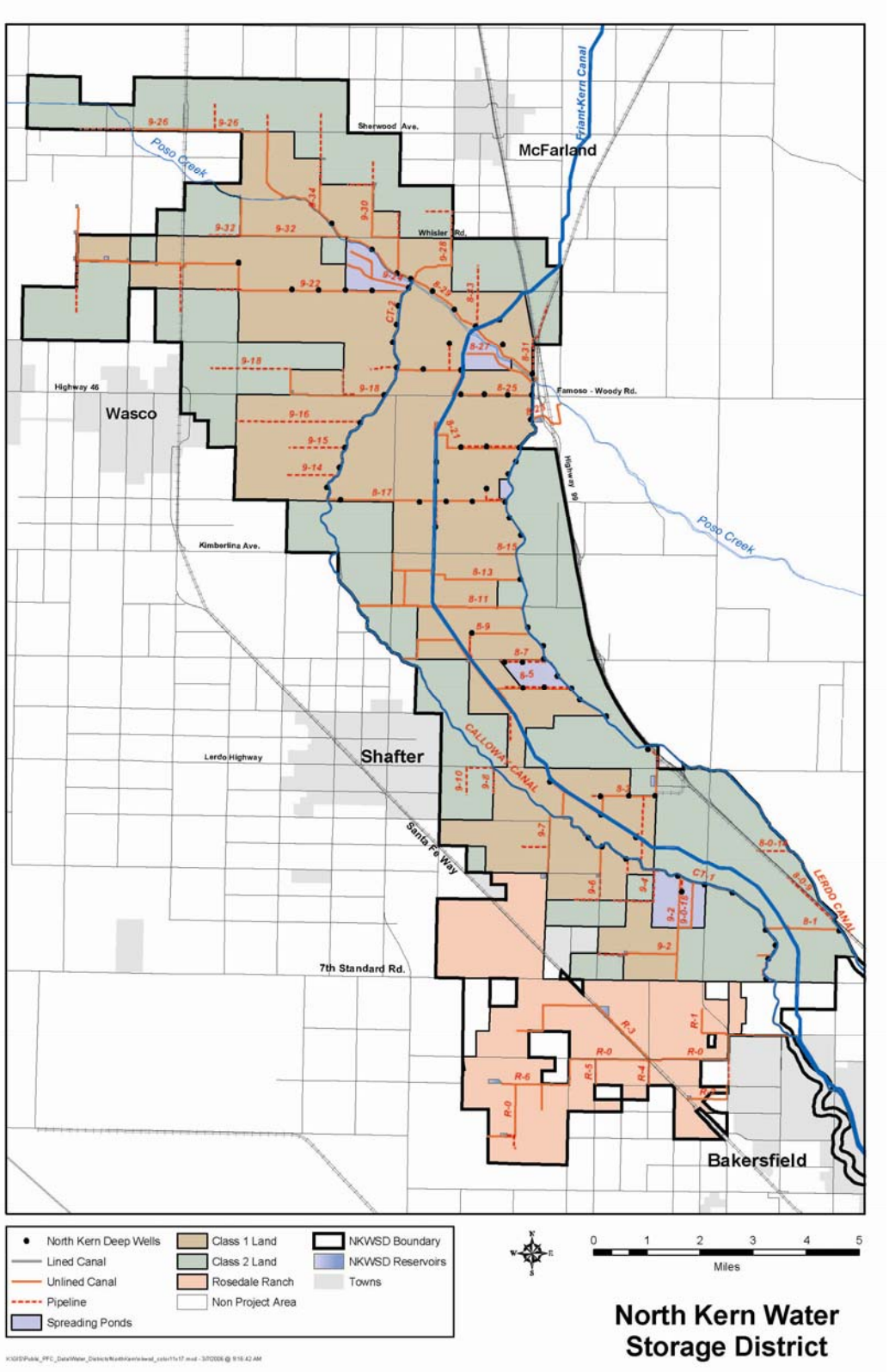
Surface water is delivered through approximately 130 miles of unlined canals heading at two diversion points on the Kern River, 20 miles of pipeline, and 20 miles of lined canal. The District's principal supply artery, and most upstream diversion, is the Beardsley-Lerdo system. This system is entirely gravity flow and consists of the diversion structure or headwords on the Kern River, 9.5 miles of concrete-lined canal (the Beardsley Canal) between the headworks and the District's southern boundary, followed by an unlined canal section (the Lerdo Canal) that continues along North Kern's eastern or "high" side. Up to 850 cfs has been conveyed through the Beardsley Canal and delivered into the District, and this represents the practical maximum delivery in this system. By agreement with Cawelo, Cawelo may use up to 240 cfs of this capacity and the City of Bakersfield has the right-of-use of up to 100 cfs. The second point of diversion, 4.5 miles downstream of the first, is the Calloway Headworks, which services the relatively large, unlined section of the Calloway Canal. This facility is also entirely gravity flow and extends for 10.4 miles before entering North Kern at Seventh Standard Road. This "wet-year" facility has a capacity of 1,000 cfs at the headworks. However, its ability to deliver water into North Kern is somewhat less because losses can be significant, particularly for diversions and deliveries of relatively short duration. The City of Bakersfield has a right-of-use up to 425 cfs of this capacity.

Kern River water is delivered to the surface water service area to the extent that there is a coincident demand. However, Kern River water that exceeds the immediate irrigation requirements is introduced directly underground through the use of about 1,500 acres of recharge basins at five sites. These facilities, the channel of Poso Creek, as well as the unlined conveyance canals within the District, have combined to directly recharge up to 24,000 acre-feet in one month and over 250,000 acre-feet in one year (1998).

In years of deficient water supply, continuity of delivery to the surface water service area is maintained by the operation of over 70 wells owned and operated by North Kern. Fifty wells were constructed as part of North Kern's 1950 project. Since then, wells have been added to maintain and enhance the 10,000 acre-feet per month of planned production for the District's wellfield. During the driest years, the wellfield is operated at or near capacity for the nine-month period from February through October. Conversely, there are years in which available surface supplies are adequate and the wellfield is not used at all.

Source of Water Supply: Use of Kern River water on district lands beginning in the 1870s predates the area's organization as a district. Procedures regarding the allocation and use of Kern River water are complex and have evolved over many years. However, three significant agreements modified North Kern Water's water supply after its formation. First, to supplement ongoing diversion to the area under existing diversion priorities, North Kern entered into the 1952 Agreement for Use of Water Rights, which provided for, among other

matters, its use of additional priorities in perpetuity. Isabella Dam and Reservoir provided regulation of the Kern River beginning in 1954. Second, following year-to-year agreements for use of storage in Isabella Reservoir, North Kern executed an agreement in 1964 for the long-term right to store water in a portion of Isabella Reservoir's conservation space. North Kern's share varies by contract from 24 percent to 34 percent of the available conservation space and reaches a minimum of about 48,000 acre-feet during the winter carryover period. Third, in 1976 the district executed a long-term contract with the City of Bakersfield for 20,000 acre-feet of Kern River water annually from the City of Bakersfield's newly acquired Kern River supplies. Diversion and use of Kern River water by the district has occurred as an entitlement under its diversion rights, unused entitlement under diversion rights held by others, contract water, and flood waters.



Poso Creek Integrated Regional Water Management Plan		GEI Consultants Bookman-Edmonston Division	North Kern Water Storage District Distribution Facilities and Service Area
Poso Creek Regional Management Group			June 2007 Figure 2-6

2.3.5 Rag Gulch Water District

Geographic Setting: Rag Gulch is a water district formed in 1955 under the provisions of Division 13 of the California Water Code. The only urbanized area in the vicinity is Richgrove, an unincorporated community on the Famoso-Porterville Highway in southern Tulare County. The boundaries of the District define three "islands", the northernmost with 270 acres, the central island with 1,270 acres, and the southernmost with 3,970 acres.

Irrigated Lands: Rag Gulch comprises a gross area of approximately 5,950 acres, in Kern and Tulare counties, of which 4,650 acre are irrigated and planted to high-value, permanent crops.

Water Delivery System: Rag Gulch's water supply consists of a 13,300 acre-foot supply in the Delta from the CVP, based on a three-party contract (the third party being DWR) that provides conveyance capacity in the California Aqueduct to the Cross Valley Canal turnout near Tupman, where Rag Gulch accepts delivery. The water is then transported 17 miles eastward and upward through six low-lift pump stations to the western edge of Bakersfield. From this point, it is delivered to Arvin-Edison, Kern County Water Agency, or other exchangers. In exchange, Arvin-Edison provides water to Rag Gulch from the Friant-Kern Canal at points located approximately 40 miles north of Bakersfield. Since the original construction of the Cross Valley Canal, the Cecil Avenue Pipeline, and the Avenue 24 pipeline system, Rag Gulch and individual or groups of landowners have completed many water distribution projects. For additional information on Rag Gulch, refer to the information contained above for Kern-Tulare.

2.3.6 Semitropic Water Storage District

Geographic Setting: Semitropic is located in Kern County, approximately 20 miles northwest of Bakersfield, in the western portion of the San Joaquin Valley. Semitropic lies between I-5 on the west, Highway 99 on the east, the city of Delano on the north and the city of Bakersfield on the south. Semitropic has an arid climate and precipitation averages about six inches per year.

Semitropic was organized in 1958 to develop conjunctive use programs and facilities, and, in particular, to import water to supplement the area's water needs. The farmers in the area relied solely on groundwater until 1973, when they began importing surface water from the SWP. At that time, Semitropic contracted with the Kern County Water Agency for an annual entitlement of 158,000 acre-feet of SWP water. As surface water deliveries have been made, Semitropic has significantly reversed its declining groundwater levels. Since it began operations, Semitropic has delivered more than five million acre-feet of surface water and banked almost one million acre-feet for its banking partners.

Irrigated Land: Semitropic covers an area of approximately 222,000 acres, of which about 142,700 acres are irrigated, on average comprised of 43,000 acres of contract land, 53,500 acres of temporary service land, 24,600 acres of in-lieu service for banking and 42,100 acres still reliant solely on groundwater. Those irrigated lands within the District but outside the surface water service area depend exclusively on groundwater for their irrigation water supply. The crop pattern within the District has changed significantly over time from row crops to permanent plantings. Currently, about 40 percent of the irrigated lands of the District contain permanent plantings; primarily almonds, pistachios, grapes, and citrus.

Water Delivery Systems: Groundwater management within the District is rooted in the conjunctive use of surface water and groundwater resources. In the 1960s, the District approved implementation of a project, which included construction of main conveyance and distribution system facilities extending from the California Aqueduct of the State Water Project to onsite farm delivery locations. The Project was predicated on the conjunctive use of imported SWP water with the underlying groundwater resource. Prior to construction of the facilities, irrigated crops within Semitropic were totally dependent on groundwater pumping. Since the imported water supply is erratic, the District devised a plan of conjunctive use, wherein the underlying groundwater reservoir continues to be used to meet demands for seasonal peaks and to provide irrigation water in times of limited surface supplies. Under the District's project, some lands receive the imported water supply, while other lands remain solely dependent on pumped groundwater for irrigation.

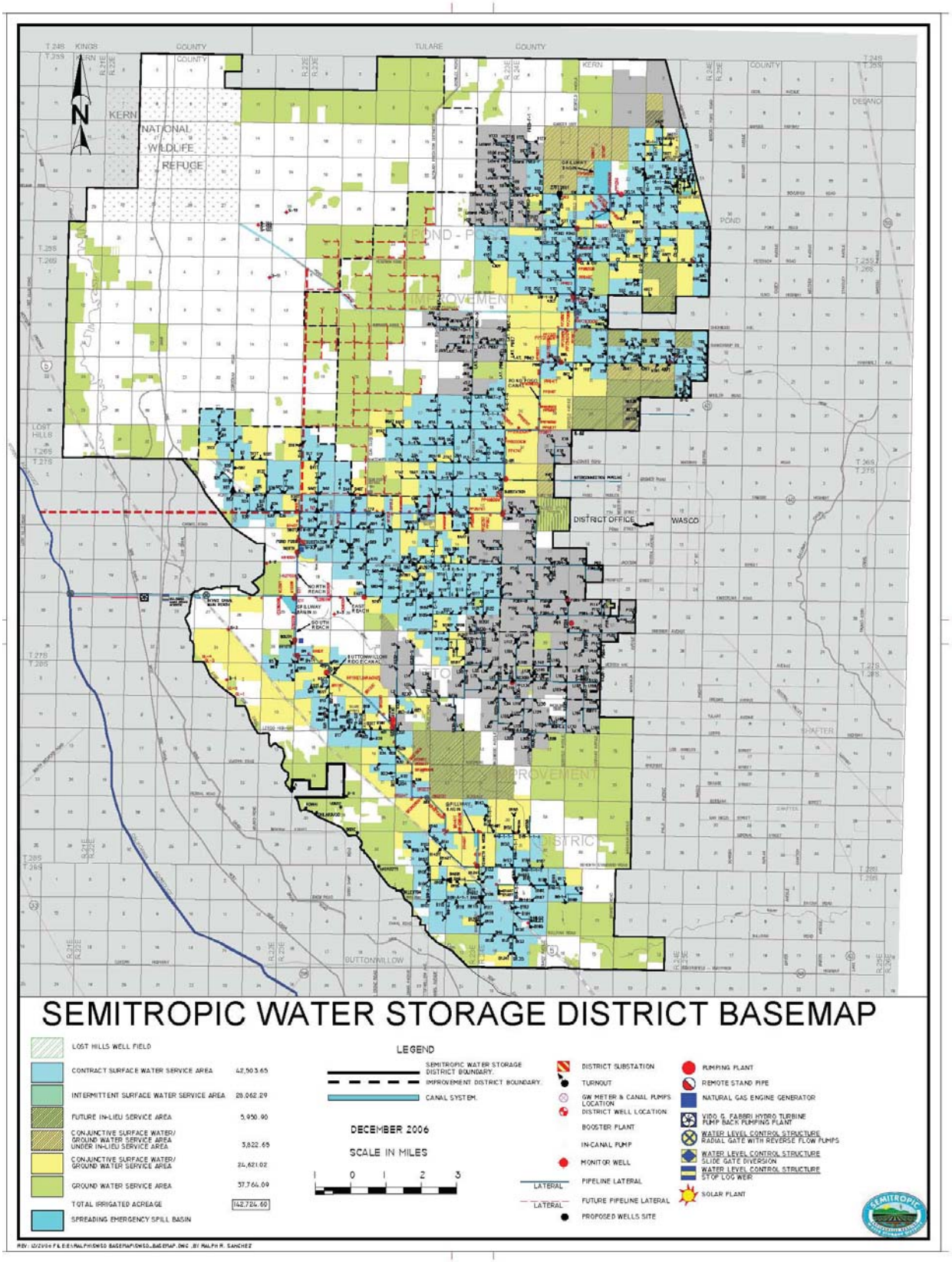
Semitropic initially contracted with the Kern County Water Agency for an annual entitlement of 158,000 acre-feet of SWP water, which was subsequently reduced to 155,000 acre-feet in 1996. The SWP annual allocation of 155,000 acre-feet is used to irrigate approximately 43,000 acres in its contract water service area. Additional SWP supplies are available from time to time and are delivered to the contract water service area and to a temporary water service area of about 33,500 acres. While the total demand for irrigation water varies from year to year, it is on the order of 450,000 acre-feet. Any demand not met with imported supplies is met with pumped groundwater. Approximately two-thirds of the District's irrigated area can take delivery of surface water from the District for irrigation. Landowners must maintain wells to meet irrigation demands when surface water supplies are limited or not available. The District maintains wells to supplement the available surface supply to some District lands and for recovery of stored groundwater for return (to banking partners) in years of reduced surface water supplies. The remaining one-third of the District's irrigated area relies exclusively on pumped groundwater. The District's importation of surface water helps to support those landowners who continue to rely on pumped groundwater by reducing the District's overall reliance on the underlying groundwater.

The District's current annual delivery capability is about 350,000 acre-feet. Farmers in the contract water service area and temporary water service area maintain wells to supplement District deliveries and protect against shortages in the imported water supply. The

Semitropic Groundwater Banking Project, implementation of which commenced in 1994, provides an intermittent supply of surface water to an additional 24,600 acres. The remaining area of the District includes about 42,100 acres which rely exclusively on groundwater.

Contract supplies have been supplemented from time to time by other available water supplies, including Poso Creek, CVP water, and local Kern River water. District landowners have conjunctively utilized imported surface water supplies with groundwater since completion of the District's original irrigation distribution system facilities in the mid 1970s.

Currently, water is conveyed from the California Aqueduct into the District via the main artery, the District's Intake Canal, which bifurcates into two main canals, the north reach and the south reach. The south reach, also referred to as the Buttonwillow Ridge Canal, runs southerly from the Intake Canal and the north reach, also referred to as the Pond-Poso Canal, runs northerly from the intake canal. Surface water is delivered from the Buttonwillow Ridge and Pond-Poso canals through a complex network of buried pipeline laterals. A second intake pipeline will become operational in July of 2007.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Semitropic Water Storage District Distribution Facilities and Service Area	
Poso Creek Regional Management Group		June 2007	Figure 2-7

2.3.7 Shafter-Wasco Irrigation District

Geographic Setting: Located immediately adjacent to and east of Semitropic, Shafter-Wasco was organized in 1937 to address rapidly declining groundwater levels. Shafter-Wasco surrounds the cities of Shafter and Wasco and is crossed by the Central Valley Highway (Highway 43). It is bounded to the east by the Calloway Canal. The northern boundary generally corresponds with Highway 46 and the southern boundary generally corresponds with Seventh Standard Road.

Irrigated Land: The District encompasses about 34,000 acres, of which about 30,000 acres are irrigated. Shafter-Wasco has a contract with the U.S. Bureau of Reclamation (USBR) for CVP water to serve 27,100 acres of the irrigated area within its boundaries. Currently, about 55 percent of the irrigated lands of the District contain permanent plantings; primarily almonds, grapes, and deciduous.

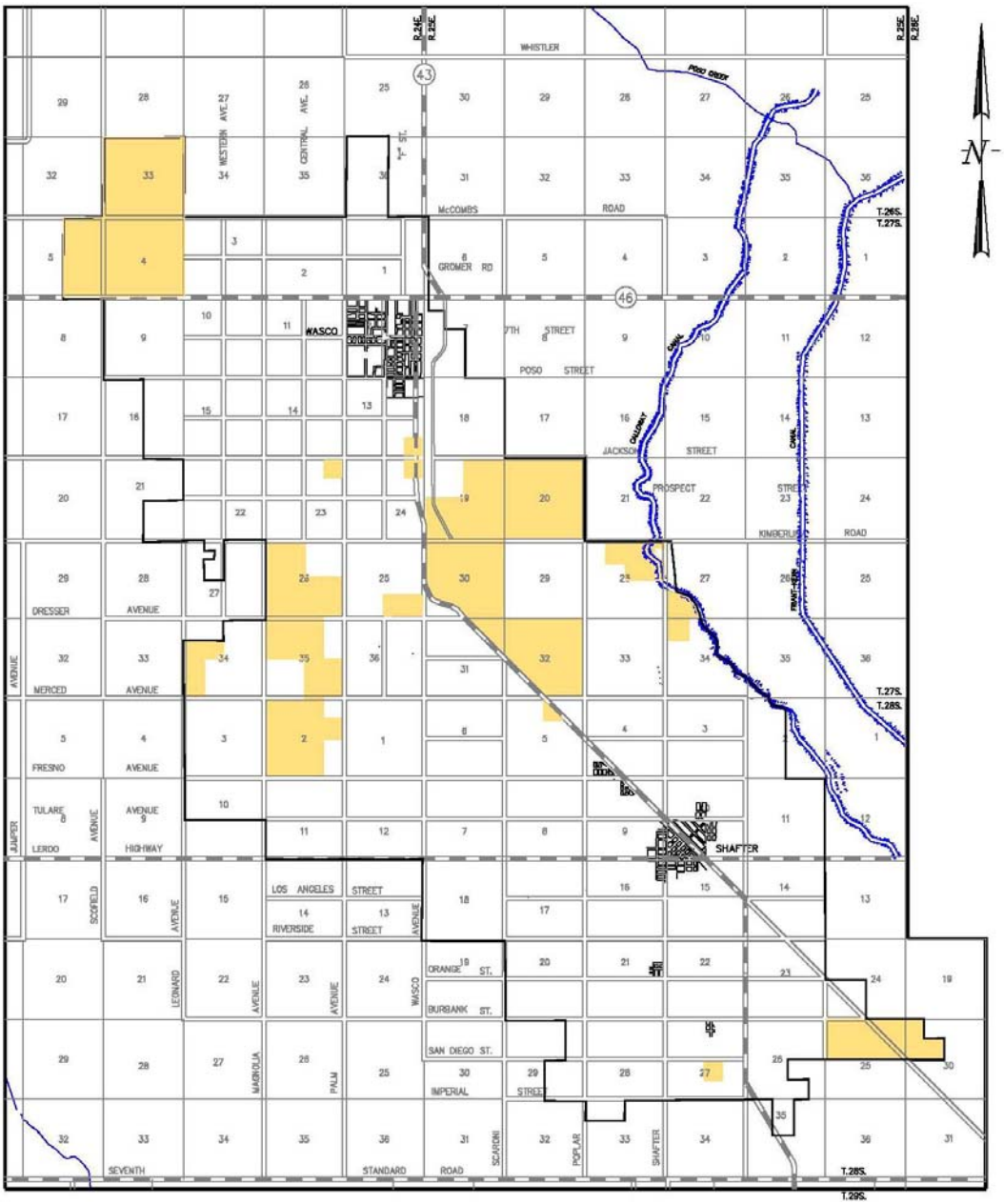
Water Delivery Systems: The District formally applied to the Bureau of Reclamation for Central Valley Project water to serve the 37,528 acres within its boundaries on February 5, 1946. Service of water to the District was to be from the Friant-Kern Canal, which passes close to the District's eastern boundary. On February 11, 1955, the Board of directors of the Shafter-Wasco Irrigation District executed a contract with the United States providing for water service and for the construction of a distribution system. The District received its first water under this contract in 1957. The District's distribution system was constructed by the Bureau of Reclamation.

The District, in cooperation with North Kern Water Storage District, installed interconnection facilities between the districts' distribution systems in 1993. The districts then established a groundwater banking water exchange agreement in which surface water in above average water years, the water will be returned to the Shafter-Wasco Irrigation District for delivery to its water users.

The District, in cooperation with Semitropic Water Storage District, constructed a 36-inch interconnection pipeline and a pumping plant to connect the distribution system of the two facilities in 1995. In particular, this interconnection is located one-half mile north of Highway 46 and connects Semitropic's Pond-Poso Canal with Shafter-Wasco's Lateral 134.4 System. Since its construction in 1995, this facility has facilitated water banking, exchange, wheeling, and sales arrangements between the two districts by accommodating gravity deliveries from Shafter-Wasco to Semitropic and pumped deliveries (through a pumping plant constructed as a part of the interconnection project) from Semitropic to Shafter-Wasco. For example, this facility allows Shafter-Wasco to make better use of its contractual supply of CVP-Friant water by regulating (through a banking arrangement with Semitropic) "wet-year" water to "dry-year" water.

Source of Water Supply: Shafter-Wasco has a contract with the Bureau of Reclamation for CVP water. The source of this surface water supply is the Friant Division of the CVP, which develops its supply from the San Joaquin River, with storage provided by Millerton Lake. The water is transported to the district through the Friant-Kern Canal. The surface water supply is used conjunctively with the underlying groundwater. Shafter-Wasco's contract entitlement consists of 50,000 acre-feet of Class 1 water and 39,600 acre-feet of Class 2 water, for a total of 89,600 acre-feet. The long-term average surface water supply available to the district is estimated at 69,000 acre-feet. The Class 1 water is storable (for use within a given year) and is considered a firm water supply. The Class 2 water supply is non-storable water and must be used when it is available.

Shafter-Wasco's primary purpose is to contract for the importation of water from the Friant Division of the CVP. It has the additional responsibility of conjunctively managing surface water and groundwater supplies to ensure an adequate water supply for water users.



SHAFTER–WASCO IRRIGATION DISTRICT

LEGEND

SHAFTER–WASCO NON–SERVICE AREA

SHAFTER–WASCO SERVICE AREA

DISTRICT BOUNDARY

Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Shafter-Wasco Irrigation Distribution Facilities and Service Area
Poso Creek Regional Management Group		June 2007 Figure 2-8

2.3.8 North West Kern Resource Conservation District

Geographic Setting: NWKRCD has been organized for the protection and conservation of soil and water resources within the District boundaries, which encompass about 595,000 acres. The eastern area encompasses the lower reaches of Poso Creek. Starting in the general areas of Knob Hill on the south and Mt. Poso on the north, Poso Creek runs through the entire District in a northwesterly direction and outlets into the Kern National Wildlife Refuge. The western boundary parallels the drainage through the valley for approximately 15 miles south from the Kern-Kings county line. The north is bounded by Kings and Tulare counties. The southern part is bounded by Buena Vista and Rosedale-Rio Bravo.

In 1940, the California Public Resources Code was amended to allow landowners to cooperatively organize soil conservation districts to serve private and non-federal lands. In 1972, the names of soil conservation districts were changed to resource conservation districts. The Pond Poso and the Shafter-Wasco Resource Conservation Districts were consolidated as the Pond-Shafter-Wasco Resource Conservation Districts. Subsequently, it became known as the North West Kern Resource Conservation District.

NWKRCD is authorized to cooperate with and receive assistance from:

- U.S. Department of Agriculture (MOU dated November 22, 1971)
- Natural Resources Conservation Service (NRCS) (MOU dated December 1, 1971)
- County of Kern Mutual Subdivision
- Extension Service (through the County of Kern)
- DWR
- U.S. Army Corps of Engineers (Corps)
- Farm Services Agency (MOU dated July 1, 1988)

The NWKRCD was established to help farmers, ranchers and others to make the best use of their natural resources and to enable local programs that conserve soil and water, prevent soil erosion, and control floodwaters and sediment damage. These basic policies are still in effect; however, the role of the RCD has expanded to include assistance to the county and towns that lie within and adjacent to the district. The sources of water in the NWKRCD are wells and surface water supplied through the Friant-Kern Canal, the California Aqueduct, the Kern River, and Poso Creek. A total of approximately 216,000 acres in irrigation districts lie within the NWKRCD.

Among the long-range goals of the NWKRCD are the following:

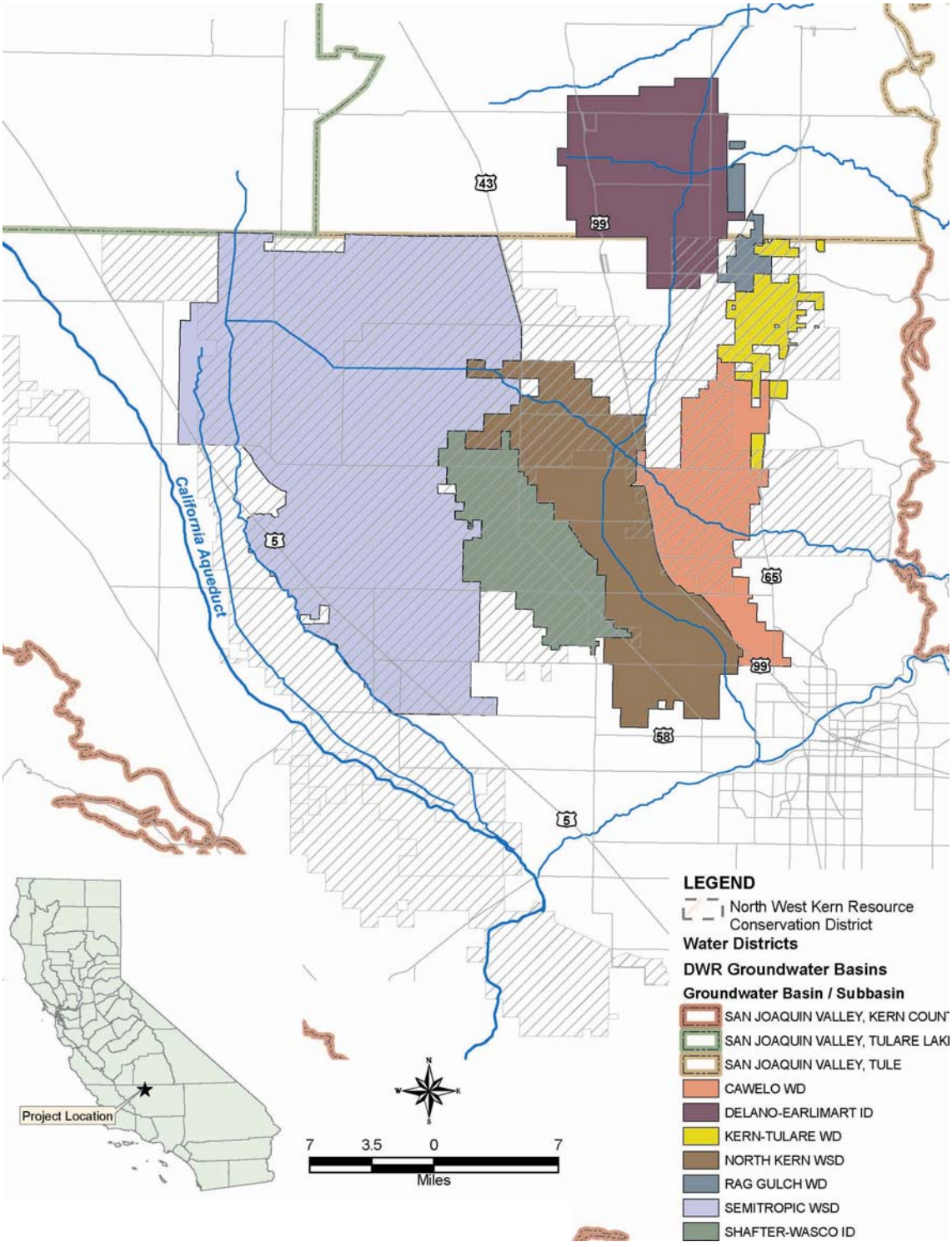
- Provide technical assistance and information so that every acre of land within the NWKRCD is treated according to its individual needs and capabilities.

- Extend public awareness programs by educating the general public on the importance of maintaining a sound soil and water resource base and how it relates to them.
- Educate the public so that it will acquire the skills, knowledge, and attitudes necessary to make wise soil and water conservation and land use decisions.
- Actively support conservation efforts and programs of cooperating agencies and civic groups, and request support from elected officials from a Mobile Lab and NWKRCD programs.

As noted in the 2006 Annual Report of the NWKRCD, a total of 102 irrigation system evaluations were conducted by the Mobile Lab Program on 8,051 acres during the 2006 irrigation season.

Watershed: Poso Creek is a major watercourse that flows northwesterly through the NWKRCD. Its watershed covers more than 250,000 acres. Precipitation on this watershed ranges from six to thirty inches. In years of high rainfall, extensive flooding occurs along a 25-mile reach from Zerker Road to the Kern National Wildlife Refuge. During the floods of 1969 and 1978, flood waters broke out of the Poso Creek Channel and inundated 17,280 acres. Improvements were made under the Emergency Watershed Protection Act to the repairs implemented in 1978 and 1979. The channel now is designed to carry 1,050 cfs. More flooding occurred in 1997 and 1998. A major project was undertaken to repair the levees with assistance from the NRCS through an Emergency Watershed Protection grant in 1997.

During 2006, routine maintenance was conducted by Semitropic from Leonard Avenue to the west, and by the North Kern east of Leonard. The integrity of the north side levee was compromised close to the Wildlife Refuge and water exited the creek for a number of days. Once the water flow in the creek subsided, Semitropic field operations personnel were able to reconstruct the levee to hold back the water at that location.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	North West Kern Resource Conservation District Service Area	
Poso Creek Regional Management Group		June 2007	Figure 2-9

2.4 Regional Management Group Relationship to the Kern County Water Agency

The Kern County Water Agency participated as a stakeholder during the process that formulated the Poso Creek IRWMP. The KCWA encompasses the entire valley area of Kern County as well as less developed mountain and desert areas, including the Tehachapi-Cummings County Water District and Tejon-Castaic Water District. The principal purpose for formation of the Agency was to provide a County-wide authority to contract with the State for water from the SWP and to wholesale the water to retailing member units in the organized area.

The Agency's functions include other activities and responsibilities, such as flood control and the construction and operation of the Cross Valley Canal, but its principal missions are the continued delivery of the SWP water supplies, the collection of revenues from the beneficiaries for reimbursement of the State costs, and the administration of its member unit water supply contracts. An equally important responsibility of the Agency is the continued exercise of vigilance regarding the administration and operation of the SWP and actions in the political, legal, and environmental sectors which may affect them. The Agency's collection of revenues is primarily based on actual quantities of water delivered to member units, but a portion of the Agency's costs (for water purchase, as well as administration) are recovered from "zone-of-benefit" assessments in portions of the County that are indirectly benefited by the availability and delivery of water.

The KCWA is the second largest contractor for water from the SWP. KCWA's Table A Allocation totals roughly 1 million acre-feet. KCWA is a wholesaler of SWP water and contracts with 16 local water districts for this supply. Semitropic and Cawelo obtain a significant portion of their water supply from the KCWA.

2.5 Regional Management Group Members' Groundwater Management Plans

2.5.1 Legislative Requirements

SB 1938, as passed by the California Legislature and signed into law by the Governor in 2002, amended the Water Code section 10750 et seq. to require that groundwater management plans prepared under the Groundwater Management Act (AB 3030) include the components listed below:

- Provide documentation that a written statement was provided to the public, describing the manner in which interested parties might participate in developing the groundwater management plan. This may include appointment of a technical advisory committee of the stakeholders in the basin.

- Development of Basin Management Objectives (BMO's).
- Adoption of monitoring protocols or a monitoring program capable of tracking changes in conditions for the purpose of meeting BMOs.
- Preparation of a map showing the area of the groundwater basin, as defined by the Department of Water Resources' (DWR) Bulletin 118, with the area of the local agencies subject to the plan as well as the boundaries of other agencies that overlie the basin in which the agency is developing a groundwater management plan.
- A description of the components relating to the monitoring management of groundwater levels, groundwater quality, inelastic land surface subsidence, and changes in surface water quality that directly affect groundwater levels or groundwater quality.
- Preparation of a plan of actions by the managing entity to involve other agencies and that enables the local agencies to work cooperatively with other public entities whose area or boundaries overlie the groundwater basin.
- The Groundwater Management Plan must be adopted by the local managing agency.
- Provisions for periodic reporting of the groundwater management activities and groundwater basin conditions.

In 2002, SB 1672 was passed by the California legislature and signed into law. This law authorizes a regional water management group, as defined, to prepare and adopt a regional plan relating to water supply, water quality, flood protection, or related matters. This law defined procedures to form a regional water management group, to communicate to the public, and to prepare and adopt an integrated regional water management plan.

As part of the Poso Creek IRWMP requirements defined by SB 1672, all of the Regional Management Group members have adopted groundwater management plans that are compliant with SB 1938. A summary of each district's groundwater management plan for Cawelo, Delano-Earlimart, Semitropic, Shafter-Wasco, North Kern, Kern Tulare, and Rag Gulch are included in Appendix A.

3 Water Management Assets, Issues, and Needs of Member Districts of the Poso Creek IRWMP Regional Management Group

3.1 Overview of Chapter

Presented in this chapter are the water management assets, issues, and needs of the member districts of the Poso Creek IRWMP Regional Management Group identified in meetings with the Consultant and presented as part of the Regional Management Group's monthly meetings. Resolving individual local district issues and needs in conjunction with the wider Region and State of California issues and needs was a consideration of the Regional Management Group. While formulating the plan, the Regional Management Group's effort focused on integrated solutions that made use of each individual districts assets to solve the water management issues and needs in the Poso Creek IRWMP Region. This integration of water management strategies and recommendations for implementation of the Poso Creek IRWMP are presented in Chapters 6, 7, 8, and 9.

The overriding local priority for implementation of the Poso Creek IRWMP is satisfying regional and local water management objectives as they are formulated through the development of each district's groundwater management plan. Goals and objectives included in each member's groundwater management plan is presented in Appendix A of this Plan. The common theme identified within each of the districts' groundwater management plans is the objective to preserve and maximize groundwater quantity and quality at the least possible cost. This common theme helps guide specific objectives for achieving water management goals including groundwater supply, groundwater quality, and protecting against inelastic land surface subsidence. Because the individual districts' goals and objectives are common to the members of the Poso Creek IRWMP Regional Management Group, implementation of their individual goals and objectives is best achieved through cooperation among participating agencies using an integrated approach. Through their involvement in the development of the Poso Creek IRWMP, participating districts have demonstrated their conviction that the most effective approach to local water management is through regional measures.

The Poso Creek IRWMP is an effort that recognizes that the most effective approach to managing a basin's water resources is an integrated plan that enlists the cooperation of the districts whose political boundaries match the basin's physical boundaries. The overarching regional objective of the plan is to foster good stewardship of the resources and to promote wise management of regional resources that responds to regional and local goals and

objectives of the groundwater management plans for the member districts. Providing a reliable water supply of good quality and at economical costs is essential for the economic well-being and welfare of the citizens of the Poso Creek IRWMP Region.

3.1.1 Physical and Institutional Issues and Needs of the Region

Significant water issues facing the Poso Creek IRWMP Region are maintaining a reliable water supply and balancing the use of surface and groundwater supplies within the basin. The identified needs associated with the management of surface and groundwater supplies for the Poso Creek IRWMP Region are summarized as follows:

- Develop additional water exchange agreements between districts in an effort to deliver surface water to direct recharge facilities to allow for absorption of wet-year supplies in addition to the in-lieu recharge capacity of the Region.

- Expand "water-banking" arrangements between districts having access to direct recharge that allow storage of and return of stored water in groundwater facilities and those which do not, thus, mitigating dry-year deficiencies for some districts.

- Expand in-lieu service areas by modifying conveyance facilities to allow delivery of surface water to presently irrigated areas now served solely from groundwater in order to increase the recharge of water to groundwater aquifers and conservation of water in groundwater aquifers.

Because surface water is available to the Region from a number of sources which have differing hydrologic timing, integration of these various supplies, combined with conjunctive use of the groundwater basin, provides the Region with an opportunity to improve its water supply reliability. Regional cooperation of the member districts provided the opportunity to evaluate solutions for individual district needs and for the Region by increasing operational flexibility.

3.2 Water Management Issues and Needs of Member Districts of the Poso Creek IRWMP Region

The water management assets, issues, and needs of the individual member districts of the Poso Creek IRWMP Region were identified by staff of the respective districts, communicated to the consultants tasked with drafting the Poso Creek IRWMP, and presented at the regularly scheduled Regional Management Group monthly meetings to allow for the other member districts, and the public, to learn about each member districts' issues and needs. Each member districts' water management issues and needs fit, in one category or another, under the broader umbrella of the planning objectives that were identified in Chapter 1. These objectives are restated herein – (1) water supply reliability, (2) maintain groundwater levels, (3) protect and enhance water quality, (4) maintain economical water

supply costs, (5) provide for adequate monitoring, (6) environmental enhancement, and (7) enhance flood control in the area.

In addition to the individual district concerns, the districts within the Region have significant common concerns in regard to future water supplies to the Region. Several of these concerns are:

- Limited ability of the districts to access their CVP water supplies from the Delta due to State and Federal regulatory measures in the Delta and increased reliance upon the SWP by The Metropolitan Water District (MWD) of Southern California;

- Several districts have contracts with the City of Bakersfield that terminate on or after December 31, 2011, thus, the ability of the districts to receive a reliable supply of Kern River water is uncertain beyond 2011;

- Loss of Kern River storage in Lake Isabella due to dam safety issues; and

- A coalition of environmental groups has settled a lawsuit against the federal government related to the water supply contracts in the Friant Division of the CVP. The result of this settlement will reduce the ability of the Districts to purchase Friant Class 1, Class 2, and Section 215 water supplies. Public materials describing this settlement were downloaded from the Friant Water Users Association's website and included as Appendix C.

For each district, an initial meeting was held early in 2006 between the District and GEI Consultants/Bookman-Edmonston to document each district's water management assets, issues, and needs and to discuss the integrated planning process. During the second half of 2006, each of the member districts presented their district's assets, issues, and needs at one of the regularly held Poso Creek IRWMP monthly meetings.

The water management assets, issues, and needs of the member districts that were discussed at the Regional Management Group's monthly meetings are summarized in subsequent sections of this chapter. In later chapters of this report, their integrated relationships are discussed, along with recommendations for implementation, including solutions to the individual agency needs as well as the regional, CALFED, and State needs.

3.2.1 Cawelo Water District

The Cawelo Water District (Cawelo) was formed in 1965 for the purpose of obtaining water supplies to supplement the pumping of groundwater for irrigation. Since Cawelo's formation, importation of surface water by Cawelo has slowed the decline of water levels. Cawelo brings the following mix of assets, issues, and needs to the Regional Management Group. These were considered in formulating the Poso Creek IRWMP.

Cawelo presented the following assets, issues, and needs to the Regional Management Group:

ASSETS

Water Supply

- SWP Contract through the KCWA for a maximum Table A Allocation of 38,200 acre-feet per year - 28,000 acre-feet per year for a 75 percent Table A Allocation.
- Temporary Contractor for CVP-Friant Water.
- Kern River Contract with the City of Bakersfield.
- Receives 20,000 to 35,000 ac-ft per year of reclaimed oilfield produced water.

Conveyance

- Cross Valley Canal (CVC) capacity - 165 cfs from the California Aqueduct to Cawelo's Pump Station "A" at the terminus of the CVC.
- Ability to pump a total of 360 cfs from the Lerdo Canal into Cawelo's distribution system.

Recharge

- A new direct recharge facility has been constructed with an estimated 160 ac-ft/day of absorptive recharge capacity (based on a long term average of 1/3 ac-ft/day).

Recovery

- Existing stored groundwater recovery capacity of 40 cfs into the Lerdo Canal.

Power and Energy

- Member of the Power and Water Resources Pooling Authority (PWRPA); Energy distributed by PG&E but purchased through PWRPA.

ISSUES

- May possibly lose firm rights on Kern River 27,000 ac-ft – in wet year, 15,000 to 20,000 yield.

- Blend SWP or Kern River water with Chevron – 3:1 blend of fresh water with oil field production – serve directly during irrigation season with no problems however use of this water in the winter is a challenge.

NEEDS

- Direct connection to Friant-Kern Canal for delivery to groundwater recharge ponds.

- Bypass Pump Station "A" in water supply conveyance system; Pump Station "A" causes a delivery constraint.

- Enhance conveyance connections with North Kern Water Storage District.

- Use oil field produced water in Poso Creek.

3.2.2 Delano-Earlimart Irrigation District

Delano-Earlimart Irrigation District (Delano-Earlimart) was formed in 1938. The most serious water supply issue facing Delano-Earlimart is the maintenance of water levels at economically viable pumping lifts for the overlying agricultural uses. While some surface water is used to directly recharge the groundwater supply through deep percolation, most of the recharge occurs indirectly, with the delivery of surface water to meet irrigation water requirements in lieu of pumping from the underlying groundwater.

Delano-Earlimart presented the following assets, issues, and needs to the Regional Management Group:

ASSETS

Water Supply

- Delano-Earlimart has the largest allocation of Class 1 (or "firm") water in the Friant Division at 108,800 ac-ft and a Class 2 water contract amount of 74,500 ac-ft.

- The District has experienced a decrease in demand per acre for irrigation water over recent years as a result of more efficient irrigation methods and/or changes in crop patterns.

Conveyance

- Nine separate turnouts from the Friant-Kern Canal.

- Fully pipelined, 172 miles of Rubber Gasket Reinforced Concrete Pipe (RGRCP).

- About two-thirds of the District's system is gravity delivery, and the remaining one-third is pressure delivery by means of a SCADA controlled system which cost $4.5 million to install in 1999.

Recharge

- Delano-Earlimart owns about 85 acres adjacent to the White River which it has developed for groundwater recharge. Deliveries can be made to this recharge area from the River as well as from the District's distribution system.

Storage and Recovery

- Delano-Earlimart presently does not have banking storage and recovery operations within the District; however, it is evaluating options with neighboring districts as part of this IRWMP.

Monitoring

- Prior to the early 1990s, the Bureau of Reclamation produced an annual water supply report, which included a presentation of groundwater level data. In 1991-1992, the Bureau phased out this report and the Friant Water Users Association took over some of the responsibilities. Presently, the District monitors water levels on representative water users' wells within the groundwater basin. Measurement of water levels at selected wells will continue to be performed in both spring and fall in order to show seasonal variation in water levels.

- As opportunities present themselves for direct and in-lieu recharge with imported water from sources other than those that have been historically available to the District, evaluation may include an analysis of short and long-term impacts on water quality of the groundwater.

- The District's conveyance system is fully metered, virtually no distribution losses, pressure-compensating float systems for constant flow regulation, and more recently completed a $3 million turnout renovation project.

Power and Energy

- Annual energy consumption of 4.5 million kWh/year; operate 18 pumping plants.

Water Banking Agreements

- There are about five thousand acres of land which are considered "excess" under federal Reclamation Law. Since these lands are not eligible to receive federal water, the District has engaged in year-to-year exchanges in an effort to provide surface water to these lands.

- Delano-Earlimart is interested in a banking project as a means to develop water for "excess" lands as well as other eligible lands, particularly in view of an anticipated reduction in the District's Class 1 water. Class 2 water could be banked when in surplus and recovered as needed.

- Rag Gulch, the District's neighbor to the east, has a groundwater depression or hole to put water in (for banking); however, it is located upslope, which would increase the cost of power and energy to convey water to this area. Further, it is understood that the growers in the area have not been receptive to the idea of recovering banked water from this same area.

ISSUES

- The District has considered changing to a full-service water management approach by acquiring wells and providing all of the irrigation water to all lands in the District, including "excess" lands. There are an estimated four-hundred growers utilizing five- to six-hundred wells in Delano-Earlimart. There could be an economy of scale if wells were clustered and jointly owned and operated. At present, Arvin- Edison Water Storage District is the only CVP Contractor operating wells. If Delano-Earlimart were to take over well facilities, farmers would have to be made "whole" in some manner.

  - A study was conducted of Delano-Earlimart's distribution system particularly on whether it has the capacity to provide "full service" deliveries.

  - Under its "partnership" with the Friant Water Users Authority, MWD is studying the potential for an exchange of SWP supplies for Friant-Kern water in view of the higher quality the latter provides in the fall of each year.

- A study was completed in the spring of 2006 for Delano-Earlimart and other Friant districts to evaluate the long-term impact of water quality exchanges with MWD.

- MWD has a potential opportunity to move SWP water up the Friant-Kern Canal and create exchanges with Shafter-Wasco, Arvin-Edison, or Southern San Joaquin MUD. Aside from potential water quality impacts, there is an institutional problem respecting place of use, which may mean that the permits would have to be opened up for amendment, which could be problematic.

NEEDS

- Delano-Earlimart is evaluating ways to manage supply in order to meet the settlement requirements with the Natural Resources Defense Council (NRDC) over its lawsuit to maintain more flows in the San Joaquin River to re-establish a salmon fishery.

- Delano-Earlimart will continue to pursue water management programs with other entities, including local districts, to provide non-project water to the District for delivery to eligible and/or excess lands.

- Delano-Earlimart will continue to support and facilitate the delivery of imported water supplies to Kern-Tulare and Rag Gulch (located immediately to the east) and the Pixley Irrigation District (located immediately to the northeast) for purposes of reducing groundwater migration out of the District.

- Delano-Earlimart is considering expansion of the District's conjunctive use program to include additional spreading and extraction capability in the vicinity of the White River and other areas of interest.

3.2.3 Kern-Tulare and Rag Gulch Water District

In 1976, Kern-Tulare and Rag Gulch Water Districts (Kern-Tulare and Rag Gulch) contracted with the City of Bakersfield for 23,000 acre-feet of Kern River water. The current term of this contract expires in 2012. Delivery of Kern River water under this agreement is facilitated with exchanges between the City of Bakersfield, KCWA's Improvement District Number 4, and Arvin Edison.

The future of surface water supplies has a high degree of uncertainty. This is due to the following reasons or actions: (1) limited access to CVP supplies from the Delta because of State and Federal actions in the Delta and increased reliance upon SWP by The Metropolitan Water District of Southern California (MWD); (2) initial term of contract with City of

Bakersfield terminates in the year 2012 and the future availability of the 23,000 acre-feet contract that it has with the City of Bakersfield is uncertain; and (3) NRDC settlement will reduce opportunities to purchase Friant water supplies.

Kern-Tulare and Rag Gulch (Districts) presented the following Assets, Issues, and Needs to the Regional Water Management Group:

ASSETS

Water Supply

- CVP contract for 53,300 acre-feet – Unreliable yield
- Kern River contract for 23,000 acre-feet – Current term ends in 2011
- 215 Contract and purchases from Friant Contractors

Conveyance

- The Districts' facilities consist of 12 pumping plants, approximately 65 miles of pressure pipeline, and 4 reservoirs to deliver water upslope from the Friant-Kern Canal - All deliveries are pumped from Friant-Kern Canal in a pipeline system
- CVC Capacity
- All deliveries are metered
- SCADA system allows water users to operate turnouts
- Districts' distribution system is inadequate to fully satisfy irrigation demands within the service area.

Recharge, Storage, and Recovery

- As imported water deliveries have increased due to distribution system improvements, groundwater pumping has been reduced that results in conserving groundwater resources.

Monitoring

- Groundwater Levels – Measured at approximately 100 wells throughout the Districts in the spring and fall of each year.

- Groundwater Quality – Samples are occasionally taken in wells throughout the Districts.

Power and Energy

- The Districts participate in exchange agreements that help offset power and energy costs that are related to the geographic location of the Districts.

Water Banking and Exchange Agreements – The following agreements are explained in the Districts' Groundwater Management Plan, adopted June 20, 2006

- Arvin-Edison Exchange
- Kern County Water Agency Exchange
- ID-4 Exchange
- North Kern Water Storage District Groundwater Banking Program
- Rosedale-Rio Bravo Water Storage District Groundwater Banking Program

ISSUES

- Federal and State regulatory actions in the Delta have severely limited the ability of the Districts to receive their CVP water supplies.
- The ability of the Districts to receive a reliable supply of Kern River water is uncertain beyond 2011.
- The San Joaquin River settlement will affect the ability of the Districts to purchase Friant Class 1, Class 2, and Section 215 water supplies.

NEEDS

- Pursue and support measures that will increase the yield and reliability of the Districts' CVP water supplies.
- Work corporately with the City of Bakersfield and the KCWA to acquire additional water supplies beyond 2011.

- Continue to purchase Friant water supplies, Section 215 water, and other water available from the Friant-Kern Canal.

- Continue to pursue water exchanges and banking programs with other water districts.

- Improve distribution facilities to maximize the delivery capability of surface water when it is available to save groundwater resources for future years.

3.2.4 North Kern Water Storage District

The most important need for North Kern Water Storage District (North Kern) is a more reliable surface water supply or exchange capabilities to better utilize its existing surface water supplies. North Kern's water supply includes direct flow rights on the Kern River, storage rights of Kern River flows in Isabella Reservoir, direct flows from Poso Creek, and groundwater. Flows on both the Kern River and Poso Creek are highly variable. North Kern's supply from the Kern River has varied from about 6,000 acre-feet in 1990 to almost 394,000 acre-feet in 1983. North Kern's supply from Poso Creek has varied historically from zero to a high of 28,000 acre-feet. Groundwater depths have averaged around 200 to 300 feet, with some years over 300 feet which results in a much higher cost to pump groundwater. Through additional structural inter-connections and exchange opportunities with the SWP and the CVP, North Kern could develop a more reliable surface water supply.

North Kern presented the following Assets, Issues, and Needs to the Regional Water Management Group:

ASSETS

Water Supply

- Kern River – Primary source of surface supply
  - Availability is highly variable (from 10,000 af/y to 400,000 af/y)
  - Good quality (~ 100 ppm TDS)

- Poso Creek – Minor source of surface supply
  - Only available in "wet" years
  - Used mostly for direct recharge

Conveyance

- Gravity system

- Main conveyance
  - Beardsley/Lerdo Canal (up to 850 cfs)
  - Calloway canal (up to 1,000 cfs)

- 130 miles of unlined canals

- 20 miles of lined canals

- 20 miles of pipelines

- Turnout from the Friant-Kern Canal (up to 200 cfs)

Recharge

- All lands overlie useable groundwater basin that is a common basin with adjoining districts

- Some areas of groundwater have elevated TDS and nitrate

- Recharged with good quality Kern River water

- Spreading basins
  - Operated since 1950s
  - Five sites (60 acres to 570 acres)
  - Total of ~1,500 acres

- Poso Creek channel

- Unlined canals

Storage

- Isabella Reservoir provides seasonal regulation of Kern River supply
  - 570,000 acre-feet – maximum capacity
  - 245,000 acre-feet – max. historical carryover
  - Nov 1 – carryover limit imposed for winter
  - North Kern's share of the conservation space is 1/3

Recovery

- District wells
  - Owns and operates over 70 wells

- Discharge into District canals
- Seasonal use to meet irrigation demand
- Not used in many years of adequate surface supplies
- Recovered up to 80,000 af/yr
- Theoretical capacity of ~200,000 af/yr

Monitoring

- Spring and fall water level measurements
  - District-owned wells (all)
  - Private wells (selected)
  - Depth to groundwater has varied from 200 to 300 feet over last 20 years

- Collect and test water samples from District-owned wells during years when wells are in use.

- North Kern is a member of the Semitropic Groundwater Monitoring Committee and submits both water level and water quality data to the Committee for its biennial monitoring report.

Power and Energy

- In-system regulation and time-of-use meters allow the District to avoid or minimize the use of electrical energy for the District-owned deep wells during the period of peak (electrical) demand charges each day.

Water Banking

- North Kern has entered into water banking agreements with neighboring districts
- North Kern has unused spreading capacity
- Available groundwater storage of > one million acre-feet
- Groundwater recovery

ISSUES

- North Kern's Issues in relation to the Poso Creek IRWMP Region concern their strategic location with neighboring districts and the need for conveyance between neighboring districts and North Kern.

- Strategically located with neighboring districts, proximate to …
  - Kern River
  - Friant-Kern Canal

- California Aqueduct via Cross Valley Canal

NEEDS

- Conveyance, recharge and recovery facilities
  - CVC - Calloway connection
  - Calloway – Lerdo connections
  - Expand existing, and construct new, connections with neighboring districts
  - Replace deep well recovery capacity
  - Add deep well recovery capacity

3.2.5 Semitropic Water Storage District

Semitropic Water Storage District (Semitropic) was organized in 1958 to implement conjunctive use programs and facilities and, in particular, to import water to supplement the area's water needs. Semitropic has been aggressive in providing solutions to its water management related issues. From Semitropic's formation in 1958 until 1973, area farmers relied solely on groundwater for irrigation. In 1973, they began importing surface water from the SWP to enhance groundwater levels. To further this management objective, Semitropic searched for ways to take advantage of an estimated 2 million acre-feet of aquifer storage. In the late 1980s and early 1990s, Semitropic began the process of finding water-banking partners. In 1994, it entered into a Memorandum of Understanding with five other local districts to create the Water Bank. Since 1973, Semitropic has, through its management practices, stabilized groundwater levels, delivered more than 5 million acre-feet of surface water, and banked more than 1,000,000 acre-feet in the first phase of the Water Bank. Semitropic has begun delivering water to the second phase of the Water Bank, which has an available capacity of 650,000 acre-feet.

Semitropic presented the following assets, issues, and needs to the Regional Water Management Group:

ASSETS

Water Supply

- SWP Contract through the KCWA for a maximum Table A Allocation of 155,000 ac-ft (until 2035).

- SWP Article 21 water (over 100,000 ac-ft in 2005).

- CVP water via the Friant-Kern Canal - Section 215 Non-Long-Term Contractor (aka: Temporary).

- Appropriative rights to Poso Creek water.
- Access to Kern River Water via North Kern.
- 10% of the Banking Partner water received for storage stays in the District.
- Groundwater to make up the difference between average demand of 450,000 ac-ft and surface water deliveries.

Conveyance

- Located near the California Aqueduct, Friant-Kern Canal, Poso Creek, Calloway Canal, and the Cross Valley Canal.
- Three turnouts from the California Aqueduct (with a combined capacity of 1,740 cfs; 640 cfs of which is under construction).
- Two turn-ins to the California Aqueduct (with a combined capacity of 460 cfs; 160 cfs of which is under construction; provision for an additional 560 cfs by adding pumping units.
- Bi-directional intertie with Shafter-Wasco (35 cfs).
- Future bi-directional interties with Shafter-Wasco (oversized distribution systems provide for a partially constructed additional capacity of about 140 cfs).
- Capacity in the CVC expansion (minimum of 35 cfs).
- In-District conveyance and delivery systems that are reversible (about 80 % of the District has dual surface water and ground water capabilities).
- Delivery systems designed at minimum of 10 gpm per acre (sufficient to avoid most on-farm groundwater pumping).

Recharge

- Indirect: Almost 100,000 acres of irrigation demand (i.e., in-lieu recharge)
- Indirect: Over 15,000 acres of additional irrigation demand are targeted for future
- (out of District) Direct: Kern Water Bank (48 ac-ft/day at 6.67% minimum)
- (out of District) Direct: Pioneer Project (64 ac-ft/day at 14% minimum)
- Direct: "Poso Creek" spreading grounds (being constructed in 2007, 20,000 ac-ft)

Storage

- The dewatered aquifer currently under Semitropic can hold over 3 MAF
- In-District storage defined for banking 1,650,000 (2006 storage ~ 1,000,000 ac-ft)
- Kern Water Bank (6.67% of 1,200,000 = 80,000 ac-ft) - currently over stored
- Pioneer Project (67,200 ac-ft = 14% of 400,000 ac-ft Pioneer plus 14% of 80,000 ac-ft 2nd priority right of Pioneer participants to use City's 2800-Acres Project)

Recovery

- District-owned wells (28 wells with a combined capacity of about 105 cfs)
- Landowner wells with pumping agreements including In-Lieu Water Service Contracts (about 306 wells; capacity available to extent not needed for landowner purposes provides a total of about 750 cfs)

Monitoring

- Single- or double-completion monitor wells at 16 locations with continuous recorders
- 150 production wells measured once or twice per year
- Water quality sampling of wells contributing to recovery for banking

Power and Energy

- Hydroelectric plant (0.80 MW)
- Solar installation (0.84MW)
- Natural gas-driven engine-generators (four at 1.0 MW each)
- Electrical distribution system (40 miles)
- Three, 10 MVA Substations
- 1 future 10 MVA substation near the well field pump plant
- 1 future 20MVA substation in the well field

- Historical maximum load 20 MW
- Current connected load 35 MW
- Future connected load 68 MW

Water Banking Agreements

- The original Banking Project and the Stored Water Recovery Unit (SWRU) provide
  - Additional facilities
  - Additional cash flow
  - Additional water
  - Less groundwater pumping in storage years and years with abundant other water supplies

ISSUES

Recurring water related issues that Semitropic plans to address as part of the Poso Creek IRWMP include:

- Enhance importation of water into the District over the long term to maintain groundwater levels and mitigate times of shortage;
- Maintain grower costs at a level commensurate with the agricultural economy by – (1) mitigating rising SWP costs, and (2) mitigating rising power and energy costs;
- Provide reliable and flexible service to water users;
- Provide Poso Creek maintenance;
- Protect water quality (both for irrigation needs and for return of stored banking water to the California Aqueduct);
- The original Banking Project and the Stored Water Recovery Unit require – (1) additional groundwater pumping in recovery years; (2) additional energy use in recovery years; (3) groundwater quality testing; (4) coordination with out of district entities; and (5) long-term guidelines for commingling raw water of the California Aqueduct; and (6) resolution of the arsenic issue (upstream or downstream treatment); and
- Consider annexing non-district adjacent areas for future groundwater banking.

NEEDS

- Future bi-directional interties with Shafter-Wasco (oversized distribution systems provide for a partially constructed additional capacity of about 140 cfs)

- Protect water quality both for irrigation needs and for return of stored banking water to the California Aqueduct

- Enhance Wildlife Improvement District facilities

- The original Banking Project and the Stored Water Recovery unit require
  - Additional groundwater pumping in recovery years
  - Additional energy use in recovery years
  - Considerable groundwater quality testing
  - Coordination with out-of-District entities
  - Resolution of the Arsenic treatment issue (upstream or downstream)

3.2.6 Shafter-Wasco Irrigation District

The most serious water supply problem facing Shafter-Wasco Irrigation District (Shafter-Wasco) is the maintenance of groundwater levels and underutilization of its surface water supply. Water users recharge surface water to the groundwater supply in above-average water years by using surface water to meet their irrigation requirements and not pumping from the groundwater supply. Some surface water is also recharged to the groundwater supply through deep percolation.

Shafter-Wasco presented the following assets, issues, and needs to the Regional Management Group:

- Provide an additional surface water supply to the 20% of its lands that are not able to receive Federal water;

- Develop a non-project water supply;

- Alleviate constraints in its water delivery system that at times is inadequate to meet district demands;

- Provide for the needs of its agricultural lands along with the urban growth in the cities of Wasco and Shafter;

- The District has to depend on others for recharge or banked water capability and interconnections with neighboring districts needs greater exchange capacity; and

- District water conveyance system needs upgrades with additional control points, along with upgrades to outlets and prioritizing outlet repairs.

ASSETS

Water Supply

- Shafter-Wasco meets 50-60 percent of its irrigation water demands from its contract with the Federal CVP; however, not all lands within the District are eligible to receive federal water under Reclamation Law.

- District primary water supply is a CVP contract water supply of 50,000 ac-ft Class 1 and 39,600 ac-ft of Class 2.

- Located between North Kern and Semitropic who's primary supplies are from other sources.

Conveyance

- District's system is composed primarily of pipe and ¾ mile of open cement lined canal.

- Water deliveries are from east to west and are gravity flow from the Friant-Kern Canal.

- Shafter-Wasco has interconnections with adjacent districts North Kern and Semitropic; currently there is an existing 36-inch pipeline intertie between Shafter-Wasco and Semitropic.

- Shafter-Wasco is adjacent to the Calloway Canal.

Recharge, Storage, Recovery, and Water Banking Agreements

- Shafter-Wasco depends on others for recharge, storage, and recovery of stored groundwater or banked water capacity.

Monitoring

- All District delivered water is individually metered.

Power and Energy

- Shafter-Wasco relies on gravity flow for is primary source of supply from the Friant-Kern Canal.

ISSUES

- Shafter-Wasco has lands that are not able to receive Federal water.
- Shafter-Wasco's delivery system at times is inadequate to meet District demands.
- Shafter-Wasco is being impacted by growth in the cities of Wasco and Shafter.
- Shafter-Wasco has to depend on others for direct recharge or banked water capability.
- There is currently an ongoing study with MWD on the issue of water quality impacts from the exchange of Shafter-Wasco's CVP water with MWD's SWP water. Friant-Kern Canal water has a very high quality, on the order of 50 ppm TDS, which would enable MWD to utilize a higher quality of supply during the fall season (when both the flow and the quality are lower in the California Aqueduct). However, SWP water, with a higher salt content than Friant-Kern supplies, could be adverse to metal features of Shafter Wasco's distribution system which are in contact with water.

NEEDS

- Provide an additional surface water supply to the 20% of its lands that are not able to receive Federal water.
- Develop a non-project water supply.
- Alleviate constraints in its water delivery system that at times is inadequate to meet District demands.
- Provide for the needs of its agricultural lands along with the urban growth in the cities of Wasco and Shafter.
- Since the District has to depend on others for recharge or banked water capability and has interconnections with neighboring districts that need greater exchange capacity, the District's water conveyance system needs upgrades with additional control points, along with upgrades to outlets and prioritizing outlet repairs.
- Shafter-Wasco would like more opportunities to take delivery of water from Semitropic, but is currently limited by the physical capacity of the single interconnection. Improvements which would increase the capacity to move water

from west to east would help to alleviate low pressures at the lower end of Shafter-Wasco's system.

- Project improvements could be made to CVP turnouts at Kimberlina Street and Fresno Street.

- Conveyance project that delivers SWP Article 21 to the District as an alternative to the Cross Valley Canal.

3.2.7 North West Kern Resource Conservation District

The North West Kern Resource Conservation District (NWKRCD) has delineated areas of toxic salt accumulation and areas in critical need of protection from water and wind erosion, and brackish agricultural drainage water. Other water management issues that need to be addressed are salt water intrusion, the pollution of groundwater supplies, and areas in the NWKRCD with severe water penetration problems.

Water conservation in the NWKRCD is needed to address the excess use of groundwater and water penetration problems on the sandy loam and loam soils of the NWKRCD. It is hoped that the North West Kern County Soil Survey will help to delineate these problem areas. The NWKRCD's Irrigation Water Management Program provides practical field testing of irrigation systems. The Mobile Lab can determine the distribution uniformity of applied irrigation water and the efficiency of an irrigation system.

There are also numerous techniques for implementing different elements of the NWKRCD program. For example, voluntary agreements between the NWKRCD and the individual landowners or users have been negotiated. The purpose is to supply certain services according to a farm or ranch conservation plan or engineering plans for a specific conservation practice.

The NWKRCD provides the following assets and has these issues and needs as part of the Regional Management Group:

ASSETS

- As previously stated in Chapter 2, the NWKRCD is authorized to cooperate with and receive assistance from a multitude of agencies. Therefore, the NWKRCD provides assistance to help farmers, ranchers, counties, towns, and others to make the best use of their natural resources and to enable local programs that conserve soil and water, prevent soil erosion, and control floodwaters and sediment damage.

- The NWKRCD operates an active Mobile Lab service for irrigation system evaluations

ISSUES

- The NWKRCD' role is to help assess issues facing the districts and growers.

NEEDS

The NWKRCD's Mobile Lab program is funded mostly by local agencies and from various federal sources. Funding is needed annually to support the program.

3.3 Significant Poso Creek IRWMP Regional Water Management Issues and Needs

As noted in the individual district discussions, two of the more significant water management issues facing the Region are surface water supply reliability and maintaining groundwater levels at economically viable pumping lifts.

3.3.1 Historical Surface Water Supplies to the Region and Projected Loss of Surface Water Supplies to the Region

Historical surface water supplies to the Region, the projected losses of surface water supplies to the Region, and the corresponding projected change in groundwater levels are presented in Chapter 4. The projected losses that are expected to surface supplies to the Region are due to the following reasons:

- SWP projected water delivered from the Delta is subject to environmental restrictions and increased reliance by southern California

- Federal CVP and Friant-Kern Canal, SJR Settlement will affect supply of Federal CVP and Friant-Kern Canal delivered water

- Kern River, Kern River Safety of Dams issue on Lake Isabella affects the projected supply of Kern River water

3.4 Relationship of Poso Creek IRWMP Local Agency and Regional Water Management Issues to CALFED and State of California Water Management Issues

3.4.1 CALFED Objectives

The CALFED Bay-Delta Program is a collaborative effort among 25 state and federal agencies to improve water supplies in California and the health of the San Francisco Bay-Sacramento-San Joaquin River Delta Watershed. In 2000, the agencies drafted a 30-year plan described in the CALFED Record of Decision. The plan sets general goals and describes a science-based planning process through which the agencies can make better, more informed decisions on future projects and programs within their jurisdictions.

The CALFED agencies working with local partners are implementing hundreds of projects to improve the quality and reliability of the Bay-Delta system. As a result, conflict in the Delta has been reduced. Water supplies are becoming more reliable, water quality issues are gaining the attention they deserve, and the Bay-Delta environment is showing some favorable responses. One objective of water supply reliability of the CALFED program is to assist local partners in developing 500,000 to 1 million acre-feet of groundwater storage. The Poso Creek IRWMP could contribute to the CALFED objective of increasing groundwater storage. Semitropic is already contributing to the objective by having in storage about one million acre-feet of groundwater for banking partners.

3.4.2 State of California Priorities

Implementation of the Poso Creek IRWMP will enable the Regional Management Group and its member agencies to respond to a range of State-wide water management initiatives. Key among these is the increasing emphasis placed on agencies to develop integrated regional solutions to water management issues and to coordinate the conjunctive management of surface water and groundwater for sustainable water supply reliability and water quality in California.

Completion and adoption of the Poso Creek IRWMP will allow participating agencies to satisfy one of the key prerequisites for grant funding through Proposition 50 and 84 of the Integrated Regional Water Management Grants Program. The integrated plan also frames specific water management projects in the context of an integrated regional water management strategy. Although the plan emphasizes groundwater management, elements of the plan address the Regional use of surface water supplies through water exchanges, water and energy conservation, and delivering surface water to meet demands that have previously been met with groundwater. This integration of surface and groundwater resources leads to a more comprehensive management of water supplies and provides a lucid framework for compliance with state and federal water quality standards.

In particular, by promoting effective water use in the groundwater subbasin, implementation of the Poso Creek IRWMP will:

- Increase California's water supply reliability;
- Reduce conflicts among water users;
- Contribute to meeting the water needs for implementing the SJR Settlement
- Contribute to meeting Delta water quality objectives; and
- Assist in the implementation of Regional Water Quality Control Board Watershed Management Initiatives chapters, plans and policies.

4 Historical and Projected Water Supplies

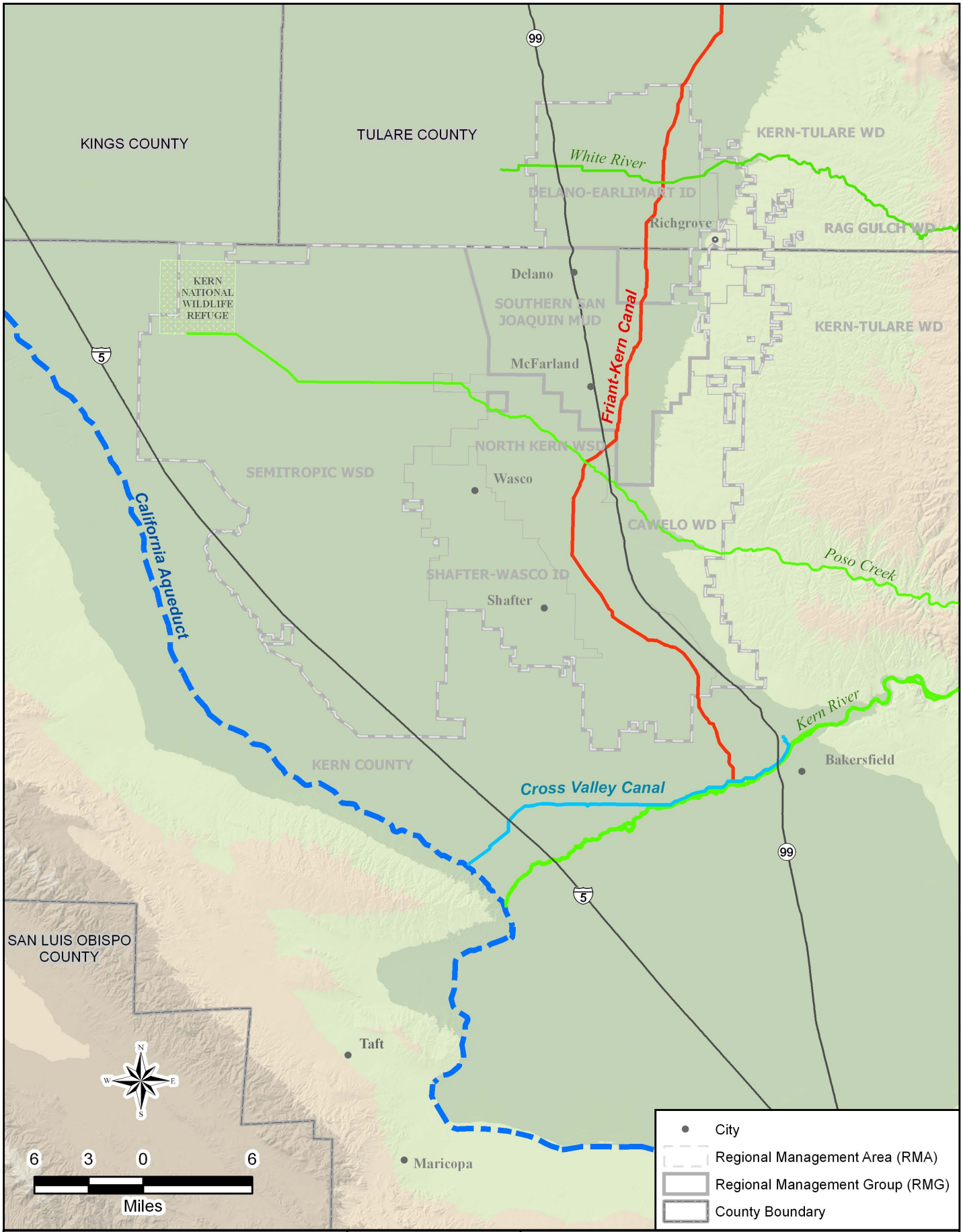
The fundamental questions which are addressed in this section are …

- *How much surface water has been brought into the Region in the past?*
- *What are the fluctuations in groundwater levels that have been observed in the past?*
- *How much surface water will be available in the future?*

4.1 Overview of Water Supply Sources

All of the water districts within the Poso Creek RMA conjunctively use both surface water and groundwater to meet water requirements. Surface water sources include both local supplies and imported supplies. The Kern River is the primary source of local supply; however, Poso Creek and other minor streams contribute to the locally-available supplies from time to time. In addition, water produced in the operation of the Kern River oilfield has contributed to the region's water supply. Sources of imported supplies include both the Central Valley Project (CVP) and the State Water Project (SWP)

CVP water from the Friant Division is conveyed to the Region through the Friant-Kern Canal, and SWP water is conveyed through the California Aqueduct, along with CVP water from the Delta Division, as shown schematically on Figure 4-1.



Poso Creek Integrated Regional Water Management Plan

Poso Creek Regional Management Group

GEI Consultants
Bookman-Edmonston Division

Cross Roads of the California Aqueduct, Friant-Kern Canal and the Kern River

JUNE 2007

FIGURE 4-1

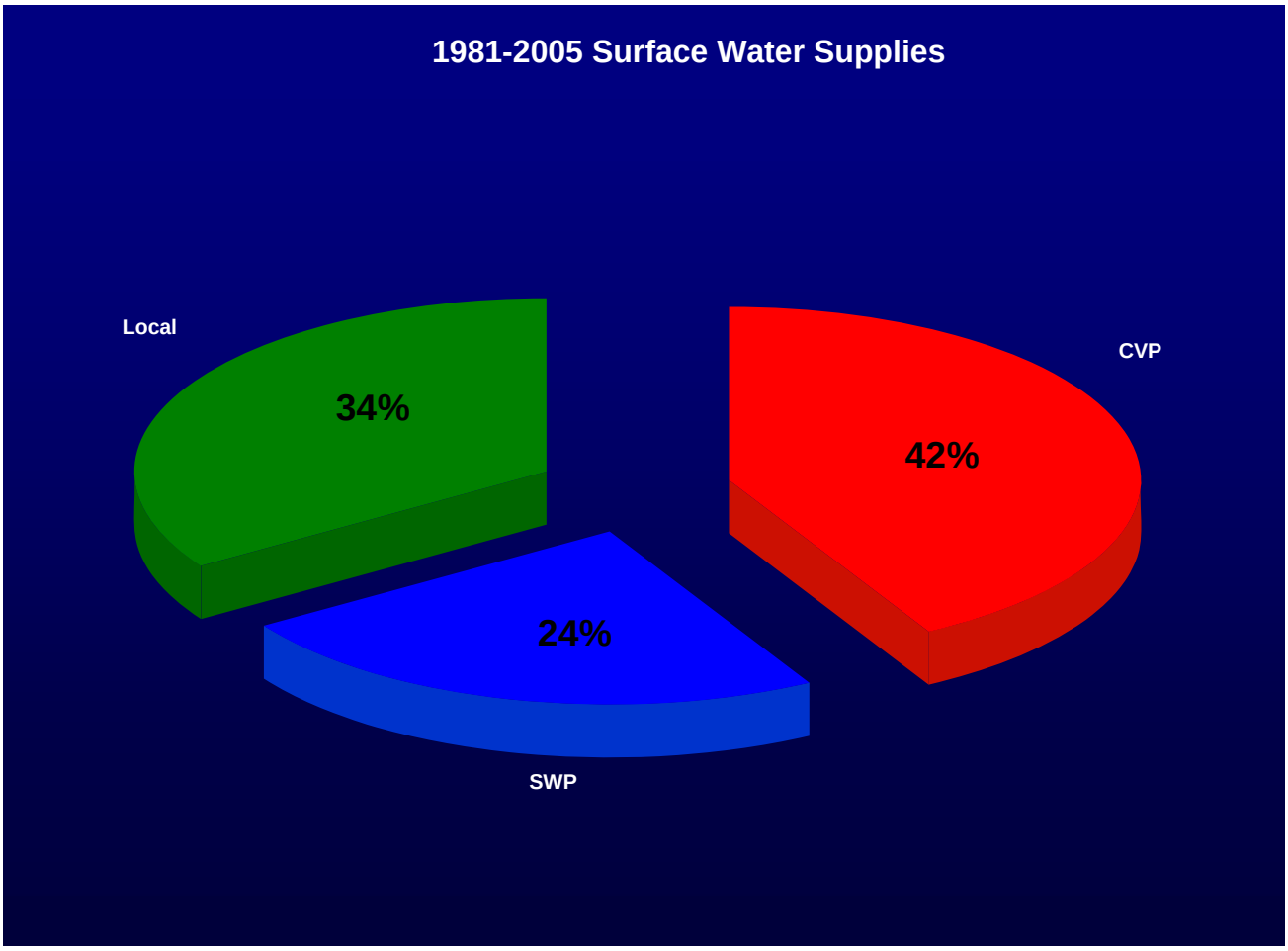
The Poso Creek Regional Management Group (RMG) members are listed, along with their respective sources of water supply, in Table 4-1. These water sources are discussed in more detail in subsequent sections of this chapter.

Table 4-1

Checklist of Water Supply Sources for the Regional Management Group

	SWP	CVP Delta	CVP Friant	Kern River	Poso Creek or Other Local Streams	Ground-water
Cawelo	✓			✓	✓	✓
Delano-Earlimart			✓		✓	✓
Kern-Tulare		✓		✓	✓	✓
North Kern				✓	✓	✓
Rag Gulch		✓		✓	✓	✓
Semitropic	✓				✓	✓
Shafter-Wasco			✓			✓

For purposes of this investigation, historical averages are based on the 25-year period extending from 1981 through 2005, unless noted otherwise. For the Poso Creek RMA, the historical average use of local and imported water supplies is illustrated in Figure 4-2.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Historical Average Use of Local and Imported Water Supplies	
Poso Creek Regional Management Group		June 2007	Figure 4-2

On average, local surface water supplies have amounted to about one-third of the total surface water supplies of the Region, with imported supplies making up the remaining two-thirds.

Over the years, both regulatory decisions and court decisions have impacted the availability of the Region's imported water supplies. In recent years, environmental and water quality issues in and surrounding the Sacramento-San Joaquin River Delta (Delta) have limited the ability to export water south of the Delta, which has reduced the reliability of SWP water supplies and CVP-Delta supplies available to the Region. For similar reasons, the reliability of CVP supplies from the Friant Division has been threatened for many years and will be significantly impacted under an agreement which was recently reached in settlement of long-standing litigation. Given the Region's heavy reliance on imported water supplies to support the irrigated agricultural economy, local measures to mitigate this loss of reliability will continue to be a high priority for the Region.

The reliability of the Kern River supplies that have been used in the Region in the past is also threatened, owing to the expiration of several long-term contracts in 2011, as well as ongoing litigation. Accordingly, all three of the principal sources of surface water supplies have experienced or will experience reduced reliability. This is the common denominator that brought the Poso Creek RMG together; in particular, the belief that by pooling their respective assets, they could implement measures and arrangements to regulate their collective water supplies at a regional level, and thereby mitigate the loss of reliability that has been experienced to date and that which is on the horizon.

4.2 Historical Conditions

For the purpose of characterizing historical water supply conditions, this investigation has relied on the 25-year period extending from 1981 through 2005. While this period may or may not be representative of long-term hydrology, it does contain both *wet* and *dry* cycles, which allow for observations to be made with respect to the response of the underlying groundwater system to changes in water supply. Further, the fundamental water supplies and infrastructure for the Poso Creek RMA were largely in place for the entirety of this period. For example, while deliveries of CVP water into the area commenced in the 1950s, deliveries of SWP water did not commence until the 1970s. Further, Kern River water under long-term contracts with the City of Bakersfield was not delivered into the RMA until the late 1970s.

4.2.1 Kern River

The Kern River is the primary source of local surface water supply to the San Joaquin Valley portion of Kern County. Since the 1870s, a portion of this supply has been conveyed to the north of the Kern River fan into the Poso Creek RMA. In particular, Kern River water has been conveyed into the area of North Kern through two main canals; the Beardsley Canal and the Calloway Canal, both of which divert directly from the channel of the Kern River. More

recently, in the late 1970s, delivery of Kern River water into the eastern portion of the Poso Creek RMA commenced. In particular, Cawelo, Kern-Tulare, and Rag Gulch began receiving Kern River water under long-term contracts with the City of Bakersfield.

Hydrology - Based on over 100 years of records, the average annual runoff of the Kern River is in excess of 700,000 acre-feet. However, runoff varies widely from year to year; the maximum annual recorded amount having been some 2.5 million acre-feet in 1983 (about 340 percent of the long-term average) and the minimum having been about 177,000 acre-feet in 1961 (about 25 percent of the long-term average). As a result, history has shown that two out of three years produce below-average runoff. This variability has made regulation of the supply essential. Regulation is accomplished through a combination of underground storage and surface storage.

Storage and Regulation of Kern River - Prior to the realization of surface regulation of Kern River (in 1954), North Kern formulated and implemented a project whereby supplies which are available in excess of irrigation requirements are percolated into underground storage through the use of over 1,500 acres of spreading ponds. Conversely, when surface supplies are short, deep wells are used to recover the previously stored water. Accordingly, for more than 50 years, North Kern has achieved a high degree of conservation and use of this widely varying source of supply through direct diversions to irrigated lands and through incidental and intentional percolation to underground storage.

Since the mid 1950s, Isabella Dam and Reservoir, constructed by the U.S. Corps of Engineers (USACE) just downstream of the confluence of the north and south forks of the river, has provided additional regulation. The reservoir, completed in 1954, has a storage capacity of almost 570,000 acre-feet and provides flood control, water conservation and recreation

The flood control operational criteria require that the water in storage be drawn down to a minimum conservation storage level of 170,000 acre-feet from November 1st through February 1st of each year. Allowable storage levels through the succeeding months of the flood season, extending to August 1st, are established on the basis of the periodically surveyed water content of the snow pack and projected runoff in each year. Through arrangements among the river interests, and partially as a result of the construction and activation of the Kern River Intertie[1], stored water carryover up to 245,000 acre-feet has been permitted. Through arrangements with the stream irrigation interests, a minimum reservoir pool of 30,000 acre-feet is maintained for recreation purposes.

Only in exceptionally *wet* years is there Kern River water that cannot be regulated for either irrigation or spreading.

[1] Completed in 1978, this facility allows for the controlled diversion of Kern River water into the California Aqueduct.

Water Quality - The quality of Kern River water is excellent, generally less than 100 milligrams per liter of total dissolved solids. The water is suitable (from a mineral water quality standpoint) for both municipal and irrigation uses.

4.2.2 Minor Streams

Poso Creek originates to the east of the Poso Creek RMA, with its headwaters in the Greenhorn Mountains. For the last 25 years, records of stream flow at Highway 65[2] have been maintained. This location marks the point at which Poso Creek enters Cawelo, which is also coincident with the eastern boundary of the Poso Creek RMA. This highly erratic local stream traverses the northeastern portion of the region, generally along a southeast-to-northwest alignment. Figure 4-3 illustrates the fluctuation in annual runoff volumes which enter the region as surface flow. The average annual runoff for 1982 through 2005 was about 22,000 acre-feet; however, it is noteworthy that almost one-half of this average was the result of two very wet years, 1983 and 1998. As shown on Figure 4-4, most of the runoff has occurred in the months of January through May, with little to no flow in the remaining months, except during very wet years. Owing to its highly erratic nature, the primary use of this supply is its contribution to the underlying groundwater supply, both through natural recharge in the stream channel and North Kern's and Cawelo's intentional water-spreading activities.

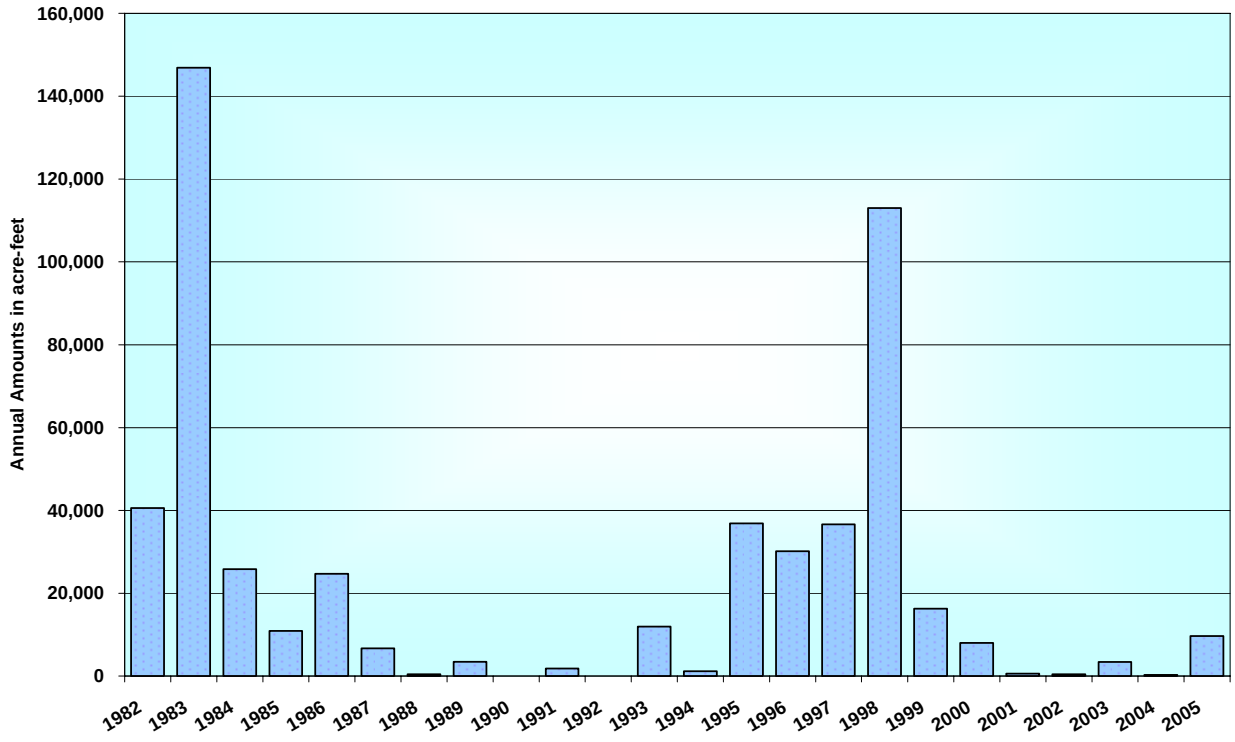
Commencing in 1997, diversions have been governed by an agreement[3] between North Kern, Cawelo, and Semitropic, who collectively share the runoff of Poso Creek. Under the agreement, riparian users are first satisfied, after which the sharing between the parties is in accordance with the following schedule (based on the measured flow of Poso Creek at Highway 65):

Less than 135 cfs	*Cawelo*
Between 135 cfs and 300 cfs	*North Kern*
Between 300 cfs and 685 cfs	*Semitropic*
Over 685 cfs	*North Kern*

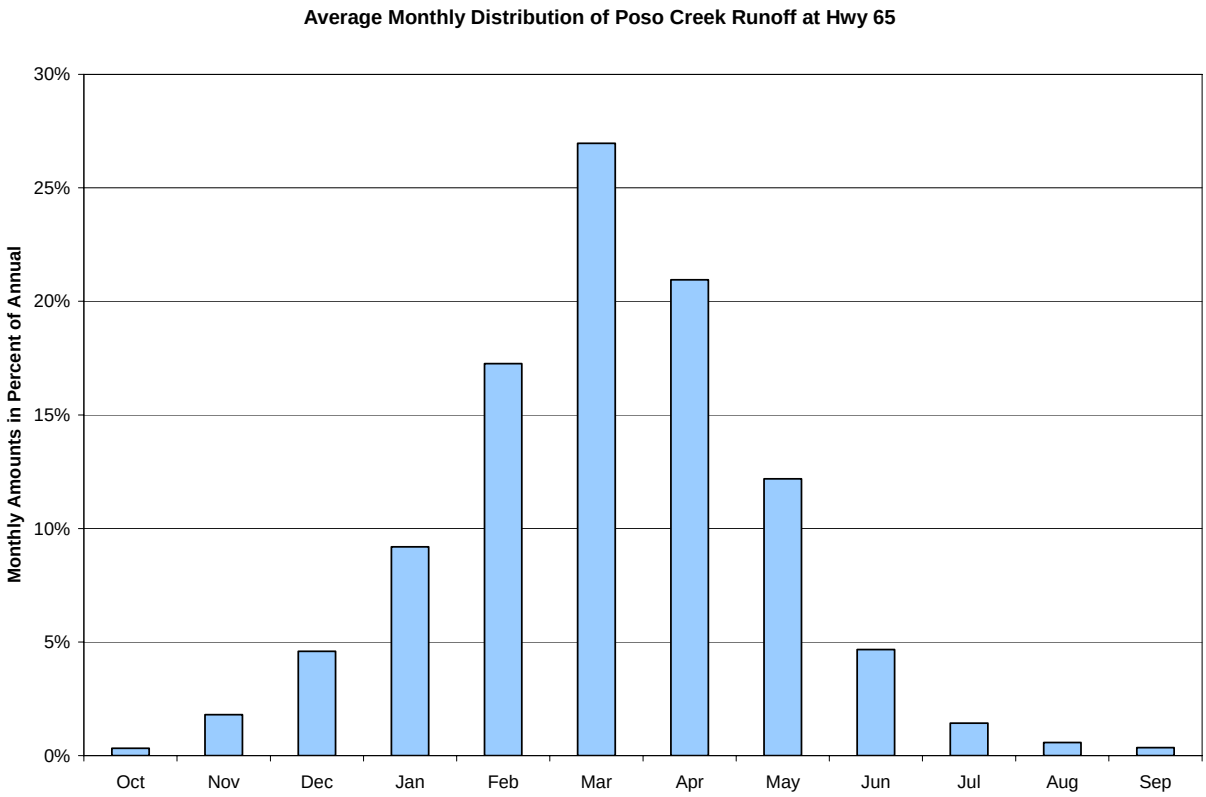
Located to the north of Poso Creek, and of lesser importance in terms of its contribution to recharge, is the White River. In this regard, the drainage area of the White River is less than one-half that of Poso Creek. Stream flow records for the White River over the last 25 years are not as good as those for Poso Creek; however, the average annual runoff volume is estimated to be on the order of 6,000 to 7,000 acre-feet. The White River courses from east to west across the north end of Kern-Tulare and Rag Gulch, then across the center of Delano-Earlimart.

[2] The drainage area of Poso Creek above State Highway 65 is about 328 square miles (USACE 1981).
[3] Agreement Regarding Operation and Monitoring of Poso Creek Flows, dated May 23, 1997; amended September 21, 1999.

Annual Runoff of Poso Creek at Hwy 65



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Annual Runoff of Poso Creek at Hwy 65	
Poso Creek Regional Management Group		June 2007	Figure 4-3



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Average Monthly Distribution of Poso Creek Runoff at Hwy 65
Poso Creek Regional Management Group		June 2007 Figure 4-4

4.2.3 Oilfield-Produced Water

The Kern River oilfield, located adjacent to the southeast boundary of the Poso Creek RMA, is currently one of the top three producing oilfields in Kern County. Water is produced as a by-product of the production of oil. While some of this water is reintroduced in the form of steam to facilitate the production of oil, there remains a significant amount of water for other uses. With some treatment, this remaining supply has been delivered into the Poso Creek RMA for irrigated agricultural uses. In particular, North Kern and Cawelo have been the recipients of this oilfield-produced water.

North Kern - North Kern began receiving oilfield-produced water in 1980, with annual amounts ranging from 100 acre-feet to over 10,000 acre-feet, and averaging about 5,000 acre-feet per year. Physically, this water has been discharged into, and conveyed in, North Kern's Beardsley Canal.

Cawelo - From 1980 until the mid 1990s, Cawelo depended on North Kern's conveyance facilities to receive water from this source of supply. During this period of time, the amount of oilfield-produced water available to Cawelo varied considerably from year to year, and averaged less than 2,000 acre-feet annually. In 1995, an 8-mile pipeline was constructed from the Kern River oilfield to Cawelo, which provided for direct delivery of the oilfield-produced water to Cawelo. Since that time, Cawelo has received from 18,000 to 22,000 acre-feet annually from this source.

Recycled Water

Water recycling within the Region includes both M&I wastewater effluent and water used to create waterfowl habitat in the Kern National Wildlife Refuge.

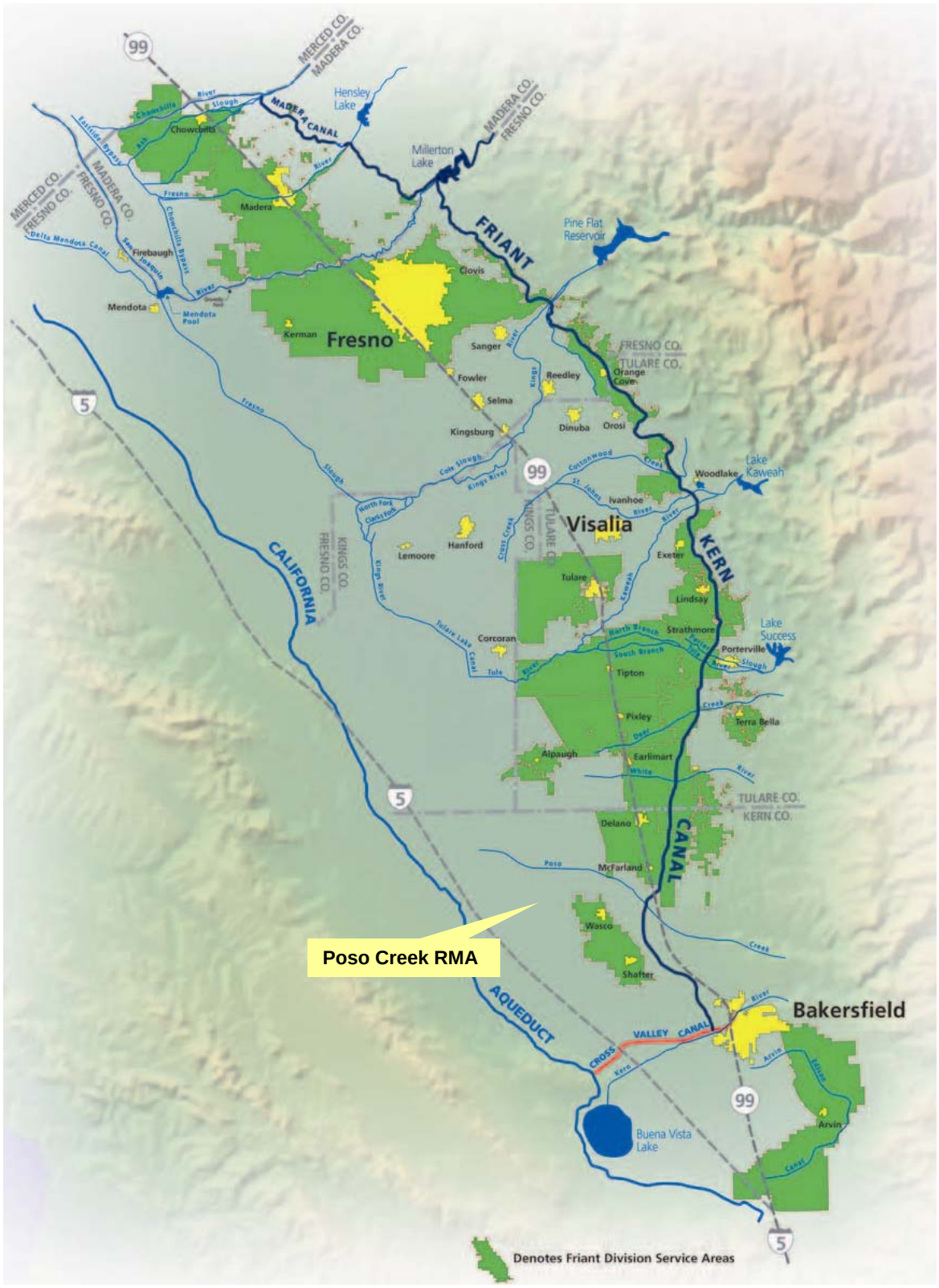
Wastewater Effluent - To the extent that wastewater is collected and treated by the communities located within the Region, the treated effluent is typically used to grow crops in the Region. Over the last 15 years, the annual volume of wastewater effluent has ranged from 5,000 to 10,000 acre-feet.

Kern National Wildlife Refuge - Some of the water which is used to create waterfowl habitat in the fall and winter is released in the spring as ponds are drawn down. The released water, which can range from 500 to 2,000 acre-feet annually, is used to irrigate crops in the area.

4.2.4 Central Valley Project – Friant Division

The Friant-Kern Canal is a feature of the U.S. Bureau of Reclamation's (USBR) Central Valley Project. The canal diverts water from Millerton Reservoir, created by Friant Dam on

the San Joaquin River, and extends southward a distance of 152 miles through Fresno, Tulare and Kern counties to its terminus at the Kern River near Bakersfield. While the reservoir capacity is about 520,000 acre-feet, 130,000 acre-feet of this amount is not useable as conservation space inasmuch as it lies below the intake for the Friant-Kern Canal. The capacity of the Canal at its head is 5,300 cubic-feet per second, and it gradually reduces to 2,000 cfs at its terminus. A number of water districts along the east side of the San Joaquin Valley, including three within the Poso Creek RMA, entered into long-term water supply contracts with the USBR, which provide for the delivery of three types of water; Class 1, Class 2, and "Other". Figure 4-5 shows the Friant-Kern Canal and its proximity to water districts in the Poso Creek RMA.



Source: Friant-Water Users Authority website - http://www.friantwater.org/

Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Friant-Kern Canal and its Proximity to Water Districts in the Poso Creek RMA	
Poso Creek Regional Management Group		June 2007	Figure 4-5

Class 1 Water - This class of water provides a relatively *firm* or regulated supply and contracts for this water total about 800,000 acre-feet per year, about one-third of which is contracted to districts within the Poso Creek RMA, as shown below, along with the year that deliveries commenced.

Delano-Earlimart	108,000 af	1950
Shafter-Wasco	50,000	1957
Southern San Joaquin	97,000	1951
Total:	255,000 af	

Class 2 Water - This type of water is made available after Class 1 demands have been met; accordingly, there are many years when this class of water is not available or is available in small amounts. In particular, in about one out of three years, the allocation ranged from zero to 10 percent. Contracts for Class 2 water total about 1.4 million acre-feet, with about 164,000 acre-feet contracted to districts in the Poso Creek RMA, as shown below.

Delano-Earlimart	74,500 af
Shafter-Wasco	39,600
Southern San Joaquin	50,000
Total:	164,100 af

Since this water is less *firm*, it cannot always be regulated to meet an irrigation demand. In these instances, Delano-Earlimart, Shafter-Wasco, and Southern San Joaquin have historically forgone delivery within their districts in favor of diversion and use by other Friant Division contractors who have a coincident demand for the supply.

Other Water - Historically, this water has commonly been referred to as *Section 215 water*, which is water that is not storable for *Project* purposes (i.e., for meeting contract obligations for Class1 and Class 2 water). This type of water has occurred in exceptionally large water supply years or from infrequent and otherwise unmanaged flood flows of short duration. This water has also been available under temporary contracts to districts who are not long-term Friant contractors. It is noteworthy that the *acreage limitation* provisions of *Reclamation law* do not apply to this type of water.

The historical allocation priorities for this water are listed following:

(1) Long-term contractors;

(2) Cross Valley contractors;

(3) Other parties within the Friant Division service area with direct delivery capabilities;

(4) CVP contractors outside of the Friant Division service area; and

(5) Other parties.

Water Quality - The quality of Friant-Kern water is excellent, with generally less than 100 milligrams per liter of total dissolved solids.

Poso Creek RMA - Deliveries of CVP-Friant water to districts within the Poso Creek RMA have averaged about 292,000 acre-feet per year for 1981-2005, ranging from less than 200,000 acre-feet (1990) to more than 350,000 acre-feet. The annual fluctuation in deliveries is illustrated on Figure 4-6.

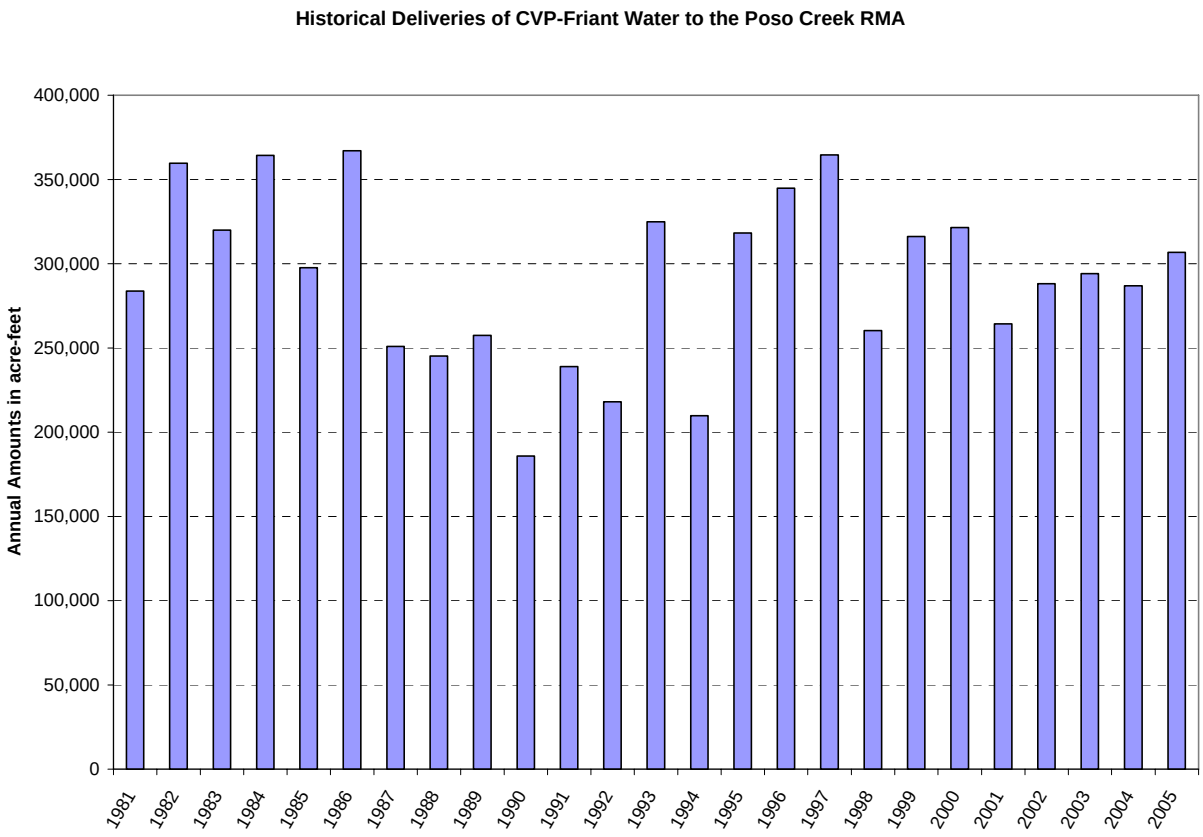
4.2.5 Central Valley Project – Delta Division

In 1973, the California Department of Water Resources completed the initial facilities of the State Water Project, including the main line of the California Aqueduct. Portions of the SWP were developed to be used in conjunction with the United States Bureau of Reclamation (Reclamation), Central Valley Project (CVP). As the state and federal projects developed, a group of San Joaquin Valley water users planned the Cross Valley Canal as a means of taking delivery of CVP water supplies available in the Delta. The Cross Valley Canal was completed in 1975 and, in 1976, the water users, which included Kern-Tulare and Rag Gulch, entered into three-party contracts with DWR and Reclamation. Under these contracts, CVP water which is made available by Reclamation in the Delta is diverted from the Delta by the SWP's Harvey O. Banks Pumping Plant; however, it is subordinate to pumping by DWR for SWP purposes. The water is then conveyed by DWR in the California Aqueduct to Tupman, where it is diverted into the Cross Valley Canal, and delivered directly to Kern-Tulare and Rag Gulch or exchanged with Arvin-Edison Water Storage District for water available in the Friant-Kern Canal.

4.2.6 State Water Project

The California Aqueduct is the principal conveyance feature of the State Water Project. In contrast to the Friant-Kern Canal, which is located on the east side of the San Joaquin Valley, the California Aqueduct conveys imported water (in this case, SWP water) into the Region along the west side of the San Joaquin Valley. The Kern County Water Agency (KCWA) was formed in the 1960s to contract with the California Department of Water Resources (DWR) for the importation of SWP water to Kern County. Individual water districts within the County then contracted with KCWA for an imported water supply, which included both Cawelo and Semitropic. These contracts provided for two types of water; relatively *firm* water (referred to as *Table A water*), and *surplus* water (referred to as *Article 21 water*).

While Semitropic has turnouts directly from the Aqueduct into its area, SWP water is conveyed to Cawelo through the Cross Valley Canal.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Historical Deliveries of CVP-Friant Water to the Poso Creek RMA
Poso Creek Regional Management Group		June 2007 Figure 4-6

Table A Water - *Table A* is an exhibit to the contract between the DWR and the SWP contractors that serves as the basis for allocating available water supply among the contractors of the SWP. Table 4-2 shows the maximum annual *Table A* amounts for the entire SWP service area, the San Joaquin Valley, and for the Kern County Water Agency.

Table 4-2
Maximum Annual SWP *Table A* Amounts
(Source: The SWP Delivery Reliability Report 2005)
(Units: acre-feet)

	SWP Service Area	San Joaquin Valley	Kern County Water Agency
	4,172,786	1,170,000	998,730

Collectively, Semitropic and Cawelo have contracted for almost 20 percent of the total KCWA *Table A* amount, as shown below:

Cawelo	38,200 af
Semitropic	155,000
Total	193,200 af

Deliveries of SWP water to Cawelo and Semitropic commenced in the 1970s; however, owing to the incomplete status of the SWP and regulatory restrictions on pumping from the Delta, the SWP is unable to deliver full (100%) *Table A* amounts in most years. Accordingly, a percent allocation is set each year which is applied to each contractor's *Table A* amount, where the percent allocation is a function of many factors, including hydrologic conditions, reservoir storage, and projected runoff (based on snow surveys). Table 4-3 shows the historical deliveries of *Table A* water to KCWA, from 1981 through 2005.

Table 4-3

Historical Deliveries of *Table A Water* to the Kern County Water Agency

(Source: The SWP Delivery Reliability Report 2002 and 2005 DWR, 2003 and 2006)

(Units: acre-feet)

Year	Amount
1981	1,340,581
1982	895,193
1983	595,112
1984	1,099,391
1985	1,083,749
1986	927,545
1987	1,021,953
1988	1,009,520
1989	1,146,062
1990	712,448
1991	33,122
1992	483,220
1993	1,167,930
1994	657,159
1995	1,151,529
1996	1,185,063
1997	1,102,807
1998	858,590
1999	1,178,150
2000	1,151,159
2001	484,991
2002	729,058
2003	900,387
2004	771,685
2005	898,857

While the reliability of this source of supply is far less than anticipated when contracts were executed, a contract amendment was made as a result of the *Monterey Agreement* in 1994, which put agricultural and urban contractors on equal footing respecting the allocation of water supply shortages. Prior to the amendment, agricultural contractors were burdened with a larger share of any shortages.

Article 21 Water - Unlike *Table A water*, *Article 21 water* cannot be scheduled; rather, it must be taken at the time it is declared to be available. It is analogous to *Section 215 water* for the CVP-Friant contractors (which was discussed previously in Section 4.2.4). The following conditions govern the availability of *Article 21 water*:

(1) It is available only when it does not interfere with Table A allocations and SWP operations;

(2) It is available only when excess water is available in the Delta;

(3) It is available only when conveyance capacity is not being used for SWP purposes or scheduled SWP deliveries; and

(4) It cannot be stored within the SWP system. In other words, the contractors must be able to use the Article 21 water directly or store it in their own system.

As a result of these conditions, *Article 21 water* is made available during the *wet* months of the year, typically December through March. Table 4-4 summarizes the historical deliveries of *Article 21 water* to the Kern County Water Agency from 1981-2005.

Table 4-4
Historical Deliveries of *Article 21 Water* to
Kern County Water Agency
(Source: The SWP Delivery Reliability Report 2002 and 2005
DWR, 2003 and 2006)
(Units: acre-feet)

Year	Amount
1981	649,181
1982	149,336
1983	605
1984	238,791
1985	191,957
1986	20,002
1987	0
1988	0
1989	0
1990	0
1991	0
1992	0
1993	0
1994	58,474
1995	59,671
1996	15,653
1997	10,264
1998	0
1999	58,241
2000	78,908
2001	23,233
2002	21,951
2003	27,891
2004	86,513
2005	471,847

If there is more demand for *Article 21 water* than the amount declared to be available, it is apportioned to those contractors requesting it in the same proportion as their *Table A* amounts.

Water Quality - The salinity of the SWP water is generally in the range of 200 to 400 milligrams per liter of total dissolved solids. This is higher than the Kern River and the CVP-Friant water, but is still satisfactory for both municipal and irrigation purposes.

4.2.7 Summary of Surface Water Supplies to the Region

Over the last 25 years, the total of all surface water supplies entering the Poso Creek RMA has averaged about 775,000 acre-feet per year; however, after considering water that was banked for parties outside of the region, and not yet returned, this average is reduced to about 740,000 acre-feet. As shown on Figure 4-7, annual amounts have ranged from less than 400,000 acre-feet to over 1,000,000 acre-feet (which include water banked for out-of-region interests).

4.2.8 Groundwater

The present utilization of water supplies in the southern San Joaquin Valley is predominantly for irrigated agriculture, which is also true for the Poso Creek RMA. Most of the lands in the Poso Creek RMA are underlain by useable groundwater and, as a result, most of the irrigated agriculture was developed in reliance on pumped groundwater and some lands continue to rely exclusively on pumped groundwater. Accordingly, to the extent that surface water supplies are inadequate to meet irrigation water requirements, groundwater is used to make up the shortfall.

Water Levels - Under water supply conditions over the last 25 years, water levels have not evidenced an obvious long-term rise or decline; rather, they have gone up during *wet* periods and down during *dry* periods. This is illustrated on Figure 4-8, which presents average water levels for each of the districts within the RMA as well as the cumulative average annual change in regional water levels. While the depth range varies for each district, the trends are comparable. Figure 4-9 superimposes the Region's surface water supplies on the average water levels for the Region.

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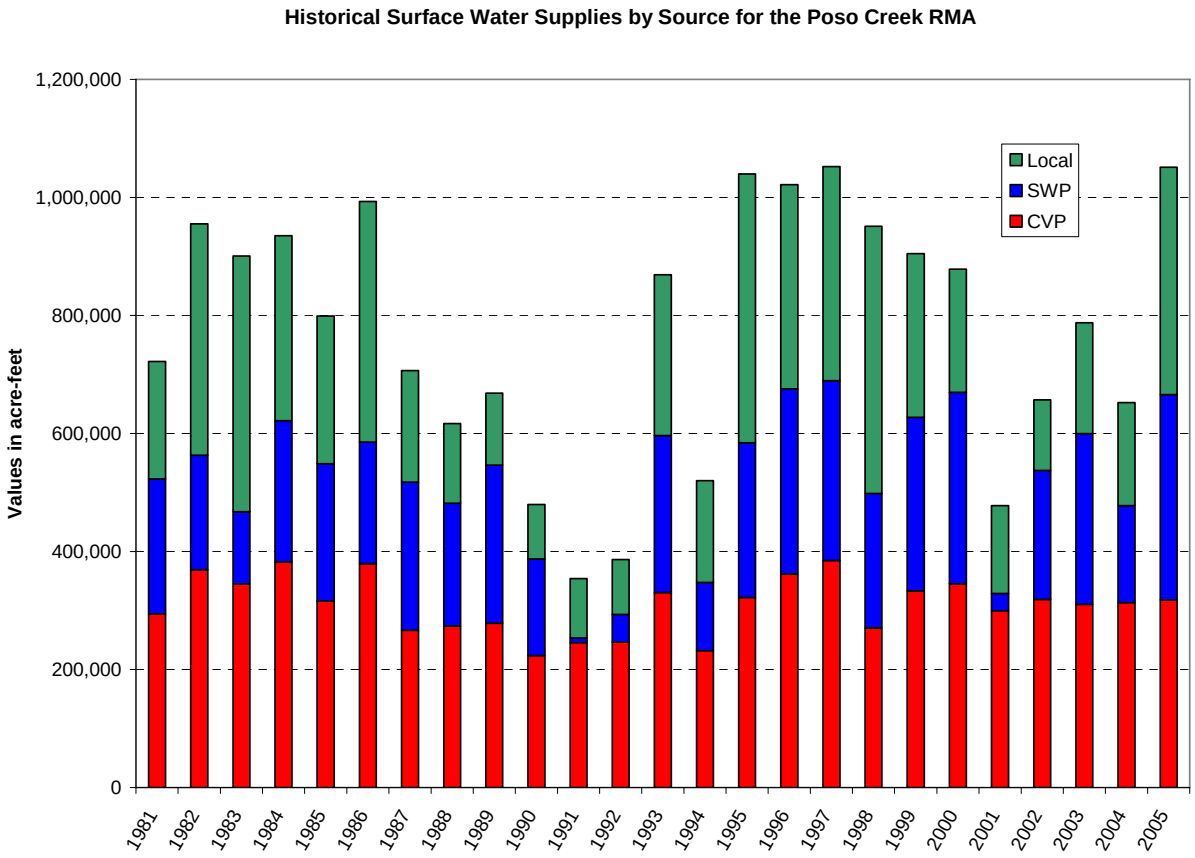
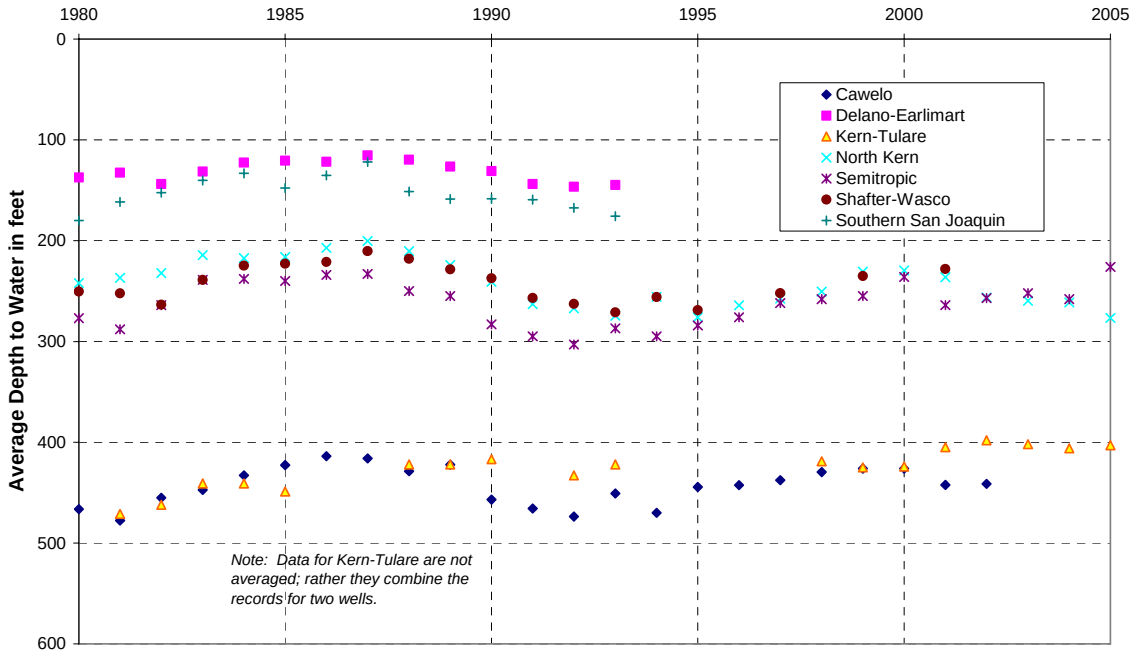
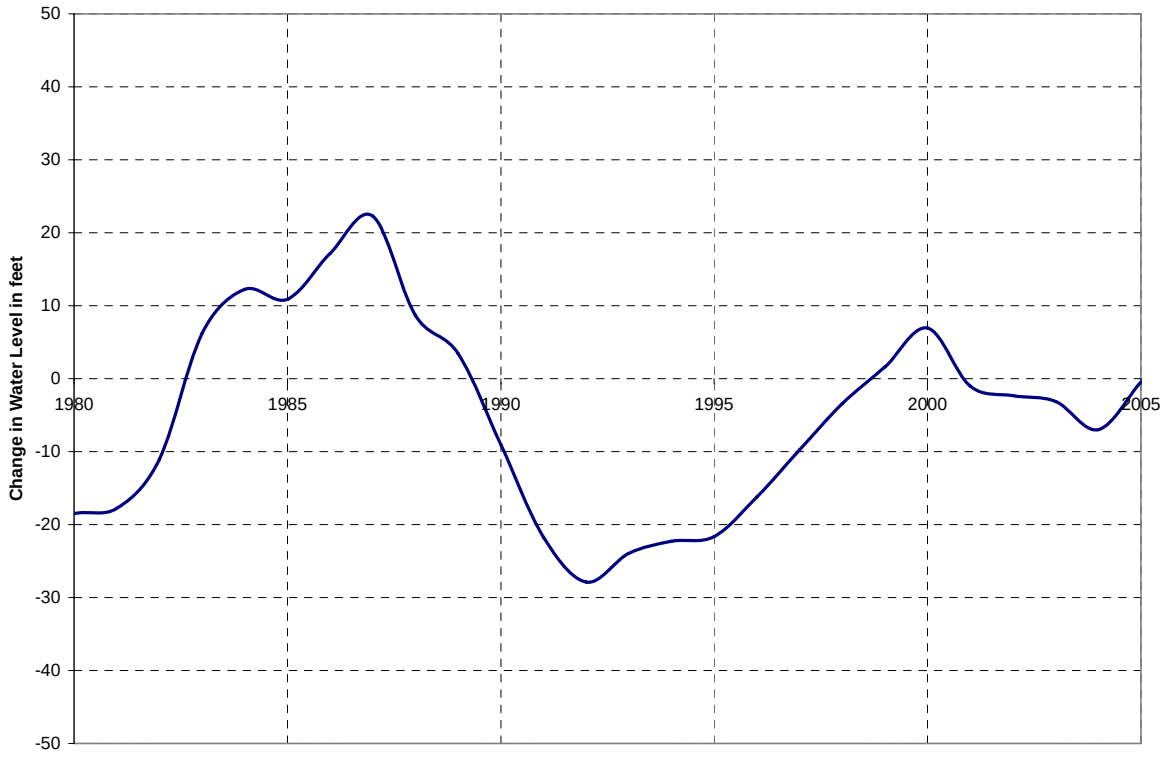


Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Historical Surface Water Supplies by Source for the Poso Creek RMA	
Poso Creek Regional Management Group		June 2007	Figure 4-7

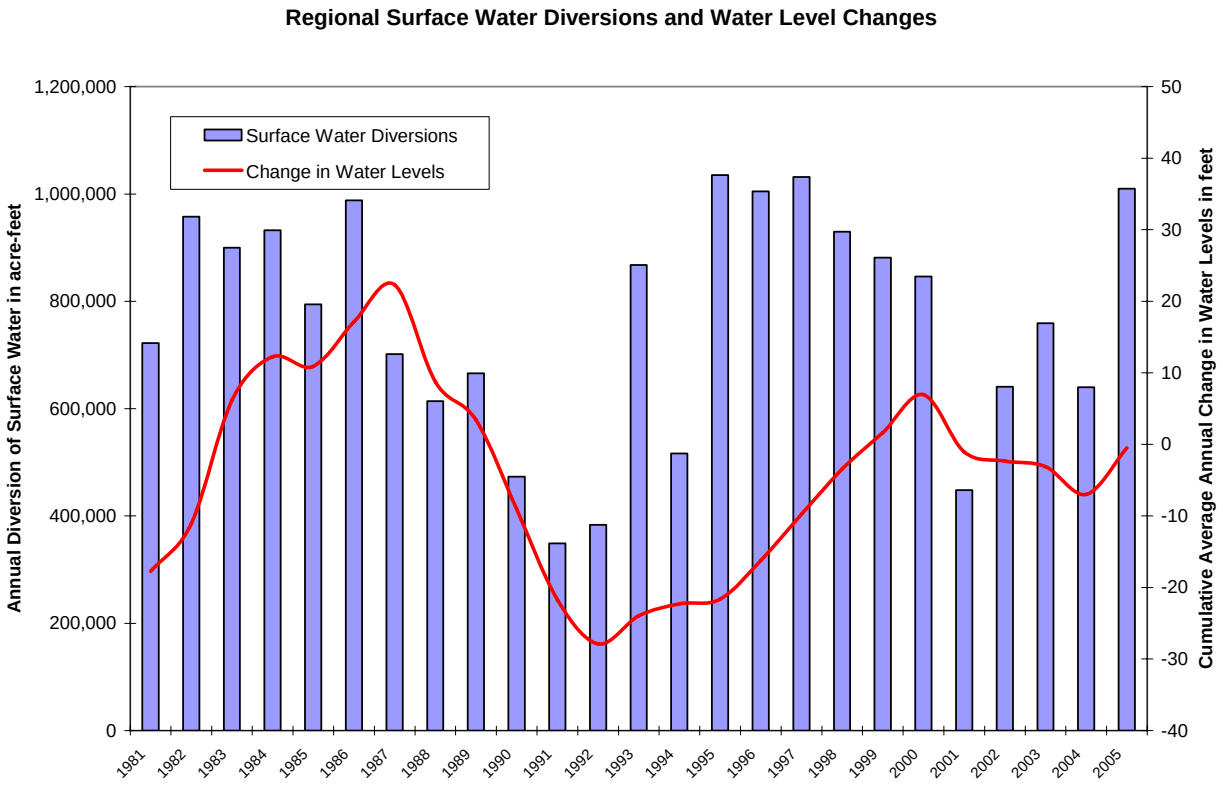
Average Depth to Water



Cumulative Average Annual Change in Regional Water Levels



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Average Depth to Water and Cumulative Average Annual Change in Regional Water Levels
Poso Creek Regional Management Group		June 2007 Figure 4-8



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Regional Surface Water Diversions and Water Level Changes	
Poso Creek Regional Management Group		June 2007	Figure 4-9

4.3 Projected Conditions

For the purpose of projecting future water supply conditions, the 73-year hydrologic period extending from 1922 through 1994 was used unless noted otherwise. This was the longest period for which the necessary data were available for each of the Region's three principal sources of surface water. While averages for this period are not directly comparable to the historical averages for the 25-year period extending from 1981 through 2005 (presented in Section 4.2 above), the comparison is considered adequate for the purpose of characterizing the direction and magnitude of projected changes in surface water supplies going forward. This, in turn, will provide guidance respecting the groundwater-level response that could be expected in the future.

4.3.1 Kern River

Kern River supplies available to the Poso Creek RMA can be expected to be less reliable in the future, as a result of 1) expiration of long-term agricultural water supply contracts in 2011, 2) ongoing water rights litigation, and 3) a storage restriction placed on Isabella Reservoir.

Agricultural Water Supply Contracts - In the mid 1970s, the City of Bakersfield entered into long-term water supply contracts which provided for the delivery of 70,000 acre-feet per year (average over the 35-year life of the contracts) into the Poso Creek RMA, with individual district contracts as summarized following:

Cawelo	27,000 af
Kern-Tulare	20,000
North Kern	20,000
Rag Gulch	3,000
Total for RMA	70,000 af

These contracts expire at the end of 2011 and the City of Bakersfield has advised that "the districts should be well into the planning and coordination of a replacement supply for any of the City Kern River water that may be needed by City for its use"[4]. Clearly, the worst case would be the loss of this source of supply in its entirety. However, it is likely that there will be years when the City will be unable to regulate the available supply and would make water available to these same districts for purchase. While it would also seem likely that the City's need for this water would increase over time, which would suggest that this source of supply to the RMA would evidence a corresponding decrease over time, this remains speculative. Qualitatively, and in summary, less water will be available in total, the cost of water will

[4] City of Bakersfield letter dated August 17, 2006.

increase, and it will not be firm. For purposes of this regional planning effort, it was assumed that water would only be available during wetter years and that, on average over the long term, there would be a 50 percent reduction in this source of supply

Ongoing Litigation - Water rights litigation is ongoing and, while it remains speculative, it has the potential to result in less water being diverted into the Poso Creek RMA in the future than under historical conditions. In other words, the best case is probably maintenance of the status quo.

Storage Restriction - The maximum capacity of Isabella Reservoir is almost 570,000 acre-feet; however, in the spring of 2006, the United States Army Corps of Engineers (USACE), who is responsible for operation and maintenance, imposed a storage restriction of 350,000 acre-feet as a result of safety concerns. While the duration of the restriction is unknown at this time, it could be in place for many years. In drier years, this restriction will have little effect: however, in wetter years, full regulation of the available supply may be difficult, which could result in the loss of supply to the Poso Creek RMA. At a minimum, it would likely shift some water from being delivered directly to irrigation to being delivered to spreading. This would have the effect of shifting some of the regulation from Isabella Reservoir to the groundwater reservoir.

4.3.2 Minor Streams

Poso Creek, the namesake for this regional planning effort, is entirely controlled by members of the Regional Management Group. In particular, recall that Cawelo, North Kern, and Semitropic are all parties to an agreement respecting the use of the natural flow of Poso Creek. Accordingly, no changes are expected in this source of supply in the future, other than hydrologic changes, which are be predicted in this report.

4.3.3 Oilfield-Produced Water

Fundamentally, this source of supply is a function of oil production in the Kern River field. North Kern has reduced its use of this supply and Cawelo has increased its use, both of which can be seen in the record of historical deliveries (reference Section 4.2.3).

North Kern - While North Kern used from 5,000 to 10,000 acre-feet annually between 1980 and the mid 1990s, their use has dropped to less than 1,000 acre-feet on average over the last few years. This recent level of use is considered to be representative of future conditions.

Cawelo - While Cawelo has received water from this source of supply since 1980, the level of use since the mid-1990s is considered to be representative of future conditions. In particular, it is projected that Cawelo will receive about 20,000 acre-feet annually. It is noteworthy that this supply is relatively *firm* inasmuch as it is a function of oil production and not of hydrology. The agreement between Cawelo and the operator of the Kern River

oilfield, under which deliveries are made to Cawelo, extends to 2026. This agreement provides that all oilfield-produced water be made available to Cawelo, except that which is used in the oilfield operations.

4.3.4 Recycled Water

The amount of water which is recycled from operations of the Kern National Wildlife Refuge is not expected to change in the future; it is expected to continue to range from 500 to 2,000 acre-feet annually. On the other hand, the amount of M&I wastewater effluent is expected to increase in the future as the population of the Region increases; accordingly, the amount of effluent which is recycled is expected to increase.

4.3.5 Central Valley Project – Friant Division

The reliability of CVP-Friant water is on the threshold of being significantly impacted. Litigation has surrounded this source of supply for many years, with the primary issue being the partial restoration of San Joaquin River flows below Friant Dam. In 2006, a settlement was reached, whereby some of the flows that historically would have been diverted to CVP-Friant contractors, will (in the future) be discharged to the river channel below Friant Dam. The effect of this settlement will be to significantly reduce the reliability of this source of supply, with the magnitude varying from year to year, depending on hydrology. During the development of the settlement, hydrologic modeling was conducted to develop and evaluate the terms of the settlement. This modeling of post-settlement operations was used as the basis for projections of future CVP-Friant supplies according to the three types of water: *Class 1*, *Class 2*, and *Other*.

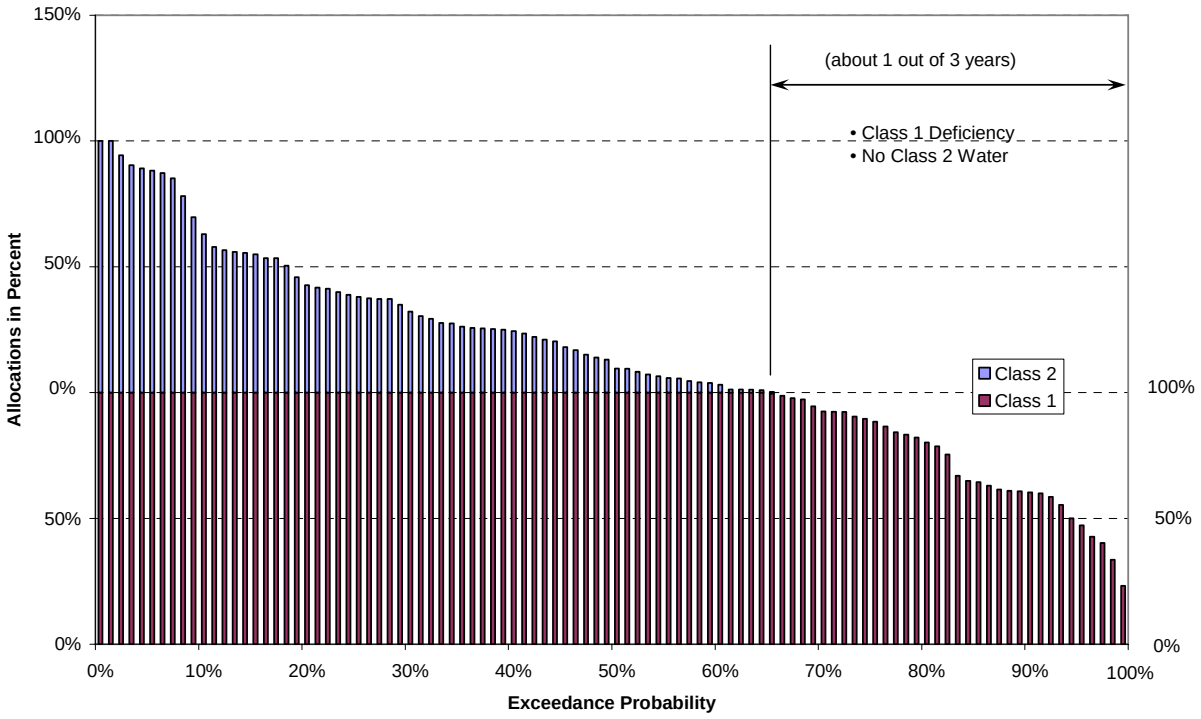
Class 1 and Class 2 Water - Projected annual allocations of *Class 1* and *Class 2* water were obtained, and these data are presented in Table 4-5. To determine the projected availability of this source of supply to the Region, the *Class 1* and *Class 2* percent allocations (as shown in the table) are simply applied to the Class 1 and Class 2 contract amounts, respectively, for the CVP-Friant contractors in the Region; namely, Delano-Earlimart, Shafter-Wasco, and Southern San Joaquin. This results in a projected long-term average availability of 265,000 acre-feet per year. The percent allocations are presented on Figure 4-10, in terms of exceedance probability. This figure illustrates the exceedance probability of a given allocation. For example, based on this figure, it can be observed that a full Class 1 allocation can be expected in about 65 percent of the years (or between 6 and 7 years out of 10). The reduction in reliability of these supplies under the recent San Joaquin River settlement is illustrated on Figure 4-11.

Table 4-5

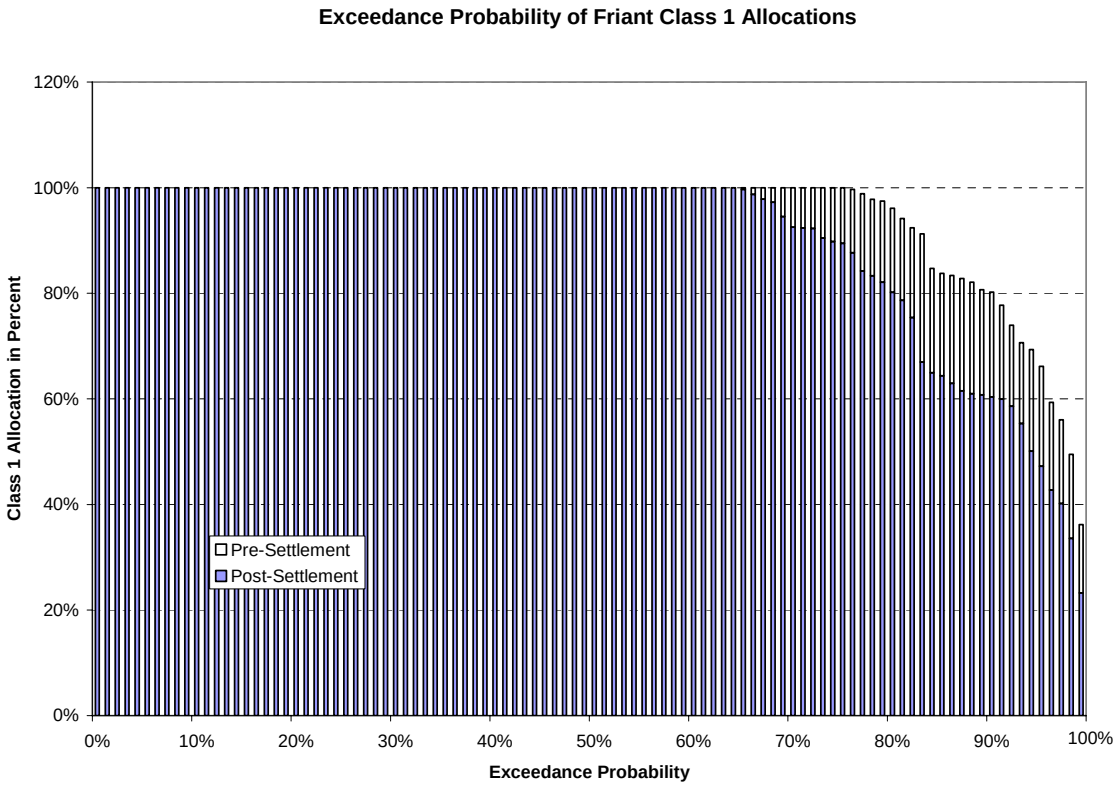
Projected Friant Class 1 and Class 2 Allocations
Under Post-Settlement Conditions

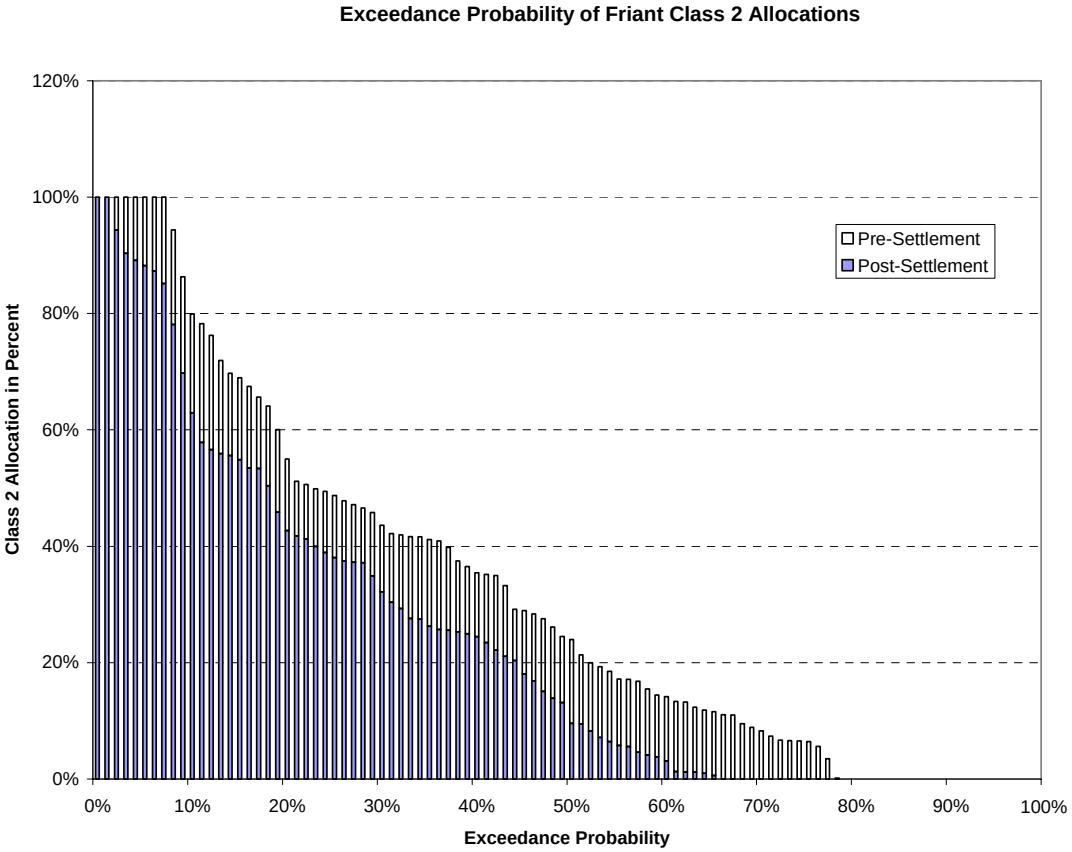
Water Year	Friant-Kern Class 1 Allocation	Friant-Kern Class 2 Allocation
1922	100%	56%
1923	100%	21%
1924	39%	0%
1925	100%	6%
1926	98%	0%
1927	100%	34%
1928	100%	8%
1929	62%	0%
1930	60%	0%
1931	23%	0%
1932	100%	37%
1933	99%	0%
1934	50%	0%
1935	100%	25%
1936	100%	26%
1937	100%	42%
1938	100%	87%
1939	78%	0%
1940	100%	23%
1941	100%	56%
1942	100%	43%
1943	100%	28%
1944	100%	9%
1945	100%	41%
1946	100%	18%
1947	100%	1%
1948	79%	0%
1949	92%	0%
1950	100%	4%
1951	100%	4%
1952	100%	64%
1953	100%	1%
1954	100%	1%
1955	97%	0%
1956	100%	49%
1957	100%	16%
1958	100%	56%
1959	93%	0%
1960	57%	0%
1961	41%	0%
1962	100%	30%
1963	100%	39%
1964	92%	0%
1965	100%	38%
1966	100%	6%
1967	100%	88%
1968	82%	0%
1969	100%	91%
1970	100%	14%
1971	100%	10%
1972	89%	0%
1973	100%	27%
1974	100%	37%
1975	100%	31%
1976	64%	0%
1977	23%	0%
1978	100%	84%
1979	100%	24%
1980	100%	58%
1981	100%	7%
1982	100%	73%
1983	100%	100%
1984	100%	26%
1985	100%	1%
1986	100%	53%
1987	65%	0%
1988	61%	0%
1989	61%	0%
1990	47%	0%
1991	67%	0%
1992	60%	0%
1993	100%	53%
1994	83%	0%
Average: (1922-1994)	91%	20%

Exceedance Probability of Friant Class 1 and Class 2 Allocations Under Post-Settlement Conditions



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Exceedance Probability of Friant Class 1 and Class 2 Allocations Under Post-Settlement Conditions	
Poso Creek Regional Management Group		June 2007	Figure 4-10



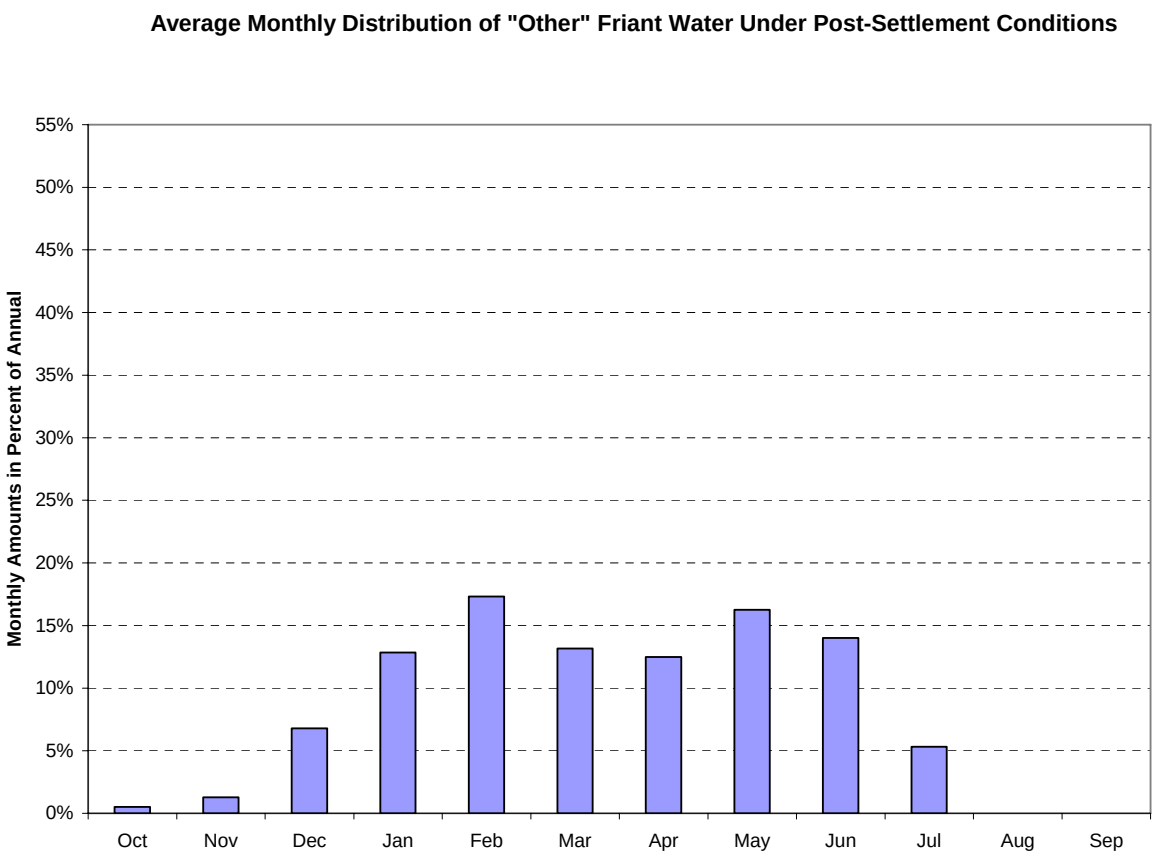


Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Exceedance Probability of Friant Class 1 and Class 2 Allocations
Poso Creek Regional Management Group		June 2007 Figure 4-11

Table 4-6
Projected System-Wide Availability of "Other" Friant Water Under Post- Settlement Conditions

(values in acre-feet)

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Calendar Year
1922	36,000	92,000	86,000	77,000	86,000	5,000	0	0	0	0	0	0	382,000	**1922**
1923	0	0	0	0	0	0	0	0	0	0	0	0	0	**1923**
1924	0	0	0	0	0	0	0	0	0	0	0	0	0	**1924**
1925	0	0	0	0	0	0	0	0	0	0	0	0	0	**1925**
1926	0	0	0	0	0	0	0	0	0	0	0	0	0	**1926**
1927	0	0	0	0	0	25,000	0	0	0	0	0	0	25,000	**1927**
1928	0	0	0	0	13,000	0	0	0	0	0	0	0	13,000	**1928**
1929	0	0	0	0	0	0	0	0	0	0	0	0	0	**1929**
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	**1930**
1931	0	1,000	0	0	0	0	0	0	0	0	0	0	1,000	**1931**
1932	0	0	0	0	0	0	0	0	0	0	0	0	0	**1932**
1933	0	0	0	0	0	0	0	0	0	0	0	0	0	**1933**
1934	0	0	0	0	0	0	0	0	0	0	0	0	0	**1934**
1935	0	0	0	0	0	0	0	0	0	0	0	0	0	**1935**
1936	0	43,000	4,000	3,000	60,000	13,000	0	0	0	0	0	0	123,000	**1936**
1937	0	106,000	101,000	115,000	99,000	30,000	0	0	0	0	0	0	451,000	**1937**
1938	20,000	190,000	237,000	218,000	317,000	237,000	109,000	0	0	0	0	0	1,328,000	**1938**
1939	0	0	0	0	0	0	0	0	0	0	0	0	0	**1939**
1940	0	0	0	0	3,000	45,000	0	0	0	0	0	0	48,000	**1940**
1941	0	106,000	16,000	77,000	63,000	0	0	0	0	0	0	0	262,000	**1941**
1942	66,000	60,000	0	0	84,000	20,000	0	0	0	0	0	0	230,000	**1942**
1943	124,000	87,000	91,000	16,000	61,000	7,000	0	0	0	0	0	0	386,000	**1943**
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	**1944**
1945	0	109,000	0	0	0	0	0	0	0	0	0	61,000	170,000	**1945**
1946	80,000	10,000	0	0	30,000	0	0	0	0	0	0	0	120,000	**1946**
1947	0	18,000	0	0	0	0	0	0	0	0	0	0	18,000	**1947**
1948	0	0	0	0	0	0	0	0	0	0	0	0	0	**1948**
1949	0	0	0	0	0	0	0	0	0	0	0	0	0	**1949**
1950	0	0	0	0	0	0	0	0	0	0	0	267,000	267,000	**1950**
1951	136,000	93,000	0	0	0	0	0	0	0	0	0	0	229,000	**1951**
1952	0	39,000	119,000	98,000	89,000	130,000	16,000	0	0	0	0	0	491,000	**1952**
1953	0	0	0	0	0	0	0	0	0	0	0	0	0	**1953**
1954	0	0	0	0	0	0	0	0	0	0	0	0	0	**1954**
1955	0	0	0	0	0	0	0	0	0	0	0	132,000	132,000	**1955**
1956	257,000	95,000	30,000	0	0	0	0	0	0	0	0	0	382,000	**1956**
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	**1957**
1958	0	0	6,000	104,000	76,000	55,000	0	0	0	0	0	0	241,000	**1958**
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	**1959**
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	**1960**
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	**1961**
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	**1962**
1963	0	59,000	0	0	0	0	0	0	0	0	0	0	59,000	**1963**
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	**1964**
1965	92,000	101,000	0	0	0	0	0	0	0	0	0	0	193,000	**1965**
1966	50,000	9,000	0	11,000	58,000	0	0	0	0	0	0	10,000	138,000	**1966**
1967	77,000	79,000	90,000	97,000	15,000	269,000	0	0	0	0	0	0	627,000	**1967**
1968	0	0	0	0	0	0	0	0	0	0	0	117,000	117,000	**1968**
1969	184,000	223,000	246,000	317,000	320,000	134,000	0	0	0	0	0	0	1,424,000	**1969**
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	**1970**
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	**1971**
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	**1972**
1973	0	0	1,000	0	7,000	102,000	0	0	0	0	0	0	110,000	**1973**
1974	129,000	35,000	34,000	72,000	65,000	27,000	0	0	0	0	0	0	362,000	**1974**
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	**1975**
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	**1976**
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	**1977**
1978	0	129,000	108,000	93,000	168,000	113,000	130,000	0	0	0	0	0	741,000	**1978**
1979	35,000	0	26,000	0	40,000	46,000	0	0	0	0	0	0	147,000	**1979**
1980	178,000	204,000	38,000	0	95,000	91,000	109,000	0	0	0	0	0	715,000	**1980**
1981	26,000	12,000	0	0	0	0	0	0	0	0	0	0	38,000	**1981**
1982	0	96,000	90,000	128,000	184,000	158,000	22,000	0	0	74,000	125,000	192,000	1,069,000	**1982**
1983	218,000	205,000	349,000	185,000	239,000	409,000	371,000	0	0	0	57,000	184,000	2,217,000	**1983**
1984	118,000	4,000	14,000	0	0	0	0	0	0	0	0	0	136,000	**1984**
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	**1985**
1986	0	239,000	185,000	85,000	74,000	76,000	0	0	0	0	0	0	659,000	**1986**
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	**1987**
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	**1988**
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	**1989**
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	**1990**
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	**1991**
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	**1992**
1993	0	16,000	0	79,000	63,000	0	0	0	0	0	0	0	158,000	**1993**
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	**1994**
Average:														
(1922-1994)	25,000	33,700	25,600	24,300	31,600	27,300	10,400	0	0	1,000	2,500	13,200	194,600	



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Average Monthly Distribution of "Other" Friant Water Under Post-Settlement Conditions
Poso Creek Regional Management Group		June 2007 Figure 4-12

Other Water - Data respecting the projected monthly availability of *Other* Friant water were obtained, and they are presented in Table 4-6 and the average monthly availability pattern is illustrated in Figure 4-12. These data reflect the system-wide availability of this type of water at Friant Dam. To determine the minimum amount of this type of water available to the Region, it was assumed that a given contractor's minimum "share" could be approximated as the contractor's Class 2 contract amount divided by the total of the Class 2 amounts for all contractors (i.e., 1,400,000 af). Accordingly, these factors are summarized as follows:

Delano-Earlimart	5.3%
Shafter-Wasco	2.8%
Southern San Joaquin	3.6%
Total for RMA	11.7%

Applying 11.7 percent to the average annual system-wide availability of about 195,000 acre-feet, results in about 23,000 acre-feet.

4.3.6 Central Valley Project – Delta Division

The reliability of delivery of CVP-Delta supplies has already been severely impacted. The significant reduction in reliability of this source of supply is a result of regulatory restrictions on pumping from the Delta, particularly since 1991. Wheeling CVP-Delta water in the California Aqueduct is second in priority to SWP purposes. Accordingly, any time there is a regulatory constraint on pumping from the Delta for SWP purposes, there is no pumping capacity to move CVP-Delta water into the Aqueduct for wheeling. Prior to 1991, the long-term average annual CVP-Delta allocation was about 95 percent, indicating a very *firm* supply. Since that time however, the long-term average allocation has been reduced to less than 60 percent. This significant loss of water supply reliability is particularly apparent when considering a repeat of the 1987-1992 drought period. While allocations during this six-year drought ranged from a little less than 50 percent to about 65 percent, it is projected that allocations during a repeat of this hydrology would range from zero (in two of the six years) to about 32 percent.

4.3.7 State Water Project

The fact that the State Water Project remains incomplete has adversely impacted the reliability of this source of supply. In addition, environmental and water quality issues in and surrounding the Sacramento-San Joaquin River Delta (Delta) have limited the ability to export water south of the Delta, which has further reduced the reliability of SWP water supplies available to the Region. The last *Delivery Reliability Report* for the State Water Project was published by DWR in April 2006; accordingly, these data were used as the basis

for projecting the future availability of this source of supply[5]. Two studies were presented in that report, which are referred to as *Study 4* and *Study 5*, and reflect 2005 and 2025 level of SWP demand, respectively. Data are included for both *Table A water* and *Article 21 water*. Under 2025 conditions, deliveries of *Table A water* are shown to increase relative to 2005; however, there is a corresponding decrease in the availability of *Article 21 water*. Deliveries of *Table A water* are shown to reach a minimum of four to five percent in Studies 4 and 5, whereas projections which were made three years earlier showed the minimum delivery at about 19 to 20 percent. The 2006 report suggests that this significant reduction in reliability is primarily attributable to a change in the *delivery-carryover storage rule*.

Table A Water - The projected allocation of *Table A water* for each year is presented in Table 4-7, for the 1922-1994 hydrologic period. To determine the projected availability of this source of supply to the Region, these allocations, expressed as a percentage, are applied to the maximum *Table A* amount for each of the SWP contractors in the Region; namely, Cawelo and Semitropic. This results in a long-term average of about 131,000 acre-feet under *Study 4*, or almost 147,000 acre-feet under *Study 5*

Article 21 Water - The projected monthly availability of *Article 21 water* is presented in Tables 4-8 and 4-9, for the 1922-1994 hydrologic period. Figures 4-13 and 4-14 show the annual and monthly distribution of these supplies, respectively. These data reflect the system-wide availability of this type of water at the Delta. To determine the minimum amount of this type of water available to the Region, it was assumed that a given contractor's minimum "share" could be approximated by the contractor's maximum *Table A* amount divided by the total of the *Table A* amounts for all contractors. Accordingly, these factors are summarized as follows for the Poso Creek RMA:

Cawelo	0.92%
Semitropic	3.75
Total for RMA	4.67%

Applying 4.67 percent to the average annual system-wide availability of about 262,000 acre-feet, results in about 12,000 acre-feet (under Study 4).

[5] It is understood that an updated report may be available in the fall of 2007.

Table 4-7

Projected SWP Table A Allocations
Under CalSim II "Study 4" and "Study 5"

Calendar Year	Delivery as a Percentage of Max. Table A (Study 4)	Delivery as a Percentage of Max. Table A (Study 5)
1922	91%	100%
1923	79%	100%
1924	30%	9%
1925	45%	36%
1926	72%	66%
1927	93%	100%
1928	82%	82%
1929	27%	27%
1930	69%	66%
1931	25%	26%
1932	34%	38%
1933	32%	32%
1934	37%	36%
1935	91%	98%
1936	86%	90%
1937	81%	82%
1938	81%	100%
1939	79%	83%
1940	78%	100%
1941	61%	95%
1942	77%	100%
1943	75%	92%
1944	75%	86%
1945	75%	94%
1946	78%	93%
1947	80%	67%
1948	71%	71%
1949	55%	49%
1950	77%	82%
1951	85%	100%
1952	63%	95%
1953	80%	100%
1954	80%	100%
1955	53%	36%
1956	87%	100%
1957	78%	86%
1958	72%	100%
1959	84%	92%
1960	45%	39%
1961	64%	66%
1962	79%	80%
1963	92%	100%
1964	80%	70%
1965	74%	84%
1966	79%	100%
1967	71%	100%
1968	81%	92%
1969	64%	95%
1970	79%	100%
1971	81%	100%
1972	81%	66%
1973	75%	98%
1974	77%	100%
1975	78%	100%
1976	79%	76%
1977	4%	5%
1978	87%	94%
1979	85%	91%
1980	66%	85%
1981	81%	92%
1982	70%	100%
1983	60%	95%
1984	67%	100%
1985	78%	83%
1986	56%	69%
1987	70%	80%
1988	21%	10%
1989	77%	85%
1990	27%	21%
1991	25%	21%
1992	34%	35%
1993	93%	100%
1994	80%	76%
Average: (1922-199	68%	76%

Table 4-8
Projected System-Wide Availability of SWP "Article 21" Water Under CalSim II - "Study 4"

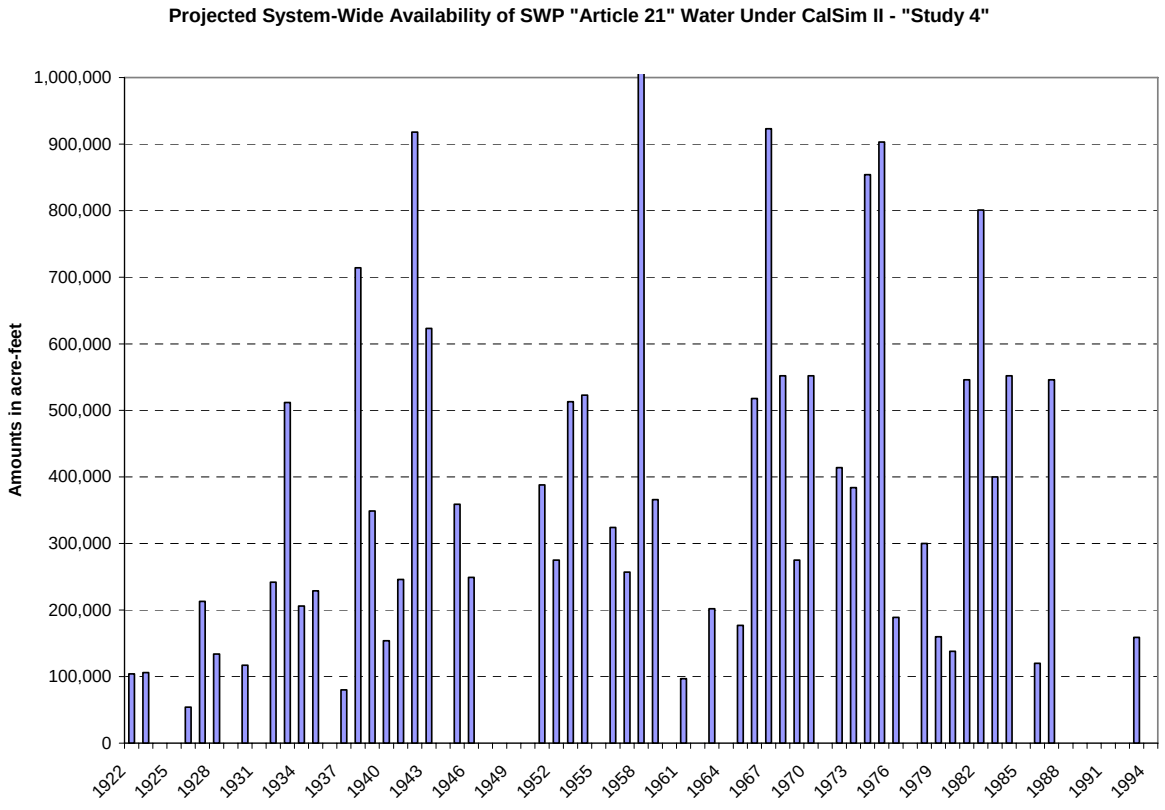
(values in acre-feet)

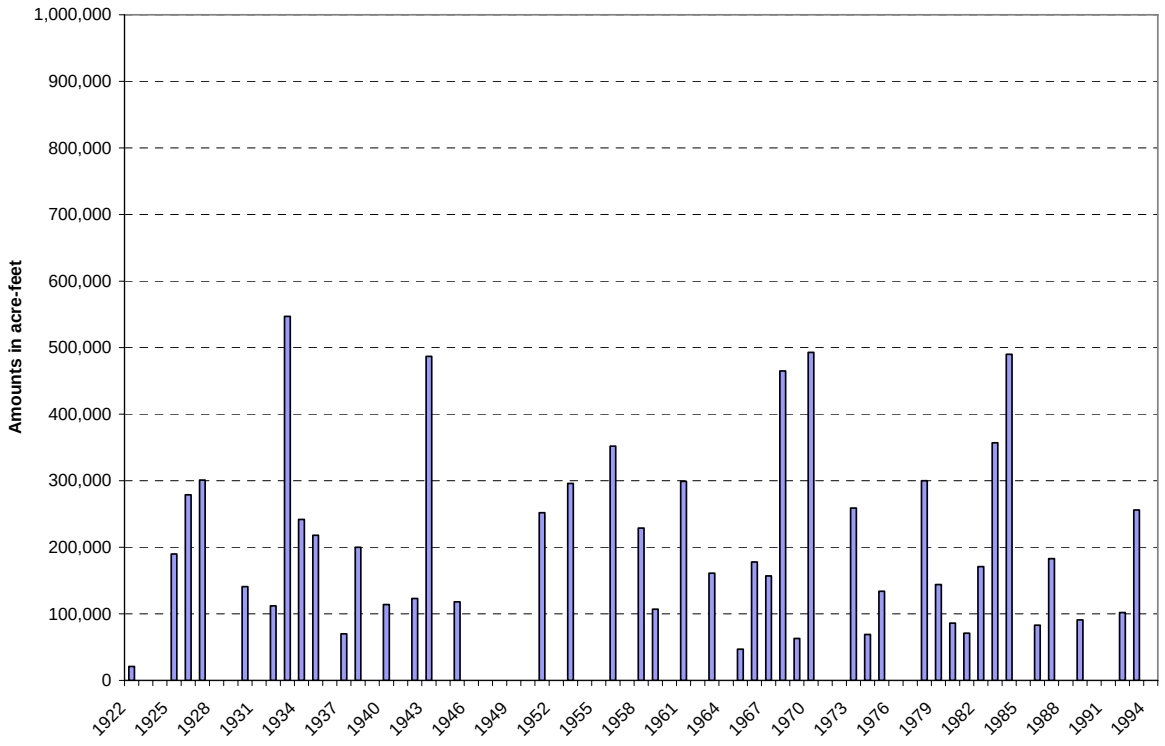
Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Calendar Year
1922	0	0	87,900	16,000	0	0	0	0	0	0	0	0	103,900	**1922**
1923	52,900	53,400	0	0	0	0	0	0	0	0	0	0	106,300	**1923**
1924	0	0	0	0	0	0	0	0	0	0	0	0	0	**1924**
1925	0	0	0	0	0	0	0	0	0	0	0	0	0	**1925**
1926	0	54,300	0	0	0	0	0	0	0	0	0	0	54,300	**1926**
1927	0	52,800	160,500	0	0	0	0	0	0	0	0	0	213,300	**1927**
1928	0	0	118,300	15,500	0	0	0	0	0	0	0	0	133,800	**1928**
1929	0	0	0	0	0	0	0	0	0	0	0	0	0	**1929**
1930	0	0	116,800	0	0	0	0	0	0	0	0	0	116,800	**1930**
1931	0	0	0	0	0	0	0	0	0	0	0	0	0	**1931**
1932	0	97,800	144,600	0	0	0	0	0	0	0	0	0	242,400	**1932**
1933	179,300	148,800	184,000	0	0	0	0	0	0	0	0	0	512,100	**1933**
1934	21,700	184,000	0	0	0	0	0	0	0	0	0	0	205,700	**1934**
1935	0	0	184,000	45,100	0	0	0	0	0	0	0	0	229,100	**1935**
1936	0	0	0	0	0	0	0	0	0	0	0	0	0	**1936**
1937	0	0	18,800	59,900	800	0	0	0	0	0	0	0	79,500	**1937**
1938	0	141,500	184,000	80,600	67,400	0	0	0	0	41,900	17,900	180,300	713,600	**1938**
1939	184,000	90,400	75,000	0	0	0	0	0	0	0	0	0	349,400	**1939**
1940	0	0	129,700	24,600	0	0	0	0	0	0	0	0	154,300	**1940**
1941	0	45,700	100,000	0	0	0	0	0	0	0	0	100,000	245,700	**1941**
1942	184,000	184,000	184,000	51,900	0	0	0	0	0	58,300	78,000	178,000	918,200	**1942**
1943	184,000	184,000	184,000	71,100	0	0	0	0	0	0	0	0	623,100	**1943**
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	**1944**
1945	0	175,000	184,000	0	0	0	0	0	0	0	0	0	359,000	**1945**
1946	176,000	0	72,700	0	0	0	0	0	0	0	0	0	248,700	**1946**
1947	0	0	0	0	0	0	0	0	0	0	0	0	0	**1947**
1948	0	0	0	0	0	0	0	0	0	0	0	0	0	**1948**
1949	0	0	0	0	0	0	0	0	0	0	0	0	0	**1949**
1950	0	0	0	0	0	0	0	0	0	0	0	0	0	**1950**
1951	20,200	184,000	184,000	0	0	0	0	0	0	0	0	0	388,200	**1951**
1952	0	75,000	100,000	0	0	0	0	0	0	0	0	100,000	275,000	**1952**
1953	184,000	144,900	184,000	0	0	0	0	0	0	0	0	0	512,900	**1953**
1954	144,900	184,000	184,000	9,800	0	0	0	0	0	0	0	0	522,700	**1954**
1955	0	0	0	0	0	0	0	0	0	0	0	0	0	**1955**
1956	0	140,300	184,000	0	0	0	0	0	0	0	0	0	324,300	**1956**
1957	0	72,500	184,000	0	0	0	0	0	0	0	0	0	256,500	**1957**
1958	178,000	184,000	184,000	80,600	70,600	26,200	0	0	71,100	78,000	56,300	177,300	1,106,100	**1958**
1959	184,000	181,800	0	0	0	0	0	0	0	0	0	0	365,800	**1959**
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	**1960**
1961	0	0	97,000	0	0	0	0	0	0	0	0	0	97,000	**1961**
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	**1962**
1963	0	0	181,900	20,200	0	0	0	0	0	0	0	0	202,100	**1963**
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	**1964**
1965	0	11,400	104,800	60,500	0	0	0	0	0	0	0	0	176,700	**1965**
1966	149,500	184,000	184,000	0	0	0	0	0	0	0	0	0	517,500	**1966**
1967	0	127,600	184,000	80,800	78,000	28,700	0	10,000	78,000	78,000	78,000	180,300	923,400	**1967**
1968	184,000	184,000	184,000	0	0	0	0	0	0	0	0	0	552,000	**1968**
1969	0	74,600	100,000	0	0	0	0	0	0	0	0	100,000	274,600	**1969**
1970	184,000	184,000	184,000	0	0	0	0	0	0	0	0	0	552,000	**1970**
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	**1971**
1972	73,000	157,000	184,000	0	0	0	0	0	0	0	0	0	414,000	**1972**
1973	0	67,700	184,000	12,500	0	0	0	0	0	0	0	119,600	383,800	**1973**
1974	184,000	184,000	184,000	63,800	0	0	0	0	0	0	60,200	178,000	854,000	**1974**
1975	184,000	184,000	184,000	41,300	0	0	0	0	0	53,400	78,000	178,000	902,700	**1975**
1976	184,000	5,300	0	0	0	0	0	0	0	0	0	0	189,300	**1976**
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	**1977**
1978	100,000	100,000	100,000	0	0	0	0	0	0	0	0	0	300,000	**1978**
1979	0	0	160,300	0	0	0	0	0	0	0	0	0	160,300	**1979**
1980	0	38,000	100,000	0	0	0	0	0	0	0	0	0	138,000	**1980**
1981	178,000	184,000	184,000	0	0	0	0	0	0	0	0	0	546,000	**1981**
1982	0	114,800	184,000	80,700	78,000	6,800	0	0	0	78,000	78,000	180,300	800,600	**1982**
1983	100,000	100,000	100,000	0	0	0	0	0	0	0	0	100,000	400,000	**1983**
1984	184,000	184,000	184,000	0	0	0	0	0	0	0	0	0	552,000	**1984**
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	**1985**
1986	0	20,300	100,000	0	0	0	0	0	0	0	0	0	120,300	**1986**
1987	178,000	184,000	184,000	0	0	0	0	0	0	0	0	0	546,000	**1987**
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	**1988**
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	**1989**
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	**1990**
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	**1991**
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	**1992**
1993	0	0	158,500	0	0	0	0	0	0	0	0	0	158,500	**1993**
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	**1994**
Average:														
(1922-1994)	49,000	66,700	92,400	11,200	4,000	900	0	100	2,000	5,300	6,100	24,300	262,000	

Table 4-9
Projected System-Wide Availability of SWP "Article 21" Water Under CalSim II - "Study 5"

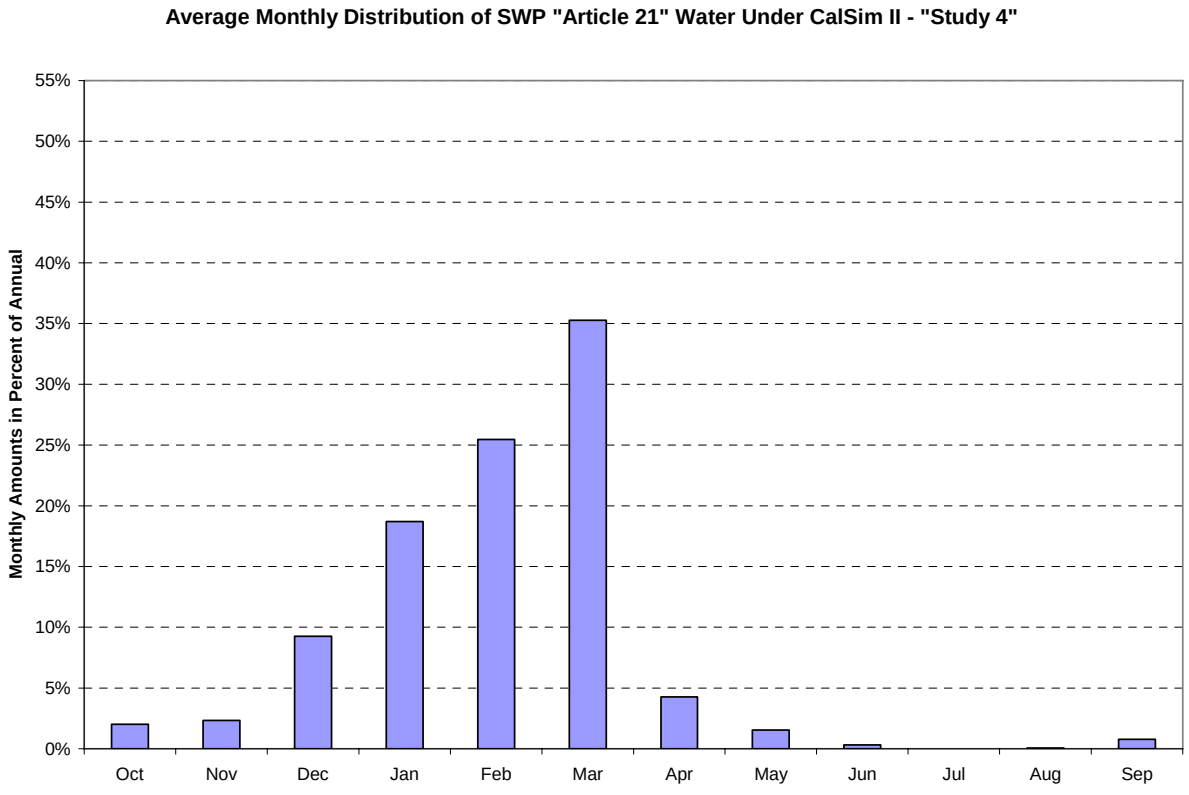
(values in acre-feet)

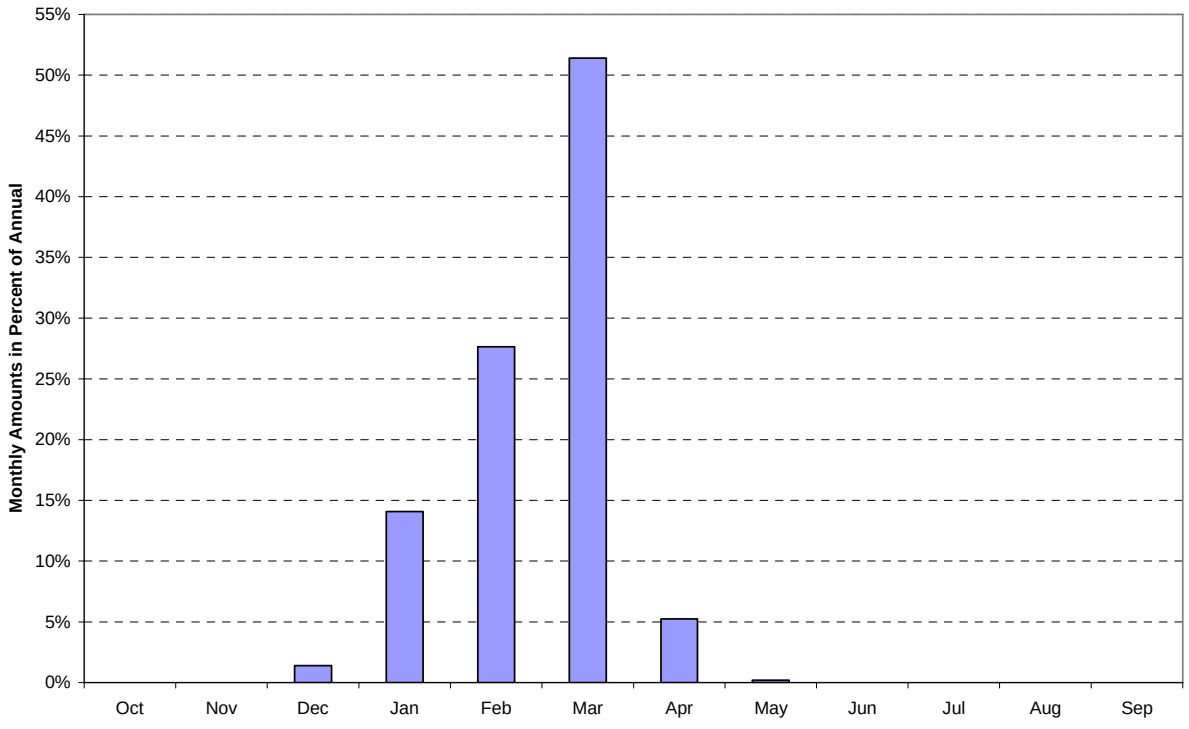
Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Calendar Year
1922	0	0	20,600	0	0	0	0	0	0	0	0	0	20,600	**1922**
1923	0	0	0	0	0	0	0	0	0	0	0	0	0	**1923**
1924	0	0	0	0	0	0	0	0	0	0	0	0	0	**1924**
1925	0	182,600	0	3,700	4,200	0	0	0	0	0	0	0	190,500	**1925**
1926	0	181,000	14,200	84,000	0	0	0	0	0	0	0	0	279,200	**1926**
1927	0	158,200	143,100	0	0	0	0	0	0	0	0	0	301,300	**1927**
1928	0	0	0	0	0	0	0	0	0	0	0	0	0	**1928**
1929	0	0	0	0	0	0	0	0	0	0	0	0	0	**1929**
1930	0	0	140,800	0	0	0	0	0	0	0	0	0	140,800	**1930**
1931	0	0	0	0	0	0	0	0	0	0	0	0	0	**1931**
1932	0	0	111,500	0	0	0	0	0	0	0	0	0	111,500	**1932**
1933	179,200	184,000	184,000	0	0	0	0	0	0	0	0	0	547,200	**1933**
1934	58,300	184,000	0	0	0	0	0	0	0	0	0	0	242,300	**1934**
1935	0	0	184,000	34,400	0	0	0	0	0	0	0	0	218,400	**1935**
1936	0	0	0	0	0	0	0	0	0	0	0	0	0	**1936**
1937	0	0	0	55,900	14,200	0	0	0	0	0	0	0	70,100	**1937**
1938	0	0	122,400	78,000	0	0	0	0	0	0	0	0	200,400	**1938**
1939	0	0	0	0	0	0	0	0	0	0	0	0	0	**1939**
1940	0	0	113,900	0	0	0	0	0	0	0	0	0	113,900	**1940**
1941	0	0	0	0	0	0	0	0	0	0	0	0	0	**1941**
1942	0	0	122,900	0	0	0	0	0	0	0	0	0	122,900	**1942**
1943	148,800	146,100	161,200	31,200	0	0	0	0	0	0	0	0	487,300	**1943**
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	**1944**
1945	0	0	118,100	0	0	0	0	0	0	0	0	0	118,100	**1945**
1946	0	0	0	0	0	0	0	0	0	0	0	0	0	**1946**
1947	0	0	0	0	0	0	0	0	0	0	0	0	0	**1947**
1948	0	0	0	0	0	0	0	0	0	0	0	0	0	**1948**
1949	0	0	0	0	0	0	0	0	0	0	0	0	0	**1949**
1950	0	0	0	0	0	0	0	0	0	0	0	0	0	**1950**
1951	0	101,200	150,500	0	0	0	0	0	0	0	0	0	251,700	**1951**
1952	0	0	0	0	0	0	0	0	0	0	0	0	0	**1952**
1953	151,300	0	144,700	0	0	0	0	0	0	0	0	0	296,000	**1953**
1954	0	0	0	0	0	0	0	0	0	0	0	0	0	**1954**
1955	0	0	0	0	0	0	0	0	0	0	0	0	0	**1955**
1956	39,300	159,000	154,000	0	0	0	0	0	0	0	0	0	352,300	**1956**
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	**1957**
1958	0	35,100	147,600	46,400	0	0	0	0	0	0	0	0	229,100	**1958**
1959	0	106,500	0	0	0	0	0	0	0	0	0	0	106,500	**1959**
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	**1960**
1961	0	161,000	138,300	0	0	0	0	0	0	0	0	0	299,300	**1961**
1962	0	0	1,200	0	0	0	0	0	0	0	0	0	1,200	**1962**
1963	0	0	161,200	0	0	0	0	0	0	0	0	0	161,200	**1963**
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	**1964**
1965	0	0	14,100	32,400	0	0	0	0	0	0	0	0	46,500	**1965**
1966	0	27,000	151,400	0	0	0	0	0	0	0	0	0	178,400	**1966**
1967	0	0	108,400	48,600	0	0	0	0	0	0	0	0	157,000	**1967**
1968	143,600	156,300	165,400	0	0	0	0	0	0	0	0	0	465,300	**1968**
1969	0	0	61,800	0	0	0	0	0	0	0	0	900	62,700	**1969**
1970	178,000	145,800	169,500	0	0	0	0	0	0	0	0	0	493,300	**1970**
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	**1971**
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	**1972**
1973	0	111,400	147,300	0	0	0	0	0	0	0	0	0	258,700	**1973**
1974	0	0	69,400	0	0	0	0	0	0	0	0	0	69,400	**1974**
1975	0	0	133,800	0	0	0	0	0	0	0	0	0	133,800	**1975**
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	**1976**
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	**1977**
1978	100,000	100,000	100,000	0	0	0	0	0	0	0	0	0	300,000	**1978**
1979	0	0	143,500	0	0	0	0	0	0	0	0	0	143,500	**1979**
1980	0	0	85,900	0	0	0	0	0	0	0	0	0	85,900	**1980**
1981	0	0	71,100	0	0	0	0	0	0	0	0	0	71,100	**1981**
1982	0	0	57,200	60,300	0	0	0	0	0	0	0	53,500	171,000	**1982**
1983	100,000	91,400	93,800	0	0	0	0	0	0	0	0	72,200	357,400	**1983**
1984	178,000	162,700	149,200	0	0	0	0	0	0	0	0	0	489,900	**1984**
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	**1985**
1986	0	0	83,200	0	0	0	0	0	0	0	0	0	83,200	**1986**
1987	0	0	183,000	0	0	0	0	0	0	0	0	0	183,000	**1987**
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	**1988**
1989	0	0	91,400	0	0	0	0	0	0	0	0	0	91,400	**1989**
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	**1990**
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	**1991**
1992	0	0	101,700	0	0	0	0	0	0	0	0	0	101,700	**1992**
1993	0	112,400	142,300	0	0	0	0	0	0	0	0	0	254,700	**1993**
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	**1994**
Average:														
(1922-1994	17,500	34,300	63,800	6,500	300	0	0	0	0	0	0	1,700	124,100	





Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Projected System-Wide Availability of SWP "Article 21" Water Under CalSim II – "Study 4 and 5"
Poso Creek Regional Management Group		June 2007 Figure 4-13





Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Average Monthly Distribution of SWP "Article 21" Water Under CalSim II – "Study 4 and 5"
Poso Creek Regional Management Group		June 2007 Figure 4-14

4.3.8 Summary

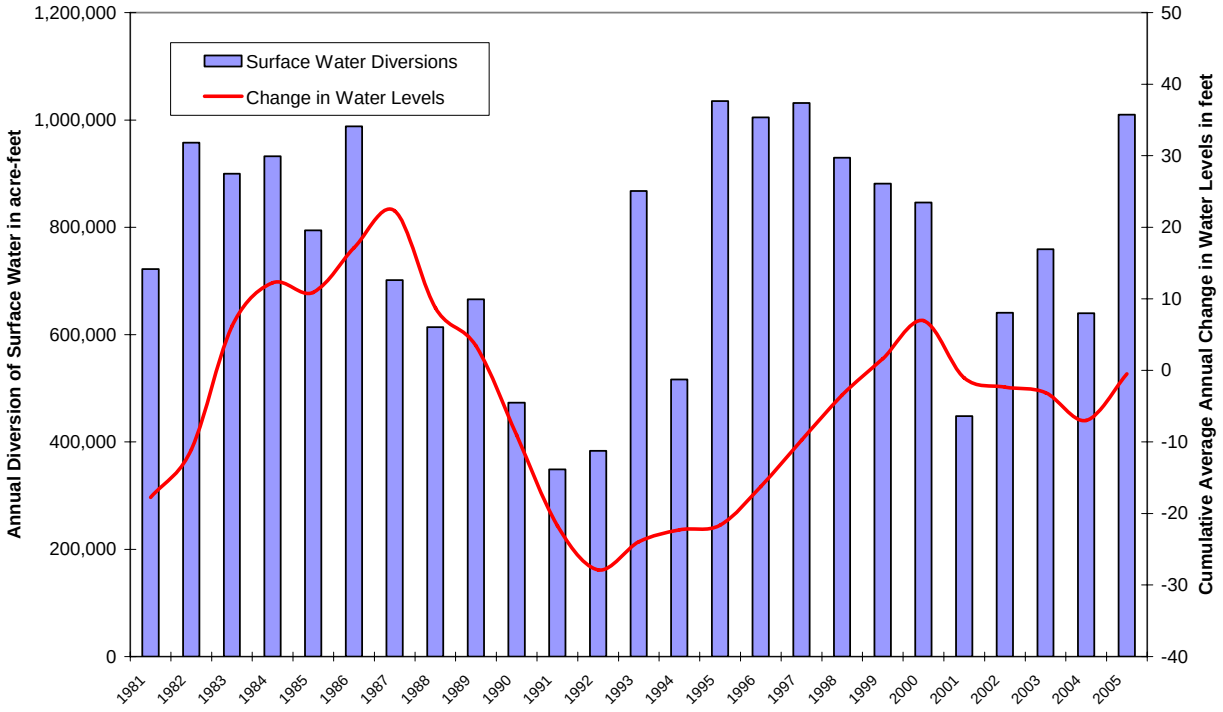
Based on information presented hereinabove, it is estimated that the long-term average annual availability of surface water supplies to the Region is on the order of 0.7 million acre-feet. This estimate is based on availability at the source of supply and does not reflect consideration of any conveyance or absorptive capability limitations; rather, these limitations are considered in operations studies presented in Chapter 7.

Additionally, this estimate is based on the minimum "share" of unregulated SWP and CVP supplies and does not include third-party banking.

4.3.9 Groundwater

As discussed above, owing to reduced water supply reliability, it is projected that less water will be available to the Region in the future as compared to the past. In addition to having less water available in the future, a portion of the water that is available will not be as "firm" as in the past and will require some form of regulation to be secured for the Region. It is likely that this regulation will have to come from and through water management programs developed cooperatively at the regional level. Just as in the past, it is reasonable to assume that groundwater will satisfy any additional shortages in surface water supplies, i.e., more groundwater will be used in the Region in the future than in the past. Accordingly, any reduction in surface water supplies can be expected to translate to a commensurate increase in the use of groundwater, assuming similar conditions of demand. While the magnitude of the water supply reduction is subject to some speculation, it is not unreasonable to think that the magnitude could be on the order of 100,000 acre-feet, on average over the long term. Given that water levels over the last 25 years have not evidenced an obvious long-term rise or decline, the expected loss of surface water supplies and the corresponding increase in the use of groundwater will induce a long-term decline in water levels. Historical water level fluctuations vis-à-vis historical water supplies provide some insight as to the potential magnitude of future water level declines. These data were presented previously and are reproduced on Figure 4-15.

Regional Surface Water Diversions and Water Level Changes



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Regional Surface Water Diversions and Water Level Changes	
Poso Creek Regional Management Group		June 2007	Figure 4-15

5 Historical Water Use and Projected Water Demand

The fundamental questions which are addressed in this section are …

- *What has been the historical "absorptive" capability?*
- *What is the future "absorptive" capability?*

Absorptive capability refers to the capability to divert and use surface water when available, where the *use* consists of deliveries to both irrigation and deliveries to spreading.

5.1 Overview of Water Demands

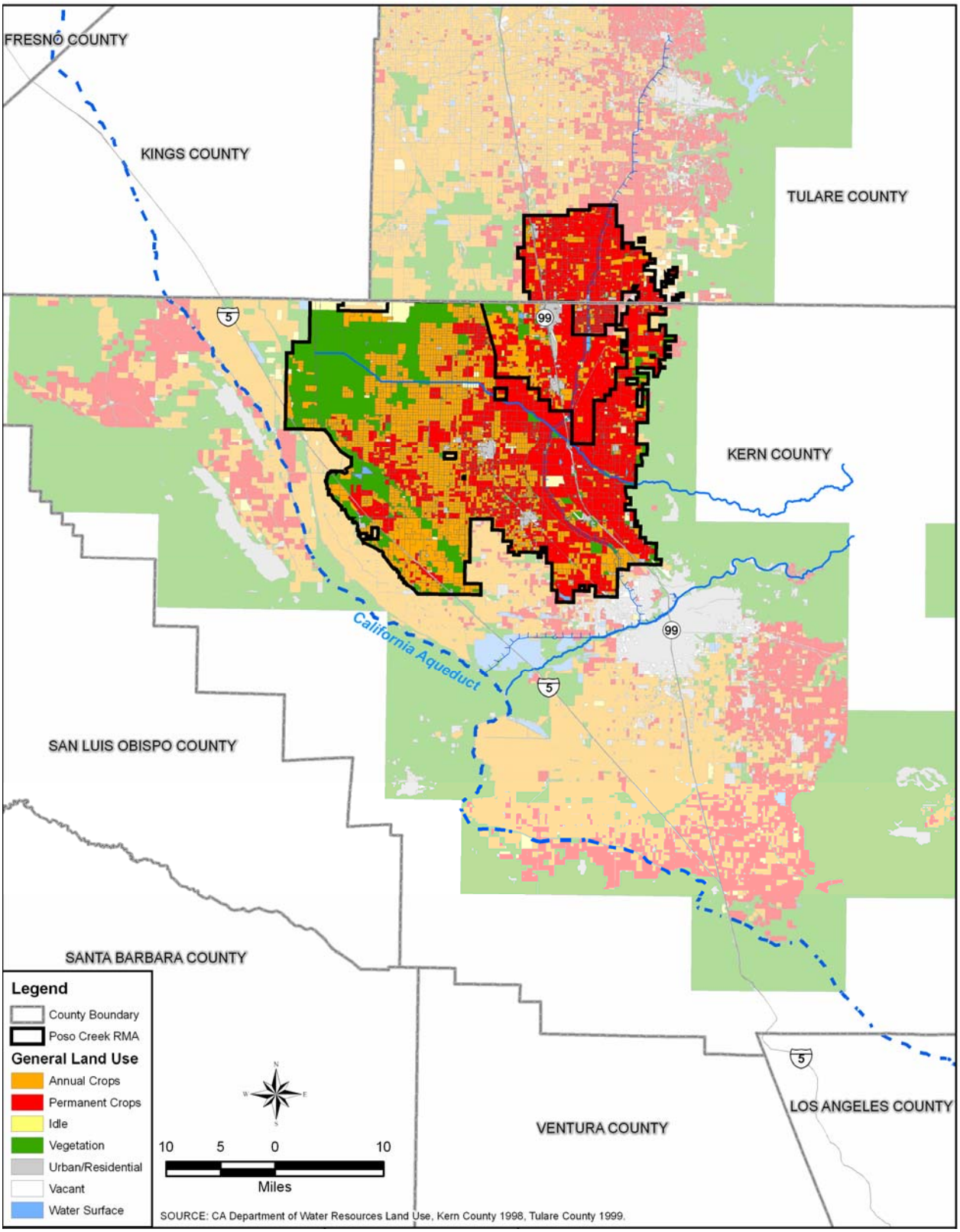
The present utilization of water supplies in the San Joaquin Valley portion of Kern County is predominantly for irrigated agriculture, which is also true for the Poso Creek RMA. As a generalization, all of the lands in the Poso Creek RMA are underlain by useable groundwater. Accordingly, to the extent that surface water supplies are inadequate to meet irrigation water requirements, groundwater is used to make up the shortfall. Further, all of the M&I use to date has relied on pumped groundwater. To the extent that surface water is available in excess of then current irrigation demands, and that water cannot be regulated in surface storage or otherwise rescheduled, then water is delivered to spreading for direct groundwater replenishment, up to the capacity of the spreading areas.

5.2 Historical Conditions

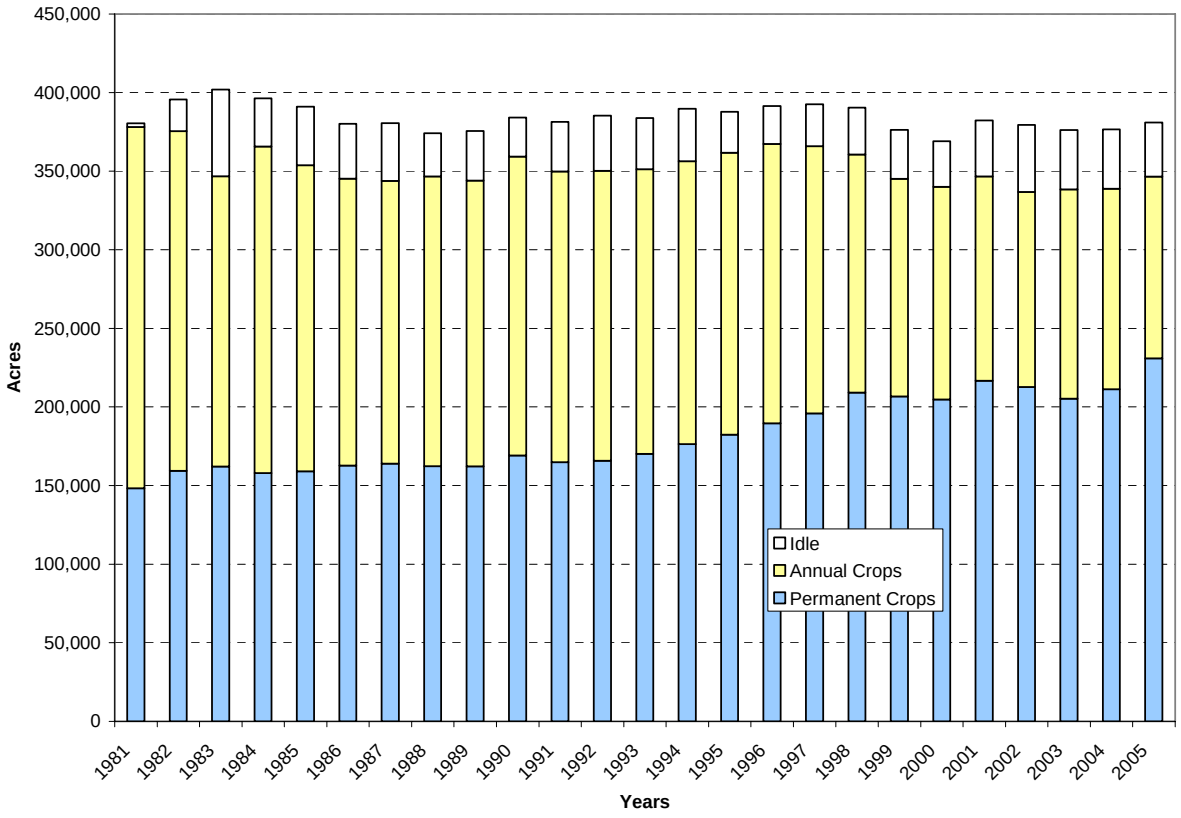
The historical use of water for irrigation, municipal and industrial, environmental and recreational, and groundwater replenishment is presented in the following paragraphs.

5.2.1 Irrigated Agriculture

Presently, about 60 percent of the Poso Creek RMA is developed to permanent crops, primarily nuts and grapes. This was not always the case; in fact, permanent crops amounted to about 40 percent of the developed acreage 25 years ago. While cotton acreage has declined significantly over the last 25 years, cotton and alfalfa remain the single largest annual crops in terms of acreage. Figure 5-2 illustrates the areal distribution of annual and permanent crops in the Region, while Figure 5-1 illustrates the trends respecting annual and permanent crops, as well as the total irrigated acreage, over the last 25 years.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Land Use in the Poso Creek RMA	
Poso Creek Regional Management Group		June 2007	Figure 5-1



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Historical Fluctuation of Permanent and Annual Crop Acreage in the Poso Creek RMA
Poso Creek Regional Management Group		June 2007 Figure 5-2

Table 5-1 presents the 2005 crop pattern.

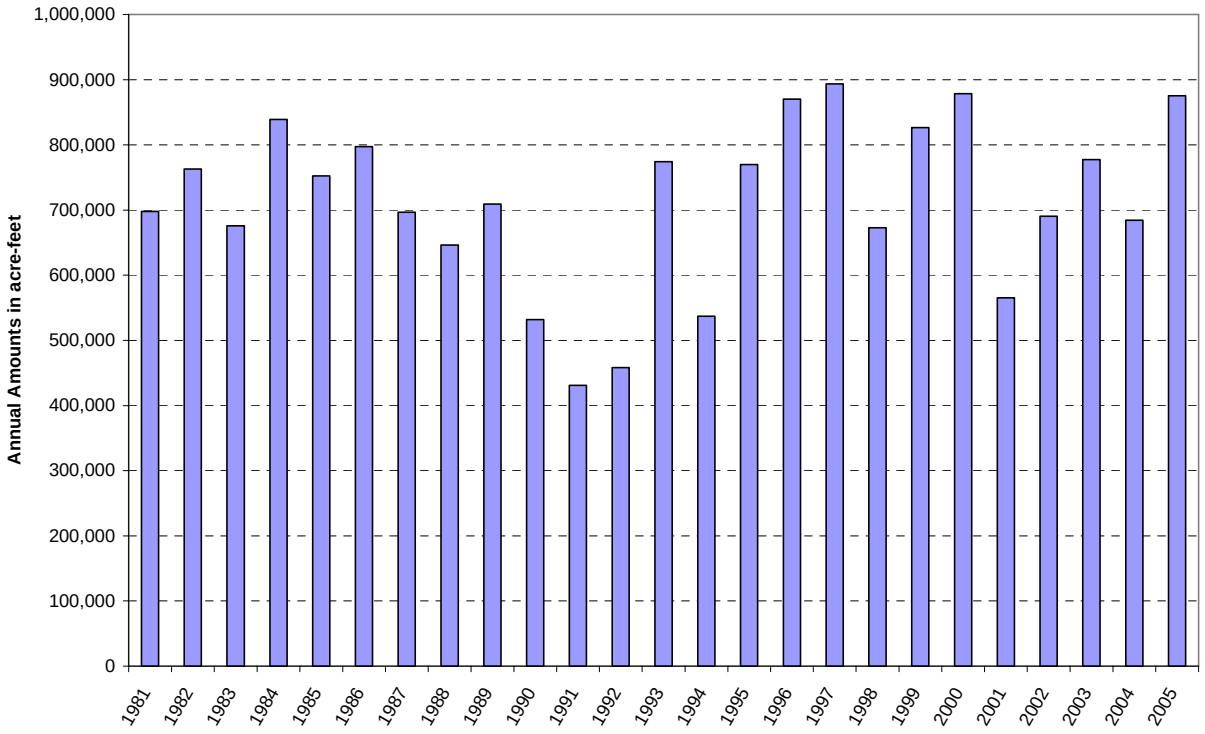
Table 5-1

2005 Crop Pattern
for the Poso Creek RMA

Nuts	32%
Vineyard	20%
Citrus	8%
Tree Fruit	2%
Subtotal Permanent Crops	62%
Alfalfa	10%
Cotton	9%
Grain	3%
Corn	3%
Vegetables (Misc.)	3%
Flowers	1%
Idle	9%
Subtotal Annual Crops	38%

The total irrigated acreage has generally ranged from 340,000 to 375,000, with an average of about 350,000 acres over the 1981 - 2005 period. While the majority of the irrigated acreage, is within the districts' surface water service areas (i.e., lands to which available surface water has been delivered), the remaining irrigated lands rely exclusively on pumped groundwater. Insofar as this planning study is concerned, it is important to understand how much water has been delivered to irrigation, because these data are reflective of the *existing* absorptive capability of irrigated agriculture in the Region. While the deliveries are a function of the available surface water supplies, they are also a function of the irrigation demand pattern and any facilities constraints that may exist with regard to conveyance and distribution. In particular, in those instances when available surface water supplies were not limiting, the deliveries only reflect the irrigation demand pattern and facilities constraints or, in other words, the *absorptive capability*. The annual deliveries to irrigation in the Poso Creek RMA are presented on Figure 5-3.

Total Annual Deliveries to Irrigation within the Poso Creek RMA



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Total Annual Deliveries to Irrigation within the Poso Creek RMA
Poso Creek Regional Management Group		June 2007 Figure 5-3

5.2.2 Municipal and Industrial

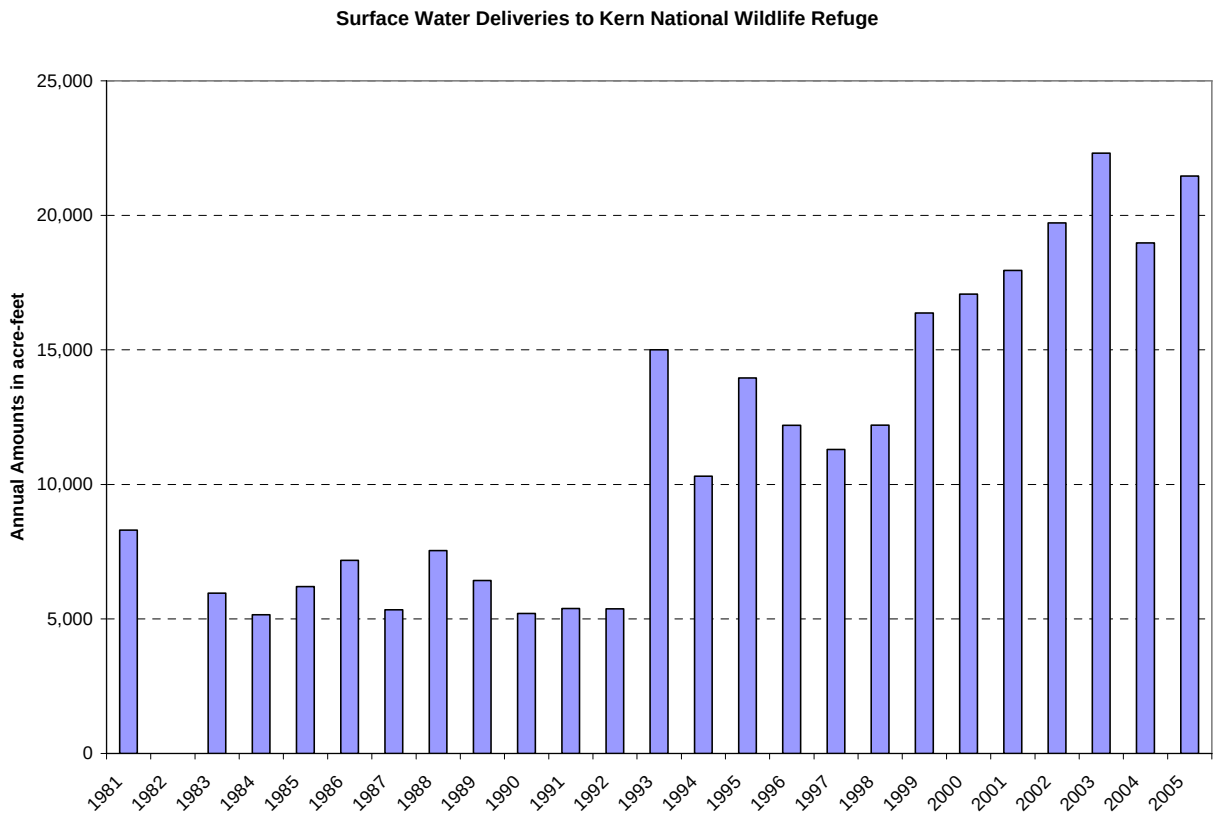
To date, water for municipal and industrial purposes in the Region has been provided solely by pumped groundwater. These uses are concentrated in the communities of Shafter, Wasco, McFarland, and Delano. Currently, the combined population of these communities is on the order of 120,000, which represents an approximate doubling of the population between 1990 and 2006, or an average growth rate of about 5 percent per year. About 100,000 reside within the city limits, with the remainder in outlying areas. The *gross* use of pumped groundwater under 2006 conditions is estimated at about 40,000 acre-feet per year. While pumping by the principal water purveyors is measured and reported, other pumping is not; accordingly, the total remains an estimate. The return flows (primarily wastewater effluent) from urban uses are either recharged to the underground or applied for irrigation, and *net* water uses are estimated to be equal to the *gross* amount of pumped groundwater less wastewater effluent and any return flow from landscape watering.

5.2.3 Environmental and Recreational

Environmental and recreational water uses within the Poso Creek RMA include the Kern National Wildlife Refuge and duck clubs as well as environmental uses that are incidental to other primary water uses.

Kern National Wildlife Refuge - The Kern National Wildlife Refuge (Refuge) is located in the northwestern portion of the Poso Creek RMA, largely within Semitropic. It covers almost 11,000 acres consisting of natural valley grasslands, a riparian corridor, and developed marsh. The Refuge lies just south of the Tulare Lake Bed, which once supported a lake that covered almost one-half million acres during flood years. As a remnant of this once expansive lake, KNWR provides wintering habitat for migrating birds, shorebirds, marsh and waterfowl, as well as upland species. About 6,400 acres are specifically managed for wetland purposes. In general, they will start wetting up the areas by sometime in August, and by February, they will begin to draw the water down. Regarding the drawdown, from 500 to 2,000 acre-feet is recycled by releasing the water from the Refuge and allowing it to be used for irrigation of crops on nearby lands.

When the Refuge was initially developed, its intended source of supply was pumped groundwater. However, it is understood that this was never an adequate supply; accordingly, the Refuge purchased surface water wherever it could do so to supplement whatever groundwater was produced. In the 1990s, with the passage of the Central Valley Project Improvement Act (CVPIA), the Refuge was given access to federal water up to 25,000 acre-feet annually; however, the Refuge has yet to receive that much water. Over the last 25 years, the Refuge has relied almost exclusively on surface water, with groundwater use being negligible during that period. Annual deliveries to the Refuge are shown on Figure 5-4, which highlights the increase in deliveries in the 1990s, as a result of CVPIA.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Surface Water Deliveries to Kern National Wildlife Refuge
Poso Creek Regional Management Group		June 2007 Figure 5-4

Duck Clubs - There are roughly 2,000 – 3,000 acres of private duck club ponds which are operated specifically for attracting waterfowl, and most of these are located in Semitropic. The primary water source for these ponds is groundwater. These duck club ponds apply an estimated 5,000 – 10,000 acre-feet annually. Semitropic has tracked land use in its area for many years, and the acreage devoted to duck ponds has not fluctuated significantly.

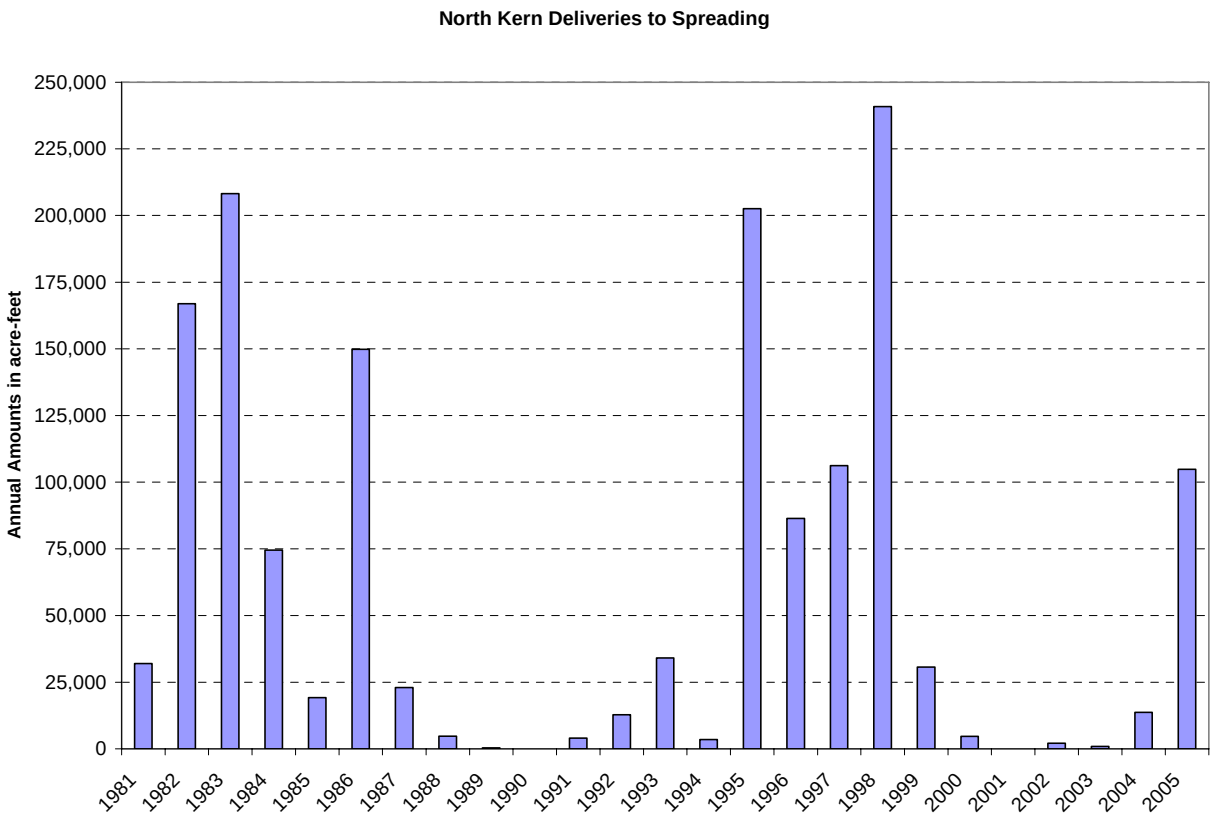
Groundwater Recharge Ponds - Groundwater recharge facilities generate incidental environmental benefits. When recharge ponds are full of water, they attract numerous waterfowl. These typically shallow ponds are not unlike the ponds which are maintained specifically for waterfowl benefits at the KNWR. More than 2,000 acres of spreading ponds are located in the Poso Creek RMA, specifically in North Kern and Cawelo, with individual sites ranging from about 50 acres to about 600 acres. While North Kern has spread a considerable amount of water in *wet* years, they have spread at least some water in almost all years.

5.2.4 Groundwater Replenishment

Groundwater is replenished through both *direct* and *indirect* means, where *direct* refers to water spreading in constructed ponds or natural channels, and *indirect* refers to surface water deliveries in lieu of pumping groundwater. The latter is often referred to as *in-lieu recharge* and is included in the deliveries to irrigation which is addressed in Section 5.2.1. Respecting direct recharge, North Kern has been operating more than 1,500 acres of spreading ponds to directly replenish the underlying groundwater for over 50 years. In fact, North Kern pioneered the construction and operation of large-scale spreading works in the southern San Joaquin Valley. More recently, Cawelo constructed more than 500 acres of ponds; however, these ponds do not have an operational history. The channel of Poso Creek has also been an important area for intentional recharge.

North Kern constructed its ponds in the 1950s to regulate its highly variable Kern River supply, which it has been doing successfully since that time. In particular, North Kern has recharged up to about 25,000 acre-feet per month and up to about 240,000 acre-feet in a single year, utilizing both its ponds and the channel of Poso Creek. Over the last 25 years (1981-2005), North Kern has recharged a total of more than 1.5 million acre-feet. Figure 5-5 illustrates the annual fluctuations of intentional recharge over this same period.

In addition to groundwater replenishment within the Region, direct recharge has also taken place outside of the Region for the same purpose, i.e., regulation of available surface water supplies. Specifically, Semitropic has caused water to be delivered to the Kern Water Bank from time to time. The Kern Water Bank is located on the Kern fan, immediately south of the Poso Creek RMA. Semitropic's deliveries to the Kern Water Bank commenced in 1995.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	North Kern Deliveries to Spreading
Poso Creek Regional Management Group		June 2007 Figure 5-5

5.3 Projected Conditions

Total water requirements for irrigation, municipal and industrial, and environmental and recreation within the Region are expected to change little from that of present conditions, inasmuch as the Region is, for practical purposes, fully developed. While significant population growth has occurred over the last 25 years and is expected to continue, it has typically been accommodated by converting agricultural land to urban uses. While there can be differences in water use between an acre of irrigated farmland and an acre developed to urban uses, it is not unreasonable, for regional planning purposes, to assume that the total water use is comparable.

5.3.1 Irrigated Agriculture

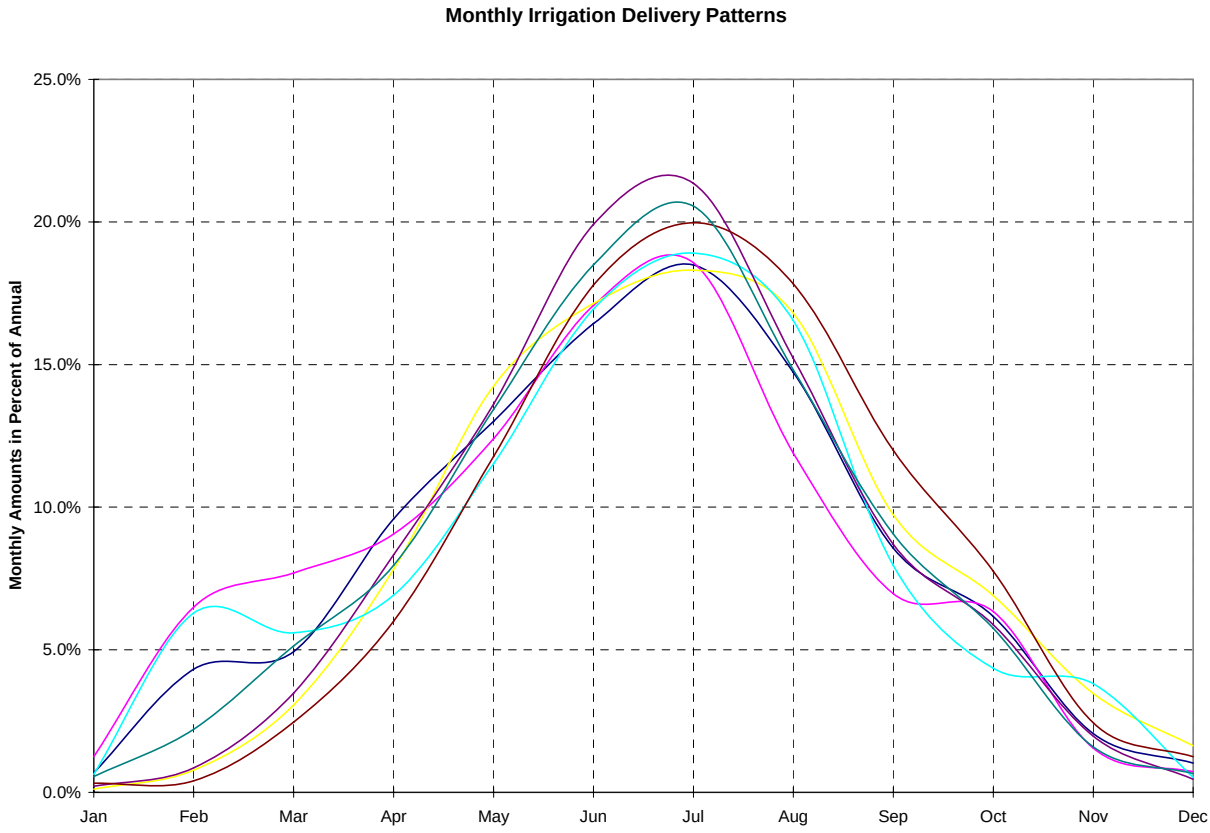
Since, as noted in Section 5.2.1, there have been changes in cropping patterns over the last 25 years, water deliveries in the more recent years are considered to be the best measure of projected conditions. Further, in terms of absorptive capability, it is appropriate to give more weight to years where the available surface water supply was not the most significant limiting factor. Accordingly, inspection of records of historical deliveries yielded the following annual absorptive capabilities for irrigation in the Region, which are considered representative of future conditions for purposes of this planning effort.

Table 5-2

Annual Absorptive Capabilities for Irrigation in the Region

Cawelo	75,000 af
Delano-Earlimart	135,000
Kern-Tulare & Rag Gulch	45,000
North Kern	140,000
Semitropic	310,000
Shafter-Wasco	70,000
Southern San Joaquin	125,000
	900,000 af

These annual amounts have been delivered on an irrigation demand schedule throughout the year. Based on monthly delivery records for recent years, a *typical* monthly pattern was developed for each district within the Region. These patterns are illustrated on Figure 5-6. The most notable difference occurs early in the year and is related to the pre-irrigation of cotton. In particular, those districts with measurable cotton acreage show a relatively greater delivery early in the year.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Monthly Irrigation Delivery Patterns
Poso Creek Regional Management Group		June 2007 Figure 5-6

5.3.2 Municipal and Industrial

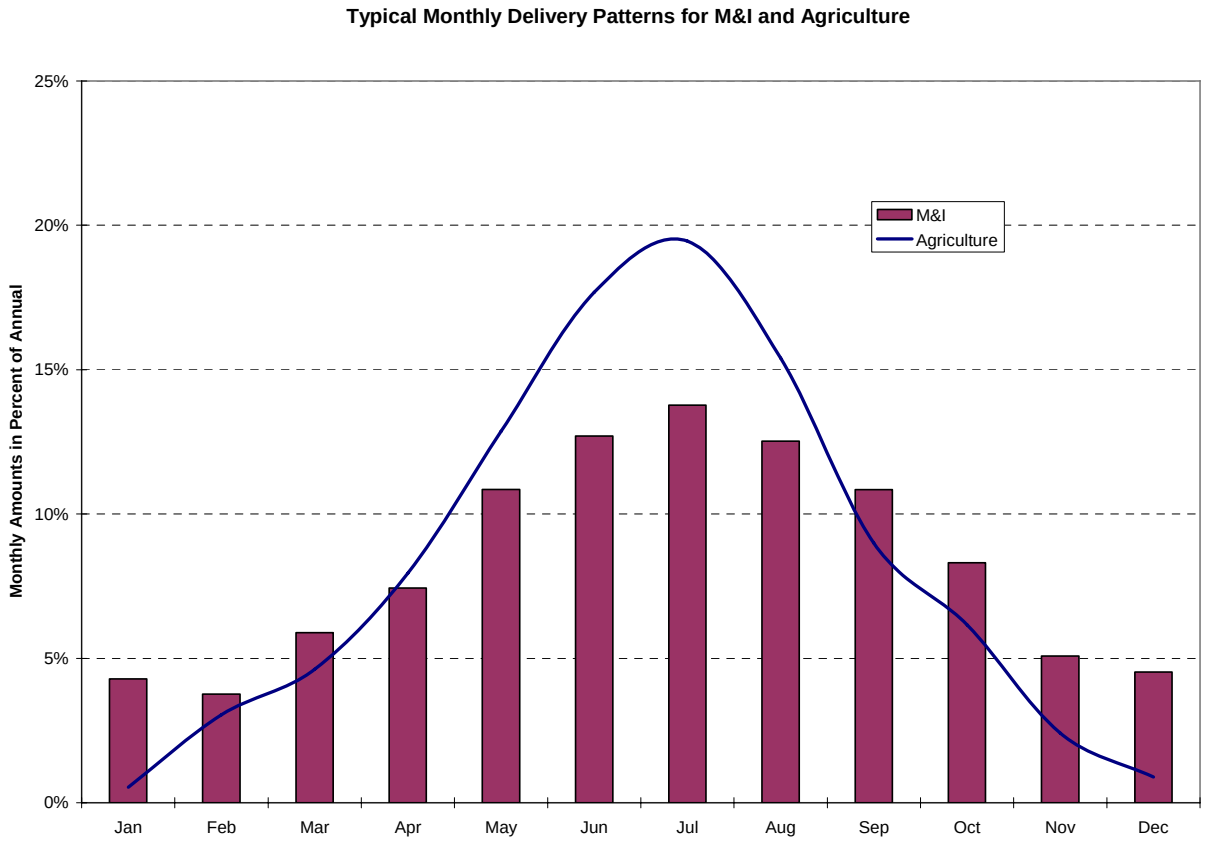
Recall (from Section 5.2.2) that the observed population growth rate for the Region was about 5 percent annually since 1990. Assuming that this rate continues, the population of the Region could double in the next 15 years. Similarly, gross water use can be expected to double, from the current estimate of 40,000 acre-feet to 80,000 acre-feet, absent additional conservation measures. The monthly pattern of M&I use is illustrated on Figure 5-7 along with the average monthly delivery pattern for agriculture for the Region. While the patterns are generally similar in shape, the overall peak use is relatively less for M&I than for irrigated agriculture.

5.3.3 Environmental and Recreational

Recall that environmental and recreational water uses include the Kern National Wildlife Refuge and duck clubs.

Kern National Wildlife Refuge - While surface water deliveries to the Refuge have averaged about 11,000 acre-feet per year over the last 25 years, annual deliveries have been building up since the mid 1990s, when the Refuge received an allocation of federal water under CVPIA. Accordingly, the more recent deliveries are considered to be more reflective of future conditions, i.e., on the order of 20,000 to 25,000 acre-feet per year. However, unlike irrigated agriculture in the Region, to the extent that surface water supplies are *short*, it is not likely, at least under present conditions, that the shortage would be made up by pumped groundwater. Accordingly, there is not the same relationship between surface water deliveries and groundwater levels that exists with irrigated agriculture.

Duck Clubs - As noted in Section 5.3.3, there have not been appreciable changes in the acreage devoted to duck ponds for many years. Accordingly, it is not unreasonable to assume that about this same acreage would continue to be used for this purpose for the foreseeable future.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Typical Monthly Delivery Patterns for M&I and Agriculture
Poso Creek Regional Management Group		June 2007 Figure 5-7

5.3.4 Applied Water

Based on information presented hereinabove, it is estimated that the long-term average annual applied water demand for the Region is on the order of 1.3 million acre-feet. This includes consideration of agricultural (at 3.5 acre-feet per acre), municipal and industrial, and environmental uses.

5.3.5 Groundwater Replenishment

Recall from the discussion of historical conditions, this discussion is limited to direct groundwater replenishment through spreading. To the extent that surface water supplies available to the Region become less reliable in the future, which is the conclusion which is reached in Section 4.2, there will be an increased demand for local regulation through direct recharge to groundwater storage. As noted in Section 5.2.4, Cawelo only recently completed construction of more than 500 acres of ponds; however, these ponds do not have an operational history. In the absence of an operational history, it is not unreasonable to think that Cawelo's spreading ponds will perform in a manner similar to those located in North Kern, inasmuch as they are proximate to two of North Kern's spreading works sites. On this basis, it is estimated that the spreading ponds in Cawelo have added between 7,000 and 8,000 acre-feet per month of spreading capacity in the Region. Collectively, North Kern and Cawelo provide the capability to spread on the order of 32,000 to 33,000 acre-feet per month.

In addition, Semitropic is constructing its first spreading ponds; however, owing to different subsurface conditions, the long-term spreading capacity remains speculative. However, as experience is gained with these yet-to-be completed ponds, they will further increase the Region's absorptive capability with respect to direct recharge.

Finally, recall that water has been recharged and stored on the Kern Fan, located to the south of the Poso Creek RMA, from time to time. In particular, this has involved two of the fan's direct recharge projects; the Kern Water Bank, and the Pioneer Project. Semitropic is a participant in the Kern Water Bank and both Semitropic and Cawelo are participants in the Pioneer Project.

6 Planning Objectives, Regional Priorities, and Integration of Water Management Strategies

A range of water management strategies were considered while developing the Poso Creek IRWMP Region's priorities. These strategies were evaluated to meet the planning objectives identified in Chapter 1 of this IRWMP and shown in Table 6-1 of this Chapter. The water management strategies that formed the Region's priorities considered the "resource management strategies" presented in the California Water Plan Update 2005 (California Water Plan) and the strategies as outlined in the State's IRWMP Proposition 50 Grant Program Guidelines. A strategy, as defined in the California Water Plan, is "a project, program, or policy that helps California's local agencies and governments manage their water and related resources."

6.1 Poso Creek IRWMP Planning Objectives and Regional Priorities

6.1.1 Planning Objectives

Seven planning objectives have been identified by the Poso Creek IRWMP RMG, which are presented in Table 6-1. These planning objectives were developed to provide a framework for formulating the Region's priorities and selecting strategies and proposed projects to meet the Region's priorities. These planning objectives were also developed in recognition that improved water resources management will benefit inhabitants throughout the Region as well as water purveyors in other parts of California.

Planning objectives 1 through 5 were selected by the RMG based on a consensus reached during a pre-application meeting held on April 20, 2005. Subsequently, during the kick-off meeting for the Poso Creek IRWMP held on January 5, 2006, the RMG added planning objective 6, and, based on stakeholder input during the monthly meetings held in 2006, planning objective 7 was added.

Table 6-1 Planning Objectives

Poso Creek IRWMP Planning Objectives		
No.	**General**	**Description**
1	Water Supply Reliability	Maintain and Improve Water Supply Reliability
2	Groundwater Levels	Maintain groundwater levels at economically viable pumping lifts
3	Groundwater Quality	Protect quality of groundwater and enhance where practical
4	Water Supply Costs	Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Poso Creek IRWMP Region
5	Monitoring	Enhance monitoring activities to meet groundwater levels and water quality goals
6	Environmental Resources	Maintain and/or enhance environmental resources within and outside of the Poso Creek IRWMP Region
7	Flood Control	Enhance flood control in the Poso Creek IRWMP Region

*Pursuant to CWC Sections 79562.5 and 79564, these water management strategies must be considered to meet the minimum IRWMP Standards

Planning objectives 1 through 7 are described below:

Water Supply Reliability - Two of the more significant problems facing the Region are surface water supply reliability and maintaining groundwater levels. The intent of this objective is to meet annual-average and critical-period regional demands, minimize localized shortages, improve system flexibility, and identify water supply reliability improvements through conjunctive use measures at the regional and local level. The intent of this IRWMP is to help ensure that an adequate water supply is maintained and improved to meet current and future regional and local water needs.

Groundwater Levels - The intent of this IRWMP is to help insure that groundwater levels will be maintained or enhanced with economically viable pumping lifts through increased conjunctive use operations.

Groundwater Quality - Groundwater quality in the Region is currently very good; thus, this objective is focused on protecting the existing quality of groundwater and enhancing water quality where practical. As conjunctive use, water banking, and exchange activities continue to increase, the need to coordinate activities with the federal, state, and local water management agencies will also increase. These activities will continue to require water quality management and may require treatment when stored groundwater is returned to the California Aqueduct. In this regard, institutional agreements are needed for delivering non-SWP water into the California Aqueduct and non-CVP water into the Friant-Kern Canal.

Water Supply Costs - The focus of this objective is to maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Poso Creek IRWMP Region. Since the Region produces crops for both local and world markets, to maintain its competitive role in the market place, the water supply must remain economical.

Monitoring - Groundwater monitoring is a vital objective for the Region to ensure the proper management and protection of its resource. The focus of this objective is to enhance on-going monitoring of groundwater levels and water quality as needed as part of the implementation of projects.

Environmental Resources - Maintaining and enhancing environmental resources within and outside the Region is the focus of this objective. Included is the protection and enhancement of a number of wetlands within the Poso Creek IRWMP Region that provides a sacred ecosystem for foul, flora and wildlife. Also, acknowledged is the connection of the Poso Creek IRWMP Region's imported water supplies to the environmental issues of the Delta and the San Joaquin River Restoration (SJR Restoration). In regards to the SJR Restoration, members of the Poso Creek IRWMP that receive water supply deliveries from

the Friant-Kern Canal will be contributing a portion of their historical surface supplies to meet the SJR Restoration Settlement needs.

Flood Management - This objective is focused on enhancing flood control to provide flood protection for the health and safety of the Region's population, while minimizing flood damage losses and seeking balanced management solutions with respect to cost and monetary/non-monetary benefits.

6.1.2 State of California Priorities

The following Statewide Priorities used in scoring Round 1 of the Proposition 50 implementation grant process are listed below. These were considered by the Poso Creek IRWMP RMG when evaluating strategies to meet the Region's priorities.

- Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- Implementation of TMDLs that are established or under development
- Implementation of Regional Water Quality Control Board (RWQCB) Watershed Management Initiative Chapters, plans, and policies
- Implementation of the SWRCB's Non-Point Source (NPS) Pollution Plan
- Assist in meeting Delta Water Quality Objectives
- Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or State species recovery plan
- Address environmental justice concerns
- Assist in achieving one or more goals of the CALFED Bay-Delta Program

As indicated in Table 6-2, the Poso Creek IRWMP planning objectives are interrelated with the State of California Priorities. All of the planning objectives relate to the statewide priority to reduce conflict between water users or resolve water rights disputes, including interregional water rights issues. Although it may appear the remaining State of California Priorities are not as directly connected to the Poso Creek IRWMP Region, several of the State of California Priorities, including TMDLs, RWQCB Watershed actions, Implementation of SWRCB's Non-Point Source Pollution Plan, and assisting in meeting the Delta Water Quality Objectives, have had an affect on the water supply reliability of the Poso Creek IRWMP Region by reducing the quantity and changing the timing of water available to be imported to the Poso Creek IRWMP Region. Therefore, the Poso Creek IRWMP planning objectives were developed based, in part, as a response to how the State of California Priorities have and will continue to influence the water supplies that originate outside of the Poso Creek IRWMP Region. Water management strategies considered to meet the planning objectives of this IRWMP are intended to reduce potential conflicts between water users within the Region that may arise if no measures are taken to restore historical quantities of imported water to this Region, and thus, maintain the water balance in the Region. The common groundwater basin of the Poso Creek IRWMP Region is also used as a

water source for several small economically disadvantaged communities that fit into the Environmental Justice concerns (EJ concerns). In addition, the planning objective to increase the Region's water supply reliability through conjunctive use measures also relates to the CALFED objectives.

6.1.3 Regional Priorities

As part of the process in developing the Regional Priorities, shown in Table 6-3, the RMG, with input from the stakeholders, considered all of the Water Management Strategies listed in Table A-1 of the DWR's IRWMP Grant Program Guidelines and the Resource Management Strategies found in the California Water Plan Update 2005. The State's IRWMP Guidelines (Table A-1 of the IRWMP Grant Program Guidelines) includes 20 water management strategies to be considered for implementation as part of an IRWM Plan. With consideration of the regional objectives as well as input from the participating stakeholders, the Poso Creek RMG identified strategies that were applicable to the Poso Creek IRWMP Region. Of the 20 water management strategies listed in Table A-1, desalination was the only strategy considered not-applicable. The other 19 strategies were recognized as applicable since they were considered on-going practices in the Poso Creek IRWMP Region. Recognizing the predominately agricultural land use and limited environmental enhancement opportunities of the Region, the RMG prioritized the strategies into two groups; those that were highest priority for implementation in the Region and those that were applicable to the Region and would be considered for project integration to meet the needs of the Region. Overall, five strategies fall into the first group, mainly strategies considered highest priority for implementation based on their consistency with the regional objectives. The remaining strategies fall into the second group, mainly strategies that were considered for project integration.

The primary objective of the IRWMP is to increase the water reliability. This is accomplished primarily through increased conjunctive use, making better use of surplus water in wet years. This objective is the major goal of the California Water Plan Update 2005.

The California Water Plan Update 2005 identified 25 resource management strategies- see Volume 2 of that report, many of which are applicable to the Poso Creek IRWMP. It is the intent of the participants for this IRWMP that the planning process identified in this IRWMP be dynamic and continues to include updates to region-wide policy as it evolves. The California Water Plan policies, recommendations, and priorities are intended to inform the Poso Creek RMG and other water resources agencies, of regional needs to support these agencies' planning (including Bulletin 160 updates), prioritization, and funding recommendations and support.

Table 6-2 Planning Objectives Related to the California State Priorities

Poso Creek IRWMP Planning Objectives			Reduce Conflicts / Resolve Water Rights Disputes	Implement TMDL	Implement Watershed Management Initiatives	Implement NPS Plan	Assist in Meeting Delta Water Quality Objectives	Implement Various State Plans	Address EJ Concerns	Assist in Achieving CALFED Goals
No.	**General**	**Description**	**California Statewide Priorities**							
1	Water Supply Reliability	Maintain and Improve Water Supply Reliability	✓				✓	✓	✓	✓
2	Groundwater Levels	Maintain groundwater levels at economically viable pumping lifts	✓						✓	
3	Groundwater Quality	Protect quality of groundwater and enhance where practical	✓		✓					
4	Water Supply Costs	Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Poso Creek IRWMP Region	✓							
5	Monitoring	Enhance monitoring activities to meet groundwater levels and water quality goals	✓							
6	Environmental Resources	Maintain and/or enhance environmental resources within and outside of the Poso Creek IRWMP Region	✓		✓		✓	✓		
7	Flood Control	Enhance flood control in the Poso Creek IRWMP Region	✓		✓					

Table 6-3 Proposition 50 Strategies Considered

Water Management Strategies Applicable to the Poso Creek IRWMP Region	
Highest Priority for Project Implementation	
1	Groundwater Management *
2	Water Supply Reliability *
3	Conjunctive Management of Surface Water and Groundwater
4	Water Transfer/Exchanges
5	Water Quality Protection and Improvement *
Considered for Project Integration	
6	Ecosystem Restoration *
7	Environmental and Habitat Protection and Improvement *
8	Flood Management *
9	Imported Water
10	Land Use Planning
11	NPS Pollution Control
12	Recreation and Public Access *
13	Storm Water Capture and Management *
14	Surface Storage
15	Water and Wastewater Management
16	Water Conservation *
17	Water Recycling
18	Watershed Planning
19	Wetlands Enhancement and Creation *
Water Management Strategies Not Applicable to the Poso Creek IRWMP Region	
20	Desalination

* Pursuant to CWC Sections 79562.5 and 79564, these water management strategies must be considered to meet the minimum IRWMP Standards

6.2 Water Management Strategies

6.2.1 Development of Projects to Support Water Management Strategies

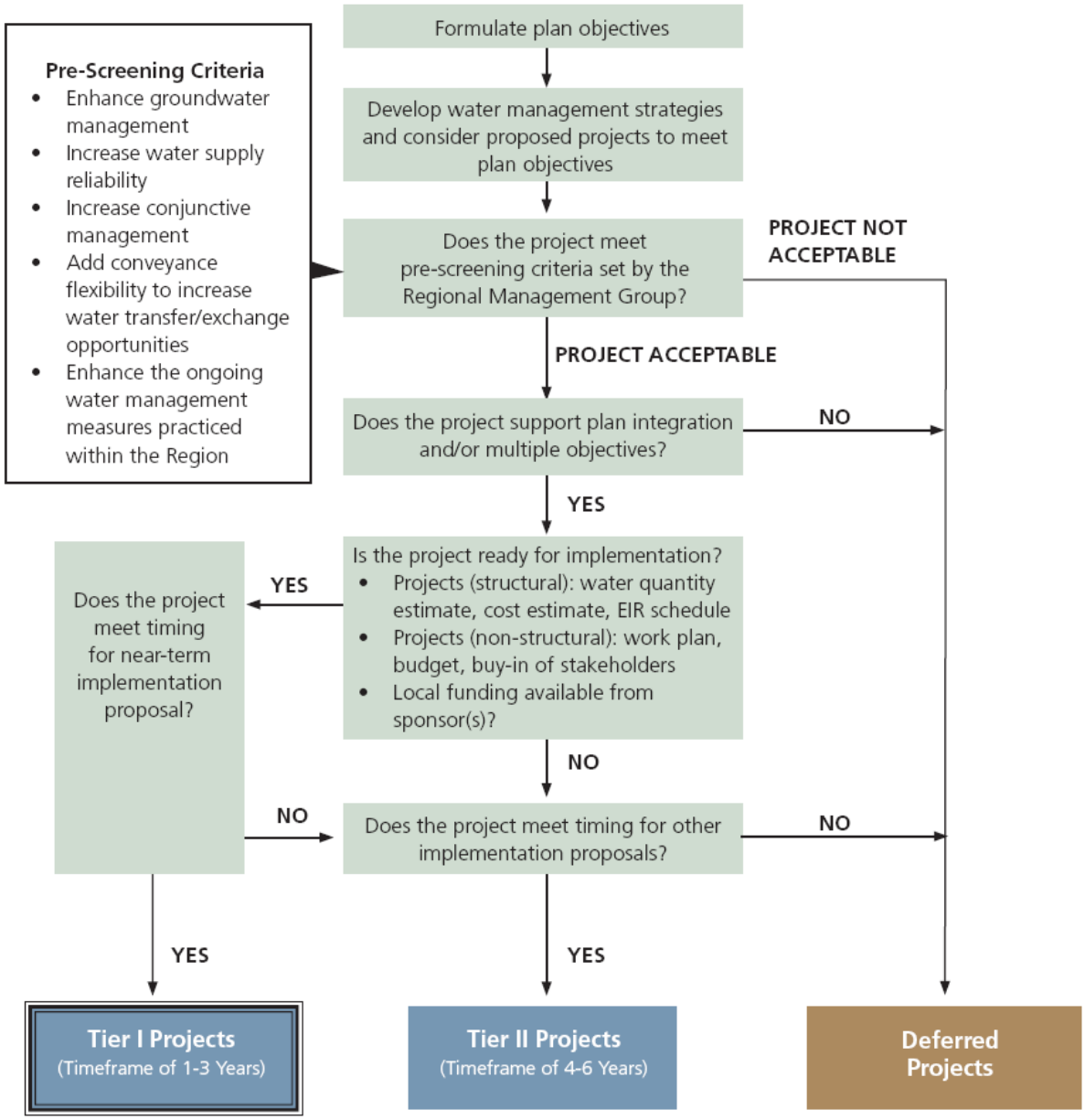
The process of developing projects to support the water management strategies for the Poso Creek IRWMP Region evolved in the course of discussions held at the monthly meetings of the RMG where each district's assets, issues, and needs were presented (See Ch. 3 for a description of each district's assets, issues and needs). These discussions identified the proposed projects the RMG considered for implementation. Because the proposed projects consists of a combination of structural and non-structural measures that can meet multiple strategies and objectives, the evaluation and ranking of individual projects was not a simple task for the RMG. In formulating the Poso Creek IRWMP, the RMG proceeded with first identifying the proposed projects and then discussing the relationship between the water management strategies and the planning objectives that are a priority to the Region (See Table 6-4). Much collaborative operational knowledge of the Region was exchanged at the monthly meetings. As a result, a planning process for project screening, as shown in Figure 6-1 was formulated and conducted as part of this IRWMP to identify acceptable proposed projects that support the water management strategies and the planning objectives that are important to the Poso Creek IRWMP Region. It is recognized by members of the RMG that a more detailed evaluation of the water supply benefits of the individual projects to the Region and a feasibility analysis concerning structural measures may be needed prior to implementation, and as part of grant proposals.

The steps used in formulating the proposed projects in support of the water management strategies for the Poso Creek IRWMP Region included:

- Compiling comprehensive list of water management strategies, projects and programs that were viewed by the member agencies as contributing to the overall water management and efficiency of the Poso Creek IRWMP Region;
- Evaluating the list of strategies to ensure it considered all strategies required by Proposition 50, Chapter 8, Integrated Regional Water Management Grant Program Guidelines, dated November, 2004;
- Highlighting water management strategies and projects that provide an opportunity to share resources, offer efficiencies, and provide synergy and/or multiple benefits across functional areas and between agencies;
- Prioritizing water management strategies that best support the Poso Creek IRWMP goals and planning objectives;
- Categorizing projects (structural and non-structural projects) as functional groups in support of the priority strategies;
- Assigning each project's readiness for implementation (based on the Pre-Screening criteria set by the RMG) as a Tier 1, Tier 2, or Deferred Project;

- Formulating project "bundles" consisting of non-structural and structural project components that were consistent with highest priority strategies;
- Formulating the implementation plan.

Poso Creek IRWMP
Planning Process for Project Screening
DRAFT



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Planning Process for Project Screening
Poso Creek Regional Management Group	June 2007	Figure 6-1

Table 6-4 Planning Objectives Compared with Water Management Strategies

Poso Creek IRWMP Planning Objectives			Groundwater Management *	Water Supply Reliability *	Conjunctive Management of Surface Water and Groundwater	Water Transfer/Exchanges	Water Quality Protection and Improvement *	Ecosystem Restoration *	Environmental and Habitat Protection and Improvement *	Flood Management *	Imported Water	Land Use Planning	NPS Pollution Control	Recreation and Public Access *	Storm Water Capture and Management *	Surface Storage	Water and Wastewater Management	Water Conservation *	Water Recycling	Watershed Planning	Wetlands Enhancement and Creation *
No.	**General**	**Description**	**Highest Priority for Project Implementation**					**Considered for Project Integration**													
1	Water Supply Reliability	Maintain and Improve Water Supply Reliability	✓	✓	✓	✓					✓					✓		✓	✓	✓	✓
2	Groundwater Levels	Maintain groundwater levels at economically viable pumping lifts	✓	✓	✓	✓	✓				✓							✓			✓
3	Groundwater Quality	Protect quality of groundwater and enhance where practical	✓	✓	✓	✓	✓				✓							✓			✓
4	Water Supply Costs	Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Poso Creek IRWMP Region	✓	✓	✓	✓					✓							✓			✓
5	Monitoring	Enhance monitoring activities to meet groundwater levels and water quality goals	✓	✓	✓	✓	✓				✓							✓			✓
6	Environmental Resources	Maintain and/or enhance environmental resources within and outside of the Poso Creek IRWMP Region	✓	✓	✓	✓	✓	✓	✓		✓			✓				✓			✓
7	Flood Control	Enhance flood control in the Poso Creek IRWMP Region		✓		✓				✓			✓		✓			✓		✓	

*Pursuant to CWC Sections 79562.5 and 79564, these water management strategies must be considered to meet the minimum IRWMP Standards. **Desalination was considered not applicable to the Poso Creek IRWMP.

6.2.2 Overview of Proposed Projects and Programs to Address Water Management Strategies

This section describes the projects and programs that were identified by the Poso Creek IRWMP RMG as a priority for project implementation. The Region's planning objectives and the five water management strategies that were selected as the highest priority group were the focal points in formulating the project components for implementation of the Poso Creek IRWMP. A total of 31 projects (see Table 6-5) were identified by members of the Poso Creek IRWMP RMG and evaluated at a conceptual level of detail. The proposed projects, described in Appendix D -Project Summary Descriptions, were evaluated first as discrete components and then second from the viewpoint of an integrated water resource management plan approach for the Poso Creek IRWMP Region. The projects and programs are presented according to the following categories:

- Expand In-Lieu Service Area (Structural Measure);
- Expand Direct Recharge (Structural Measure);
- Modify Conveyance Systems (Structural Measure);
- Non-Structural Measures;
- Enhance Environmental Resources;
- Enhance Flood Control; and
- Assist Economically Disadvantaged Communities.

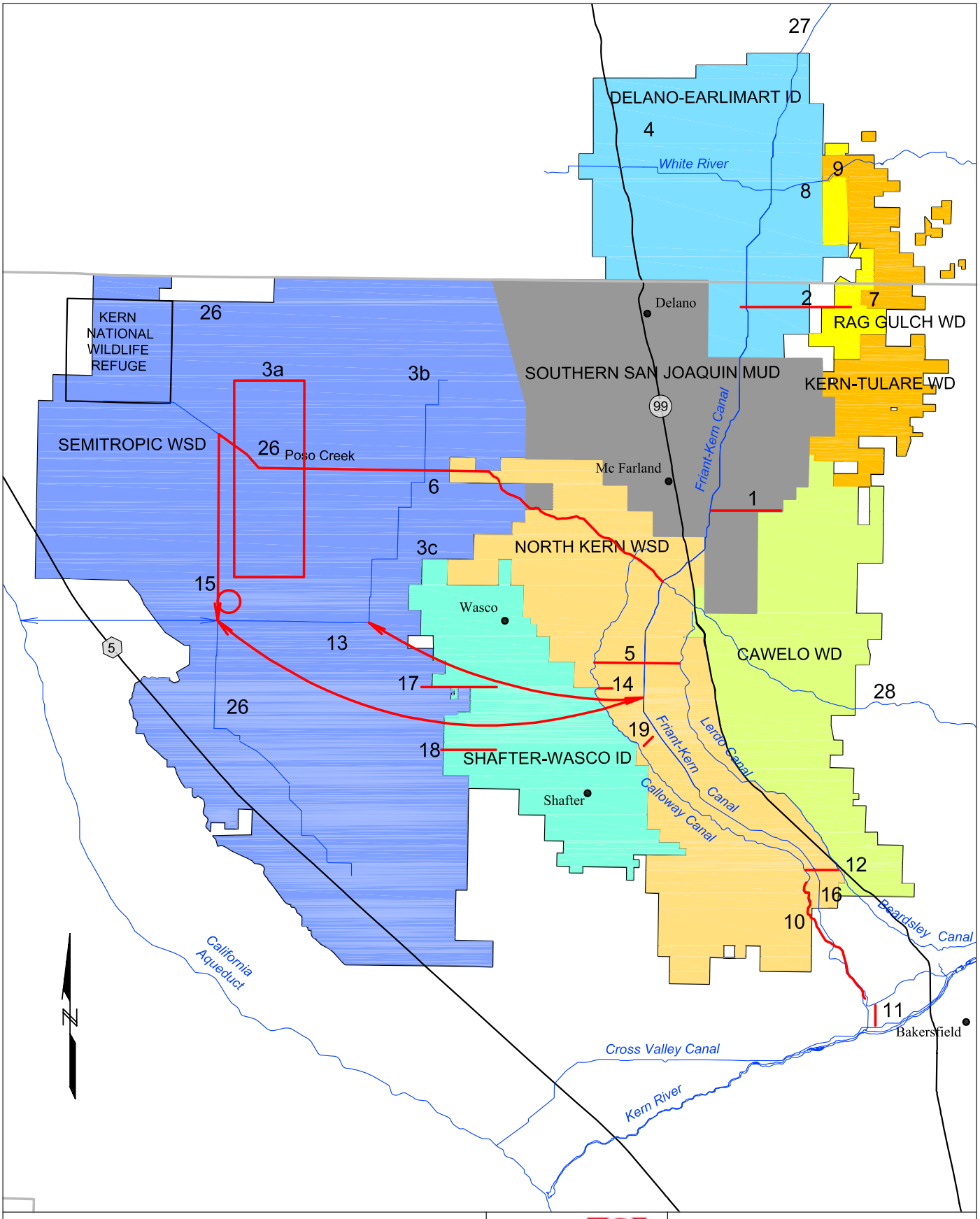
A general schematic showing the general location of the project components is shown in Figure 6-2.

A summary of the proposed projects and how they meet the California Statewide Priorities and the Poso Creek IRWMP planning objectives is included in Table 6-6 and Table 6-7, respectively. Additionally, a summary of the proposed projects and how they meet the Proposition 50 Water Management Strategies and the Resource Management Strategies found in the California Water Plan Update 2005 is included in Table 6-8 and Table 6-9, respectively. Presented in Chapter 8 are the quantitative objectives which helped link the highest priority strategies to the water supply and demand assessment and the evaluation of water supply operations for the Region. A description of plan formulation, Regional benefits and plan performance is also discussed in Chapter 8. An implementation plan and schedule is included in Chapter 8 of this IRWMP.

Table 6-5 Proposed Project Components Considered for Integration into the Poso Creek IRWMP

Structural Projects to Increase Water Supply Reliability	
Expand In-Lieu Service Areas	
1	Connect Friant-Kern Canal Turnout to Cawelo's North System
2	Ninth Avenue Pipeline
3a	Stored Water Recovery Unit (SWRU) In-Lieu Service Areas
3b	Expand P-1030 In-Lieu Service Area
3c	P-565 New In-Lieu Service Area
Expand Direct Recharge	
4	G-W Banking North of DEID with Pixley ID
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities
6	Pond Poso Spreading Grounds
7	Rag Gulch G-W Banking Project
8	White River G-W Banking for DEID
9	White River G-W Banking in Rag Gulch
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity	
10	Calloway Canal Improvements
11	Calloway Canal to Cross Valley Canal Interconnection
12	Calloway Canal to Lerdo Interconnection
13	Multi-District Conveyance Facility
14	North Inter-connection between North Kern/Shafter-Wasco
15	Pilot Arsenic Treatment Plant
16	Reverse Flow in the Friant-Kern Canal
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road
18	Shafter-Wasco/Semitropic Interconnection on Madera Avenue
19	South Inter-connection between North Kern/Shafter-Wasco
Non-Structural Projects	
20	Energy Usage
21	Joint Powers Authority
22	Institutional Agreements and Governance for IRWMP Implementation
23	G-W Banking for Parties Outside of Poso Creek IRWMP Region
24	Optimize the Region's Pumping Lifts
25	Enhance Groundwater Monitoring and/or Modeling
Enhance Environmental Resources	
26	Wildlife Improvement Projects in IRWMP Region
27	Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region
Enhance Flood Control	
28	Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek
Assist Economically Disadvantaged Communities	
29	Enhance Water Supply and Treatment Facilities

(The initial list of project components was 31;several concepts were added during the Plan formulation, as noted in Ch. 8)



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Proposed Project Components
Poso Creek Regional Management Group		June 2007 Figure 6-2

Table 6-6 Projects Consistency with Statewide Priorities

Project ID	Project Name	Reduce Conflicts / Resolve Water Rights Disputes	Implement TMDL	Implement Watershed Management Initiatives	Implement NPS Plan	Assist in Meeting Delta Water Quality Objectives	Implement Various State Plans	Address EJ Concerns	Assist in Achieving CALFED Goals
Structural Projects to Increase Water Supply Reliability									
Expand In-Lieu Service Areas									
1	Connect Friant-Kern Canal Turnout to Cawelo's North System	✓				✓			✓
2	Ninth Avenue Pipeline	✓				✓			✓
3a	Stored Water Recovery Unit (SWRU) In-Lieu Service Areas	✓				✓			✓
3b	Expand P-1030 In-Lieu Service Area	✓				✓			✓
3c	P-565 New In-Lieu Service Area	✓				✓			✓
Expand Direct Recharge									
4	G-W Banking North of DEID with Pixley ID	✓				✓			✓
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities	✓				✓			✓
6	Pond Poso Spreading Grounds	✓				✓			✓
7	Rag Gulch G-W Banking Project	✓				✓			✓
8	White River G-W Banking for DEID	✓				✓			✓
9	White River G-W Banking in Rag Gulch	✓				✓			✓
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity									
10	Calloway Canal Improvements	✓				✓			✓
11	Calloway Canal to Cross Valley Canal Interconnection	✓				✓			✓
12	Calloway Canal to Lerdo Interconnection	✓				✓			✓
13	Multi-District Conveyance Facility	✓				✓	✓		✓
14	North Inter-connection between North Kern/Shafter-Wasco	✓				✓			✓
15	Pilot Arsenic Treatment Plant	✓		✓		✓	✓		✓
16	Reverse Flow in the Friant-Kern Canal	✓				✓			✓
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road	✓				✓			✓
18	Shafter-Wasco/Semitropic Interconnection on Madera Avenue	✓				✓			✓
19	South Inter-connection between North Kern/Shafter-Wasco	✓				✓			✓
Non-Structural Projects									
20	Energy Usage	✓							
21	Joint Powers Authority	✓							
22	Institutional Agreements and Governance for IRWMP Implementation	✓				✓	✓		✓
23	G-W Banking for Parties Outside of Poso Creek IRWMP Region	✓				✓	✓	✓	✓
24	Optimize the Region's Pumping Lifts	✓							✓
25	Enhance Groundwater Monitoring and/or Modeling	✓							✓
Enhance Environmental Resources									
26	Wildlife Improvement Projects in IRWMP Region	✓							
27	Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region	✓	✓	✓		✓	✓		✓
Enhance Flood Control									
28	Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek	✓		✓					✓
Assist Economically Disadvantaged Communities									
29	Enhance Water Supply and Treatment Facilities							✓	

Table 6-7 Projects Consistency with Planning Objectives

Project ID	Project Name	Maintain and Improve Water Supply Reliability	Maintain groundwater levels at economically viable pumping lifts	Protect quality of groundwater and enhance where practical	Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Poso Creek IRWMP Region	Enhance monitoring activities to meet groundwater levels and water quality goals	Maintain and/or enhance environmental resources within and outside of the Poso Creek IRWMP Region	Enhance flood control in the Poso Creek IRWMP Region
Structural Projects to Increase Water Supply Reliability								
Expand In-Lieu Service Areas								
1	Connect Friant-Kern Canal Turnout to Cawelo's North System	✓	✓	✓	✓			
2	Ninth Avenue Pipeline	✓	✓	✓	✓			
3a	Stored Water Recovery Unit (SWRU) In-Lieu Service Areas	✓	✓	✓	✓			
3b	Expand P-1030 In-Lieu Service Area	✓	✓	✓	✓			
3c	P-565 New In-Lieu Service Area	✓	✓	✓	✓			
Expand Direct Recharge								
4	G-W Banking North of DEID with Pixley ID	✓	✓	✓	✓			
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities	✓	✓	✓	✓			
6	Pond Poso Spreading Grounds	✓	✓	✓	✓			
7	Rag Gulch G-W Banking Project	✓	✓	✓	✓			
8	White River G-W Banking for DEID	✓	✓	✓	✓			
9	White River G-W Banking in Rag Gulch	✓	✓	✓	✓			
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity								
10	Calloway Canal Improvements	✓	✓	✓	✓			
11	Calloway Canal to Cross Valley Canal Interconnection	✓	✓	✓	✓			
12	Calloway Canal to Lerdo Interconnection	✓	✓	✓	✓			
13	Multi-District Conveyance Facility	✓	✓	✓	✓			
14	North Inter-connection between North Kern/Shafter-Wasco	✓	✓	✓	✓			
15	Pilot Arsenic Treatment Plant	✓	✓	✓	✓			
16	Reverse Flow in the Friant-Kern Canal	✓	✓	✓	✓			
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road	✓	✓	✓	✓			
18	Shafter-Wasco/Semitropic Interconnection on Madera Avenue	✓	✓	✓	✓			
19	South Inter-connection between North Kern/Shafter-Wasco	✓	✓	✓	✓			
Non-Structural Projects								
20	Energy Usage		✓		✓			
21	Joint Powers Authority	✓	✓	✓				
22	Institutional Agreements and Governance for IRWMP Implementation	✓	✓	✓	✓		✓	
23	G-W Banking for Parties Outside of Poso Creek IRWMP Region	✓	✓	✓	✓			
24	Optimize the Region's Pumping Lifts	✓	✓		✓			
25	Enhance Groundwater Monitoring and/or Modeling		✓	✓		✓		
Enhance Environmental Resources								
26	Wildlife Improvement Projects in IRWMP Region						✓	
27	Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region						✓	
Enhance Flood Control								
28	Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek							✓
Assist Economically Disadvantaged Communities								
29	Enhance Water Supply and Treatment Facilities							

Table 6-8 Projects Consistency with Water Management Strategies

		Highest Priority for Project Implementation					Considered for Project Integration														
Project ID	Project Name	Groundwater Management *	Water Supply Reliability *	Conjunctive Management of Surface Water and Groundwater	Water Transfer/Exchanges	Water Quality Protection and Improvement *	Ecosystem Restoration *	Environmental and Habitat Protection and Improvement *	Flood Management *	Imported Water	Land Use Planning	NPS Pollution Control	Recreation and Public Access *	Storm Water Capture and Management *	Surface Storage	Water and Wastewater Management	Water Conservation *	Water Recycling	Watershed Planning	Wetlands Enhancement and Creation *
Structural Projects to Increase Water Supply Reliability																				
Expand In-Lieu Service Areas																				
1	Connect Friant-Kern Canal Turnout to Cawelo's North System	✓	✓	✓	✓					✓				✓			✓			
2	Ninth Avenue Pipeline	✓	✓	✓	✓					✓				✓			✓			
3a	Stored Water Recovery Unit (SWRU) In-Lieu Service Areas	✓	✓	✓	✓					✓				✓			✓			
3b	Expand P-1030 In-Lieu Service Area	✓	✓	✓	✓					✓				✓			✓			
3c	P-565 New In-Lieu Service Area	✓	✓	✓	✓					✓				✓			✓			
Expand Direct Recharge																				
4	G-W Banking North of DEID with Pixley ID	✓	✓	✓	✓					✓				✓			✓			
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities	✓	✓	✓	✓					✓				✓			✓			
6	Pond Poso Spreading Grounds	✓	✓	✓	✓					✓				✓			✓			
7	Rag Gulch G-W Banking Project	✓	✓	✓	✓					✓				✓			✓			
8	White River G-W Banking for DEID	✓	✓	✓	✓					✓				✓			✓			
9	White River G-W Banking in Rag Gulch	✓	✓	✓	✓					✓				✓			✓			
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity																				
10	Calloway Canal Improvements	✓	✓	✓	✓					✓				✓			✓			
11	Calloway Canal to Cross Valley Canal Interconnection	✓	✓	✓	✓					✓				✓			✓			
12	Calloway Canal to Lerdo Interconnection	✓	✓	✓	✓					✓				✓			✓			
13	Multi-District Conveyance Facility	✓	✓	✓	✓	✓				✓				✓			✓			
14	North Inter-connection between North Kern/Shafter-Wasco	✓	✓	✓	✓					✓				✓			✓			
15	Pilot Arsenic Treatment Plant	✓	✓	✓	✓	✓				✓				✓		✓	✓			
16	Reverse Flow in the Friant-Kern Canal	✓	✓	✓	✓					✓				✓			✓			
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road	✓	✓	✓	✓					✓				✓			✓			
18	Shafter-Wasco/Semitropic Interconnection on Madera Avenue	✓	✓	✓	✓					✓				✓			✓			
19	South Inter-connection between North Kern/Shafter-Wasco	✓	✓	✓	✓					✓				✓			✓			
Non-Structural Projects																				
20	Energy Usage			✓	✓															
21	Joint Powers Authority	✓	✓	✓	✓	✓			✓	✓				✓						
22	Institutional Agreements and Governance for IRWMP Implementation	✓	✓	✓	✓	✓	✓	✓	✓	✓										
23	G-W Banking for Parties Outside of Poso Creek IRWMP Region	✓	✓	✓	✓	✓														
24	Optimize the Region's Pumping Lifts	✓	✓	✓																
25	Enhance Groundwater Monitoring and/or Modeling	✓																		
Enhance Environmental Resources																				
26	Wildlife Improvement Projects in IRWMP Region						✓	✓												✓
27	Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region						✓	✓												✓
Enhance Flood Control																				
28	Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek		✓	✓		✓			✓		✓	✓		✓			✓		✓	
Assist Economically Disadvantaged Communities																				
29	Enhance Water Supply and Treatment Facilities															✓				

* Pursuant to CWC Sections 79562.5 and 79564, these water management strategies must be considered to meet the minimum IRWMP Standards

Table 6-9 Projects Consistency with Resource Management Strategies from the California Water Plan Update 2005

Project ID	Project Name	Agricultural Lands Stewardship	Agricultural Water Use Efficiency	Conjunctive Management and Groundwater Storage	Conveyance	Desalination	Drinking Water Treatment and Distribution	Economic Incentives (Loans, Grants, and Water Pricing)	Ecosystem Restoration	Floodplain Management	Groundwater Remediation/Aquifer Remediation	Matching Water Quality to Water Use	Pollution Prevention	Precipitation Enhancement	Recharge Areas Protection	Recycled Municipal Water	Surface Storage - CALFED	Surface Storage - Regional/Local	System Reoperation	Urban Land Use Management	Urban Water Use Efficiency	Water - Dependent Recreation	Watershed Management	Water Transfers	Other Resource Management Strategies
Structural Projects to Increase Water Supply Reliability																									
Expand In-Lieu Service Areas																									
1	Connect Friant-Kern Canal Turnout to Cawelo's North System		✓	✓																					
2	Ninth Avenue Pipeline		✓	✓																					
3a	Stored Water Recovery Unit (SWRU) In-Lieu Service Areas		✓	✓																					
3b	Expand P-1030 In-Lieu Service Area		✓	✓																					
3c	P-565 New In-Lieu Service Area		✓	✓																					
Expand Direct Recharge																									
4	G-W Banking North of DEID with Pixley ID		✓	✓																					
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities		✓	✓																					
6	Pond Poso Spreading Grounds		✓	✓																					
7	Rag Gulch G-W Banking Project		✓	✓																					
8	White River G-W Banking for DEID		✓	✓																					
9	White River G-W Banking in Rag Gulch		✓	✓																					
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity																									
10	Calloway Canal Improvements		✓	✓	✓																				
11	Calloway Canal to Cross Valley Canal Interconnection		✓	✓	✓														✓						
12	Calloway Canal to Lerdo Interconnection		✓	✓	✓														✓						
13	Multi-District Conveyance Facility		✓	✓	✓							✓							✓						
14	North Inter-connection between North Kern/Shafter-Wasco		✓	✓	✓																				
15	Pilot Arsenic Treatment Plant		✓	✓	✓							✓													
16	Reverse Flow in the Friant-Kern Canal		✓	✓	✓														✓						
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road		✓	✓	✓																				
18	Shafter-Wasco/Semitropic Interconnection on Madera Avenue		✓	✓	✓																				
19	South Inter-connection between North Kern/Shafter-Wasco		✓	✓	✓																				
Non-Structural Projects																									
20	Energy Usage																								✓
21	Joint Powers Authority		✓	✓	✓														✓						✓
22	Institutional Agreements and Governance for IRWMP Implementation		✓	✓	✓																				
23	G-W Banking for Parties Outside of Poso Creek IRWMP Region		✓	✓	✓																				
24	Optimize the Region's Pumping Lifts		✓	✓																					
25	Enhance Groundwater Monitoring and/or Modeling			✓																					✓
Enhance Environmental Resources																									
26	Wildlife Improvement Projects in IRWMP Region								✓																
27	Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region								✓										✓						
Enhance Flood Control																									
28	Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek			✓						✓													✓		
Assist Economically Disadvantaged Communities																									
29	Enhance Water Supply and Treatment Facilities						✓																		

6.3 Overview of Water Management Strategies and Challenges

This section summarizes existing and on-going activities that relate to the water management strategies considered for the Poso Creek IRWMP Region. A variety of water management strategies were considered to address the regional planning objectives of the Poso Creek IRWMP. This discussion is intended to inform the Poso Creek member agencies, and other water resource agencies, of on-going regional measures that are being supported by these agencies and helped focus the planning, prioritization, and funding recommendations leading into the implementation phase of this integrated regional planning effort.

Some water management strategies, such as "groundwater management" and "conjunctive use" have been combined into one discussion because of their similarity with respect to this IRWMP. Others, such as "water supply reliability" are included in this IRWMP as an objective rather than a "strategy" because many of the strategies discussed below support improving water supply reliability. Lastly, some strategies, such as "water conservation" are incorporated into strategies relevant to existing efforts in the Region. In this case, the term "system improvement" is used to reinforce potential water district facility or operational improvements that could be implemented to improve overall water management flexibility.

In support of these various strategies, a number of water management structural and non-structural projects are proposed for implementation for this Poso Creek IRWMP Region that are expected to enhance the management of the Region's surface water and groundwater resources. These plans, investigations, or projects generally span several water management strategies and, in many cases, represented an initial stage of exploration and coordination that the RMG considered when formulating the plan.

6.3.1 Groundwater Management

Importance and Challenges

Groundwater is a valuable local water resource. Its resistance to varying hydrologic conditions, in comparison to surface water, provides supply reliability benefits, particularly in dry years. In addition, effective groundwater management can provide water quality benefits by allowing the flexibility to preserve the highest quality supplies for the highest beneficial use.

Challenges and/or needs are - (1) inventory and maintain a working knowledge base on groundwater resources and identify critical information gaps; (2) continue to contribute to the data gathering and investigations to build a credible body of knowledge about the Region's groundwater resources; (3) support the preparation and distribution of factual information to ensure that the public has an opportunity to become better informed about the importance of

their groundwater resource; and (4) identify policy issues that need to be considered by or recommended to the respective member agencies.

Existing Planning Efforts

A central part of the IRWMP is to preserve the Region's groundwater resources for the long-term viability of the Region's economic prosperity and environmental well-being. All of the RMG members have adopted or are in the process of adopting groundwater management plans in accordance with SB 1672 and SB1938. As such, the plan includes components of AB 3030 and SB 1938 (California Water Code Section 10540 *et seq*.).

This IRWMP intends to build on the existing monitoring network in the Poso Creek IRWMP Region. Groundwater monitoring is an integral part of this program for the Region to ensure the proper management and protection of the resource. The following objectives in the context of groundwater monitoring are currently being practiced - (1) promotion of joint development and operation of facilities for the benefit of the Region; (2) encouraging cooperation among the member agencies by providing a common data pool for analysis and decision-making; and (3) monitor and assess data collection, storage, and analysis capabilities.

6.3.2 Water Supply Reliability

Importance and Challenges

Strategies that contribute to improved water supply reliability, a stated goal of the CALFED Bay-Delta Program, the Integrated Regional Water Management grant program, and this IRWMP for Poso Creek, are an important consideration given the various challenges faced by the member agencies of the Poso Creek IRWMP Region, such as the following:

- **Reductions and changes to baseline supplies -** A variety of external constraints will reduce and change the timing of existing supplies currently used in the Poso Creek IRWMP Region. These include, but are not limited to, regulatory constraints on Delta exports, reductions in local surface water to recharge the groundwater aquifer, and timing of water delivering from the Friant-Kern Canal due to meeting the needs of the San Joaquin River Settlement.

- **Increasing demands -** The Poso Creek IRWMP Region is experiencing some increase in its municipal water demands but communities throughout California continue to offset some of this gain in per capita water use through conservation programs.

- **Hydrologic vulnerability -** The reliability of Poso Creek IRWMP Region water supplies vary significantly with hydrologic conditions. Some sources of supply to the

Poso Creek IRWMP Region are severely limited in dry years, leaving the Region vulnerable to future drought periods.

- **Infrastructure Constraints -** Water infrastructure in the Poso Creek IRMWP Region limits the ability of member agencies to exchange water when it is available in order to increase overall water supply.

Existing Planning Efforts

Poso Creek IRWMP member agencies are evaluating innovative ways of ensuring safe, reliable supplies to meet today's needs as well as the long-term future needs. The intent of the water supply reliability objective is to meet annual-average and critical-period regional demands, minimize localized shortages, improve system flexibility, and identify operational modifications that can help maintain water supplies in the Region at the current level. This IRWMP is intended to help ensure that an adequate water supply is maintained and improved to meet current and future local and regional water needs.

6.3.3 Conjunctive Use Management of Surface Water and Groundwater

Importance and Challenges

Conjunctive use management is the coordinated operation of surface water storage and use, groundwater storage and use, and conveyance facilities to meet water management objectives. Although surface water and groundwater are sometimes considered to be separate resources, they are connected by the hydrologic cycle. Conjunctive use management allows surface water and groundwater to be managed in an efficient manner by taking advantage of the ability of surface storage to capture and temporarily store storm water and the ability of aquifers to serve as long-term storage.

Needs for additional Region-wide conjunctive use practices in the Poso Creek IRWMP Region include - (1) enhance Region-wide importation of water into the area over the long-term to maintain water levels and mitigate times of shortage; (2) maintain Region-wide grower costs at a level commensurate with the agricultural economy; (3) provide Region-wide reliable and flexible service to water users; (4) protect Region-wide water quality; (5) develop a non-project water supply; and (6) alleviate constraints in existing water delivery systems.

Existing Planning Efforts

All member agencies of the Poso Creek IRWMP Region are currently implementing conjunctive use projects and programs. These include the following:

- Semitropic has a conjunctive use plan that has clearly arrested the long-term decline in groundwater levels in its service area;
- Semitropic has stored about one million acre-feet of water in the groundwater basin for its banking partners;
- Shafter-Wasco Irrigation District has a conjunctive use plan to monitor groundwater levels, monitor water quality and use surface water for in-lieu groundwater pumping;
- North Kern Water Storage District has a groundwater management plan to maximize the utility of its groundwater resource through conjunctive use;
- Kern-Tulare and Rag Gulch have implemented a groundwater management plan to arrest the decline of groundwater levels by providing a supplemental surface water supply to reduce groundwater pumping;
- Cawelo Water District has implemented an in-lieu Water Banking Program and added a direct recharge facility; and
- Delano-Earlimart Irrigation District has initiated a conjunctive use water exchange program that allows use of neighboring districts groundwater banking facilities.

6.3.4 Water Transfers/Exchanges

Importance and Challenges

A water transfer is defined in the Water Code as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer or exchange of water or water rights. Many transfers, such as those among contractors of the State Water Project or Central Valley Project, do not fit this definition. A more general definition is that water transfers are a voluntary change in the way water is usually distributed among water users in response to water scarcity. Transfers can be from one party with extra water in one year to another who is water-short that year.

Existing Planning Efforts and Challenges

Numerous water transfers and exchange agreements are in-place in the Poso Creek IRWMP Region that have been developed to facilitate water deliveries and to optimize the management of water resources.

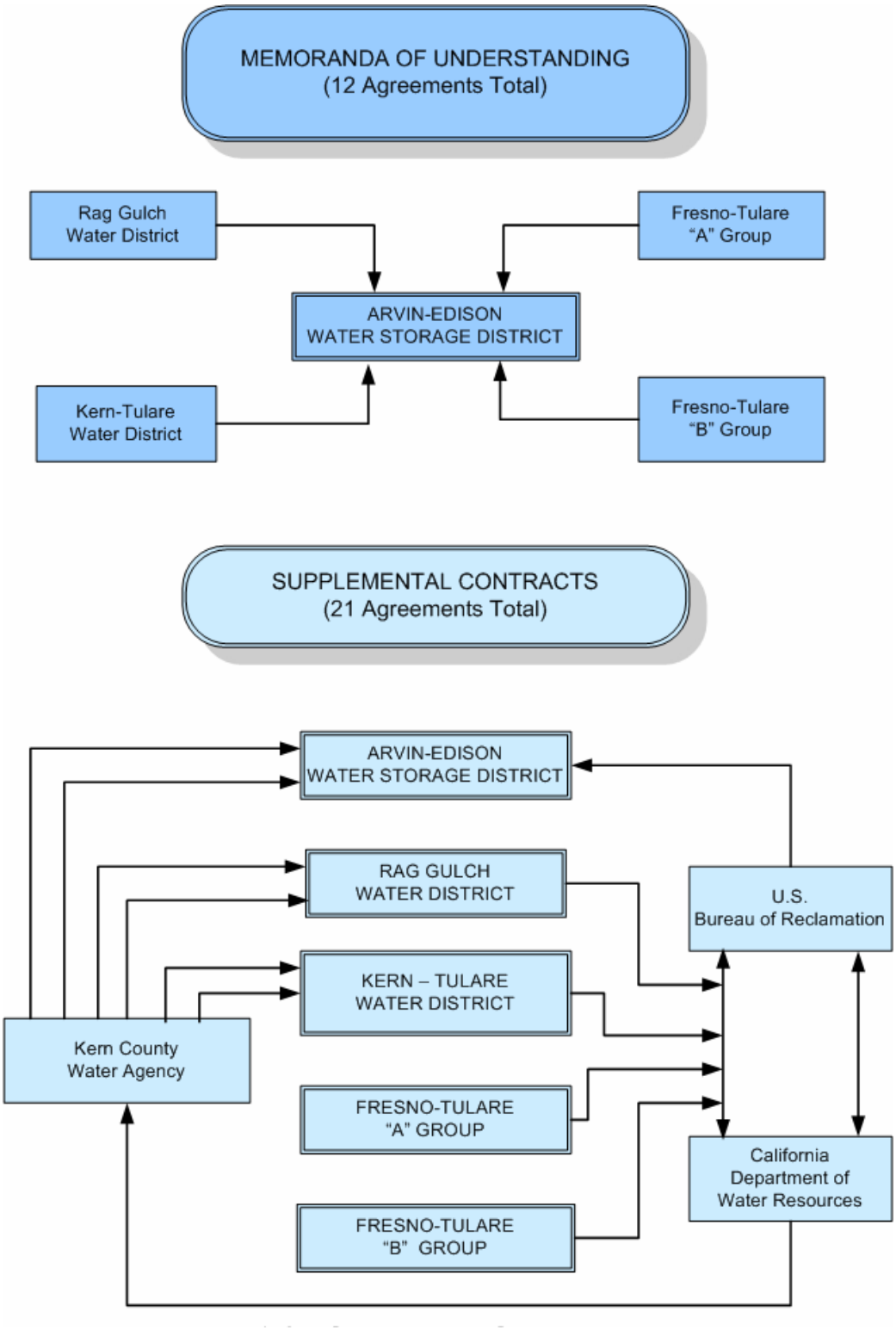
The RMG will continue to form exchange agreements between member districts as part of the conjunctive use management of supplies. Some of these transfers and agreements involve entities who are member agencies of the Poso Creek IRWMP RMG with entities outside the RMG. For example, in order to address declining water levels and potential water quality issues with its groundwater basin, Arvin-Edison entered into agreements to exchange water.

In 1974, Arvin-Edison entered into agreements with northerly entities in Fresno, Tulare and Kern Counties, providing for an exchange of a portion of the Arvin-Edison's supply from the

federal Friant-Kern Canal for a supply of CVP water pumped from the Delta through the California Aqueduct and then through the Cross Valley Canal to a point of delivery at Arvin-Edison's Intake Canal. These ten entities each executed separate contracts for CVP water with the United States and participation agreements with several other public entities to provide for the funding and construction of the Cross Valley Canal. A separate wheeling agreement was executed between the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (USBR) for use of the California Aqueduct. In all, 33 separate agreements were required to effect the change.

The contractual relationship between the 14 entities involved in the exchange is shown in Figure 6-3. Implementation of strategies under the Poso Creek IRWMP may require additional water exchange agreements among not only member agencies but also other local, state and federal agencies.

A proposed water exchange with Semitropic for 2007 was noted in the meeting minutes of the regular Board of Directors meeting of the Wheeler Ridge-Maricopa Water Storage District dated February 14, 2007. The meeting minutes noted that if Semitropic has access to Central Valley Project water via exchange with CVP contractors, and the quantity available is more than it can use in-District, it would likely bank the water on the Kern Water Bank. However, other Water Bank participants including the District are water short, and could take the water through the Kern Water Bank Canal into the California Aqueduct and thence for in-District deliveries. Semitropic is willing to deliver this water in this fashion in-lieu of direct recharge on the Water Bank, and accept banked water from the District in-lieu of banked water recovery for the District planned for later in the year. On a share the savings approach, the District would then pay to Semitropic (a) ½ the avoided pumping recovery charge (1/2 of $60 per acre-foot, or $30 per acre-foot), and (b) one acre-foot from the District's bank account for every acre-foot delivered. Bureau of Reclamation staff have indicated support for this idea due to this similarity to operational exchanges made in San Luis Reservoir.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Cross Valley Canal Exchange Agreements	
Poso Creek Regional Management Group		June 2007	Figure 6-3

6.3.5 Water Quality Protection and Improvement

Importance and Challenges

Protecting water quality of both surface and groundwater, are important elements of the Poso Creek IRWMP Region's overall water management approach. Water quality must be protected throughout all stages of its use cycle. First, water protection must start at the source, whether that is a remote watershed of the Kern River drainage or a smaller watershed such as Poso Creek or a groundwater basin. Protecting and restoring the ecosystems of receiving water will also enhance water quality since water quality is not only a function of the pollutants in the water body, but also of the ability of that water body to sustain aquatic life across the food web.

Existing Planning Efforts

As one of Poso Creek IRWMP regional objectives, water quality protection and improvement is essential to the success of the IRWMP's overall vision. Member agencies of the Poso Creek IRWMP are currently implementing a variety of programs to achieve this goal.

A couple of significant efforts are underway in the Region to identify and address water quality issues, they include:

- **Agricultural return flows -** Agricultural return flow from irrigation is minimized in the Poso Creek IRWMP Region due to irrigation system improvements including conversion to drip systems that promote agricultural water conservation. Most of the Poso Creek IRWMP Region does not return flows to streams and rivers and, therefore, have little affect on surface water quality;

- **Groundwater monitoring -** Groundwater monitoring and assessment is being performed by the members of the Poso Creek IRWMP who are also members of the Semitropic Monitoring Committee. As part of this plan's implementation, projects that have a water quality component will consider one similar to Semitropic's; and

- **Aqueduct Pump-In Proposal -** Semitropic Water Storage District has a component of the Kern County Water Agency aqueduct pump-in proposal to evaluate water quality pump-in criteria for returning stored water to the California Aqueduct.

6.3.6 Ecosystem Restoration

Importance and Challenges

Ecosystem restoration seeks to repair past damage to ecosystem processes and functions. Enabling the return of the physical and biological processes that shape the landscape can be instrumental in restoring wetlands, riparian habitat conditions, and native fish and wildlife populations. Ecosystem restoration integrates a large-scale perspective that may improve water quality and quantity for wildlife, aquatic species, and human consumption.

Existing Planning Efforts

Ecosystem restoration is a water management strategy that member agencies are aware of and to which they make a concerted effort to restoring the ecosystem. Following is a few selected examples of existing ecosystem restoration projects:

- Bank stabilization, which prevents erosion and incision in the stream channel and thereby protects channel complexity;
- Riparian planting, which supplies breeding and foraging habitats for species; and
- Hydrologic improvements, which may include channel widening, levee breaching, and construction of in-channel detention basin.

Example of Semitropic's Ecosystem Restoration Project

6.3.7 Environmental and Habitat Protection and Improvement

Importance and Challenges

Tule Elk Reserve is a 950-acre habitat located outside of the Poso Creek IRWMP boundary; south of Semitropic near the confluence of the California Aqueduct and the Cross Valley Canal.

Habitat protection and improvement projects seek to preserve and restore important habitat areas for wildlife populations. Protection of wetland and riparian habitat in particular offer several benefits to supplying breeding and foraging habitats for resident and migrating birds, amphibians, snakes, small mammals, coyote, and deer within the region. Wetlands and riparian vegetation also contribute to protection of water supplies and water quality, improvement of hydrologic function, and mitigation of flooding risks. Maintenance of a wide stream buffer and active floodplains allow natural water resources functions to occur in balance with wildlife habitat.

Existing Planning Efforts

In order to consolidate various activities, such as securing water supplies for duck clubs, the Semitropic Board of Directors in 2004 approved the formation of the Semitropic Wildlife Improvement District, which is intended to exclusively serve the needs of wildlife interests. This will provide a focal point and a means to accomplish common wildlife improvement objectives. It also provides the benefits of using a public agency in securing funds, construction of facilities and project management that individual or private entities, such as duck clubs, find hard to do individually.

In addition, Semitropic has acquired approximately 4,000 acres of prime habitat land in the northwest part of the district for preservation and groundwater storage purposes. The district has proposed and submitted its own Habitat Conservation Plan, which proposes to dedicate most of this land to permanent habitat. Mitigation credits will be sold to accomplish this goal. There is also an area of about 34,000 acres of undeveloped land in the northwest part of the district that is considered prime uplands habitat.

6.3.8 Flood Management

Importance and Challenges

Flood management projects protect communities and properties from flood hazards through improved conveyance, detention, and retention techniques. Effective watershed management approaches can additionally seek runoff reduction through source area control, improved filtration, and use of naturally existing surface detention features to reduce or delay peak flows. Careful flood management can provide opportunities for ecosystem and environmental habitat protection, restoration, and enhancement.

Existing Planning Efforts

Major flood and/or stormwater management activities are currently underway to improve flood protection in many critical areas across the region. The most significant of these efforts is flood control of the Kern River through storage in Lake Isabella. Given recent disasters in other portions of the country, significant flood-related damage over the last decade throughout the region, and concerns related to climate change and the potential for greater flood risk, flood management is a priority issue for much of California. Managing flooding is vital for protecting private property and public facilities, and is often an element of surface water storage projects. At this time, a planning study of a flood management project is being considered for the Poso Creek drainage, which is under the flood management strategy.

Isabella Dam, a flood control facility on the Kern River.

6.3.9 Imported Water

Importance and Challenges

Most of the Poso Creek member agencies rely upon imported water from the federal Central Valley Project (CVP) through water deliveries by the Friant-Kern Canal and from the State Water Project (SWP) through the California Aqueduct. Because imported water constitutes such a critical component of the agencies' baseline supplies, significant resources are invested to protect and ensure the continued delivery and viability of imported supplies.

Challenges to imported water include:

- Reliability of water supply;
- Local infrastructure to facilitate exchanges; and
- Additional recharge ponds to capture excess water.

These challenges are being addressed through additional facilities that are being recommended as part of the Poso Creek IRWMP.

Existing Planning Efforts

Agencies currently using imported water as part of their water supplies are identified in the following list:

Agency	Imported Water Type
Cawelo Water District	SWP
Delano-Earlimart Irrigation District	CVP
Kern-Tulare Water District	CVP
North Kern Water Storage District	Kern River
Rag Gulch Water District	CVP
Semitropic Water Storage District	SWP
Shafter-Wasco Irrigation District	CVP

6.3.10 Land Use Planning

Importance and Challenges

Land use planning is an important tool to influence land development to promote economic health while ensuring adequate and reliable water supplies. Land use policy and planning is one of the most effective methods of reducing hydrologic and ecologic impacts associated with detrimental changes to land cover. Land use planning can improve the siting of potential developments to reduce harmful impacts. Planning projects can restore floodplain connectivity, protect stream buffers, reduce urban stormwater pollution, and enhance habitats. Land use policies and ordinances can also reduce flood hazards and damages, as well as result in water conservation as human use and irrigation demands are reduced. Land use planning and policy activities may include the following actions:

- Development of water and/or watershed elements for local city or county general plan updates;
- Adoption of policies linking land use, water demands, and watershed protection;
- Development of creek setback ordinances to protect riparian corridors for wildlife habitat and flood protection; and
- Development of stream corridor enhancement measures for use during recreation and trails design discharge rate, volume, and pollutant loadings to receiving waters.

Existing Planning Efforts

Every municipality throughout the Poso Creek IRWMP Region is currently employing the strategy of land use planning. A few examples of land use planning projects and programs being implemented throughout the Region are listed below:

- Most land use planning activities are outside the boundary of the Poso Creek IRWMP Region since the Region consists of predominantly agriculture land use; and
- In the event of land use changing from agriculture to urban, conflict on water right issues has emerged.

6.3.11 Non-Point Source (NPS) Pollution Control

Importance and Challenges

Pollution reduction and management projects seek to improve runoff water quality for both human and environmental uses. NPS pollution control programs generally strive to protect and restore water resources by reducing the pollutant deliveries to those resources. NPS pollution control programs provide source water quality benefits, ecosystem and environmental habitat protection, and public health and safety benefits, for beneficial use through implementation of total maximum daily loads (TMDLs). In urbanized areas, Best Management Practices (BMPs) can be implemented to address a range of water quantity and quality considerations. Poso Creek member agencies recognize the importance of NPS pollution control through TMDLs and BMPs in an overall water management approach. Nevertheless, fewer NPS pollution control issues exist with the Poso Creek IRWMP Region.

Existing Planning Efforts

The Poso Creek IRWMP Region is reacting to affects on their imported water supply based on the NPS Pollution Control projects and programs currently underway in other areas of the state of California. It is anticipated that the Poso Creek IRWMP Region will not need NPS Pollution Control measures within their region.

6.3.12 Recreation and Public Access

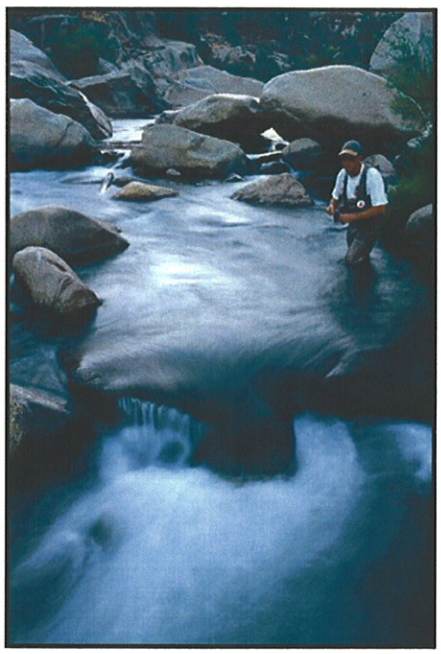
Importance and Challenges

Construction and maintenance of trails and other public access points along water bodies can increase social investment in protection of those water resources. Interpretive signage and trails along water bodies and watershed lands provide the opportunity to educate people about water resources and management needs. Recreation and public access projects include extension or completion of trails along stream channels, surrounding ponds and wetlands, and providing connections to adjacent uplands areas.

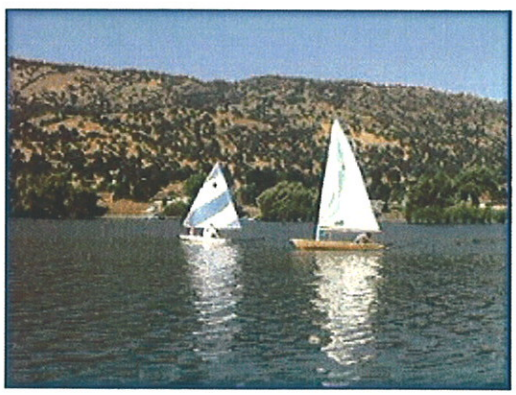
Existing Planning Efforts

Most major recreation facilities in the region are operated and managed by state and federal agencies, and are not under the jurisdiction of the participants in this planning process. Local agencies in the region, however, are working to improve recreational facilities and to provide better public access where possible. Potential management changes that potentially impact recreational opportunities along the Kern River are a concern of the Poso Creek IRWMP members, but, not a priority for it when competing for limited funding.

A few selected examples of current recreation and public access in the Poso Creek IRWMP Region are shown in the photos.



Fishing on the Kern River



Boating on Lake Isabella

6.3.13 Storm Water Capture and Management

Importance and Challenges

Storm water capture and management is important to protecting source water quality and public health as well as maintaining flood protection. Storm water capture and management also creates opportunities for ecosystem protection and restoration. Detention and filtration of stormwater runoff through riparian zones and wetlands can significantly improve surface water quality and watershed health. Most of the major challenges and issues faced by water management agencies relating to storm water capture and management are not in the Poso Creek IRWMP Region since they relate to urbanized areas.

Existing Planning Efforts

Although storm water capture and management is largely associated with urban areas, the Poso Creek IRWMP Region is currently engaging in such a practice. Storm water capture from Poso Creek is managed by Cawelo, North Kern and Semitropic. Each of these Districts have developed facilities that diverts storm water from Poso Creek to either percolate the water using recharge ponds or to direct use as in-lieu recharge.

6.3.14 Surface Water

Importance and Challenges

Surface water continues to be an important component of water supply reliability. Surface storage is the use of reservoirs to collect water for later release and use. Surface storage has played an important role in Kern County where the pattern and timing of water use does not usually match the natural runoff pattern. Most Poso Creek IRWMP member agencies rely on surface storage as part of their water supply. Similarly, surface storage is often necessary for, or can increase, benefits from other water management activities such as water transfers, conjunctive management and conveyance improvements.

Existing Planning Efforts

The water entities of Kern County achieve a high degree of utilization of their available water supplies. Surface water sources include – Kern River, Poso Creek and imports from the CVP and the SWP.

Kern River - Kern River runoff varies widely from year to year, the maximum annual recorded amount having been some 2.3 million acre-feet in 1969 (about 320 percent of the long-term average). The Kern River is regulated by storage in Isabella Dam and Reservoir.

Poso Creek - Poso Creek originates to the east of the Poso Creek IRWMP Region with its headwaters in the Greenhorn Mountains. Only during times of relatively higher runoff does Poso Creek flow within the Poso Creek IRWMP's boundaries. North Kern's use of this source of supply has varied annually from zero to 28,000 acre-feet.

Central Valley Project – An approximate volume of 420,000 acre-feet per year of surface water is delivered to Kern County through the Friant-Kern Canal, a feature of the U.S. Bureau of Reclamation's (USBR) Central Valley Project.

State Water Project - The California Aqueduct is the major conveyance feature of the State Water Project. It diverts water from the Delta near Sacramento and after crossing the Tehachapi Mountains, splits into two branches with one terminus in Riverside County and the other terminus in Los Angeles County near Castaic. About 1,000,000 acre-feet per year is delivered to water users in Kern County by the California Aqueduct.

6.3.15 Water and Wastewater Treatment

Importance and Challenges

Cities, towns, small to large municipalities, and facilities that process agriculture commodities have existing wastewater and water treatment plants. Depending on the size and funding capability of a given entity, facility improvements and/or expansions can be difficult to fund, such is the case for the disadvantaged communities in the Region. Maintenance of existing facilities in response to growth will be an important factor in ensuring regional water quality in the Region.

Existing Planning Efforts

Water and wastewater facility operators in the Poso Creek IRWMP Region ensure that high quality water is provided to protect the quality of receiving ground waters. Water and wastewater treatment as a water management strategy will continue to be practiced within the Poso Creek IRWMP Region, by the cities, facilities that process agriculture commodities, and numerous dairies. This IRWMP considers this strategy to be integrated in as practicable, for the predominately agricultural Region.

6.3.16 Water Conservation

Importance and Challenges

For this IRWMP, the system improvement strategy refers to potential projects or operational changes that will improve water management at the district or farm level, and measures that can be taken related to urban use. System improvement projects include canal lining, installation of facilities to reduce operational spills, or changes in management that can result in decreased applied water for irrigation or additional reuse of water. Common elements among these strategies include:

- They are locally formulated;
- They provide local/district-wide water supply reliability;
- They improve water system operation at the district level;
- They generally provide water quality benefits; and
- They enhance district water system flexibility and system operations.

Existing Planning Efforts

The majority of the water conservation planning effort within the Poso Creek IRWMP Region is coordinated through the North West Kern Resource Conservation District (NWKRCD) with some districts making use of the resources of Cal Poly, San Luis Obispo's Irrigation Training and Research Center. A description of the NWKRCD, their general information and activities are provided in their annual report. Annual reports are available upon request of the NWKRCD, 500 California Avenue, Suite #100, Bakersfield, CA 93309. The purpose and long-range goals and objectives of the NWKRCD are stated in the long range plan. Briefly, NWKRCD was established to enable local people to have an organized means to carry out programs for the conservation of soil and water; to prevent soil erosion, to control floodwaters and sediment damages; and to help farmers, ranchers and others to make the best use of their natural resources.

Water conservation programs being implemented throughout the Poso Creek IRWMP Region include the following:

- Metering;
- Public information programs;
- Water conservation coordinators;
- Conservation pricing;
- Residential Water Savings Plumbing codes; and
- Commercial, Industrial, Institutional Programs

6.3.17 Water Recycling

Importance and Challenges

Poso Creek IRWMP member agencies recognize the multiple benefits provided by use of recycled water. However, given the primarily agricultural nature of the planning area, limited opportunity exists for recycled water.

However, recycled water where opportunities exist provides the following benefits:

- Provides a reliable, drought-proof supply;
- Reduces dependence on imported supplies;
- Enables high quality potable supplies to be applied to their highest and best use;
- Local supply would be under local control;
- Can provide a water supply to marshland habitats; and
- Reduces wastewater discharges

Opportunities for water recycling can contribute to ecosystem management and can contribute to an improved water balance. Use of recycled water supplies can help maintain flow conditions in wetlands and habitat areas during dry spells.

Existing Planning Efforts

Water recycling within the Region includes both M&I wastewater effluent and water used to create waterfowl habitat in the Kern National Wildlife Refuge. Some water recycling occurs in urban areas of the Poso Creek IRWMP Region include the towns of McFarland, Shafter, and Wasco. To the extent that wastewater is collected and treated by the communities located within the Region, the treated effluent is typically used to grow crops in the Region. Over the last 15 years, the annual volume of wastewater effluent has ranged from 5,000 to 10,000 acre-feet. A moderate growth rate is anticipated which will involve some industrial and residential areas. However, it is anticipated that these efforts will have a minor effect in the overall groundwater balance for the Region because of the difference in the scale of water use for agriculture and urban within this Poso Creek IRWMP boundary is large.

Some of the water which is used to create waterfowl habitat in the fall and winter is released in the spring as ponds are drawn down. The released water, which can range from 500 to 2,000 acre-feet annually, is used to irrigate crops in the area. Related to the ongoing and future efforts, the NWKRCD coordinates with the Natural Resources Conservation Service in review of Draft Environmental Impact Reports (EIRs) and in developing plans for sewage disposal and agricultural waste disposal within the Region.

The Kern River oilfield, located adjacent to the southeast boundary of the Poso Creek RMA, is currently one of the top three producing oilfields in Kern County. Water is produced as a

by-product of the production of oil. While some of this water is reintroduced in the form of steam to facilitate the production of oil, there remains a significant amount of water for other uses. North Kern and Cawelo have both been recipients of this oil-produced water, which with some treatment, has been delivered for irrigated agricultural uses.

6.3.18 Watershed Planning

Importance and Challenges

Watershed planning comprises an approach to protecting water quality and quantity that focuses on all factors within a hydrologically connected drainage basin. Because of its dual emphasis on uplands land management and water resources, watershed planning can significantly affect sediment and pollutant loading from stormwater runoff. Using a watershed approach is beneficial because it addresses problem-solving in a holistic manner with all appropriate stakeholders actively involved.

Watershed planning involves evaluation of existing watershed conditions, identification of issues and opportunities, and development of strategies, policies, and projects that contribute to healthy watershed functioning. Watershed planning contributes to coordinated protection, restoration, and improvement in hydrologic, geomorphic, and biologic function of the Kern River drainage basin.

Existing Planning Efforts

Within the Poso Creek IRWMP Region, the NWKRCD provides the function of watershed planning through technical assistance and information so that every acre of land within the District is treated according to its individual needs and capabilities. To meet this goal, the NWKRCD focuses on these objectives:

1. Continue to implement Irrigation Mobile Lab Program;
2. Reduce Soil Erosion on lands within the District;
3. Reduce Flood Damage in upstream areas;
4. Influence land use decisions with units of governments by responding to Consultation Notices;
5. Monitor Water Quality within the District;
6. Provide Technical Assistance to landowners, developers and Planners;
7. Provide follow-up assistance to Cooperators of the District; and
8. Encourage landowners to become Cooperators of the District.

The NWKRCD works with landowners through workshops and demonstration programs that deal with water conservation techniques on the farm and use of the mobile irrigation lab. These are key elements in NWKRCD's conservation strategies.

6.3.19 Wetlands Enhancement and Creation

Importance and Challenges

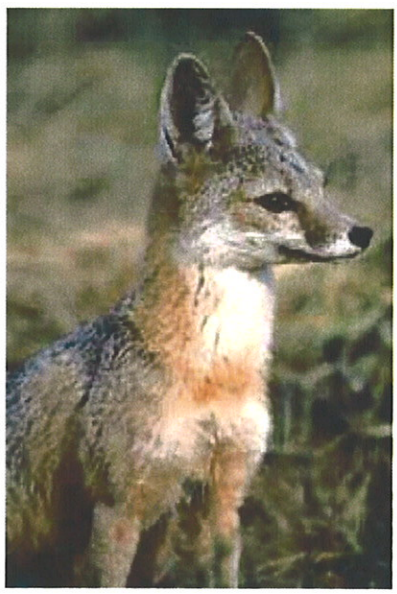
Wetlands are among the most productive wildlife habitats in the Poso Creek IRWMP Region. They provide food, cover, and water to a number of bird species, as well as numerous mammals, reptiles and amphibians. Many species rely on the freshwater wetlands for their entire life cycle. Creation and enhancement of streams, wetlands, and other habitat areas promote biodiversity, as well as contribute to a host of additional watershed services. In 1992, the Semitropic Board of Directors included a proposed multi-purpose environmental program in its project election process. Landowners overwhelmingly approved a multitude of programs, including the Goose Lake Wetland Improvement Project.

Existing Planning Efforts

At one time, Kern River tributary Jerry Slough and the bed of Goose Lake provided a wetlands environment that supported varied and diverse wildlife. These waterways, together with the original Kern River floodway and Poso Creek, pass through Semitropic Water Storage District (Semitropic)'s service area, making it vastly important for the District to take measures to sustain these precious wetland environments.

Due to this unique environment, there were once more than 50 privately owned duck clubs within Semitropic's service area, 21 of which are still active. In addition, the Federal Kern National Wildlife Refuge is located mostly within Semitropic's service area. The 6,389-acre refuge represents one of the few remaining examples of the grasslands, vernal pools, and playas that once bordered historic Tulare Lake. Over 100 bird and 6 reptile species use the refuge. Approximately 300 acres of managed wetlands provide habitat for migratory waterfowl and shorebirds.

Threatened and endangered species include the San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, and the vernal pool fairy shrimp.



Endangered San Joaquin Kit Fox (found in Kern National Wildlife Refuge)

7 Water Supply Operations Studies

The fundamental questions which are addressed in this section are …

- *How much of the surface water supplies which are projected to be available in the future can be "absorbed" under present conditions?*
- *How much of the surface water supplies which are projected to be available in the future cannot be "absorbed" under present conditions?*

7.1 Present Conditions

For purposes of this report, *present conditions* refer to the absorptive capability under the current physical and institutional setting. In this section, the surface water supplies which are projected to be available to the Region in the future (reference Section 4.3) are compared with the absorptive capacity under present conditions in order to answer the above-stated questions.

7.1.1 Approach

The hydrologic period extending from 1922 through 1994 was used as the period over which projected surface water supplies were evaluated against the absorptive capacity. Ultimately, the amount of surface water that can be absorbed (i.e., diverted and used) within a given district is a function of the available supply, conveyance capacity from the source of supply to the district, and internal absorptive capacity. The evaluation was conducted on a district-by-district basis, considered only the contract supplies available to that district, and followed these generalized steps:.

(1) On a monthly basis, consider the extent to which unregulated supplies available to a given district satisfy the irrigation absorptive capability of that district.

(2) On a monthly basis, consider the extent to which any remaining unregulated supplies can satisfy spreading absorptive capability (if any).

(3) On an annual basis, consider the extent to which regulated supplies available to a given district satisfy the remaining irrigation absorptive capability.

As a result of applying these tests, any remaining irrigation absorptive capacity, spreading absorptive capacity, regulated supplies, and unregulated supplies were quantified for each

district. In other words, absent other arrangements, these results reflect the best a given district could do with its own supplies and absorptive capacity.

7.1.2 Available Supplies

The surface water supplies projected to be available in the future were addressed in Section 4.3. Recall that these data reflect the availability at the source of supply and do not reflect conveyance constraints from the source of supply to a given district. Further, while the regulated supplies are district specific, the unregulated supplies are not. In particular, assumptions must be made with respect to how much of the system-wide unregulated supplies can be expected to be available to a given district. On the SWP, this refers to *Article 21 water*, and on the CVP-Friant side, this refers to *Other Friant water*. Certain assumptions in this regard were made and noted in Sections 4.3.5 and 4.3.7. These assumptions are believed to be conservative, i.e., if anything, the available supplies have been underestimated. The extent to which the monthly availability of *Article 21 water* and *Other Friant water* overlap or not is illustrated on Figure 7-1. It is noted that the second chart, which is in acre-feet, reflects the system-wide availability. Figure 7-2 illustrates the annual frequency of availability for each month, for each of these two sources of supply.

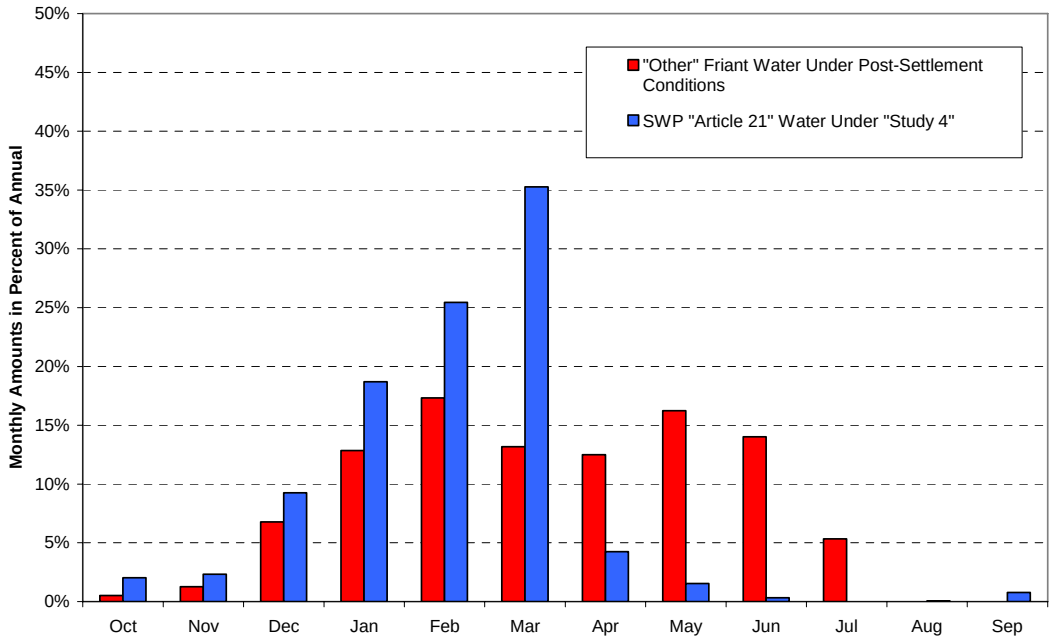
7.1.3 Conveyance Capacity

The two main conveyance features are the California Aqueduct and the Friant-Kern Canal. For purposes of this study, conveyance constraints were only considered with respect to the unregulated surface supplies.

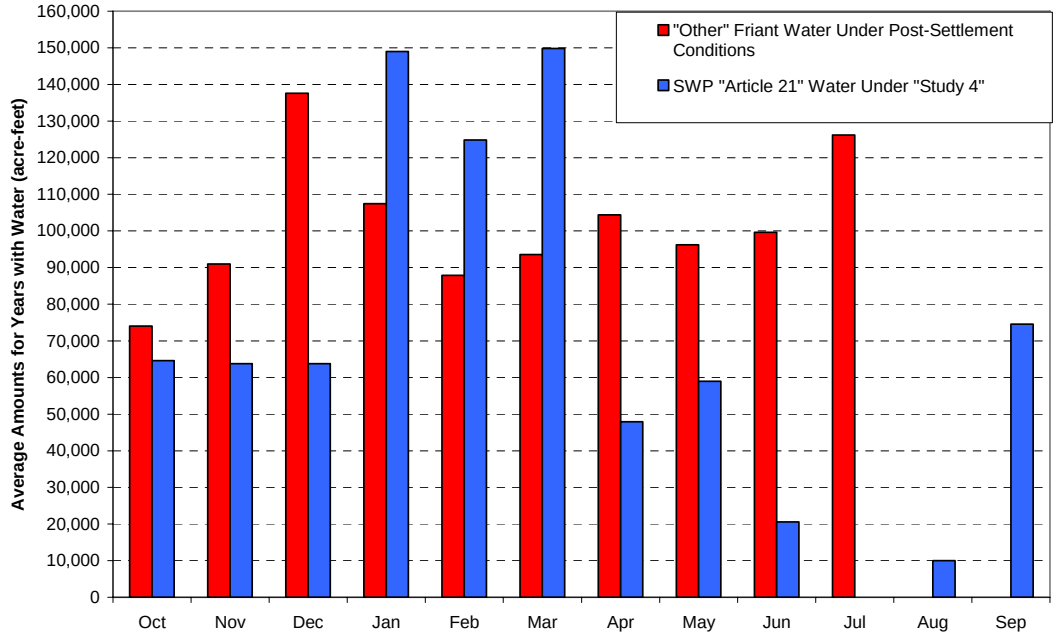
California Aqueduct - The projections of *Article 21* water include consideration of pumping capacity at the Banks Pumping Plant; accordingly, no further constraints were considered in conveying the water south in the California Aqueduct.

Friant-Kern Canal - The data respecting *Other* Friant water reflect the system-wide availability of this type of water at Friant Dam, i.e., the data do not reflect any conveyance constraints in the Friant-Kern Canal. Based on the knowledge and experience of the CVP-Friant contractors in the Poso Creek RMG, it was assumed that there would not be any capacity to convey *Other* Friant water to the Region during the months of May through August. This is a significant assumption inasmuch as the projections suggest that, depending on the hydrology of a given year, availability of this type of water can include the months of May, June, and July, or about one-third of the average annual availability. Further, given that the recent San Joaquin River settlement has yet to be implemented, the rules which will govern the sharing of Friant-Kern Canal capacity to move this water are uncertain at this time. With regard to the remaining months, September through April, it was assumed that conveyance capacity would not be a constraint. Sensitivity to this latter assumption was also tested.

Average Monthly Distribution of "Other" Friant Water Under Post-Settlement Conditions and SWP "Article 21" Water Under "Study 4"

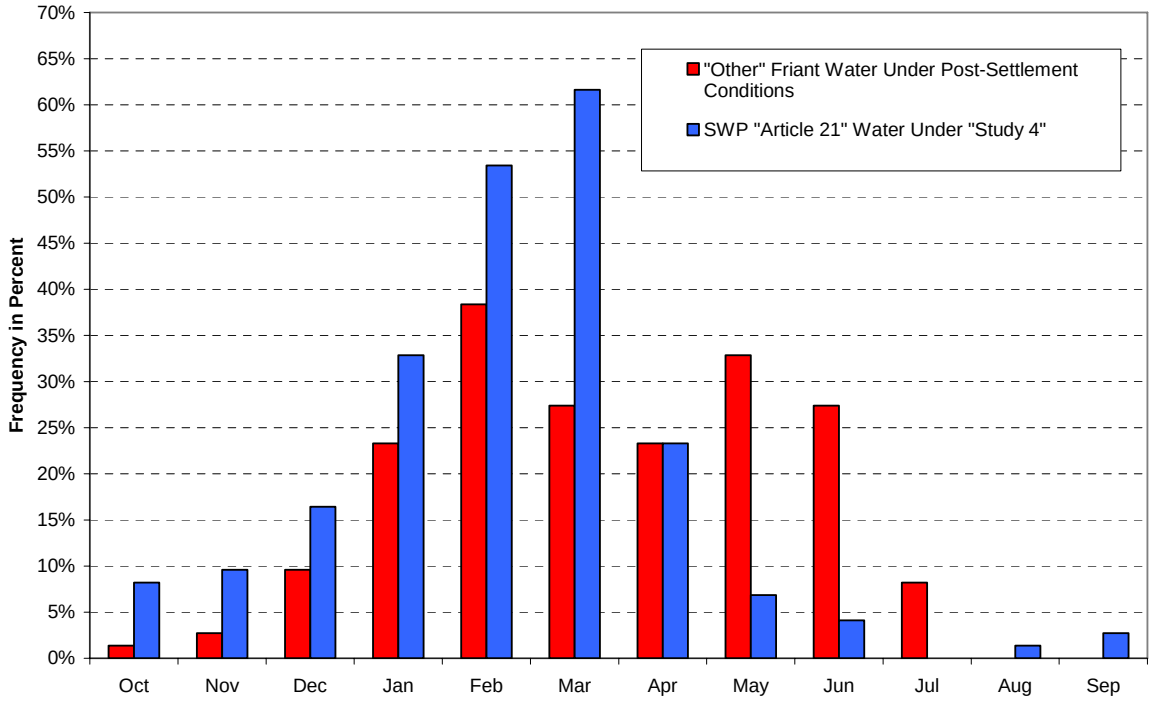


Average Monthly Distribution of "Other" Friant Water Under Post-Settlement Conditions and SWP "Article 21" Water Under "Study 4"



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Average Monthly Distribution of "Other" Friant Water Under Post-Settlement Conditions SWP "Article 21" Water Under "Study 4"
Poso Creek Regional Management Group		June 2007 Figure 7-1

Frequency of Years with "Other" Friant Water Under Post-Settlement Conditions or SWP "Article 21" Water Under "Study 4"



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Frequency of Years with "Other" Friant Water Under Post-Settlement Conditions or SWP "Article 21" Water Under "Study 4"	
Poso Creek Regional Management Group		June 2007	Figure 7-2

7.1.4 Absorptive Capacity

There are two components to absorptive capacity; there is an irrigation component and a spreading component. While the irrigation component is common to all districts in the Region, the spreading component is not. In particular, recall that North Kern and Cawelo are the only districts with significant spreading capability within the Region. Both of these components were addressed in Section 5.3. In particular, the spreading absorptive capacity for North Kern and Cawelo was taken at 20,000 and 2,500 acre-feet per month, respectively. These were reduced from the maximum amounts to be conservative and, in the case of Cawelo, to reflect the fact that there is no history of operations upon which to assess unused capacity, as there was in the case of North Kern. The annual irrigation absorptive capacities are summarized following in Table 7-1.

Table 7-1

Annual Absorptive Capabilities for Irrigation in the Region

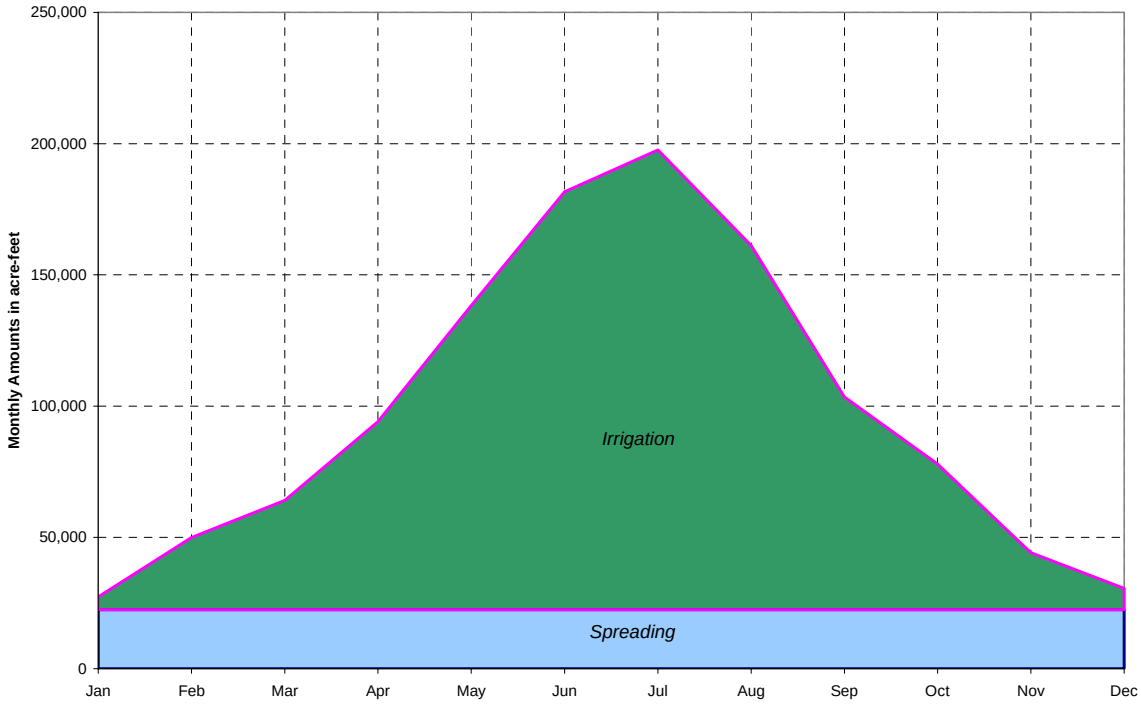
Cawelo	75,000	af
Delano-Earlimart	135,000	
Kern-Tulare & Rag Gulch	45,000	
North Kern	140,000	
Semitropic	310,000	
Shafter-Wasco	70,000	
Southern San Joaquin	125,000	
	900,000	af

The total absorptive capability for the Region is illustrated on a monthly basis for both irrigation and spreading on Figure 7-3. The bottom chart on Figure 7-3 provided an illustrative comparison of the irrigation absorptive capability under present conditions to the maximum potential capability, where the maximum assures that conveyance and distribution facilities existed to serve every irrigated acre in the Region.

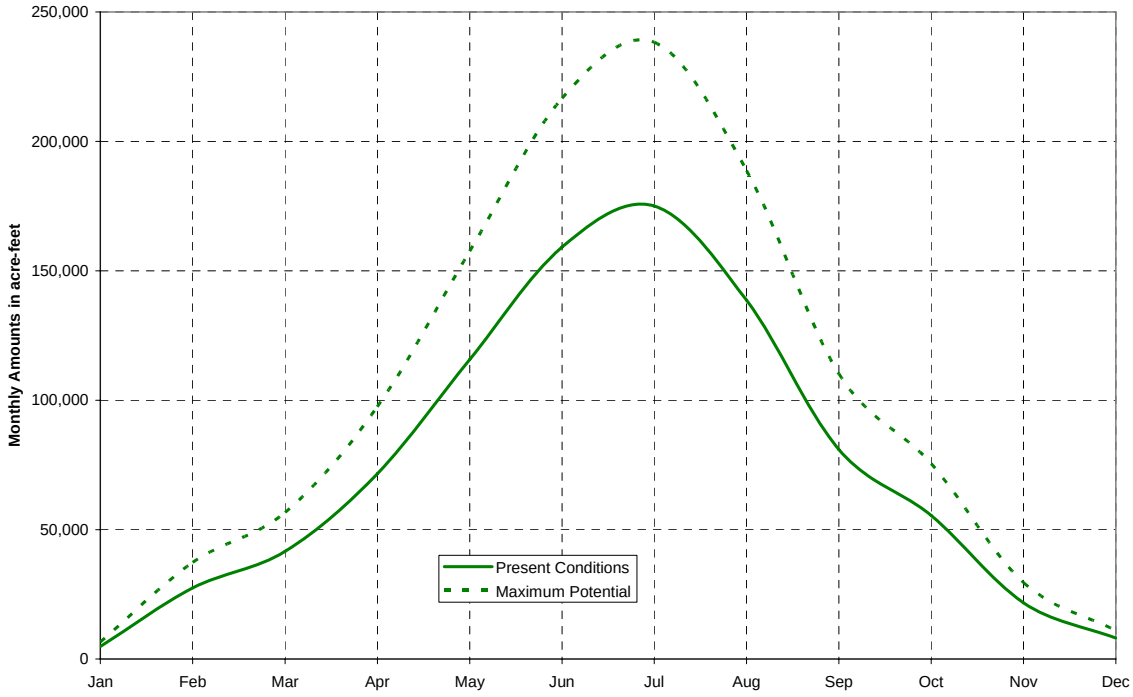
7.1.5 Projected Use of Available Surface Water Supplies

With regard to imported SWP and CVP-Friant water supplies, the projected average annual use within the Poso Creek Region was estimated to be reduced by about 70,000 acre-feet as compared to historical deliveries for the 1981-2005 period, with about one-half of the amount attributable to each of the two sources. In addition, it was assumed that the yield of the contracts for Kern River water with the City of Bakersfield would be reduced by one-half, or about 34,000 acre-feet. Accordingly, the total reduction in use of these sources of supply was estimated at about 105,000 acre-feet, which represents a 14 percent reduction in the total surface supplies to the Region.

Absorptive Capability for the Poso Creek RMA Under Present Conditions



Irrigation Absorptive Capability for the Poso Creek RMA Under Present Conditions Compared with the Maximum Potential Capability



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Absorptive Capability for the Poso Creek RMA	
Poso Creek Regional Management Group		June 2007	Figure 7-3

7.1.6 Unused Surface Water Supplies

After consideration of the available supplies, conveyance capacity, and absorptive capacity on a district-by-district basis, a portion of the available surface water supplies remains unused from time to time. The average annual amount that was available but remained unused was estimated at about 31,000 acre-feet over the 1922-1994 hydrologic period. This average principally consists of CVP-Friant water; about 8,000 acre-feet of *Other* Friant water that was constrained by conveyance in the Friant-Kern Canal; about 7,000 acre-feet of *Other* Friant water that was beyond the present absorptive capability; and about 14,000 acre-feet of *Class 1* and *Class 2* water that was also beyond the present absorptive capability. This water typically occurs in the wetter years.

7.1.7 Unused Absorptive Capacity

After considering the available surface water supplies on a district-by-district basis, there is unused absorptive capacity from time to time, including both irrigation and spreading. In particular, there is unused capacity at times when there are unused surface water supplies within the Region.

7.1.8 Sensitivity

These results are sensitive to a number of criteria and assumptions. One of the larger factors is the amount of unscheduled state and federal water that will be available to the Region, i.e., SWP *Article 21* water and CVP-Friant *Other* water. First, there is the estimate of the system-wide availability; then, the estimate of the amount available specifically to districts within the Poso Creek RMA. With regard to the latter, it is believed that the assumptions which are reflected in the results reported in Section 7.2 represent the minimum or worst-case bookend. In other words, it is believed to be likely that more water will be available to the RMA, owing to the inability of others (who have a right to a share of the water) to put the water to use when it is available. While the amount is speculative, the evaluation was repeated under the assumption that the amount of CVP-Friant *Other* water was doubled. This had little effect on the amount of water delivered; however, it increased the undelivered amount from about 21,000 acre-feet to 37,000 acre-feet per year.

7.1.9 Summary and Conclusions

When considered on a district-by-district basis, the surface water supplies available to the Poso Creek RMA are not usable in their entirety because of the timing and magnitude of the occurrence of water quantities in excess of absorptive capacity. Most of the unused supply is CVP-Friant water; *Class 1* and *Class 2*, as well as *Other*, which typically occur in the wetter years. Accordingly, from a regional water management perspective, most important is the occurrence of unused absorptive capacity within the Region coincident with the occurrence of unused surface water supplies available to the Region. As a generalization, there is unused irrigation absorptive capacity in Semitropic and Cawelo at times when there are

unused regulated supplies (primarily CVP-Friant *Class 1* and *Class 2* water). Also as a generalization, there is unused spreading absorptive capacity in North Kern and/or Cawelo at times when there are unused unregulated supplies (primarily CVP-Friant *Other* water). Finally, there is not enough undelivered water to offset more than about one-third of the indicated reduction in deliveries in the best case.

7.2 Future Conditions

Similar to the evaluation of present conditions (Section 7.1), the surface water supplies which are projected to be available to the Region in the future are again compared with the absorptive capacity; however, certain changes are reflected in the institutional and/or physical setting. In particular, there is the potential for increasing the Region's absorption of available surface water supplies through 1) local agreements and institutional approvals respecting movement of water between districts within the RMA, 2) conveyance improvements to link the source of supply to the location of the unused absorptive capacity, and 3) development of new absorptive capacity. It is noted that the comparison of results between present and future conditions was based on the assumed increase in the availability of CVP-Friant *Other* water that was considered in Section 7.1. In other words, each scenario considers how much of the undelivered amount (37,000 acre-feet per year on average) could potentially be absorbed within the Region.

7.2.1 Scenario A

Under this scenario, certain changes to the present institutional setting are considered. In particular, it is assumed that SWP water and CVP water can be delivered anywhere within the Region. This scenario is based on the present physical setting, i.e., no facilities improvements are reflected. It is estimated that an additional 16,000 acre-feet per year on average could be used in the Region, which would reduce the undelivered amount to about 30,000 acre-feet per year on average. Development of the 16,000 acre-feet is summarized below:

2,000 af ……. Class 1 and Class 2 deliveries to North Kern and Cawelo for irrigation.
5,000 af ……. Class 1 and Class 2 deliveries to Semitropic by exchange with Cawelo.
2,000 af ……. Semitropic *Article 21* water to North Kern and Cawelo for spreading.
7,000 af ……. *Other* Friant water to North Kern and Cawelo for spreading.

7.2.2 Scenario B

Under this scenario, certain conveyance improvements to link the source of supply to the location of the unused absorptive capacity are considered, along with the institutional

changes contemplated in Scenario A. In particular, it is assumed that the capacity of North Kern's turnout from the Friant-Kern Canal is increased from 200 cfs to 400 cfs. It is estimated that this would increase the delivery of *Other* Friant water to spreading in North Kern and Cawelo by about 2,000 acre-feet as compared to Scenario A. However, there remains about 10,000 acre-feet per year (on average) of undelivered *Class 1* and *Class 2* water, which could be released into Poso Creek for delivery to Semitropic and/or could be delivered to unused spreading capacity in North Kern and Cawelo. It is noted that this average is the result of water occurring in about one to two years out of ten, i.e., they are the wettest years. Since the *Class 1* and *Class 2* supplies are regulated, it is reasonable to expect that some portion of this water could be absorbed in the Region. It has been very roughly estimated that on the order of one-half of the 10,000 acre-feet could be absorbed in unused spreading capacity. Accordingly, the additional diversion, as compared to present conditions, would be about 18,000 acre-feet per year plus that portion of the remaining 10,000 acre-feet of *Class 1* and *Class 2* water, for a range of 23,000 acre-feet up to a maximum of 28,000 acre-feet per year on average.

8 IRWMP Formulation and Regional Benefits

8.1 Operational Objectives

During the plan formulation process, the Regional Management Group (RMG) evaluated the proposed non-structural and structural water management measures using operational objectives that were quantitative and qualitative. The RMG described the planning objectives as operational objectives as a means to help decide which project components, when implemented, would best meet the Region's priorities; and provide a means to measure performance of implementing the water management measure. For the purpose of the IRWMP, operational objectives were evaluated in conjunction with the technical analysis of the water supply, demand, and operations study of the Region, consideration of the Region's highest priorities, and how the water management measure met multiple strategies.

The goal of the RMG was to select a "bundle" from the identified projects (both non-structural and structural measures) that supported the Region's highest priorities; of which the highest priority identified in the Plan is recovering the projected water supply loss to the Region. Another goal was to be able to predict how well a group of selected water management measures from this "bundle" of projects would provide a solution to meet the operational objectives, hence the need to describe the planning objectives quantitatively.

Accordingly, the RMG wanted to apply a fair and equitable approach that included a combination of technical and operational knowledge when selecting a group of project components to implement from the proposed water management strategies. It was important to the RMG to maintain a regional equity when formulating the IRWMP and when selecting projects from this Plan to include in grant funding proposals. Describing the planning objectives and highest priority water management strategies as quantitative and qualitative operational objectives helped serve this purpose. Furthermore, prioritizing the water management measures to implement within each objective help prioritize which projects to implement under limited funding opportunities.

The quantitative and qualitative operational objectives and resulting prioritized water management measures to implement to meet the highest priority strategies and planning objectives are listed in Table 8-1.

Table 8-1 Operational Objectives Related to Water Management Strategies

	Planning Objectives	Operational Objectives		Regional Management Group's Proposed Water Management Strategies to Implement	Groundwater Management *	Water Supply Reliability *	Conjunctive Management of Surface Water and Groundwater	Water Transfer/Exchanges	Water Quality Protection and Improvement *
No.	**General**	**Description**	**Quantitative and Qualitative**	**Water Management Measures to Implement (Listed by priority within each objective)**	**Highest Priority Water Management Strategies for Region**				
1	Water Supply Reliability	Enhance Water Supply Reliability of surface supplies (SWP-CA Aqueduct, CVP-Friant, CVP-CA Aqueduct, Kern River, and Poso Creek) equal to or greater than Historical utilization in order to maintain Region's water balance	**Surface Water Supply Utilization within Poso Creek Region (including SSJMUD)** **Historical** Utilization = 740,000 ac-ft/yr **Projected** Utilization = 14 percent loss; 104,000 ac-ft/yr **Projected with IRWMP** = Utilization objective is to maintain or increase up to **Historical**	1) Implement non-structural projects that involve Water Exchanges and Groundwater Banking agreements between RMG members; including CEQA/NEPA documents 2) Modify conveyance systems between districts with available supply to districts with under utilized In-Lieu Service Areas and Direct Recharge Capacity 3) Increase return conveyance from groundwater banking for drought protection 4) Expand Direct Recharge 5) Increase operational flexibility 6) Implement Third-Party Banking programs 7) Expand In-Lieu Service Areas	✓	✓	✓	✓	
2	Groundwater Levels	Maintain groundwater levels at economically viable pumping lifts	**Historical** = Levels in balance (Water Supply Accomplishments) **Projected** = Levels will decrease **Projected Utilization with IRWMP** = Maintain or increase groundwater levels up to **Historical**	1) Implement GW Banking Projects within the Region and Third-Party Banking Projects 2) Expand conjunctive management of surface and groundwater supplies within Region 3) Update and implement the RMG's GW Management Plans 4) Continue involvement in Regional Monitoring Committee	✓	✓	✓	✓	✓
3	Groundwater Quality	Protect quality of groundwater and enhance where practical	**Historical** = The water quality standards and operational agreements that are needed for returning stored groundwater to CA Aqueduct and Friant-Kern Canal have not been in place **Projected** = Need agreements in place **Projected with IRWMP =** Initiate agreements to be in place	1) Implement institutional agreements that address water quality issues in returning water to the CA Aqueduct and the Friant-Kern Canal 2) Consider conveyance modifications that enhance water quality exchanges	✓	✓	✓	✓	✓
4	Water Supply Costs	Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Poso Creek IRWMP Region	**Historical** = District's have pumped groundwater to make up difference in supplies to meet demands **Projected** = District's pumping cost will increase due to imbalance in water supply/demands and resulting increased lifts **Projected with IRWMP** = Districts will reduce pumping lifts to Historical condition or better	1) Secure grant funding to help offset capital cost needed for maintaining water supply costs at a viable level 2) Implement water management actions identified in each District's Groundwater Water Management Plan 3) Support Districts water supply pricing policy	✓	✓	✓	✓	
5	Monitoring	Enhance monitoring activities to meet groundwater levels and water quality goals	**Historical** = Water is of good quality within the Region **Projected** = Water will be of good quality for the Region **Projected with IRWMP =** Water quality for the Region is expected to remain good; potential changes in quality will be evaluated	1) Participate in Regional Groundwater Committee 2) Support water quality monitoring for returning water to the CA Aqueduct and/or the Friant-Kern Canal 3) Evaluate exchanges and banking effects on water quality	✓	✓	✓	✓	✓
6	Environmental Resources	Maintain and/or enhance environmental resources within and outside of the Poso Creek IRWMP Region	Environmental resources will be enhanced as an integrated water management strategy; environmental enhancement projects will be constructed synergistically with water supply reliability efforts in this IRWMP	1) Support conjunctive management of water supplies related to SJR Restoration Flows 2) Support conveyance improvements, structural and operational, that help Districts in the RMG implement SJR Settlement 3) Support construction of wildlife enhancement components listed in Project No. 26 in conjunction with Semitropic's new groundwater banking area	✓	✓	✓	✓	✓
7	Flood Control	Enhance flood control in the Poso Creek IRWMP Region	Flood control will be enhanced as an integrated water management strategy; the flood control project component of this IRWMP is a long-term project not ready for implementation	1) Evaluate conjunctive management of connecting Friant-Kern Canal to proposed Flood Control Structure on Poso Creek 2) Contribute In-Kind Services to evaluate pipeline connection		✓		✓	

*Pursuant to CWC Sections 79562.5 and 79564, these water management strategies must be considered to meet the minimum IRWMP Standards. **Desalination was considered not applicable to the Poso Creek IRWMP.

8.1.1 Pre-Screening and Readiness of Projects and Programs for Implementation

As part of the RMG's efforts to pre-screen proposed projects prior to applying the operational objectives, the RMG applied a planning process for selecting projects that met the planning objectives, water management strategies, and timing for near-term implementation. The planning process started with formulating the plan objectives and developing the water management strategies and proposed projects to meet the planning objectives. Next, a set of pre-screening criteria were established and each proposed project was evaluated to determine whether the project supported the plan integration and the multiple objectives. Lastly, the project's near-term implementation status was determined and the proposed projects were categorized as a Tier 1, Tier 2, or Deferred project (see Figure 6-1 Project Screening Process).

- A Tier 1 project is a project that is ready for implementation and can be completed within three years.
- A Tier 2 project is a project that will be ready for implementation in four to six years.
- A deferred project is a project that did not support the plan integration and the multiple objectives set by the RMG, and it did not meet the timing for near-term implementation proposals.

Since many of the proposed projects meet several plan objectives and span multiple water management strategies, a key factor in pre-screening the proposed projects into their respective Tiers was the project's readiness for near-term implementation. The projects that met highest priorities for the Region and the timing for near-term implementation were categorized as Tier 1 projects; projects that met the priorities for the Region and met the timing for longer term implementation were categorized as Tier 2 projects. Since most of the proposed projects identified in the planning process and described in Appendix D are ready for construction or have progressed to the point that they are ready to proceed to construction, either as a study or a project ready for implementation, most of the proposed projects were categorized as Tier 1 projects. Thus, the RMG needed to apply another level of project selection criteria in order to equitably select a group of projects to include in the near term grant funding opportunities for the Region.

In addition, near term funding opportunities aligned with this IRWMP are also an important factor in prioritizing the proposed projects into a respective group of projects to be included in the near term grant funding proposal in support of IRWMP implementation. Each project's funding needs were evaluated versus how the project fit into the funding opportunities, in addition to the previous pre-screening evaluation. Accordingly, four "bundles" were developed, namely Bundles 1, 2, 3 and Deferred to help guide the technical evaluation of proposed projects as the RMG determines a selected group of Regional water management measures to implement.

8.1.2 Availability of Local, State, or Federal Funding Sources

Projects and implementation efforts, such as improvements to conveyance systems, distribution systems and/or interconnections between Districts, are anticipated to include funding from local districts. Funding for larger-scale projects with regional and statewide benefits is more challenging. Given the primarily agricultural nature of the Region, and the fact that most communities in the Region are economically disadvantaged, proponents of large-scale, multi-benefit projects and programs often must seek additional funding sources. Thus, availability of grant funding has and will continue to have an influence in project implementation prioritization.

For the anticipated grant applications, local funding is already being committed in the form of in-kind services for program planning, design, and implementation of projects as part of this IRWMP. The size and number of projects that will be submitted for grant funding will depend on the amount of funding available for each program, specific evaluation criteria, and readiness of each project to proceed. Additional projects, programs, and investigations will be developed and prioritized depending on local need and regional benefits.

In anticipation of grant funding opportunities under Proposition 50 and 84, the RMG prioritized projects for implementation and assigned proposed projects a priority "Bundle" 1, 2, 3, or n/a, as indicated in Table 8-2. The priority 1 projects are considered the best group of projects to meet regional operation objectives listed in Table 8-1. The RMG also recognized that the priority 1 set of projects provided an integrated regional solution for all member districts water supply reliability concerns and thus provided a reasonable solution, or group of project components, that all parties would support in a grant funding proposal. As indicated previously, projects ready to proceed to implementation were pre-screened based on the RMG pre-screening criteria and identified as Tier 1 projects, whereas, the priority 1, 2, 3 and n/a classification was a priority assignment for deciding projects to include in the near-term implementation grant funding proposals.

In short, the overriding theme of the RMG is to promote a group of project components that provides measurable benefits to the Region and to each member district. The projected water supply challenges for this Region are greater than any single funding opportunity can solve. The RMG is committed to applying grant equitably to help solve Regional issues.

Table 8-2 Project Pre-Screening and Ranking

Project ID / Location on Map[1]	Project Name	Project Acceptable	Meets Planning Objectives	Project Integrates Goals and Multiple Objectives[2]	Ready for Implementation	Project Screening[3] Tier 1, 2 and Deferred	Project Priority for Implementation Proposals [4] 1,2,3 and n/a
Structural Projects to Increase Water Supply Reliability							
Expand In-Lieu Service Areas							
1	Connect Friant-Kern Canal Turnout to Cawelo's North System	Yes	Yes	Water Supply Reliability Groundwater Levels Operation flexibility	**CEQA not completed;** Ready for construction by 2008.	Tier 1	2
2	Ninth Avenue Pipeline	Yes	Yes	Water Supply Reliability Groundwater Levels Operation flexibility	**CEQA not completed;** Ready for construction by 2009.	Tier 1	2
3a	Stored Water Recovery Unit (SWRU) In-Lieu Service Areas	Yes	Yes	Water Supply Reliability Groundwater Levels Operation flexibility	**CEQA completed**; Design will be completed by 2008; Project R/W have not been acquired; Phase 2 ready for construction in 2008.	Tier 1	2
3b	Expand P-1030 In-Lieu Service Area	Yes	Yes	Water Supply Reliability Groundwater Levels Operation flexibility	**CEQA completed**; Project R/W have not been acquired; Ready for construction by 2008	Tier 1	2
3c	P-565 New In-Lieu Service Area	Yes	Yes	Water Supply Reliability Groundwater Levels Operation flexibility	**CEQA completed**; Final design completed; Ready for construction in 2007; Part of the R/W has been acquired.	Tier 1	2
Expand Direct Recharge							
4	G-W Banking North of DEID with Pixley ID	Yes	Yes	Water Supply Reliability Groundwater Levels Operation flexibility	**CEQA not completed;** Feasibility study started in 2007.	Tier 1	3
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities	Yes	Yes	Water Supply Reliability Groundwater Levels Operation Flexibility Enhance Exchanges	**CEQA not completed;** Currently in the Design phase; Ready for construction by 2009.	Tier 1	1
6	Pond Poso Spreading Grounds	Yes	Yes	Water Supply Reliability GW Levels	**CEQA completed**; Construction started in 2007; Phases to be completed in 2008-2009.	Tier 1	1
7	Rag Gulch G-W Banking Project	Yes	Yes	Water Supply Reliability GW Levels	**CEQA not completed;** Feasibility study completed in 2006; Construction of project is not planned in near-term.	Deferred	n/a
8	White River G-W Banking for DEID	Yes	Yes	Water Supply Reliability GW Levels	**CEQA not completed;** Feasibility study started in 2007.	Tier 1	3
9	White River G-W Banking in Rag Gulch	Yes	Yes	Water Supply Reliability GW Levels	**CEQA not completed;** Feasibility study completed in 2007.	Deferred	n/a
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity							
10	Calloway Canal Improvements	Yes	Yes	Water Supply Reliability Operational flexibility Water Conservation Energy Savings	**CEQA completed**; Project R/W have been acquired; Project in Design phase.	Tier 1	2
11	Calloway Canal to Cross Valley Canal Interconnection	Yes	Yes	Water Supply Reliability Operational flexibility Water Conservation Energy Savings	**CEQA completed**; Project R/W partly acquired; Project in Design phase.	Tier 1	1
12	Calloway Canal to Lerdo Interconnection	Yes	Yes	Water Supply Reliability Operational flexibility Water Conservation Energy Savings	**CEQA completed**; Project R/W have been acquired; Project in Design phase.	Tier 1	1
13	Multi-District Conveyance Facility	Yes	Yes	Water Supply Reliability Operational flexibility Water Conservation Energy Savings	**CEQA not completed;** Depending on alternative, ready for construction in 2008.	Tier 1	1
14	North Inter-connection between North Kern/Shafter-Wasco	Yes	Yes	Water Supply Reliability Operational flexibility	**CEQA completed;** Construction started in 2007.	Tier 1	1
15	Pilot Arsenic Treatment Plant	Yes	Yes	Water Supply Reliability Groundwater Levels Water Quality Dry and critical year capacity. Water needs outside of Region.	**CEQA completed**; Planning study completed; Conceptual design completed; Ready for construction in 2008.	Tier 1	3
16	Reverse Flow in the Friant-Kern Canal	Yes	Yes	Water Supply Reliability Operational flexibility Enhances Exchanges Enhances GW Levels	**CEQA needed for the two phases**: Intertie and flow structure improvements; Ready for construction: Interie in 2008 and structure improvements by 2009.	Tier 1	2
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road	Yes	Yes	Water Supply Reliability Operational flexibility Enhances Exchanges Enhances GW Levels	**CEQA not completed;** Project R/W have not been acquired; Preliminary design completed; Ready for construction in 2008.	Tier 1	1
18	Shafter-Wasco/Semitropic Interconnection on Madera Avenue	Yes	Yes	Water Supply Reliability Operational flexibility Enhances Exchanges Enhances GW Levels	**CEQA not completed;** Project R/W have not been acquired; Preliminary design completed; Ready for construction in 2008.	Tier 1	1
19	South Inter-connection between North Kern/Shafter-Wasco	Yes	Yes	Water Supply Reliability Operational flexibility Enhances Exchanges Enhances GW Levels	**CEQA not completed;** Project R/W have not been acquired; Preliminary design completed; Ready for construction in 2008.	Tier 1	2
Non-Structural Projects							
20	Energy Usage	Yes	Yes	Water Supply Costs	This proposed measure is to evaluate opportunities as part of implementation of structural projects. Currently, Semitropic operates an energy program.	Tier 2	3
21	Joint Powers Authority	Yes	Yes	Reduce Potential Conflict Governance	This proposed measure is intended to help implement structural projects.	Tier 1	2
22	Institutional Agreements and Governance for IRWMP Implementation	Yes	Yes	Reduce Potential Conflict Governance	Remaining CEQA needs for implementation of projects is part of this Non-Structural project.	Tier 1	1
23	G-W Banking for Parties Outside of Poso Creek IRWMP Region	Yes	Yes	Water Supply Reliability Operational flexibility Enhances Exchanges Enhances GW Levels	**CEQA completed for Semitropic's 1.65 MAF Banking Program**; CEQA not completed for North Kern operating a G-W Bank for parties outside of Poso Creek IRWMP Region.	Tier 1	2
24	Optimize the Region's Pumping Lifts	Yes	Yes	Groundwater Levels	Conceptual planning phase. May be implamented in the long-term.	Tier 2	3
25	Enhance Groundwater Monitoring and/or Modeling	Yes	Yes	Monitoring Reduce Potential Conflict	This proposed measure is in support of on-going activities.	Tier 1	2
Enhance Environmental Resources							
26	Wildlife Improvement Projects in IRWMP Region	Yes	Yes	Wildlife Enhancement	Proposed projects to be integrated in conjunction with structural project 3a.	Tier 1	2
27	Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region	Yes	Yes	Wildlife Enhancement Reduce Potential Conflict	Proposed measures are in support of water management actions in this Region that are in response to actions outside of this Region.	Tier 1	1
Enhance Flood Control							
28	Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek	Yes	Yes	Water Supply Costs Water Supply Reliability Flood Control	**CEQA not completed;** Currently in Planning phase.	Tier 2	3
Assist Economically Disadvantaged Communities							
29	Enhance Water Supply and Treatment Facilities	Yes	Yes	Water Supply Costs Water Supply Reliability	Proposed project descriptions to be included in IRWMP.	Tier 2	2

[1] Location of proposed project as shown in Figure 6-2

[2] Multiple objectives include enhancing water supply reliability, groundwater levels, operation flexibility, reducing pumping cost, and supporting integration of other objectives.

[3] Level of readiness for implementation;
Tier 1 indicates project is ready for implementation within three years;
Tier 2 incidates project is not ready for implementation within 4-6 years;
Deferred indicates the project does not meet the pre-screening criteria, does not support plan integration and objectives, and/or will not be ready for implementation within 6 years.

[4] The Regional Management Group set Project Priorities for implementation as 1,2,3 and n/a to indicate the bundle of projects that can best meet the Regional priorities. A portion of Bundle 1 will be submitted as Proposition 50 and 84 Implementation Grant Proposals. Other funding opportunities, including local funding, will be pursued for Bundles 1,2 and 3.

8.1.3 Consistency with the CA Water Plan's Water Management Strategies

The principles of integrated regional water management are used in the California Water Plan (Bulletin 160-05) to evaluate potential water solutions for regions across the State. Bulletin 160-05 includes a diverse set of 25 resource management strategies to meet the water-related resource management needs of each region and the State. All projects need to be consistent with and support the strategies identified in Bulletin 160-05. Consistency with these strategies is discussed in Chapter 6, Presentation of Planning Objectives, Regional Priorities and Integration of Water Management Strategies. The projects in this IRWMP support one or, in most cases, many of the resource management strategies outlined in Bulletin 160-05.

8.2 IRWMP Benefits and Beneficiaries

Implementation of the proposed Poso Creek IRWMP water management measures will result in multiple benefits to the Region. In accordance with the IRWMP objectives, the IRWMP formulation followed the Region's focus on water management measures that maintain or increase the following broad planning objectives:

- Groundwater management
- Water supply reliability
- Conjunctive management of surface water and groundwater
- Flexibility for water transfer/exchanges
- Protection of water quality

Several key public and overall benefits to the Region include the following:

- Maintaining or increasing water supply reliability for local use, the region, and the state, including drought protection by maintaining or increasing the absorptive capacity of surface supplies through in-lieu and direct recharge of the groundwater basin.
- Maintaining or increasing groundwater levels within the Region that support economically viable groundwater pumping lifts.
- Maintaining groundwater quality, which is currently very good.

The Region's operational objectives presented in Table 8-1 will provide the basis for determining the feasibility of a group of projects proposed for implementation grant proposals, and allow for a method to measure the benefits realized from implementing these projects to meet the Region's priorities. The RMG intends the IRWMP be implemented in an adaptive management manner. The participants in the IRWMP RMG will continue to meet monthly to coordinate their efforts and may be joined by other participants following the Plan adoption as the IRWMP moves into implementation. These monthly meeting of the RMG, have in fact, fostered benefits in better water management agreements being initiated and realized between districts within the Region. Therefore, the group of projects and proposed measures will likely continue to be refined in response to local and regional needs, agreements between RMG members are realized, and as other funding opportunities are available.

8.2.1 Benefits to Poso Creek IRWMP Member Agencies and Stakeholders

Measures implemented by this IRWMP will directly benefit member agencies by helping to gain back some of their historical surface water supply reliability that has been contributed to environmental and urban benefits outside of this Region. Other benefits will include additional flexibility in operations, thus allowing for more exchanges and banking arrangements that improve *wet* year and *dry* year water management. Another benefit to the member agencies is the reduction of water delivery costs to their grower's water supplies. Since the growers within member agencies of the Region produce crops for both local and world markets, it is a benefit to the Region's member agencies to keep the water supply economical to allow the growers to maintain their competitive role in the market place. Economically disadvantaged communities, who are stakeholders in this IRWMP and rely on the common groundwater basin for their drinking water supply, will benefit from any resulting improvements to water supply reliability and groundwater levels.

8.2.2 Regional and Banking Partner Benefits

Measures implemented by this IRWMP will benefit Regional groundwater banking partners by adding flexibility of surface water deliveries and increasing the absorptive capacity within the Region. These measures will also adhere with the Basin Management Objectives contained within groundwater banking programs within this Region that state they are operated to the benefit of landowners within the Region, without adversely affecting water supplies of any district landowners or landowners in neighboring districts.

8.3 IRWMP Impacts and Mitigation

Measures implemented through this IRWMP will help offset the impacts to historical surface water supply reliability that is predicted for this Region. Depending on the location of the proposed planning projects that become implemented, much of the Poso Creek IRWMP area has a groundwater model developed that can be used to predict groundwater level changes

due to implementation of the proposed measures. Based on the water supply and demands evaluation presented heir in for the previous 25 years, and the prediction the Region will be losing supply, modeling of the Regional impact to water levels may not be necessary to reach a general observation that water levels will be decreasing over time.

8.4 IRWMP Data Management and Data Analysis

Each member district participates in collection of spring and fall groundwater level measurements in production and monitoring wells. A groundwater level database is maintained by the KCWA in coordination with the DWR that contains data for Kern County which includes the member agencies of the Poso Creek IRWMP that are within Kern County. Three members are also currently participants in the Semitropic Groundwater Monitoring Committee that produces a bi-annual report on the groundwater conditions.

8.5 IRWMP Plan Monitoring Systems

The RMG recognize that successful implementation of the IRWMP strategies and projects requires participating entities to have a monitoring and assessment program to ensure that the region's groundwater and surface water resources are protected and can sustain long-term beneficial uses. As stated in Section 8.4, monitoring activities do exist based largely on water level data collected each spring and fall. Recently, this data has been improved by the addition of dedicated monitoring wells and the placement of transducers to provide continuous measurement of water levels in these monitoring wells. It is possible that as the IRWMP progresses, districts currently not included in a program such as the Semitropic Groundwater Monitoring Committee program will be included and will participate in biannual reports on groundwater conditions.

This IRWMP was developed using data and input supplied by stakeholders, counties, and various state and federal agencies that were used to depict current conditions, needs, and conflicts in the region. Data necessary to develop specific projects has and will continue to be obtained from investigations sponsored by individual project sponsors and obtained from the California Department of Water Resources, Reclamation, and local counties and agencies as available and appropriate.

9 Poso Creek IRWMP Implementation

9.1 Implementation Plan

The Poso Creek IRWMP Regional Management Group (RMG) spent several monthly meetings focused on plan formulation. These monthly discussions included exchange of operational knowledge that resulted in assigning priorities for implementing water management measures as indicated in Table 8-1 Operational Objectives Related to Water Management Strategies. A challenge faced by the RMG in the plan formulation process was separating the proposed projects into project "bundles" for implementation; the main challenge being the RMG was faced with deciding which of the approximately $250 million in water management concepts were the highest priority *regional* projects and appropriate for the near-term grant opportunities.

The project bundles were labeled as Bundle 1, 2, 3 and Deferred, as indicated in Table 8-2 Poso Creek IRWMP - Project Pre-Screening and Ranking. A detailed description of each proposed project of the Plan is contained in Appendix D.

The project Bundles for implementation and related benefits to the Region are summarized in the following sections of this chapter. The RMG discussed how each proposed project would help meet the Region's highest priorities. The RMG also identified the benefits that each Bundle will provide to the Region, and to each individual district. Project Bundles focused on the following:

Bundle 1 projects are those that will provide the greatest benefit towards meeting the Region's priorities and can be implemented in the near-term; within the next three years.

Bundle 2 projects will provide added benefits to the Region when implemented. They will help meet objectives for the Region; however, many of these projects require longer lead time and also require greater funding than is currently available. They also, in many cases rely on prior construction of Bundle 1 projects.

Bundle 3 projects include those projects more specific to the needs of an individual district or are less likely to be implemented as a regional project in the near-term.

Bundle Deferred projects were considered as part of the planning process, however, based on the preliminary evaluation by the sponsoring districts, it was decided that implementation of the projects not be pursued at this time.

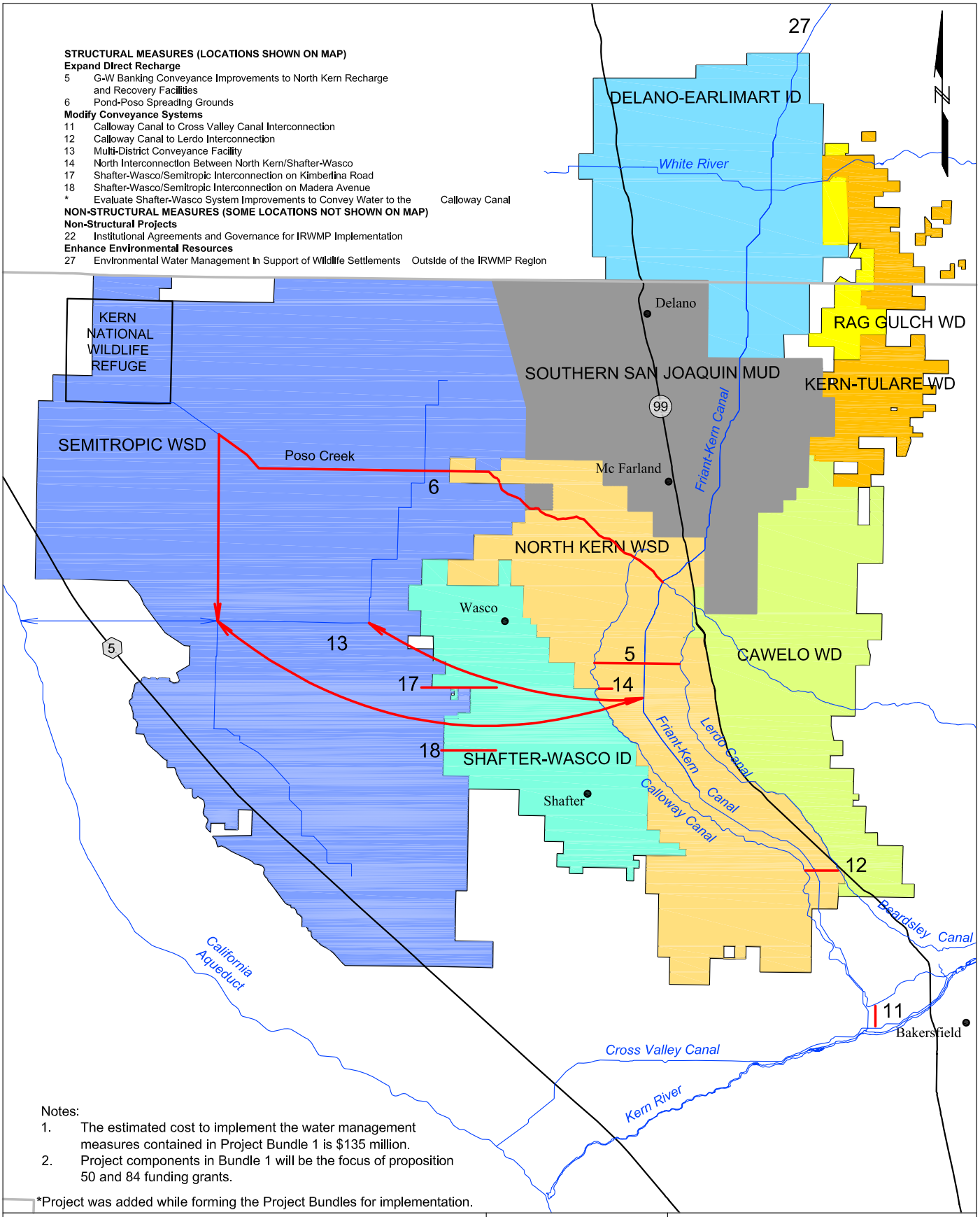
9.1.1 Project Bundle 1

Project Bundle 1 consists of non-structural and structural projects that were identified by the RMG as the best integrated regional solution for meeting the Region's priorities. The projects contained in Project Bundle 1 are also the focus for Proposition 50, Proposition 84, and other near-term funding proposals. The estimated cost to implement the water management measures contained in Bundle 1 is approximately $135 million. Since the cost to implement the projects in Bundle 1 far exceeds that which will be available through grants funds or matching contributions, the RMG evaluated and formulated a refined a set of projects to consider for implementation for the near-term funding opportunities. This selected group of implementation projects is described in Section 9.2 of this Plan.

A list of the projects in Bundle 1, including the project name, the respective project sponsors, the implementation status and the estimated cost to implement the projects are included in Table 9-1. The general location of the projects in Bundle 1 is shown on Figure 9-1.

Table 9-1 Implementation Plan Project Bundle 1

Project ID / Location on Map[1]	Project Name	Project Sponsors	Ready for Implementation	Estimated Cost
Structural Projects to Increase Water Supply Reliability				
Expand Direct Recharge				
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities	North Kern WSD Delano-Earlimart ID Kern-Tulare and Rag Gulch IRWMP Participants	**CEQA not completed;** Currently in the Design phase; Ready for construction by 2009.	$17.5 million
6	Pond Poso Spreading Grounds	Semitropic WSD	**CEQA completed**; Construction started in 2007; Phases to be completed in 2008-2009.	$12 million
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity				
11	Calloway Canal to Cross Valley Canal Interconnection	North Kern WSD Cawelo WD IRWMP Participants	**CEQA completed**; Project R/W partly acquired; Project in Design phase.	Canal Alternative: $11.3M Pipeline Alternative: $17.3M
12	Calloway Canal to Lerdo Interconnection	North Kern WSD Cawelo WD IRWMP Participants	**CEQA completed**; Project R/W have been acquired; Project in Design phase.	$21.8M (500 cfs design estimate)
13	Multi-District Conveyance Facility	Semitropic WSD Shafter-Wasco ID IRWMP Participants	**CEQA not completed;** Depending on alternative, ready for construction in 2008.	$55M to $85M depending on alternative chosen; Some project components overlap with other IRWMP projects
14	North Inter-connection between North Kern/Shafter-Wasco	North Kern WSD Shafter-Wasco ID IRWMP Participants	**CEQA completed;** Construction started in 2007.	$1.14 million
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road	Shafter-Wasco ID Semitropic WSD IRWMP Participants	**CEQA not completed;** Project R/W have not been acquired; Preliminary design completed; Ready for construction in 2008.	$12.2 million
18	Shafter-Wasco/Semitropic Interconnection on Madera Avenue	Shafter-Wasco ID Semitropic WSD IRWMP Participants	**CEQA not completed;** Project R/W have not been acquired; Preliminary design completed; Ready for construction in 2008.	4.8 million
*	Evaluate Shafter-Wasco System Improvements to Convey Water to the Calloway Canal	Shafter-Wasco ID IRWMP Participants	**CEQA not completed;** Project R/W have not been acquired.	Not estimated
Non-Structural Projects				
22	Institutional Agreements and Governance for IRWMP Implementation	IRWMP Participants	Remaining CEQA needs for implementation of projects is part of this Non-Structural project.	Cost will vary depending on the level of effort put into each task
Enhance Environmental Resources				
27	Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region	Delano-Earlimart ID Shafter-Wasco ID IRWMP Participants	Proposed measures are in support of water management actions in this Region that are in response to actions outside of this Region.	The costs of this project is uncertain; this project is in response to loss of historical supplies from outside this Region.
[1] Location of proposed project as shown in Figure 6-2 and Figure 9-1.			Total	~ 135 million
* Project was added while forming the Project bundles for implementation.				



Poso Creek Integrated Regional Water Management Plan

Poso Creek Regional Management Group

GEI Consultants
Bookman-Edmonston Division

Bundle 1 Project Locations

June 2007 Figure 9-1

The Bundle 1 water management measures, consisting of non-structural and structural projects, are listed below. In the case of the non-structural projects, the tasks that will be undertaken as part of the implementation of the non-structural projects are listed immediately after the project.

Institutional Agreements (components of non-structural project No.22)

1. Prepare a programmatic NEPA/CEQA document that allows for water movement between the RMG water districts (including SSJMUD).
2. Negotiate groundwater banking arrangements in North Kern and Semitropic for Kern-Tulare/Rag Gulch, Delano-Earlimart, Shafter-Wasco, and other interested RMG members.
3. Negotiate exchanges of Delano-Earlimart and Shafter-Wasco Friant water for non-CVP project water.
4. Negotiate exchanges of Kern-Tulare/Rag Gulch CVP Delta water supply for regulated local water supply.
5. Address water quality pump-in agreements for the Friant-Kern Canal and the California Aqueduct.
6. Complete adoption of all the RMG's updated groundwater management plans.
7. Complete CEQA documents for structural projects No.5, No.13, No.17, No.18, and the Shafter-Wasco System Improvements to Convey Water to the Calloway Canal of Bundle 1 (projects No.6, No.11, No.12, and No.14 are completed).

Proposed Facilities (structural projects)

1. Connect the Calloway Canal to the Cross Valley Canal (project No.11).
2. Interconnect the Calloway Canal, Lerdo Canal, Friant-Kern Canal, and North Kern wells (components described in project No.5 and No.12).
3. Interconnect Semitropic and Shafter-Wasco distribution systems (project No.17 and/or No.18).
4. Modify Shafter-Wasco facilities to increase delivery capability from Semitropic to Shafter-Wasco distribution facilities and to the Calloway Canal (this concept was developed during plan formulation).
5. Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity; increase conveyance to and from groundwater banking for the RMG and for third-party participants (components described in projects No.12, No.13, and No.14).
6. Expand Direct Recharge (project No.6).

The project benefits of the Bundle 1 projects for each of the member districts that form the RMG are presented below.

Bundle 1 - Program Benefits

Cawelo

- Improves ability to move water to/from the California Aqueduct, CVC, Friant-Kern Canal, and North Kern Canals and enhances Cawelo's ability to participate in banking programs, transfers, and exchanges.
- Provides ability to move water from the CVC to the Lerdo Canal for delivery to Cawelo and avoid Pump Station A capacity constraints.

Delano-Earlimart

- Provides banking programs to improve dry year water supply reliability.
- Provides non-project water for delivery to Excess Lands.
- Provides flexibility in managing SJR settlement water.

Kern-Tulare/Rag Gulch

- Provides banking programs to improve dry year water supply reliability.
- Improves ability to manage CVP delta water supplies through exchanges that regulate timing of water supply availability.

North Kern

- Improves ability to move water to/from the California Aqueduct, CVC, Friant-Kern Canal, and North Kern Canals and enhances North Kern's ability to participate in banking programs, transfers, and exchanges.
- Will allow for the transfer of water from the CVC to the Lerdo Canal for delivery to North Kern and avoid requirements of the Warren Act Contract in the Friant-Kern Canal.

Semitropic

- Improves ability to move water to/from the California Aqueduct, CVC, Friant-Kern Canal, and North Kern Canals and enhances Semitropic's ability to participate in banking programs, transfers, and exchanges.
- Provides for Delta water supply (from Kern-Tulare/Rag Gulch) to facilitate return of banked water supplies to others.

Shafter-Wasco

- Improves ability to move water to/from the California Aqueduct, CVC, Friant-Kern Canal, and North Kern Canals and enhances Shafter-Wasco's ability to participate in banking programs, transfers, and exchanges.

- Improves ability to participate in the water quality exchange with the Metropolitan Water District of Southern California.
- Provides non-project water for delivery to Excess Lands.

SSJMUD

- Improves ability to participate in water management programs.

Regional Benefits and Operational Objectives

Water Supply Reliability (WSR) – Regains a portion of the projected loss to the Region in surface supplies and improves drought protection. Implementing projects in Bundle 1 would provide regional benefits towards 6 of the 7 water management measures listed for the water supply reliability objective shown in Table 8-1 and repeated below:

1) Implement non-structural projects that involve water exchanges and groundwater banking agreements between RMG members; including CEQA/NEPA documents.
2) Modify conveyance systems between districts with available supply to districts with under utilized in-lieu service areas and direct recharge capacity.
3) Increase return conveyance from groundwater banking for drought protection.
4) Expand direct recharge.
5) Increase operational flexibility.
6) Implement third-party banking programs.
7) Expand In-Lieu Service Areas (accomplished by projects in Bundle 2).

Groundwater Levels – In connection with the WSR benefit, a corresponding water level benefit will occur to the Region. Implementing projects in Bundle 1 would provide regional benefits towards the water management measures listed for the groundwater level objective:

1) Implement GW Banking Projects within the Region and Third-Party Banking Projects.
2) Expand conjunctive management of surface and groundwater supplies within Region.
3) Update and implement the RMG's Groundwater Management Plans.
4) Continue involvement in Regional Monitoring Committee.

Groundwater Quality – Institutional agreements will better define operating criteria regarding water quality issues. Implementing projects in Bundle 1 would provide regional benefits towards the water management measures listed for the groundwater quality objective:

1) Implement institutional agreements that address water quality issues in returning water to the CA Aqueduct and the Friant-Kern Canal.
2) Consider conveyance modifications that enhance water quality exchanges.

Water Supply Costs - In connection with the WSR benefit, a corresponding water level benefit will occur causing a positive benefit on water supply costs. In addition, grant funding will help offset water supply costs to the predominately agricultural region and the economically disadvantaged communities within the region that rely on the common groundwater basin for their source of drinking water. Implementing projects in Bundle 1 would provide regional benefits towards the water management measures listed for the water supply costs objective:

1) Secure grant funding to help offset capital cost needed for maintaining water supply costs at a viable level.
2) Implement water management actions identified in each district's groundwater management plan.
3) Support each district's water supply pricing policy.

Monitoring - Institutional agreements will contain additional monitoring. Implementing projects in Bundle 1 would provide regional benefits towards the water management measures listed for the monitoring objective:

1) Participate in Regional Groundwater Committee.
2) Support water quality monitoring for returning water to the CA Aqueduct and/or the Friant-Kern Canal.
3) Evaluate exchanges and banking effects on water quality (this is accomplished through each district's groundwater management plans).

Environmental Resources - In connection with the WSR benefit, some corresponding environmental water benefits will occur within the Region as well as, outside the Region due to improved operation and flexibility in managing water from the Delta and as it relates to the SJR Settlement. Implementing projects in Bundle 1 would provide regional benefits towards the water management measures listed for the environmental resources objective:

1) Support conjunctive management of water supplies related to SJR Restoration Flows.
2) Support conveyance improvements, structural and operational, that help districts in the RMG implement the SJR settlement.
3) Support construction of wildlife enhancement components listed in Project No. 26 in conjunction with Semitropic's new groundwater banking area (accomplished as part of Bundle 2).

The estimated cost to implement Bundle 1 is larger than the combined funding opportunities identified in Proposition 50 and 84; therefore, the RMG intends to submit components of these measures as the implementation proposal, as described in Section 9.2 of this Plan. The costs associated with planning and implementing the project measures will be considered for funding match in each in accordance with each implementation proposal requirements.

9.1.2 Project Bundle 2

Project Bundle 2 includes non-structural and structural projects that will allow for enhancing the Region's environmental resources, assisting economically disadvantaged communities by means of enhancing the water supply and treatment facilities, expanding the Region's groundwater banking capacity (either through in-lieu or direct recharge), and expanding conveyance capacity that will allow for flexibility in water exchanges and transfers by means of forming third-party banking agreements. Bundle 2, as described in this section, is estimated to cost $105 million to implement. While projects contained in Bundle 2 will not be the focus of Proposition 50 and 84 implementation proposals, proponents of small-scale projects and programs such as improvements to conveyance systems, distribution systems and/or interconnections between districts, are anticipated to include funding from local districts. Given the primarily agricultural nature of the Region, and the fact that communities in the Region are economically disadvantaged, funding for larger-scale projects with regional and statewide benefits will be more challenging requiring the proponents of large-scale, multi-benefit projects and programs to seek additional funding sources. A list of projects in Bundle 2 is shown in Table 9-2 and the general location of the projects is shown on Figure 9-2.

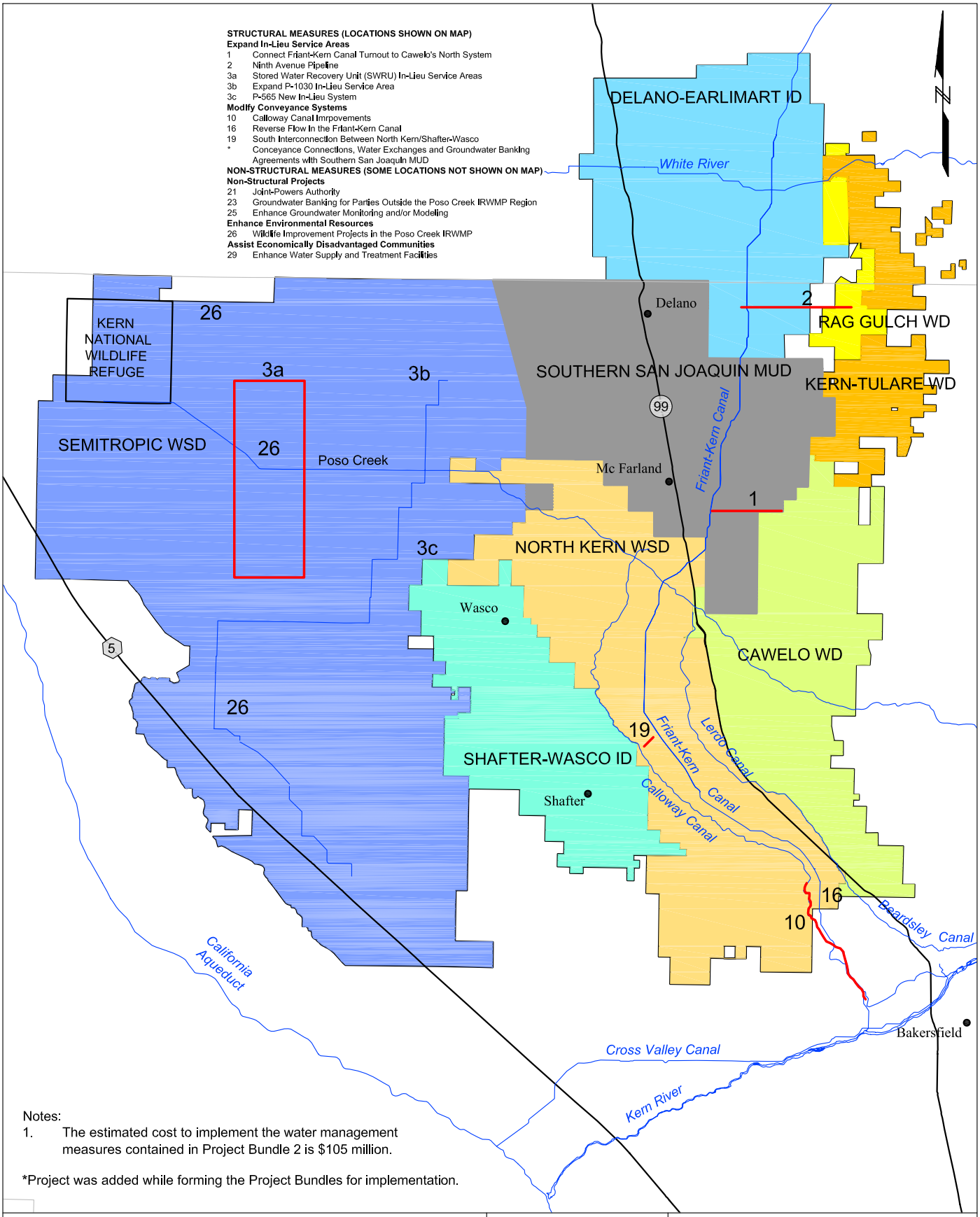
Many of the Bundle 2 projects are being implemented or are planned to be implemented in the near-term in conjunction with Bundle 1 projects. The cost associated with the proposed projects identified by the RMG was far more than the grant funding opportunities; therefore, the projects listed in Bundle 2 will likely consider funding from sources other than Proposition 50 and 84 grant opportunities. Nevertheless, since these projects are being implemented by the RMG members as part of the Plan, the non-state costs associated with the projects may be considered for inclusion in proposals for grant funding in order to fulfill necessary funding match requirements.

Table 9-2 Implementation Plan Project Bundle 2

Project ID / Location on Map[1]	Project Name	Project Sponsors	Ready for Implementation	Estimated Cost
Structural Projects to Increase Water Supply Reliability				
Expand In-Lieu Service Areas				
1	Connect Friant-Kern Canal Turnout to Cawelo's North System	Cawelo WD Kern-Tulare WD	**CEQA not completed;** Ready for construction by 2008.	$4.3 million
2	Ninth Avenue Pipeline	Kern-Tulare WD Rag Gulch WD	**CEQA not completed;** Ready for construction by 2009.	$8 million
3a	Stored Water Recovery Unit (SWRU) In-Lieu Service Areas	Semitropic WSD	**CEQA completed**; Design will be completed by 2008; Project R/W have not been acquired; Phase 2 ready for construction in 2008.	System X = $14 millon System Y = $10.2 million System Z = $17.9 million
3b	Expand P-1030 In-Lieu Service Area	Semitropic WSD	**CEQA completed**; Project R/W have not been acquired; Ready for construction by 2008	$5 million
3c	P-565 New In-Lieu Service Area	Semitropic WSD	**CEQA completed**; Final design completed; Ready for construction in 2007; Part of the R/W has been acquired.	$15 million
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity				
10	Calloway Canal Improvements	North Kern WSD Cawelo WD	**CEQA completed**; Project R/W have been acquired; Project in Design phase.	$29.9M
16	Reverse Flow in the Friant-Kern Canal	IRWMP Participants	**CEQA needed for the two phases**: Intertie and flow structure improvements; Ready for construction: Interie in 2008 and structure improvements by 2009.	> $1 million
19	South Inter-connection between North Kern/Shafter-Wasco	North Kern WSD Shafter-Wasco ID	**CEQA not completed;** Project R/W have not been acquired; Preliminary design completed; Ready for construction in 2008.	$600,000
*	Conveyance Connections, Water Exchanges and Groundwater Banking Agreements with Southern San Joaquin MUD	SSJMUD IRWMP Participants	**CEQA not completed;** Project R/W have not been acquired.	Not estimated
Non-Structural Projects				
21	Joint Powers Authority	IRWMP Participants	This proposed measure is intended to help implement structural projects.	Not estimated
23	G-W Banking for Parties Outside of Poso Creek IRWMP Region	IRWMP Participants	**CEQA completed for Semitropic's 1.65 MAF Banking Program**; CEQA not completed for North Kern operating a G-W Bank for parties outside of Poso Creek IRWMP Region.	~ $1 million
25	Enhance Groundwater Monitoring and/or Modeling	IRWMP Participants	This proposed measure is in support of on-going activities.	Not estimated
Enhance Environmental Resources				
26	Wildlife Improvement Projects in IRWMP Region	North West Kern RCD Semitropic WSD	Proposed projects to be integrated in conjunction with structural project 3a.	To be dertermined
Assist Economically Disadvantaged Communities				
29	Enhance Water Supply and Treatment Facilities	IRWMP Participants	Proposed project descriptions to be included in IRWMP.	To be dertermined
			Total	~105 million

[1] Location of proposed project as shown in Figure 6-2 and Figure 9-2.

* Project was added while forming the Project bundles for implementation.



Notes:

1. The estimated cost to implement the water management measures contained in Project Bundle 2 is $105 million.

*Project was added while forming the Project Bundles for implementation.

Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Bundle 2 Project Locations
Poso Creek Regional Management Group		June 2007 Figure 9-2

The Bundle 2 projects, consisting of non-structural and structural projects, are listed below. In the case of the structural projects, the tasks that will be undertaken as part of the implementation of the structural projects are listed immediately after the project.

Institutional Agreements (non-structural projects)

1. Assist economically disadvantaged communities to improve water supply and treatment facilities.
2. Negotiate groundwater banking arrangements in North Kern and Semitropic for third-party banking partners.
3. Implement Joint Powers Authority agreements between districts within the Region and with groups outside of the Region.
4. Enhance existing groundwater monitoring and/or modeling efforts.

Proposed Facilities (structural projects)

1. Improve wildlife projects within the Region (project No.26 will be implemented in conjunction with project No.3a).
2. Expand In-Lieu Service Areas (projects No.1, No.2, No.3a, No.3b, and No.3c).
3. Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity; increase conveyance to and from groundwater banking for the RMG and for third-party participants (projects No.10, No.16, and No.19).
4. Modify conveyance connections between the RMG districts and SSJMUD (this concept was developed during plan formulation).

The benefits of Bundle 2 projects for each of the member districts that form the RMG are presented below.

Bundle 2 - Program Benefits

For RMG Member districts:

- Improves in-lieu absorptive capacity and conveyance capacity.
- Provides flexibility between SWP and CVP contractors by providing additional operational opportunities and conveyance facilities for exchanges and conjunctive use programs between participates.
- Provides additional conveyance between banking partners and improves dry year water supply reliability.
- Improves ability to move water to/from the California Aqueduct, CVC, Friant-Kern Canal, and North Kern Canals to enhance ability of local and third-parties to participate in groundwater banking programs, transfers, and exchanges.

For SSJMUD

- Improves ability to participate in water management programs.
- Improves ability to deliver SJR Settlement water via the CVC-Calloway as a recirculation route.
- Improves ability to exchange CVC-Calloway delivered water for simultaneous water quality exchange with MWD. Where CVC-SWP would go to SSJMUD and SSJMUD's Friant supply would go through Arvin Edison Water Storage District (AEWSD) to MWD.
- Allows for banking program for SSJMUD to offset SJR Settlement impacts and for large exchanges of agricultural quality deep well water to SSJMUD for SSJMUD's Friant water.

Benefits and Operational Objectives

Water Supply Reliability – Adds to the Region's ability to absorb surface supplies and improves drought protection; helps gain back projected loss by surface supply.
Groundwater levels – In connection with the WSR benefit, a corresponding water level benefit will occur.
Groundwater Quality – Institutional agreements will enhance operating criteria regarding water quality issues.
Water Supply Costs - In connection with the WSR benefit, a corresponding water level benefit will occur and corresponding positive impact on water supply costs. In addition, obtaining outside funding will help offset water supply costs to disadvantaged communities and the predominately agriculture area.
Monitoring - Institutional agreements will contain additional monitoring needs.
Environmental Resources - In connection with the WSR benefit, some corresponding environmental water benefits will occur within the Region as well as, outside the Region.

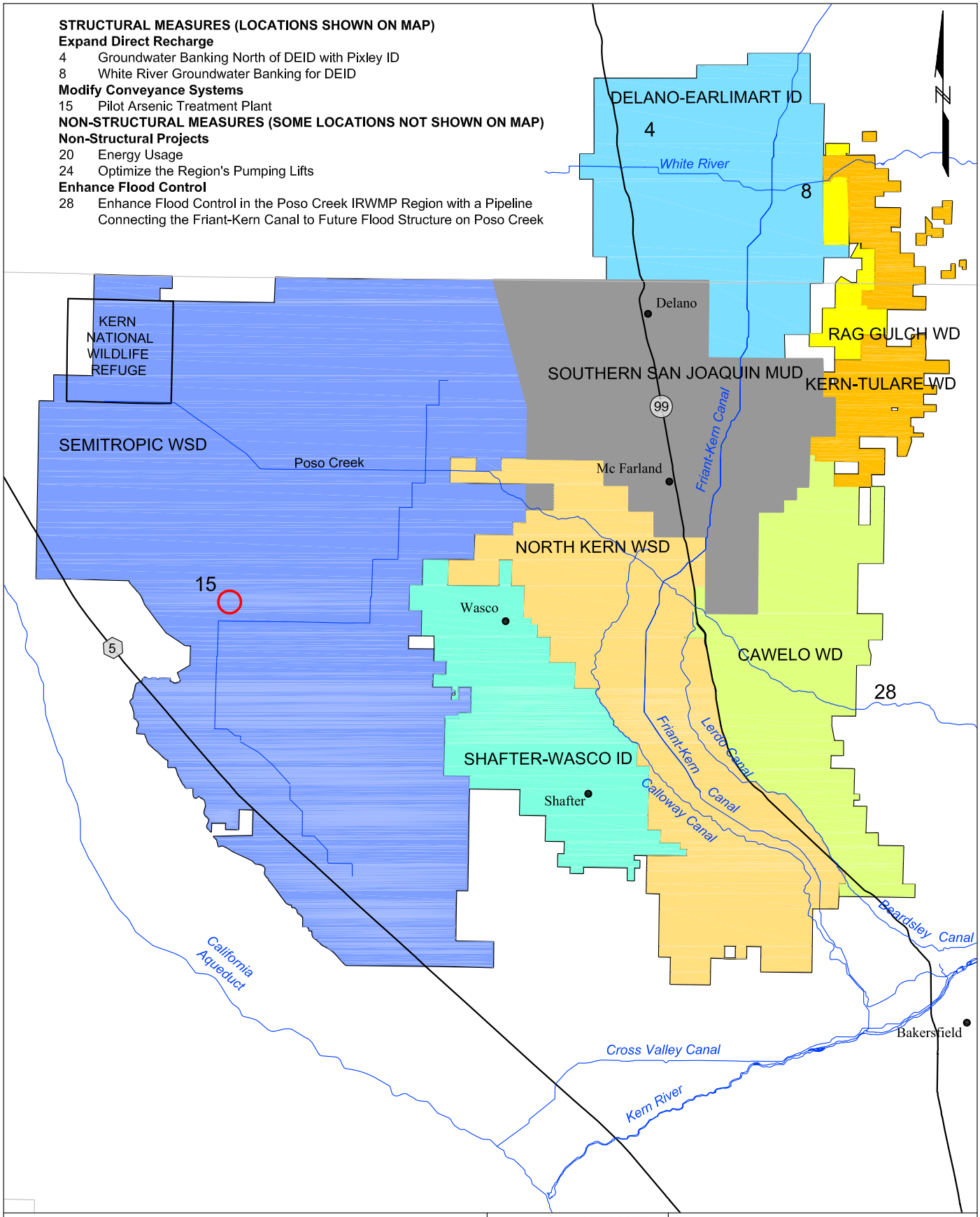
9.1.3 Project Bundle 3

Project Bundle 3 contains non-structural and structural projects that are more specific to the individual needs of each of the districts than the projects contained in Bundles 1 and 2 or they are less likely ready to be implemented in the near-term. Cost estimates for Bundle 3 projects are preliminary at best. Bundle 3 projects are described in Table 9-3 and the locations are shown on Figure 9-3. Again, since these projects are being considered for implementation by the RMG members as part of the Plan, any costs incurred with planning and implementing the project measures contained in Bundle 3 will be considered for funding match in accordance with each implementation proposal requirements.

Table 9-3 Implementation Plan Project Bundle 3

Project ID / Location on Map[1]	Project Name	Project Sponsors	Ready for Implementation	Estimated Cost
Structural Projects to Increase Water Supply Reliability				
Expand Direct Recharge				
4	G-W Banking North of DEID with Pixley ID	Delano-Earlimart ID	**CEQA not completed;** Feasibility study started in 2007.	To be dertermined
8	White River G-W Banking for DEID	Delano-Earlimart ID	**CEQA not completed;** Feasibility study started in 2007.	To be dertermined
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity				
15	Pilot Arsenic Treatment Plant	Semitropic WSD	**CEQA completed**; Planning study completed; Conceptual design completed; Ready for construction in 2008.	$20.5 million
Non-Structural Projects				
20	Energy Usage	Semitropic WSD	This proposed measure is to evaluate opportunities as part of implementation of structural projects. Currently, Semitropic operates an energy program.	Not estimated
24	Optimize the Region's Pumping Lifts	IRWMP Participants	Conceptual planning phase. May be implamented in the long-term.	Not estimated
Enhance Flood Control				
28	Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek	Kern County Water Agency	**CEQA not completed;** Currently in Planning phase.	Not estimated

[1] Location of proposed project as shown in Figure 6-2 and Figure 9-3.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Bundle 3 Project Locations
Poso Creek Regional Management Group		June 2007 Figure 9-3

The Bundle 3 projects, consisting of non-structural and structural projects, are listed below. In the case of the non-structural projects, the tasks that will be undertaken as part of the implementation of the non-structural projects are listed immediately after the project.

Institutional Agreements (non-structural projects)

1. Implement energy usage evaluations for the Region (project No.20).
2. Optimize the Region's pumping lifts (project No. 24).
3. Planning for flood control project on Poso Creek; pipeline connecting Friant-Kern Canal to future flood structure (project No.28).

Proposed Facilities (structural projects)

1. Expand Direct Recharge for DEID (projects No.4 and No.8).
2. Build pilot arsenic treatment plant in Semitropic (project No.15).

The benefits of Bundle 3 projects for each of the member districts that form the RMG are presented below.

Bundle 3 - Program Benefits

For RMG Member districts:

- Improves absorptive capacity of surface supplies and energy usage.
- Adds some flexibility between SWP and CVP contractors by providing additional operational opportunities for exchanges and conjunctive use programs between participants.
- Improves ability to move water to/from the California Aqueduct in regard to water quality concerns.

Regional Benefits and Operational Objectives

Water Supply Reliability – Reinforces benefits contained in Bundle 1 and Bundle 2 projects for the Region to absorb surface supplies and improve drought protection.
Groundwater levels – In connection with a positive WSR benefit, a corresponding water level benefit will occur.
Groundwater Quality – The pilot arsenic treatment plant will ensure water quality criteria are met for pumping into the California Aqueduct.
Water Supply Costs - In connection with the WSR benefit, a corresponding water level benefit will occur, positively impacting the water supply costs. In addition, other funding opportunities may offset water supply costs.
Monitoring - Institutional agreements will enhance additional monitoring needs for optimizing the basin's pumping lifts and energy usage.
Environmental Resources - Some corresponding environmental water and energy benefits will occur within the Region as well as, outside the Region.

Flood Control – Contribute to the long-term evaluation of the flood control enhancement on Poso Creek.

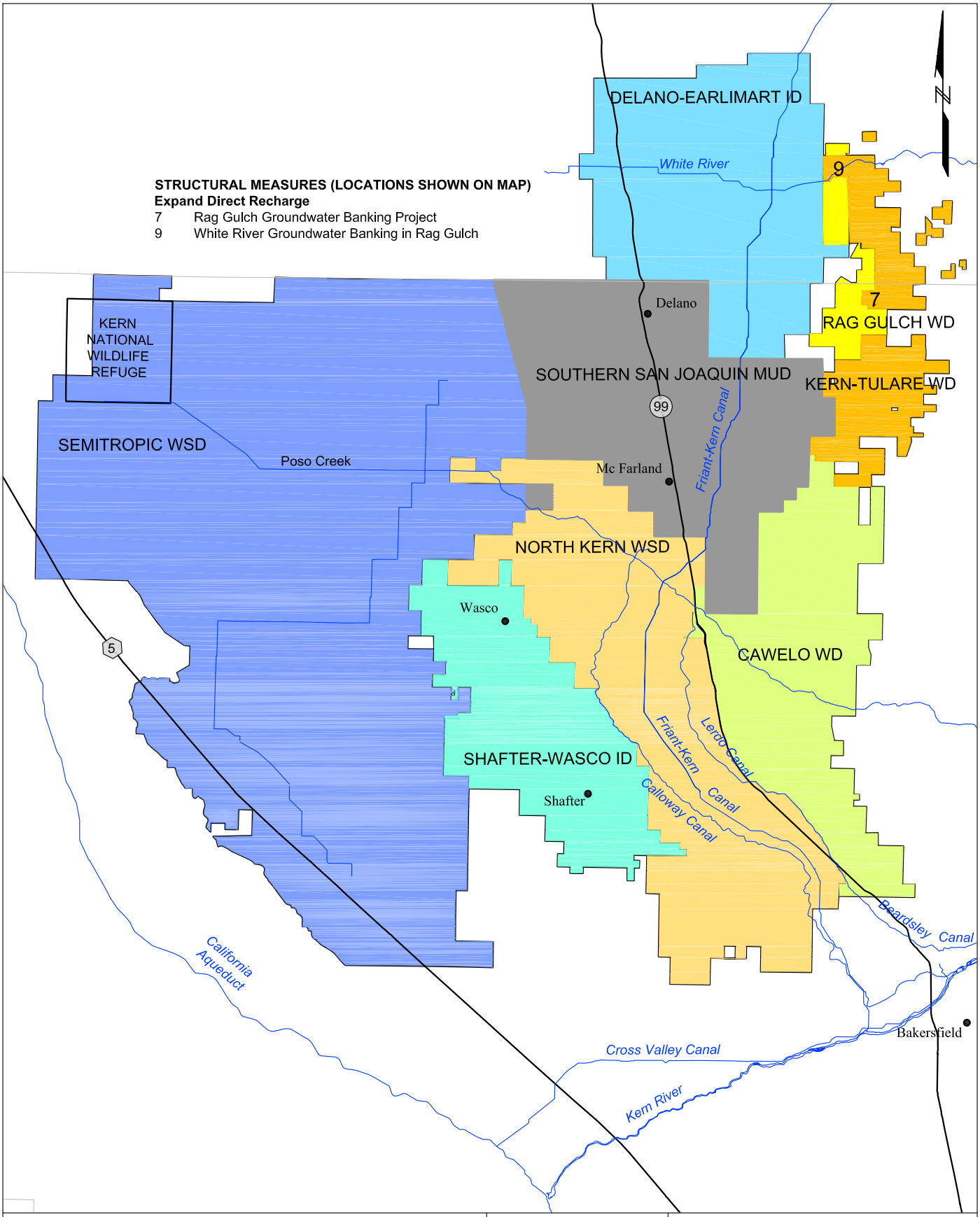
9.1.4 Project Bundle Deferred

Project Bundle Deferred, consisting of structural projects aimed at increasing the water supply reliability of the Region is listed in Table 9-4 and are shown on Figure 9-4. The projects contained in Bundle Deferred were considered by the RMG as part of the planning process, but, are not expected to be pursued as part of the near-term implementation proposals. These projects were considered too costly for the water supply benefit they provided, did not support the plan integration and/or multiple objectives, nor did they meet the timing for near-term implementation proposals.

Table 9-4 Implementation Plan - Project Bundle Deferred

Project ID / Location on Map[1]	Project Name	Project Sponsors	Ready for Implementation	Estimated Cost
Structural Projects to Increase Water Supply Reliability				
Expand Direct Recharge				
7	Rag Gulch G-W Banking Project	Kern-Tulare WD	CEQA not completed; Feasibility study completed in 2006; Construction of project is not planned in near-term.	$2 million
9	White River G-W Banking in Rag Gulch	Rag Gulch WD	CEQA not completed; Feasibility study completed in 2007.	$2.3 million
				Total Cost ~ 4.5 million

[1] Location of proposed project as shown in Figure 6-2 and Figure 9-4



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Bundle Deferred Project Locations
Poso Creek Regional Management Group		June 2007 Figure 9-4

9.2 Implementation Projects for Near-Term Funding Proposals

The projects that are proposed for near-term funding opportunities were identified and selected by the RMG from the Bundle 1 projects. The selected implementation projects are listed in Table 9-5 and are shown on Figure 9-5. The estimated cost to implement these projects is in the order of $65 million, however, as the projects proceed through design, the RMG will consider implementing only some of the project components of Project No. 5, thus, reducing the cost to implement the whole group of projects. In addition, the RMG expects to implement components of these projects in phases as funding opportunities can be secured to match local contributions.

Water management measures that will result from implementing the projects selected from Bundle 1 for near-term funding opportunities are as follows.

Institutional Agreements (components of non-structural project No.22) identified for Near-Term Funding Proposals.

1. Prepare a programmatic NEPA/CEQA document that allows for water movement between the RMG water districts (including SSJMUD).
2. Negotiate groundwater banking arrangements in North Kern and Semitropic for Kern-Tulare/Rag Gulch, Delano-Earlimart, Shafter-Wasco, and other interested RMG members.
3. Negotiate exchanges of Delano-Earlimart and Shafter-Wasco Friant water for non-CVP project water.
4. Negotiate exchanges of Kern-Tulare/Rag Gulch CVP Delta water supply for regulated local water supply.
5. Address water quality pump-in agreements for the Friant-Kern Canal and the California Aqueduct.
6. Complete adoption of all the RMG's updated groundwater management plans.
7. Complete CEQA documents for structural projects No.5 and No.17, (CEQA documents for projects No. 6, No.12, and No.14 are completed).

Proposed Facilities (structural projects) identified as Implementation Projects for Near-Term Funding Proposals.

1. (The project to Connect the Calloway Canal to the Cross Valley Canal that was listed as project No.11 of Bundle 1 has some expected delays due to other construction being conducted at a local oil refinery, therefore it was not selected for the near-term funding proposals).
2. Interconnect the Calloway Canal, Lerdo Canal, Friant-Kern Canal, and North Kern wells (The RMG is considering components described in project No.5 and project No.12).

3. Interconnect Semitropic and Shafter-Wasco distribution systems , which is project No.17; project No.18 of Bundle 1 will be considered after project No.17 is constructed, thus, it was not selected for the near-term funding proposals.
4. Modify Shafter-Wasco facilities to increase delivery capability from Semitropic to Shafter-Wasco distribution facilities and to the Calloway Canal (this concept was developed during plan formulation, will be refined by the RMG, and components may be included in the near-term funding proposals).
5. Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity; increase conveyance to and from groundwater banking for the RMG and for third-party participants (components described in projects No.12 and No.14; project No.13 will be considered following construction of projects No.12 and No.14 since the multi-district conveyance project overlaps and will benefit by the construction of components of projects No.12 and No.14. Also, due to the limited funding opportunities, project No.13 was not selected for the near-term proposals.
6. Expand Direct Recharge (project No.6). Project No. 6and project No. 14 have both starting construction; Poject No. 6 will be constructed in phases.

The program benefits (listed for each district in Section 9.1 of this Plan) and the regional benefits and operational objectives remain the same for implementing the RMG's selected list of projects to be implemented as part of near-term funding proposals as compared to Bundle 1 projects. However, the difference being that the magnitude of the benefits may be reduced based on implementing fewer of the conveyance improvements.

9.3 Technical Analysis and Economic Evaluation

As part of the project formulation, the RMG recognized the need to conduct technical analysis and provide economic measures that allow for an equitable evaluation of water supply benefits to make decisions on which projects to implement and include in near-term proposals for Proposition 50 and 84 and other funding opportunities. This Plan states an operational objective for water supply reliability to recover the projected loss to surface supplies as compared to historical by implementing non-structural and structural components of the Plan. The projected loss to surface supplies was estimated to be in the order of 100,000 acre-feet per year, based on technical analysis of the water supply operations study (presented in chapter 7) that projected surface supplies and operational changes imposed on the Region.

The RMG identified Bundle 1 as a group of projects that will likely contain the project components to be implemented to recover the projected loss to surface supplies to the Region. Any positive benefits to supply will also provide a positive effect on pumping lifts to the Region, thus reducing water supply costs to growers.

The RMG recognized that the group of projects proposed within Bundle 2 will have additive and synergistic effects to reaching the highest priority for the Region, gaining back the projected loss to the surface supplies. The water supply benefits of Bundle 2 will provide

some redundancy in conveyance of the *wet* year and *dry* year water supplies as Bundle 1, provide added benefits of flexibility in operations, and add to the capacity of the Region to provide groundwater banking for third-party banking participants. The third-party banking arrangements provide additional water supply and funding to the Region. In this regard, they also add to the complexity to the technical analysis and economic evaluation of Bundle 2 projects. It is likely that many of the Bundle 2 projects will be funded and implemented. A detailed technical analysis and economic evaluation of the Bundle 2 projects has not been completed for this planning effort, however, it is anticipated that several of the Bundle 2 projects will have a detailed technical analysis and economic evaluation completed prior to implementation and funding, specifically if they are included in near-term funding proposals. Projects that do progress to implementation will provide a synergistic effect for the Region in meeting the high priority operational objectives of improving water supply reliability and groundwater levels.

9.4 Financial Plan for IRWM Plan Implementation

9.4.1 Grant Funding Opportunities

Proposition 50, Round 2 and Proposition 84 implementation grants have been identified by the RMG as the near-term grant funding opportunities for implementing the project components selected from Bundle 1. Implementing water management measure with the highest priority contained in Bundle 1 is driven by the RMG member districts issues and needs that relate to modifying the management of their surface water supplies in response to changes due to environmental and urban water uses imposed on them from outside of the Region. The resulting modifications to the Region's ability to absorb surface supplies will also have significant statewide water supply reliability benefits. Because of these issues, local agencies expect that some funding assistance will come from outside of the RMG to help implement the projects under this Plan.

9.4.2 Local In-Kind Services

It is anticipated that the RMG entities will contribute direct funding and in-kind services to support project implementation of Bundles 1, 2, and 3. In accordance with each Integrated Regional Water Management, Grant Program Guidelines, and Proposal Solicitation Packages, it is also anticipated that their contributions will qualify as a funding match when projects are included in a proposal. Typical tasks that are expected to qualify for funding matches include the following:

- Project formulation, grant application preparation and progress reporting
- Engineering, design and bidding
- Acquisition of land and right-of-way easements
- Contract administration
- Legal fees

- Preparation of environmental documentation
- Environmental mitigation
- Project management
- Coordination and collaboration
- Collection and preparation of basic project data

Further, as the local entities form agreements as part of the implementation of projects, these agreements will contain provisions to share the costs of building each project component. It is up to the RMG to determine the equitable sharing of the costs to the benefits provided to the member districts of the Region. It is also expected that the local districts will be responsible for the operation and maintenance costs of each project implemented, as explained in operating agreements formed for each project. The extent and the costs of these contributions will vary by project.

9.5 Implementation Responsibilities

9.5.1 Capital Improvement, Ownership, and Operating Responsibilities

Each RMG member district, or stakeholder, will be responsible for operating the facilities within their district boundaries in accordance with the institutional agreements formed as part of each project implementation. The Region is governed by water districts and a few small communities. These water districts have completed numerous capital improvement projects and have formed many agreements for operation of such facilities.

9.5.2 Implementation Responsibilities

Implementation responsibilities include coordinating the following activities:

- The RMG and other interested parties/stakeholders will continue to participate in the regularly scheduled monthly meetings as the Plan moves into implementation.
- Semitropic will continue to act as the lead agency for the RMG as the Plan is implemented.
- Participation in a Joint Powers Authority formed as part of the Proposition 84 funding area.
- Coordination of the RMG with state and federal agencies.
- Communication with other entities outside the Region.
- Work with the appropriate local, state, and federal agencies to prepare and complete necessary environmental documents as identified in the Plan.
- Pursuit of opportunities to fund the projects and overall program consistent with the Plan.

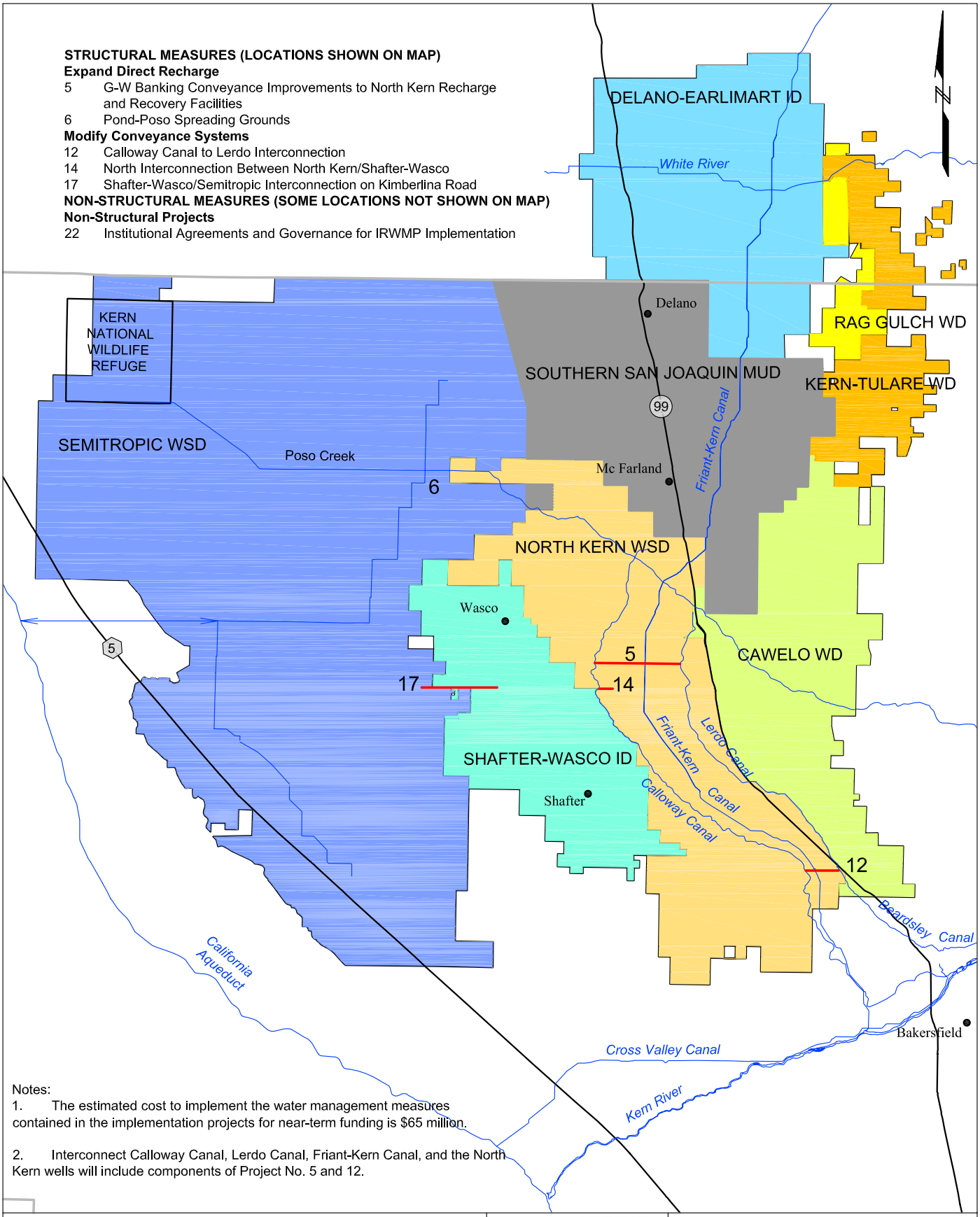
9.6 IRWMP Implementation Schedule

An implementation schedule is projected for each of the selected implementation projects for near-term funding proposals, as shown in Table 9-5. Implementation schedules for the remaining projects contained in Bundles 1, 2, 3, and Deferred are not shown in the Plan since they are not anticipated to be the focus of near-term funding proposals. Implementation schedules that will be included in proposals for each funding opportunity will be detailed versions of the schedules shown in this Plan. The RMG and stakeholders are already implementing some of these projects using their own funding, which is anticipated to be applied as in-kind funding match in the various proposals.

Table 9-5 Implementation Projects for Near-Term Funding Proposals

Project ID / Location on Map[1]	Project Name	Project Sponsors	Ready for Implementation	Estimated Cost
Structural Projects to Increase Water Supply Reliability				
Expand Direct Recharge				
5	G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities	North Kern WSD Delano-Earlimart ID Kern-Tulare and Rag Gulch IRWMP Participants	**CEQA not completed;** Currently in the Design phase; Ready for construction by 2009.	$17.5 million
6	Pond Poso Spreading Grounds	Semitropic WSD	**CEQA completed**; Construction started in 2007; Phases to be completed in 2008-2009.	$12 million
Modify Conveyance Systems to enhance exchanges and delivery of supplies to in-lieu and direct absorptive capacity				
12	Calloway Canal to Lerdo Interconnection	North Kern WSD Cawelo WD IRWMP Participants	**CEQA completed**; Project R/W have been acquired; Project in Design phase.	$21.8M (500 cfs design estimate)
14	North Inter-connection between North Kern/Shafter-Wasco	North Kern WSD Shafter-Wasco ID IRWMP Participants	**CEQA completed;** Construction started in 2007.	$1.14 million
17	Shafter-Wasco/Semitropic Interconnection on Kimberlina Road	Shafter-Wasco ID Semitropic WSD IRWMP Participants	**CEQA not completed;** Project R/W have not been acquired; Preliminary design completed; Ready for construction in 2008.	$12.2 million
Non-Structural Projects				
22	Institutional Agreements and Governance for IRWMP Implementation	IRWMP Participants	Remaining CEQA needs for implementation of projects is part of this Non-Structural project.	~ $500,000
			Total	~ 65 million

[1] Location of proposed project as shown on Figure 6-2 and Figure 9-5.



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Implementation Project Locations for Near-Term Funding Proposals
Poso Creek Regional Management Group		July 2007 Figure 9-5

Table 9-6 Implementation Project Schedules for Near-Term Funding Proposals

Project No. 5 — **G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities**

	2007				2008				2009				2010				Notes
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
CEQA/NEPA Compliance																	1
Project Design and Bidding																	2
Acquisition of Land/Right-of-Way																	
Acquisition of Permits																	
Construction																	
Monitoring																	
Performance Measures																	

[1] Project CEQA has not been completed

[2] Project currently in the Design phase

Project No. 6 — **Pond Poso Spreading Grounds**

	2007				2008				2009				2010				Notes
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
CEQA/NEPA Compliance-**Completed**																	1
Project Design and Bidding																	
Acquisition of Land/Right-of-Way-**Completed**																	
Acquisition of Permits																	
Construction																	2
Monitoring																	
Performance Measures																	

[1] Project CEQA has been completed

[2] Construction started in 2007 amd phases will be completed in 2008 and 2009

[3] Schedule described above is for the first phases being built, later phases will be built in 2008 and 2009

Project No. 12 — **Calloway Canal to Lerdo Interconnection**

	2007				2008				2009				2010				Notes
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
CEQA/NEPA Compliance - Completed																	1
Project Design and Bidding																	
Acquisition of Land/Right-of-Way																	
Acquisition of Permits																	
Construction																	2
Monitoring																	
Performance Measures																	

[1] Overall Project CEQA has been completed

[2] Construction started in 2007

Project No. 14 — **North Inter-connection between North Kern/Shafter-Wasco**

	2007				2008				2009				2010				Notes
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
CEQA/NEPA Compliance - Completed																	1
Project Design and Bidding																	2
Acquisition of Land/Right-of-Way																	3
Acquisition of Permits																	
Construction																	4
Monitoring																	
Performance Measures																	

[1] Overall Project CEQA has been completed

[2] Preliminary design completed

[3] Have not acquired all R/W, but cooperating with landowners

[4] Ready for construction by 2009

Project No. 17 — **Shafter-Wasco/Semitropic Interconnection on Kimberlina Road**

	2007				2008				2009				2010				Notes
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
CEQA/NEPA Compliance																	1
Project Design and Bidding																	2
Acquisition of Land/Right-of-Way																	3
Acquisition of Permits																	
Construction																	
Monitoring																	
Performance Measures																	

[1] Overall Project CEQA has not been completed

[2] Preliminary design completed

[3] Project R/W have not been acquired

Table 9-6 Implementation Project Schedules for Near-Term Funding Proposals

Project No. 22 **Institutional Agreements and Governance for IRWMP Implementation**

	2007				2008				2009				2010				Notes
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Programmatic CEQA/NEPA for Water Exchange/Banking Between RMG Districts																	
Groundwater Banking Agreements Between Semitropic and/or North Kern and other RMG Districts																	
Exchange Agreements Between DEID and Shafter-Wasco (CVP-Friant) and RMG Districts																	
Exchange Agreements Between KT & RG (CVP-Delta) and RMG Districts																	
Prepare Water Quality Pump-in Criteria for Friant-Kern Canal and the California Aqueduct																	
Complete Adoption of all the RMG's Updated Groundwater Management Plans.																	
Complete CEQA documents for structural projects # 5 and #17																	

10 Stakeholders and Public Involvement

10.1 Background

Seven agricultural water districts overlying the groundwater basin in the northerly portion of Kern County together with a resource conservation district formed the Poso Creek Regional Management Group (RMG) and developed this IRWMP. These water agencies, along with the resource conservation district that encompasses almost the entire study area, made up the eight-agency partnership formed for the purpose of developing this IRWMP. The RMG documented the water management needs of the area and developed regional water management strategies to address these needs and the framework for implementing them. Planning objectives were identified as noted in Section 1.3

The agencies listed below make up the RMG that formulated and adopted the Poso Creek IRWMP.

- Semitropic Water Storage District – Lead Agency
- Cawelo Water District
- Delano-Earlimart Irrigation District
- Kern-Tulare Water District
- North Kern Water Storage District
- Rag Gulch Water District
- Shafter-Wasco Irrigation District
- North West Kern Resource Conservation District (NWKRCD)

Semitropic acted as the Lead Agency in the development of the IRWMP and was responsible for all administrative responsibilities associated with the planning process. As the lead agency, Semitropic organized the RMG meetings, facilitated data exchanges among members, and provided administrative reports required for the Poso Creek IRWMP. Semitropic submitted an application and received Proposition 50, Chapter 8 funding for preparation of this plan. In this regard, much of the funding for the Poso Creek IRWMP was provided from the California Department of Water Resources.

10.2 Stakeholder involvement:

At the beginning of this IRWM Plan process, the RMG identified a list of stakeholders for the region. The stakeholders were initially contacted by the RMG in written correspondence. The RMG notified the stakeholders when meetings were held, which provided stakeholders with a recurring forum for comments and input. The Stakeholders, listed below and

presented in Section 1.1.2 of this report, were provided opportunities to actively participate in development of the Poso Creek IRWMP.

10.2.1 Regional Stakeholders:

- Buena Vista Water Storage District
- Lost Hills Water District
- Rosedale-Rio Bravo WSD
- Southern San Joaquin Municipal Utility District
- Kern County Water Agency
- Friant Water Users Authority
- Kern County Board of Supervisors
- City of Delano
- City of McFarland
- City of Shafter
- City of Wasco
- Lost Hills Utility District
- Kern National Wildlife Refuge

10.2.2 State and Federal Stakeholders:

- California Department of Fish and Game
- California Department of Water Resources
- U.S. Bureau of Reclamation

10.2.3 Legislative Contacts:

- Congressman Kevin McCarthy
- Congressman Jim Costa
- Congressman Devin Nunes
- Senator Dean Florez
- Senator Roy Ashburn
- Assembly Member Nicole Parra
- Assembly Member Jean Fuller
- Assemblyman Bill Maze

10.3 Public Involvement

10.3.1 Public Involvement Process

The RMG developed and implemented the public involvement process to ensure that the public was informed in the development of the Poso Creek IRWMP. This process included

regularly scheduled meetings of the RMG throughout the Poso Creek IRWMP process that allowed the public recurring opportunities to provide their input. See Appendix E for documentation of the Poso Creek RMG's public involvement efforts.

10.3.2 Public Meetings

The RMG held an initial meeting on April 20, 2005, to solicit input from the participating agencies regarding the preparation of an IRWMP. Following notification of the selection of the Poso Creek IRWMP Planning Grant Application, a subsequent public kick-off meeting was held on January 5, 2006 to organize planning efforts and address other initial issues.

On January 17th, 2006 the Semitropic Water Bank Monitoring Committee was briefed on the award of the IRWMP Planning Grant and the expected activity necessary to prepare the Plan. This monitoring committee was briefed again at its May 16th, 2006 meeting.

At the public kick-off meeting for the Poso Creek IRWMP, the RMG developed a list of stakeholders for the region. A participation process that ensured that the stakeholders' opinions could influence decisions about water management and a process that would continue to identify additional stakeholders was also developed early in the plan process. Development of existing groundwater management plans for seven water agencies to comply with requirements of AB 3030 and SB 1938 also involved public participation and the opportunity to identify potential stakeholders for the IRWMP process.

An advertised public meeting was held early in the plan formulation process at the time of the March 21, 2006 meeting of the RMG. The purpose of the public meeting was to present to the public, information about the proposed Poso Creek IRWMP planning process and to receive comments from interested parties. The presentation described the region encompassed by the Poso Creek IRWMP.

The Poso Creek IRWMP has been discussed at other water management meetings including the Kern County Water Agency Member Unit Managers Meetings, the Kern Fan Monitoring Committee, and the Pioneer Project participants meetings.

An advertised public meeting was held prior to formal adoption of the IRWMP on July 9th, 2007. The purpose of this public meeting was to present the Poso Creek IRWMP findings and to receive public comment. This public meeting was held during the 30-day comment period and prior to adoption by each of the RMG member district's Board of Directors. See Appendix F for a copy of the resolutions of plan adoption for each of the member district's that form the RMG.

10.3.3 Project Brochure

As the Poso Creek IRWMP was being formulated, the RMG developed a brochure that was used to communicate with water district board members, stakeholders, and interested parties. A copy of the brochure is provided as an attachment to this IRWMP as Appendix E.

10.4 Economically Disadvantage Communities Representation

The cities of Wasco, Shafter, and Earlimart located within the Poso Creek IRWMP Region, and the cities of Delano McFarland, Lost Hills and the unincorporated community of Richgrove, are located within the boundary that encompasses the RMA. Each of these communities qualify as *economically-disadvantaged* communities based on a comparison of the statewide median household income with household incomes within these urban areas, as shown in Chapter 1. Although these cities are not members of the RMG, all of these cities are considered stakeholders and were given the opportunity to review the draft Poso Creek IRWMP as well as provide input during development of the plan.

In regard to water management issues and concerns within the RMA, each of these communities rely on the same common groundwater basin for their water supply as the seven agricultural water districts that formed the RMG. It is recognized that any positive benefits that result from implementing water management measures in the RMA will have a direct positive benefit to the water supplies of these communities. It is also understood that because these are *economically-disadvantaged* communities, they have limited economic resources to draw upon to help resolve the projected loss of surface supplies to the RMA.

As for implementation of the IRWMP and applying for funding grants, it is the intent of the RMG to help these communities in qualifying for grant funding by being participants in this planning process and to assist these communities by identifying and informing them of funding opportunities. Funding opportunities that are outside of the Propositions 50 and Proposition 84 funding for IRWMP implementation will also be considered.

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Valley Water Alliance representing Friant-Kern Water Users (see page 7-11 of Chapter 7)

Wheeler Ridge Water Storage District Engineer's Report (see page 6-23 of Chapter 6)

Appendix A

Groundwater Management Plan Summaries

Cawelo Water District

Cawelo has prepared a groundwater management plan under California Water Code Section 10750, et. Seq. The plan was developed in accordance with the Groundwater Management Planning Act of 2003 (SB 1938). Cawelo's GMP update is complete and the GMP was adopted at the Board's July 12, 2007 meeting.

Delano-Earlimart Irrigation District

Delano-Earlimart has prepared a groundwater management plan under California Water Code Section 10750, et. Seq. The plan was developed in accordance with the Groundwater Management Planning Act of 2003 (SB 1938). Delano-Earlimart's GMP update is in progress and will be adopted at the Board's 8-9-07 meeting.

Kern-Tulare and Rag Gulch Water Districts

In December 2000, the districts adopted a groundwater management plan that was developed in accordance with AB 3030. In May 2003, the districts updated and adopted it to be compliant with SB 1938. The plan formalizes their groundwater management programs and assists with modifications to these programs that will preserve and enhanced the districts' groundwater resources. The program's objective is to preserve and maximize groundwater quantity and quality at the least possible cost.

Kern-Tulare and Rag Gulch share common distribution systems and staff. Therefore, one water management plan covering both districts has been prepared. This is consistent with earlier water management plans prepared for these two districts.

Prior to their formation, groundwater levels were falling at a rate of approximately 10 feet per year, groundwater quality was degrading, and subsidence of the land surface was occurring. With the importation of water since 1977, groundwater conditions have improved dramatically.

Basin Management Objectives

- Maintain or improve groundwater levels within the district
- Control degradation of groundwater quality

Groundwater Management Plan Objectives

- Pursue measures to increase reliability of CVP supplies
- Work with the City of Bakersfield to extend contract water supplies
- Continue to purchase Friant and 215 water supplies
- Pursue water exchanges and banking programs
- Develop in-district groundwater recharge and/or banking programs – Rag Gulch and White River
- Revise water pricing policies to encourage use of district water – completed prop 13 (218) to increase standby by $60 per acre
- Improve distribution system facilities to maximize delivery capability – Ninth Avenue Pipeline Project

The two districts accomplish an effective conjunctive use program by providing a supplemental surface water supply to reduce groundwater pumping. This aspect of their program relies on an extensive system of conveyance and distribution facilities. Since the construction of the distribution system, the districts have successfully reduced groundwater

overdraft. They currently provide an indirect economic inducement by establishing water rates high enough to promote water conservation, yet low enough to compete with groundwater pumping costs. This pricing system encourages the use of surface water to meet irrigation demands when available, thereby preserving the underlying groundwater resource. Under the groundwater management plan, the districts continue to make every effort to preserve the presently available groundwater recharge capabilities and to enhance them to every extent possible. Delivery of surface water in lieu of groundwater pumping continues, limited only by the availability of affordable surface water and the districts' distribution facilities.

As a result of increasing environmental actions in the Delta, the districts' CVP water supply is only a fraction of what it once was. This reduced water supply leads to inadequate water supplies to permanent crops and will cause a reduction in groundwater levels. This has caused the districts to pursue groundwater-banking programs.

The districts have identified the following key components to fully realize the potential of the groundwater management plans:

- Preparation of a periodic report summarizing groundwater conditions in the districts. This report includes estimates of historical groundwater pumping and the long-term safe yield of the groundwater basin.
- Development of a network of water user wells, and sampling and records retention procedures that can provide the data needed to accomplish the goals of the plan.
- Consideration of the expansion of the districts' conjunctive use program.
- Preparation of periodic reports that summarize the districts' activities, including water supply, power use, crops produced, irrigation demand, and groundwater extraction.

North Kern Water Storage District

On October 19, 1993, the Board of Directors of North Kern passed Resolution No. 93-92 to adopt and implement a groundwater management program pursuant to Part 2.5, Division 6 of the California Water Code. In 2007, The District updated their existing Groundwater Management Plan (GMP) to be compliant with the current requirements of AB-3030 and SB 1938. The updated plan is scheduled to be adopted the Fall of 2007.

North Kern and Rosedale Ranch are referred to as "North Kern" or simply the "District" if the text applies to both. Management issues specific to Rosedale Ranch are identified as such where applicable.

Purpose of the Groundwater Management Plan

North Kern has been actively engaged in groundwater management for over 50 years and Rosedale Ranch for over 25 years, and to a large extent, the GMP formalizes management goals and activities which are currently in place. The GMP documents management goals that have been formulated with public and stakeholder input, adopted by the Board of Directors, and used by the District manager to guide operation, engagement in basin-wide groundwater management, project implementation, and monitoring of project effects. The GMP has been updated to reflect the increased emphasis on water quality and regional groundwater issues.

Groundwater Management Issues

North Kern's local issues are difficult to separate from regional groundwater issues or the North Kern's specific surface water supply issues because the two are intricately intertwined in the North Kern's conjunctive use activities. North Kern's groundwater management issues include:

- Maintain the ability to provide an adequate water supply of satisfactory quality at reasonable cost.
- Protect North Kern's surface water rights and contracts.
- Protect and enhance the District's ability to replenish the groundwater.
- Pursue participation in groundwater banking for the benefit of the District, potential banking partners, and the groundwater basin as a whole.
- Protect and enhance the District's groundwater extraction capabilities.
- Monitor groundwater levels and quality.
- Conservation of the groundwater resource.
- Participate in regional groundwater management.

- Protect North Kern's right to continue conjunctive use as urbanization occurs within its boundaries.

Basin Management Objectives

By definition, North Kern's historical conjunctive use practices have caused the District to address intertwined groundwater and surface water issues. As stated in the 1993 Groundwater Management Program, the overarching objective of the GMP remains to:

"…preserve and maximize the utility of the groundwater resource through conjunctive use with available surface water, all with the goal of obtaining an adequate water supply of satisfactory quality at the least reasonable economic cost."

In order to address the Groundwater Management Issues listed previously, North Kern's GMP contains the following Basin Management Objectives (BMO):

Protect the Water Supply
The objective is to preserve and protect water rights and contracts respecting its existing surface water supplies.

Implementation actions pursued to meet this objective include: 1) pursuing opportunities to supplement these supplies, 2) purchase of Kern River and/or other supplies, primarily in the above-average years, 3) increasing the District's ability to import water during the wetter years, 4) expanding the District's existing irrigation distribution system facilities (to lands already developed to irrigated agriculture, but relying exclusively on pumped groundwater), 5) purchase of additional water supplies on a permanent or long-term basis, if and when available, and 6) litigation if necessary.

Protect Groundwater Replenishment Capability
The objective is to make every reasonable effort to preserve the presently available direct recharge capabilities, and consider enhancement of the capabilities of existing facilities, as well as the development of additional facilities.

Implementation actions pursued to meet this objective include: 1) continue to deliver surface water in lieu of groundwater pumping, limited by the availability of surface water and distribution facilities, 2) continue the present practice of encouraging the construction of distribution system facilities to lands which relay exclusively on pumped groundwater, 3) in Rosedale Ranch, unlined canals will remain unlined to facilitate incidental recharge for the purpose of direct replenishment as incidental percolation, 4) protect the physical recharge interface in recharge ponds by minimizing vehicular travel and trampling.

Protect Conjunctive Use

The objective is to preserve and enhance North Kern's existing extensive conjunctive use activities.

Implementation actions pursued to meet this objective include: 1) continue the historical practices of improving and constructing new water conveyance, storage and pumping facilities, 2) continue conjunctive use program in Rosedale Ranch by providing surface water delivery, when available, in lieu of pumping groundwater and 3) when surface supplies are available, continue to use the water pricing structure to encourage the use of these supplies, and thereby preserve the groundwater resource, by setting water rates competitive with the cost to produce groundwater.

Management of Groundwater Extraction

The objective is to maintain wells to supplement the available surface supplies for lands that depend on the District for irrigation water. Rosedale Ranch will encourage landowners to use available surface supplies in lieu of groundwater.

Implementation actions pursued to meet this objective include: 1) continue to own and operate District wells which allows for termination of groundwater pumping when surface water is available, 2) pursue opportunities to enhance existing wells or construct new District wells to more optimally manage the groundwater or meet any of the other Basin Management Objectives, and 3) continue to use pricing incentives for Rosedale Ranch which will encourage landowners to use available surface supplies in lieu of pumping groundwater.

Encourage Conservation

Although "conservation" saves very little water in a basin such as North Kern operates in because return flows are recaptured and reused, *the objective* is to continue to practice conservation in District operations and encourage and support conservation at the on-farm level.

Implementation actions pursued to meet this objective include: 1) pursue opportunities to participate in grant programs targeted for conservation, 2) periodically review the energy efficiency of its selected power sources that are used to extract groundwater, 3) continue to protect incidental seepage of water from its conveyance systems as replenishment to groundwater basin, rather than regard it as a loss, and 4) continue to encourage landowners to make use of field irrigation evaluations performed by the North West Kern RCD-DWR Mobile Laboratory.

Cooperate with Neighbors

The objective is to continue and enhance cooperation with neighbors. The District and Rosedale Ranch are surrounded by similar water agencies, all with conjunctive use projects that share a common groundwater resource, requiring cooperation.

Implementation actions pursued to meet this objective include: 1) continue to encourage and facilitate importation of available surface water supplies to these neighboring areas, 2) remain vigilant with respect to water transfer, exchange, and banking arrangements which have the potential to affect the common groundwater resource, and 3) take a leadership role respecting hydrologic accounting and groundwater monitoring on a multi-district basis.

Manage Groundwater Levels

This objective is to manage groundwater levels at economically viable pumping lifts for the agricultural uses in the basin.

Implementation actions pursued to meet this objective include all identified actions in the previously stated Basin Management Objectives.

Minimize Subsidence

The objective is to maintain groundwater levels above historical low levels in areas where subsidence has occurred historically, and otherwise operate to minimize the potential for subsidence and initiate corrective actions if subsidence is detected.

Implementation actions pursued to meet this objective include: 1) provide redundancy and flexibility in groundwater production facilities so that the spatial distribution of pumping can be altered in response to observed fluctuations in groundwater levels, 2) operate wells to equalize pumping heads on both sides of subsurface zones that have a potential for subsidence, and 3) monitor subsidence so that corrective action can be taken in a timely manner, and 4) provide surface water in lieu of groundwater within the Management Area to landowners where on-farm pumping has been shown to cause subsidence.

Protect Groundwater Quality

The objective is to control degradation of groundwater quality and enhance quality where practicable.

Implementation actions pursued to meet this objective include: 1) comply with and encourage District landowners to comply with the Kern County Ordinance No. G-5006 regarding well construction, 2) operate and maintain District wells in a manner that protects the wellhead, 3) adjust operations and maintenance to mitigate problems that are identified by North Kern's Groundwater Monitoring Program, 4) test water quality before completing new District wells so that perforations are not placed in zones of poor water quality, 5) if requested, provide guidelines to landowners for well construction and maintenance methods, 6) cooperate with landowners to solve water quality problems, 7) operate the North Kern conjunctive use system to maintain groundwater levels and gradients that limit the mobilization and migration of known groundwater contaminants, 8) continue to replenish the aquifer with high quality surface water , and 9) develop communication channels with Kern

County Environmental Health, Kern County Planning, and other agencies to stay informed on known contaminant sites.

Minimize Adverse Groundwater-Surface Water Interactions.
The objective is to maintain and enhance, when practical, flows and water quality in surface water features that are impacted by groundwater activities.

Implementation actions pursued to meet this objective include: 1) maintain an existing agreement with two water agencies (namely; Cawelo Water District, upstream, and Semitropic Water Storage District, downstream) for sharing of the waters of Poso Creek, 2) continue to utilize the Poso Creek channel, when dry, as a recharge facility, 3) maintain the existing water diversion permits, and 4) provide high quality water to the District's groundwater replenishment facilities.

Develop Groundwater Banking
The objective is to explore the feasibility of developing a groundwater bank as an expansion of ongoing conjunctive use activities.

Implementation actions pursued to meet this objective include: 1) conduct feasibility studies, 2) develop tools to evaluate the hydrologic impacts, including regional effects, 3) pursue the permitting, environmental documentation, and contracting required to implement projects, 4) develop funding, 5) construct facilities, and 6) develop an operating plan that is consistent with all of the Basin Management Objectives stated above. Banking arrangements could be effected through direct and/or in-lieu groundwater recharge.

Address Urbanization
The objective is to maintain North Kern's water rights and ability to achieve the Basin Management Objectives identified above as land uses change from irrigated agriculture to urban uses.

Implementation actions pursued to meet this objective include: 1) conduct an alternatives analysis to identify options available to the District, 2) with stakeholder involvement, formulate the District's objectives with regard to urbanization, 3) enter into basin-wide discussion that addresses urbanization, and 4) explore various agreements that could be negotiated or other actions that could be pursued to protect North Kern's water rights, including uses for urban lands, and 5) encourage development of dual water systems in newly urbanized areas to maximize conjunctive use of surface water and groundwater supplies.

Semitropic Water Storage District

Semitropic has prepared a groundwater management plan under California Water Code Section 10750, et. Seq. The plan was developed in accordance with the Groundwater Management Planning Act of 2003 (SB 1938). The Board of Directors approved Resolution No. ST 03-7 on September 22, 2003, which adopted the plan.

Semitropic has been managing its groundwater resources since its formation in 1958. In fact, it was formed in response to declining groundwater levels. The groundwater management plan formalized the goals and objectives evidenced by Semitropic's conjunctive use management practices, which have evolved over many years of operations. Through these practices, Semitropic has managed its groundwater and surface water resources to the benefit of its landowners, the groundwater basin, and California. It is noted that many of the groundwater management plan goals and objectives have been implemented before the plan's formal adoption.

Purpose: The purpose of the groundwater management plan is to set forth basic operating objectives that will preserve and enhance the quantity and quality of the groundwater that is vital to sustaining the local economies that rely, in whole or in part, on this resource, and to implement groundwater management activities that ensure the long-term sustainability of its resources.

Goals: The goals of the groundwater management plan are to, at the least cost, preserve, enhance, or augment the resource as necessary to mitigate and enhance the present groundwater levels in the regional groundwater basin. Semitropic's groundwater management is rooted in the conjunctive use of surface water and groundwater resources (that is, water supplies from the two sources are integrated to accomplish optimal use of each). The goals are implemented through five major BMOs, as follows:

- Maintain groundwater levels at economically viable pumping lifts for the agricultural uses (economy) of the area;
- Control the degradation of groundwater quality and enhance quality where practicable;
- Limit inelastic subsidence;
- Preserve the historical flow of Poso Creek into the area; and
- Operate the groundwater banking program to benefit Semitropic's landowners, without adversely affecting the water supplies of any Semitropic landowners or landowners in neighboring districts.

These are the fundamental basin management objectives which will guide the District's decision making, to the extent practicable and economically feasible. Specific management actions, practices, and policies which are applicable to the Management Area are discussed below for each of the management objectives.

Objective 1 - Maintain groundwater levels at economically viable pumping lifts for the agricultural uses (economy) of the area.

- Preserve the yield of the District's contract for imported State Water Project water (through participation in the efforts of the Kern County Water Agency and the State Water Contractors to monitor SWP operations).
- Support measures that will improve the reliability of the SWP (to the extent that it is economically feasible for agriculture).
- Purchase and import "Article 21" water, as available from the State Water Project.
- Purchase and import additional SWP water which is available from time to time (on an annual basis) through the Kern County Water Agency (KCWA). In this regard, support KCWA efforts to keep SWP Table A amount within Kern County and available at a price affordable to potential buyers, such as the District.
- Continue to support and develop the District's water banking capabilities within the Management Area.
- Continue to support the development of in-lieu recharge projects within the groundwater management area, i.e., to accommodate the delivery and use of available surface water supplies in lieu of pumped groundwater, including expansion of main conveyance facilities to and from the California Aqueduct, as well as irrigation distribution system facilities.
- Support the limited development of direct recharge within the District. To this end Semitropic has purchased 1,440 acres of land to be used for direct recharge. To date, about 320 acres are being converted in the first and second phases of the Poso-Creek Spreading Grounds.
- Participate in water banking projects located outside of the District's area as an additional means of regulating water supplies available to the District. The District is limited in its ability to take surface water which may become available either late in the year or early in the year, since (owing to geology) in-lieu recharge is the primary means of recharge (which limits the District's absorptive capability to the relatively "low" irrigation demands of these times of the year). Accordingly, among other matters, participation in direct recharge banking projects outside of its area provides a place to store water which is independent of irrigation demand.
- Facilitate the importation of surface water supplies to neighboring water agencies relying on the common groundwater resource.
- Encourage the use of surface water (in lieu of pumped groundwater) when available (e.g., through water-pricing policies and contracts for intermittent water deliveries).

Objective 2 - Control degradation of groundwater quality and enhance quality where practicable.

- Maintain groundwater levels such that the movement of relatively higher TDS groundwater (lying to the west) is mitigated. This would involve maintaining groundwater levels through the actions summarized for the first basin management objective.
- Construct a sanitary well seal, in accordance with Kern County Ordinance No. G-5006, on all new wells. Refer to Appendix B for a copy of the ordinance.
- Construct an annular well seal, in accordance with Kern County Ordinance No. G-5006, on all new wells. (If applicable, this seal is to isolate the groundwater located above the Corcoran or "E" clay, from that found below this regional, confining clay layer.)
- Abandon wells in accordance with provisions of Kern County Ordinance No. G-5006. The District has adopted a policy to financially assist landowners with the expense of properly destroying abandoned wells.
- Provide guidelines to landowners for well construction and maintenance methods to minimize risk of corrosion, encrustation, casing failure, siphoning of pesticides, wellhead spills of toxics and other actions that have potential to cause aquifer contamination.
- Seek partners that would help finance the treatment of drainage water in localized areas and any otherwise "unusable" water, all with the objective of developing useable supplies.
- Test water quality before completing new wells so that perforations are not placed in zones of poor water quality.
- Continue gathering data to update and refine the estimate of the location of the base of fresh water and pockets of poor water quality, and to enhance the understanding of the hydrologic character of the western edge of the District.
- Provide landowners within the District with the technical information required so that their operations protect the main aquifer from migration of poor water located to the west, above the E-clay, and below the production zone.
- Contact Kern County Environmental Health on a regular basis to stay current with the status of known contaminant sites.
- Obtain from Kern County Environmental Health all monitoring data for independent review of the groundwater quality beneath the City of Oxnard's bio-solids spreading operation to assure that the operation will not degrade water quality.
- Contact agencies north of the Kern County boundary to obtain the same level of information obtained in Kern County concerning; groundwater quality, contaminant sites, water level and quality monitoring, and groundwater management.

Objective 3 - Limit inelastic subsidence.

- Maintain groundwater levels within historical water level fluctuations to eliminate or limit inelastic subsidence. This would include the actions summarized for the first basin management objective.
- Provide redundancy and flexibility in groundwater production facilities so that the spatial distribution of pumping can be altered to some extent from year to year in response to observed fluctuations in groundwater levels.
- As required in the mitigation measures of the Semitropic Water Bank EIR, the District has constructed an Extensometer located near the future well field for the purpose of measuring land subsidence. Data is gathered and logged daily and recovered at least semiannually.

Objective 4 - Preserve the historical flow of Poso Creek into the area.

- Maintain an existing agreement with two upstream water agencies (namely; North Kern Water Storage District and Cawelo Water District) for sharing of the waters of Poso Creek.
- Maintain the District's existing water diversion permit, and convert it to a license at the appropriate time.

Objective 5 - Operate groundwater banking program to benefit District landowners, without adversely affecting water supplies of any District landowners or landowners in neighboring districts.

- Only water stored under the banking agreement may be withdrawn from Semitropic's groundwater basin. Water must first be stored before it is withdrawn.
- Semitropic will retain a minimum quantity of its SWP supply to maintain the quality of water delivered to farmers.
- The District will retain about ten percent of the water delivered to account for aquifer and operational losses.
- Pursuant to the In-lieu service contracts the District cannot require more water to be pumped from the wells on a given farm than the total of all prior surface water deliveries to that farm for banking purposes.
- A network of new monitor wells, solely for monitoring purposes, has been constructed to supplement the network of production wells.
- Withdrawal of stored water would be prohibited if such withdrawals would cause the average groundwater levels over a three-year period to be 15 feet lower than the average groundwater levels which would have prevailed without the project over the same three-year period and other mitigation measures are not taken.
- Groundwater levels are reviewed by a Monitoring Committee composed primarily of representatives from surrounding water districts.

Implementation of Semitropic's Groundwater Management Plan: Implementation of the objectives stated in the groundwater management plan has been ongoing since the late 1960s, when landowners approved the construction of main conveyance and distribution system facilities extending from the California Aqueduct to farm delivery locations. Certain activities that will be under way over the next one to three years are related to the BMOs identified in the groundwater management plan. These include (1) the planned construction of new irrigation distribution systems that will deliver surface water supplies (when available) to lands currently relying exclusively on pumped groundwater (this relates to the first basin management objective); and (2) the development of a groundwater flow model that can be used to evaluate the anticipated water level response of planned operations, as well as to evaluate what would have happened under a changed set of conditions (this is important with regard to the fifth basin management objective).

Achievement of Groundwater Level Enhancement: Semitropic's conjunctive use programs have clearly arrested the long-term decline in water levels that persisted prior to their implementation. SWP water has been delivered since 1973. The irrigation distribution system was built out between 1972 and 1977 to include 42,000 acres. Water pricing incentives have been in place since 1979. A number of landowner wells were connected to Semitropic's system from 1989 through the present.

While imports from the SWP significantly reduced declining groundwater levels, they did not eliminate it. The 1987-1992 droughts, with reduced SWP deliveries, led to declining water levels causing Semitropic to search for ways to take advantage of available underground storage (estimated at 2 million acre feet). In the late 1980s and early 1990s, Semitropic began the process of finding water-banking partners. The attached figure depicts the value of groundwater recharge in reducing groundwater overdraft.

Groundwater Banking for Other Partners: Semitropic's infrastructure has been extensively improved and expanded as part of the Water Bank, which was approved in 1994. The Groundwater Monitoring Committee was formed to provide regional oversight of the Water Bank. An interconnection to Shafter-Wasco, constructed in 1994, also provides regional management conveyance capacity. As part of the Water Bank, the irrigation distribution systems were expanded to 30,700 acres of which 20,600 acres has first priority use by the Original Banking Partners and 10,100 acres has first priority use by the District.

While Semitropic has developed significant in-lieu recharge capability, it had not developed any significant direct recharge capability. Accordingly, to provide additional banking flexibility, Semitropic purchased shares in the Kern Water Bank in 1995 for outside-district banking. The Kern Water Bank is a direct recharge project.

Semitropic's Stored Water Recovery Unit: In the late 1990s, Semitropic pursued planning for an expansion of its Water Bank through a project referred to as the Stored Water Recovery Unit. When implemented, the Stored Water Recovery Unit will provide improved dry-year pump-back capacity with the construction of a well field in the northwest portion of the district. Because of requests from the Banking Partners and others, there is an expanded need to increase the SWP's dry-year yield. In response to this need, Semitropic developed the concept and produced supporting feasibility studies and environmental documentation. This project makes use of an unfarmed area in the northwest portion of the district known to contain good quality groundwater. The project makes use of increased storage capability of the aquifer system and adds 650,000 acre-feet of storage capacity. The return capacity would increase by up to 200,000 acre-feet per year of dry-year yield. This water would be delivered directly into the California Aqueduct through a new facility including a seven-mile-long pipeline originally envisioned as having a 96-inch-diameter. Subsequently, the diameter of this pipeline was increased to 120 inches to accommodate future demands for conveyance capacity between the Friant-Kern Canal and the California Aqueduct. Of the yield, 150,000 acre-feet would come from 65 new wells constructed in the proposed wellfield area and 50,000 acre-feet would be produced from existing wells in the farmed areas and transported to the return pipeline by current Semitropic facilities. Semitropic has considerably more groundwater pumping capacity than the current 300 cfs return capacity, but is limited to 300 cfs by the reverse flow pipeline and pumping plant that returns water to the California Aqueduct facilities.

Interconnection with Shafter-Wasco: Water transfers and facilities are used to transport SWP water through Semitropic facilities to interconnections with Shafter-Wasco. These facilities consist of a pumping plant and a 3-mile long, 36-inch diameter pipeline. Also planned for construction are project features including a 30-inch diameter and 60-inch diameter connections to other infrastructure enabling an expansion of the water transfers between the two districts.

Groundwater Banking Program: In 1994, Semitropic entered into a Memorandum of Understanding (MOU) with five adjacent local districts which provided for proceeding with implementation of the Semitropic Groundwater Bank (Water Bank). These districts included North Kern, Shafter-Wasco, Southern San Joaquin Municipal Utility District, Buena Vista Water Storage District, and Rosedale-Rio Bravo Water Storage District.

The goal of the Water Bank has been to provide long-term underground storage of surplus SWP water to stabilize declining groundwater levels and provide drought supplies to the Banking Partners. The Banking Partners are the Metropolitan Water District of Southern California, Santa Clara Valley Water District, Alameda County Water District, Alameda County Zone 7 Water Agency and Vidler Water Company. Newhall Land and Farming Company has acquired a part of Vilder's interest.

Water is stored in the groundwater basin when agencies make their SWP or other supplies available to Semitropic. Theses surface supplies are delivered to landowners in lieu of their pumping of groundwater. During extraction years, two mechanisms can be used to return water to the Banking Partners. The first is through exchange, whereby a portion of the District's SWP water is used to return previously banked water and the District pumps and delivers a like amount of groundwater to its Contract Service Area, which is otherwise entitled to the SWP supply.

The second method of return of water to the California Aqueduct is used in particularly dry years when the SWP Table A allocation is insufficient to meet Semitropic's contractual commitment to return water to the Banking Partners. Under this circumstance, Semitropic will extract groundwater and physically deliver it through pump-back facilities to the California Aqueduct.

This program is fully subscribed to by the Banking Partners, who have delivered about almost one million acre-feet of water to Semitropic. The water can be returned at a rate of up to 300 cubic feet per second (cfs). The proven and working Water Bank has a return capability of 90,000 acre-feet per year of direct return to the California Aqueduct. This is achieved with a flow rate of 300 cfs (18,000 acre-feet per month) for the five months of the off-peak irrigation season

Timeline of Selected Water Resource Management Actions

Semitropic Water Storage District

Formation of Semitropic Water Storage District

First Delivery of SWP water

Adoption of General Project Service Charge (water-pricing initiative)

Water banking "demonstration project" with DWR (100,000 af)

- MOU with neighboring districts regarding formation of groundwater monitoring committee
- Approval of Semitropic Groundwater Banking Project (1,000,000 af)
- Construct connection to Shafter-Wasco Irrigation District

Construct Monitor Wells (8)

Construct Monitor Wells (7)

Construct Groundwater Banking Project Facilities

Construct irrigation distribution system facilities (42,000 acs)

Connect landowner wells to the District's System

- Temporary water banking program with MWD (50,000 af)
- Construct Monitor wells (5)

Purchase share of Kern Water Bank

Construct Monitor Wells (5)

Expand irrigation distribution system facilities

Expand irrigation distribution system facilities

Expand irrigation distribution system facilities

With Conjunctive Use (— Observed)

Without Conjunctive Use (--- Projected)

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Shafter-Wasco Irrigation District

In an effort to preserve local management of water supplies and protect groundwater investment developed over the past four and a half decades, the Shafter-Wasco Board of Directors adopted a groundwater management program under provisions of California Water Code 10750 et seq., which were added through the enactment of AB 225 and recently updated it to be compliant with SB 1938. The initial plan was adopted by Resolution 93-10 on June 8, 1993. The updated plan is scheduled to be adopted on August 14, 2007. Shafter-Wasco has the responsibility of conjunctively managing its surface water and groundwater supplies to ensure an adequate water supply for water users. The primary focus is to coordinate the management of surface water supplies with particular emphasis on the CVP.

The management program attempts to sustain storage levels and the groundwater supply. Physically, the objective is to preserve the utility of the groundwater resource, both in terms of quantity and quality. Further, enhancement or augmentation of the resource is necessary to mitigate the present level of overdraft in the overall groundwater basin and the attendant long-term decline in groundwater levels.

Key groundwater management program elements include:

- Policy on conjunctive use of surface water and groundwater;
- Groundwater monitoring; and
- Groundwater recharge

Objective 1 - In order to implement program elements, Shafter-Wasco has adopted policies to:

- Import all available surface water;
- Encourage surface water use through economic policy and inducements.

Objective 2 - Monitoring elements of the program include:

- The monitoring of groundwater levels;
- Monitoring agricultural water quality; and
- Preparing an annual water supply report

Objective 3 - Also included in the program are these groundwater recharge elements:

- Use of surface water in-lieu of pumping groundwater;
- Water supply exchanges and agreements with neighbors; and
- Water supply banking agreements

Appendix B

Kern County Ordinance No. G-5006

MAY 22 1989

ENVIRONMENTAL HEALTH

ORDINANCE NO. G-5006

AN ORDINANCE OF THE BOARD OF SUPERVISORS OF THE COUNTY OF KERN, STATE OF CALIFORNIA, REPEALING IN ITS ENTIRETY CHAPTERS 14.04 AND 14.08 OF THE KERN COUNTY ORDINANCE CODE COMMENCING WITH SECTION 14.04.010 THEREOF AND ADDING INSTEAD THEREOF A NEW CHAPTER 14.08, COMMENCING WITH SECTION 14.08.010 CONCERNING THE REGULATION OF WELLS AND WATER SYSTEMS AND THE ADOPTION BY REFERENCE OF CERTAIN STANDARDS CONTAINED IN CALIFORNIA STATE DEPARTMENT OF WATER RESOURCES, BULLETIN NO. 74-81, AND KERN COUNTY HEALTH DEPARTMENT HANDBOOK "UT 50".

The following ordinance, consisting of two (2) sections, was duly and regularly passed and adopted by the Board of Supervisors of the County of Kern, State of California, at a regular meeting of the Board of Supervisors held on the 9th day of May 1989, by the following vote, to wit:

AYES: Austin, Larwood, Hettinger, Shell

NOES: None

ABSENT: Ashburn

Ben Austin
Chairman of the Board of Supervisors of the County of Kern, State of California

(SEAL)

ATTEST:

SUE LASITER
Clerk of the Board of Supervisors

By Earlene Smith Deputy Clerk

THE BOARD OF SUPERVISORS OF THE COUNTY OF KERN ORDAINS AS FOLLOWS:

Section 1. This Ordinance shall take effect and be in full force on and after the 8th day of June, 1989, and shall be published once in the Bakersfield Californian, a newspaper of general circulation, published and printed in the County of Kern, State of California, together with the names of the members of the Board of Supervisors voting for and against the same.

Book No. 894195
Ord. No. G-5006

Section 2. Chapters 14.04 and 14.08, of the Kern County Ordinance Code commencing with Section 14.04.010 are repealed and in their place a new Chapter 14.08, commencing with Section 14.08.010 is added to read as follows:

ARTICLE I. PURPOSE AND DEFINITIONS

Section 14.08.010 - Purpose.

(a) It is the purpose of this Chapter to provide for the design, construction, reconstruction, abandonment, and destruction of:

1. wells defined herein as air conditioning, domestic, agricultural, cathodic protection, industrial, hazardous material monitoring, monitoring and observation, and grounding;
2. geophysical test holes; and
3. test wells;

in such a manner that the ground water of this County will not be degraded, contaminated or polluted, and that water obtained for beneficial uses will not jeopardize the health, safety, or welfare of the people of this County.

(b) In addition, it is the purpose of this Chapter to provide for the design, construction, and modifications of public and non-public water systems, and the permitting of the same, to assure an adequate supply of pure, wholesome and potable water for the users. Nothing in this Chapter shall be interpreted as abrogating any more restrictive requirements of other governmental agencies or state law.

Section 14.08.020 - Definitions. Except where the context otherwise requires, the definitions set forth in the following sections shall apply throughout this Chapter.

Section 14.08.022 - Abandoned Well. "Abandoned well" means a well not equipped with operable pumping equipment, which has not been used for a period of one (1) year and which has not been declared to be an "Out of Service Well". Such well must be destroyed in accordance with Section 14.08.360.

Section 14.08.023 - Agency. "Agency" means the Kern County Water Agency or any other public agency or County department designated by the Board of Supervisors as the County's authorized representative

and delegated the responsibility of administering any of the provisions of this Chapter.

Section 14.08.024 - Agricultural Well. "Agricultural well" means a well used primarily to supply water for irrigation, livestock or other agricultural purposes. Any domestic water service shall be only incidental to the primary agricultural purpose.

Section 14.08.026 - Air Conditioning Well. "Air conditioning well" means a well used to return to the ground water which has been used in a closed system as a coolant in air conditioning processes, or as a heating agent.

Section 14.08.028 - Annular Seal. "Annular seal" means the placement of impervious material in the annular space to prevent the flow of water across or along the annular space.

Section 14.08.030 - Annular Space. "Annular space" means the void between the wall of the well bore and the conductor casing, and between the conductor casing and the well casing, and between the well bore and the well casing.

Section 14.08.032 - Aquifer. "Aquifer" means a geologic formation that transmits water in sufficient quantity to supply pumping wells or springs.

Section 14.08.036 - Bulletin 74-81. "Bulletin 74-81" means the Department of Water Resources Bulletin No. 74-81. "Water Well Standards: State of California."

Section 14.08.038 - Bulletin 74-1. "Bulletin 74-1" means the Department of Water Resources Bulletin No. 74-1, "Cathodic Protection Well Standards: State of California."

Section 14.08.040 - Cathodic Protection Well. "Cathodic protection well" means any artificial excavation in excess of fifty (50) feet deep constructed by any method for the purpose of installing equipment or facilities for the reduction of corrosion of metallic structures and equipment in contact with the ground, commonly referred to as "cathodic protection."

Section 14.08.042 - Contamination. "Contamination" means an impairment of the quality of the waters of the State to a degree which creates a hazard to the public health through poisoning or through the

spread of disease. Contamination shall include any equivalent effect resulting from the disposal of waste. Contamination may include "pollution."

Section 14.08.044 - Construction. "Construction" means the excavation by digging, drilling or other means of the bore of a well and includes, but is not limited to, excavation, installation of casing, placement of gravel, perforation of casing in place, installation of annular seals and sealing off strata.

Section 14.08.046 - Degradation. "Degradation" means the unreasonable impairment of the quality of water by contaminants, pollutants or natural phenomena which adversely affects the beneficial uses of such water.

Section 14.08.048 - Department. "Department" means the Kern County Environmental Health Services Department unless otherwise specified.

Section 14.08.050 - Destroyed Well. "Destroyed well" means a well that has been destroyed in accordance with the requirements of this Chapter (Section 14.08.360).

Section 14.08.052 - Disposal Well. "Disposal well" means a well used for the disposal of unusable liquids.

Section 14.08.054 - Distribution System. "Distribution system" means all facilities used by a domestic water supplier to deliver water from the source or related treatment facilities to the user connections.

Section 14.08.056 - Domestic Water. "Domestic water" means that water plumbed to a dwelling or structure which is intended to be used for, but not limited to, drinking, food preparation, dish washing and bathing. Domestic water must also be potable as defined in Section 14.08.090.

Section 14.08.058 - Furnish. "Furnish" means to supply.

Section 14.08.060 - Geophysical Test Hole. "Geophysical test hole" means any artificial excavation in excess of fifty (50) feet deep constructed by any method for the purpose of determining subsurface geologic conditions.

Section 14.08.062 - Grounding Well or Terminal. "Grounding well or terminal well" means any artificial excavation in excess of fifty (50) feet deep constructed by any method for the purpose of installing grounding anodes or grounding terminals for any surface or subsurface equipment which is operated by or influenced by electricity, or for any other grounding purposes.

Section 14.08.063 - Hardrock. "Hardrock" means consolidated formation (crystalline or metamorphic rock).

Section 14.08.064 - Hazardous Materials. "Hazardous materials" means all the following liquid and solid substances:

1. Substances on the list prepared by the Director of the Department of Industrial Relations pursuant to Section 6382 of the Labor Code of the State of California.

2. Hazardous substances, as defined in Section 25316 of the Health and Safety Code of the State of California.

3. Any substance or material which is classified by the National Fire Protection Association (NFPA) as a flammable liquid, a class II combustible liquid or a class III-A combustible liquid.

Section 14.08.066 - Hazardous Material Monitoring Well. "Hazardous material monitoring well" means any artificial excavation constructed by any method to extract water or vapor samples, or to install instruments or equipment to detect, measure, record or otherwise monitor or observe the level, chemical constituency or similar characteristics of the ground water beneath or within two hundred (200) feet of a hazardous material site as defined in Section 14.08.068.

Section 14.08.068 - Hazardous Material Site. "Hazardous material site" means a location where hazardous materials are, or have been, handled, treated, stored, or disposed.

Section 14.08.070 - Health Officer. "Health Officer" means the Health Officer of Kern County or his duly authorized representatives. Such authorized representatives may include the Agency or any other public agency designated by the Board of Supervisors as the County's authorized representative and delegated the responsibility of implementing and administering any of the provisions

of this Chapter.

Section 14.08.072 - Industrial Well. "Industrial well" means a well whose primary purpose is to supply water to industry on an individual basis.

Section 14.08.074 - Monitoring and Observation Well. "Monitoring and Observation well" means any artificial excavation constructed by any method to extract water or vapor samples, or to install instruments or equipment to detect, measure, record or otherwise monitor or observe the level, chemical constituency or similar characteristics of the ground water. "Monitoring and observation well" does not mean wells constructed for the purpose of monitoring the presence of ground water which has adversely affected, or threatens to adversely affect, crop root zones (perched water).

Section 14.08.076 - Non-Public Domestic Well or Water System. A "non-public domestic well or water system" means a well or system used to supply domestic water to more than one (1) and less than five (5) service connections.

Section 14.08.078 - Nuisance. "Nuisance" means any use or condition of property or portion thereof, including structures, wells, etc. located thereon, which is unsafe, injurious to health, or which can contribute to ground water degradation.

Section 14.08.080 - Out of Service Well. "Out of service well" means a well that has not been used for a period of one (1) year and which complies with the provisions of Section 14.08.370.

Section 14.08.082 - Owner. "Owner" means the person(s) who is listed on the last equalized property tax assessment role as the owner of the land on which the well is located, or the person(s) who has a legal possessory interest in such land, whether by lease, easement or other legal claim.

Section 14.08.084 - Perched Water. "Perched water" means water in a local zone of saturation held above the main body of ground water by a relatively impermeable stratum. (Water in this zone is generally unpotable.)

Section 14.08.086 - Person. "Person" means any individual, company, firm, corporation or partnership, municipality, public entity

or other public body or institution or association of persons.

Section 14.08.088 - Pollution. "Pollution" means degradation of the quality of waters of the State by contaminants, pollutants or natural phenomena to a degree which unreasonably affects: (1) such waters for beneficial uses, or (2) facilities which serve such beneficial uses. "Pollution" may include "Contamination."

Section 14.08.090 - Potable Water. "Potable water" means water which is safe for drinking, culinary and domestic purposes and meets all requirements of the Health Officer.

Section 14.08.092 - Private Domestic Well. "Private domestic well" means a well used to supply water for the domestic needs of an individual residence or structure.

Section 14.08.094 - Public Domestic Well or Water System. "Public domestic well or water system" means any well or system used to supply or convey water for domestic needs to five (5) or more service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year.

Section 14.08.096 - Purveyor. "Purveyor" means any person that furnishes or supplies domestic water to users from any source. This includes serving a minimum of two (2) connections and a maximum of one hundred ninety-nine (199) connections. "Purveyor" also includes those persons that supply domestic water for public use or use a private domestic water supply in the operation of a business.

Section 14.08.098 - Recharge Well. "Recharge well" means a well used to introduce water into the ground as a means of replenishing ground water aquifers or basins or impeding the migration of poor quality water within the ground water basin.

Section 14.08.100 - Reconstruction. "Reconstruction" means any alteration, repair, restoration, addition, or subtraction of a well bore, the casing gravel pack, annular seals, surface seals, conductor casing or well casing, or perforations. (This shall not include merely "blowing out" of the perforations.)

Section 14.08.102 - Service Connection. A "service connection" means a connection between a domestic water main and a user connection.

Section 14.08.104 - Source Facilities. "Source facilities" means all components of the facilities used in the production, treatment, storage and delivery of water to a domestic water distribution system.

Section 14.08.106 - Test Well. "Test Well" means a well constructed for the purpose of obtaining the information needed to design a well prior to its construction, or to determine the availability of water in an area.

Section 14.08.108 - Substandard Water System or Well. A "substandard water system or well" means any water system or well which is constructed or operated in an unsafe manner, or in violation of any law, ordinance, regulation, Department rule or order.

Section 14.08.110 - User Connection. "User connection" means the connection of a user's piping to the water purveyor's facilities.

Section 14.08.112 - User. A "user" means any person, as defined herein, using water for domestic purposes.

Section 14.08.114 - Water Quality. "Water quality" means the chemical, physical, biological, bacteriological, radiological and other properties and characteristics of water affecting its beneficial use.

Section 14.08.116 - Well. A "well" means any artificial excavation constructed by any method for the purpose of extracting water from or injecting water into the underground, or used for the purposes of observation or monitoring of the ground water basin, or for cathodic protection, or as a grounding terminal. This definition shall not include:

1. Any well constructed or converted under the jurisdiction of the Department of Conservation of the State of California. (Division of Oil and Gas) except those wells converted for use as water wells;
2. Wells used for the purpose of:
   (a) dewatering excavations during construction, or
   (b) stabilizing hillsides or earth embankments:
3. Springs;
4. Disposal and injection wells constructed or converted under the jurisdiction of the California Water Quality

Control Board or the Environmental Protection Agency underground injection control program.

ARTICLE II. PERMITS, REGISTRATION, REPORTS AND FEES

Section 14.08.120 - Permit Required. Except as otherwise provided, it shall be unlawful for any person or contractor acting on his behalf to construct, reconstruct, deepen or destroy any well described in Section 14.08.116 or cause any of these acts to be done without first having filed a valid application for a permit with the Department and having received approval to begin work.

Every permit shall be deemed to be conditioned upon compliance with the requirements of Article III of this Chapter, except that permits issued to construct, reconstruct, deepen or destroy cathodic protection wells and hazardous material monitoring wells shall be deemed to be conditioned on compliance with the respective reference documents specified in Sections 14.08.220 and 14.08.230.

The Health Officer may prescribe additional permit conditions if the Health Officer determines that they are required to prevent degradation of underground waters as provided for in Section 14.08.010.

Section 14.08.130 - Registration. All persons as defined herein (hereinafter referred to as "Well Contractors") who intend to engage in the construction, deepening, reconstruction or destruction of wells as defined in Section 14.08.116 which are located within Kern County, must first register with the Department and furnish a copy of their current California water well contractor's license (Class C-57) and a Certificate of Insurance covering both Workers' Compensation, Public Liability and Property Damage. Well Contractors must give the Department written notice within fifteen (15) days of any suspension, or revocation of either their license or appropriate insurance coverage. No permits will be issued to any Well Contractor who fails to meet both license and insurance requirements as set forth above.

Section 14.08.140 - Expiration of Permit Application. A permit application issued pursuant to this Article shall expire on the ninetieth (90th) calendar day after date of issuance if the work has not been started and reasonable progress toward completion is not maintained, except that the Health Officer may extend the expiration

date of a permit when warranted.

Section 14.08.150 - Fees. The Department has adopted a published schedule of fees (non-refundable) to be paid by the permit applicant to cover the cost of processing the permit application and field inspections or tests incidental to issuance of any permit pursuant to this Article. Such fees are subject to the approval of and modification by the Board of Supervisors. All fees must be submitted to the Department with the application for a permit.

Section 14.08.160 - Report of Excavation. Any person who has drilled, dug or bored a well for which a permit was issued shall, within thirty (30) days after completion of drilling, digging or boring of such excavation, furnish the Health Officer with a report of such excavation. A copy of the report providing such information submitted to state agencies shall satisfy this requirement. The report shall include soil/lithologic log, E-log (if made), information concerning the type of casing, the depth of the excavation, the number and location of the perforations in the casing, the location, depth and type of materials used in the sealing off strata, chemicals used in drilling, and any other data required by the Health Officer.

Section 14.08.170 - Application for Permit.

(a) Application for a permit required by Section 14.08.120 of this Article shall be made to the Department. Such application shall be on forms furnished by the Department and shall provide all information required by the Department pertaining to the project. Every application shall be signed by the owner, or the authorized agent of the owner.

(b) The following information shall be furnished:

1. Owner's name, address and telephone number.
2. Whether the intended use of the well is for domestic purposes, agricultural, grounding, observation, cathodic protection, monitoring, or for any other purpose or combination of purposes regulated by this Chapter.
3. Location of well by reference to street address, nearest streets or crossroads or other significant

features and by reference to Section, Township, and Range. The quarter of the quarter section to contain the well shall also be identified. An example would be the SW 1/4 of the NE 1/4 of Section 24, T27S, R24E, or using the California Department of Water Resources letter location system, 27S/24E-24G.

4. The Assessor's Parcel Number (APN).
5. Dimensioned plot plan indicating north direction, distances and locations of existing and proposed structures, sewers or sewage disposal systems, other wells, and any other potential source of contamination or degradation on the property or adjacent properties within two hundred (200) feet of the well or proposed well.
6. Well drilling contractor's or subcontractor's name, address, and their contractor's C-57 license number and telephone number.
7. Nature of the work to be done, whether construction, reconstruction, destruction or other work, and, in the case of construction or reconstruction, the method to be used, whether cable tool, rotary, reverse flow, or other method.
8. Estimated depth of well when completed.
9. Diameter, thickness and type of casing.
10. Significant feature of well (e.g., conductor casing, gravel pack, sealing, or perforation locations).

(c) In addition to the foregoing, the Department may require such other and further information relevant to the project as it may deem necessary to determine whether the public purposes expressed in Section 14.08.010 of this Chapter requires the denial of the permit or the imposition of further conditions.

(d) If the well is to be located on a lot less than 2.5 acres (net) in size, the applicant must submit with the application, a

pre-development plan. This plan must delineate the proposed location of all structures and improvements, sewage disposal facilities, area reserved for alternate sewage disposal system, and all potential sources of contamination even on adjacent lots within two hundred (200) feet of the proposed well site. It shall be the responsibility of the permit applicant to prepare a plan that demonstrates the proposed well will not prohibit the free and equal use of the adjacent properties.

(e) Copies of an issued permit shall be forwarded by the Department to the applicant, the Kern County Building Inspection Department, the Kern County Assessor's Department and the Kern County Water Agency.

Section 14.08.180 - Permit Denial. A permit may be denied for any of the following:

1. Failure to supply any information required by or requested pursuant to Section 14.08.170 which is known to, or by the exercise of reasonable diligence, can be acquired by, the applicant.

2. Failure to obtain required approvals from the Kern County Planning and Development Services Department.

3. Failure to submit fees with application.

4. Failure to meet requirements of Section 14.08.130 governing registration.

5. Failure to comply with Section 14.08.190 governing setbacks from pollution sources, except if a variance has been granted by the Health Officer pursuant to Section 14.08.380.

ARTICLE III. WELL STANDARDS

Section 14.08.190 - General Location of Well.

(a) It shall be unlawful for any person to drill, dig, excavate or bore any well in any location in which sources of pollution or contamination are known to exist at such location whereby ground water may become contaminated or polluted even when the well is properly constructed and maintained.

(b) It shall be unlawful to locate a domestic well on a lot or premises when a connection with a public water supply system willing and able to serve such lot or premises, is available within three hundred (300) feet or when a connection already exists. Agricultural

wells may be located in Agricultural Zone districts only.

(c) All wells shall be located an adequate horizontal distance from potential sources of contamination and pollution, with due consideration given to local geological conditions and soil permeability. In any event, as a minimum, the following set back distances shall apply:

septic tank or sewer line	50 feet
subsurface sewage leaching field or pit privy	100 feet
cesspool or seepage pit	150 feet
hazardous material site	200 feet
animal enclosures	100 feet
storm water runoff sump or agricultural drainage sump	100 feet
front property line (not including easements)	25 feet
other property line (not including easements)	5 feet
agricultural or industrial well	200 feet
another well (except hard rock)	100 feet
Class I, II, III waste disposal well	200 feet

(d) The effect on surrounding properties must be considered when measuring set back distances. No approval by the Department should limit or hinder the free and equal use of property by adjacent property owners, except where they have given their approval in writing to the applicant. Such written approval shall be in a form satisfactory to the Department and may be required to be recorded with the County Recorder.

(e) Where extraordinary danger of degradation exists or special hazards are involved, the above distances shall be increased, or special means of protection particularly in the construction of the well, shall be provided as determined by the Health Officer. All wells shall be located up gradient from the specified source of contamination.

(f) All wells drilled within an A (Agricultural) Zone District be set back a distance of seventy (70) feet from mid-section lines and eighty (80) feet from section lines, except that where circumstances justify, an administrative variance may be granted

pursuant to Section 14.08.380.

(g) The top of the well casing shall extend a minimum of one (1) foot above the 100-year base flood elevation as determined by the Federal Emergency Management Agency ("FEMA"), Kern County Planning and Development Services Department or by any special flood study approved by representatives of Kern County. The proposed well site shall meet the minimum standards as provided in Chapter 17.48 of the Kern County Ordinance Code.

(h) Where the proposed well is to be located near a building, such well shall be located far enough from the building so that it will be accessible for repair, maintenance, etc.

(i) The proposed well may not be moved more than five (5) feet from the originally approved site location without a reinspection of the new site being performed by the Health Officer.

Section 14.08.200 - Well Casing Material and Installation. Well casing shall be new with a minimum thickness of 3/16" (0.188"). All other requirements for casing materials and installation shall be as outlined in Chapter II, Part II, Section 12 of Bulletin 74-81 "Water Well Standards - State of California." Provided, however, that the use of fiberglass casing is not approved. PVC well casing must display the letters NSF-wc. (National Sanitation Foundation - well casing.)

Section 14.08.210 - Well Construction. A well shall be constructed in accordance with the standards contained in Chapter II, Part II of Bulletin 74-81, "Water Well Standards - State of California," including the latest revisions thereof.

(a) Drilling Fluids or Additives - The use of any used drilling fluids or additives for any purpose in the construction of a well is prohibited.

(b) The use of any polluted contaminated water in the actual drilling process or for flushing the well hole is prohibited.

(c) It shall be unlawful to inject any pesticide or chemical into the discharge pipe of a well which is not equipped with an approved backflow protection device or method as described in Section 14.08.280.

Section 14.08.220 - Cathodic Protection Wells. Cathodic protection wells shall be constructed and sealed in conformance with the cathodic well standards set forth in Bulletin 74-1, "Cathodic Protection Well Standards", including the latest revisions thereof, with the exception that the depth of the annular seal shall be as required in Section 14.08.240.

Section 14.08.230 - Hazardous Material Monitoring Well.

Hazardous material monitoring wells shall be constructed and sealed in conformance with the standards set forth in Kern County Health Department Publication UT-50.

Section 14.08.240 - Sealing the Upper Annular Space.

(a) The area between the wall of the well bore and the well casing of the drilled hole (the annular space) shall be effectively sealed to protect it against contamination or pollution by entrance of surface and/or shallow, subsurface waters. The minimum depth of the upper annular seal shall be as specified in subsection (b) below.

(b) The minimum depth of the upper annular seal shall be as follows:

Private Domestic Wells	50 feet
Non-Public Domestic Wells	50 feet
Public Domestic Wells	50 feet
Industrial Wells	50 feet
Observation and Monitoring Wells	20 feet
Cathodic Protection Wells	50 feet
Air-Conditioning Wells	50 feet
Agricultural Wells	50 feet

Section 14.08.250 - Sealing Conditions. The requirements for sealing a well shall be as specified in Part II, Chapter II, Section 9B of Bulletin 74-81.

Section 14.08.260 - Annular Seal; Sealing Off Strata.

(a) When any well is to be constructed or reconstructed in such a manner that it will penetrate two (2) or more water bearing strata, one (1) or more of which has been determined by the Health Officer to contain ground water of a quality which will cause the

degradation of ground water in the other strata if the waters are allowed to intermingle, the undesirable stratum shall be sealed off to prevent the flow of the poor quality water through the annular space from degrading water in the strata containing water of an acceptable quality.

(b) Whenever an aquifer containing poor quality water is required to be sealed off as provided in subsection (a) above, a minimum of a twenty (20) foot annular seal shall be placed in the confining formation separating the aquifer containing poor quality water from the aquifers containing acceptable quality water. An electrical geophysical log of the well shall be run to assist in the placement of the annular seal, and a copy made available to the Department. The strata producing the undesirable quality water shall be sealed off by pumping an impervious material opposite the strata no less than twenty (20) feet, even when the confining formation is less than twenty (20) feet in thickness. The sealing material shall fill the annular space in the interval to be sealed, and the surrounding void spaces which might absorb the sealing material. The sealing material shall be placed from the bottom to the top of the interval to be sealed.

(c) Gravel chute shall extend through the annular seal at least two (2) feet into the gravel pack.

(d) Sealing materials shall consist of neat cement, cement grout or cement. In areas of subsidence or under special conditions, the use of other approved sealing materials may be allowed with prior approval of the Health Officer.

(e) In areas where deep subsidence may occur (as, for example, portions of the San Joaquin Valley), provision shall be made for maintaining the integrity of the annular seal in the event of subsidence. Such preventive measures may include the installation of a "sleeve" or "slip joint" in the casing, which will allow vertical movement in the casing without its collapse.

Section 14.08.270 - Well Development or Redevelopment.

Developing, redeveloping, or conditioning of a well shall be done with care and by methods which will not cause damage to the well or cause

adverse subsurface conditions that may destroy barriers to the vertical movement of water between aquifers. The following methods used in the developing, redeveloping, or conditioning of a well when done with care are acceptable:

(a) Overpumping.

(b) Surging by use of a plunger.

(c) Surging with compressed air.

(d) Backwashing or surging by alternately starting and stopping the pump.

(e) Jetting with water.

(f) Introduction of chemicals designed for this purpose.

(g) Bailing.

(h) A combination of the above.

The use of explosives for development shall be only by persons licensed for that purpose. Special care shall be exercised when such explosives are employed in development of a well which penetrates two or more distinct aquifers separated by a natural barrier.

The use of any chemicals for the purpose of development of a well, or any other purpose(s), shall be included on the Well Drillers Log, or if performed by other than the driller on a separate report. Where chemicals or explosives have been used, the well shall be pumped to remove residue from such chemicals and/or explosives to restore the water quality of any affected aquifer to the water quality conditions which existed prior to the use of such chemicals and/or explosives.

Section 14.08.280 - Surface Construction Features. Wells drilled for the purpose of producing water for any beneficial use shall be equipped with the following features, installed as outlined in Chapter II, Part II, Section 10 of Bulletin 74-81:

(a) Disinfection access/sounding tube.

(b) Screened air vent (optional for flowing artesian wells).

(c) A backflow protection device or method approved by the Department.

(d) Unthreaded sample spigot.

Section 14.08.290 - Responsibility for Compliance. It is the responsibility of the Well Contractor to construct the well in accordance with Article III of this Chapter, except for surface construction features.

It is the responsibility of the owner of the well to supply all surface construction features (i.e., slab, watertight sanitary seal, backflow protection device, vent, sounding tube and sample tap) and all required water quality analyses.

Section 14.08.300 - Surface Sealing.

(a) All wells hereafter constructed, deepened or reconstructed shall, prior to being placed into service, be provided with: A watertight reinforced monolithic concrete slab a minimum thickness of six (6) inches, set a minimum of four (4) inches above ground level at the well site, and extending horizontally at least three (3) feet from the edge of the well casing in all directions, and covering the unsealed portion of the well excavation, except that monitoring wells, as defined in Section 14.08.074, shall have a minimum concrete slab two (2) foot by two (2) foot with a minimum thickness of six (6) inches. The concrete slab shall be constructed so as to adequately drain water away from the well casing. Where deviation from this pattern of construction would serve a practical purpose without lessening well protection, the Health Officer may approve such deviation. All wells shall be provided with a sanitary seal so as to prevent surface water from entering the well. Each slab (or well) shall be identified by the name of the owner on the well permit, or APN number, or other approved method.

(b) In those cases where it is not possible to meet the horizontal set back distances from pollution sources described in Section 14.08.190, an alternative means of protection for the well may be to increase the depth of the upper annular seal. Where horizontal set back distances cannot be met or adverse or special hazards exist (such as perched water), the depth of the upper annular seal shall be increased as required by the Health Officer.

(c) In hard rock formations, the minimum depth of seal shall be twenty (20) feet or one (1) foot into hard rock if encountered

first. Sampled hard rock cuttings shall be collected and held at the site for inspection of the Health Officer.

(d) Annular seals of one hundred (100) feet or less in dry formations may be poured. All other seals shall be positively placed from the bottom upward using a pump or by air pressure.

(e) All seals shall set forty-eight (48) hours after placement if an accelerator is not used. A twenty-four (24) hour set time may be allowed if the sealing material contains an accelerator.

(f) During the pumping of sealing material for the annular seal, all standing water must be allowed to drain off and not incorporate into the annular seal nor into the slab.

Section 14.08.310 - Disinfection of Wells. Every new, deepened, repaired or reconstructed individual domestic or community water supply well, after completion of construction, deepening, repair or reconstruction, and before being placed in service, shall be disinfected by a method approved by the Health Officer to produce water meeting bacteriological standards as set forth in applicable State laws and regulations.

Section 14.08.320 - Other Sanitary Requirements. The gravel used in gravel-packed wells, and lubricant mud shall meet the sanitary requirements of Bulletin 74-81, Part II, Section 11.

Section 14.08.330 - Water Quality Testing.

(a) Water from all wells which provide water for any beneficial use shall be tested radiologically, bacteriologically and chemically by a State Certified Laboratory. The results of all such laboratory water testing shall be submitted to the Health Officer within ninety (90) days of drilling or reconstructing the well.

(b) Water from all wells that will be used in food processing or public domestic water systems shall comply with the Domestic Water Quality Standards contained in California Code of Regulations, Title 22, Domestic Water Quality Monitoring Regulations, Sections 64401 et. seq. or the latest revision thereof, or adequate treatment facilities to remove the constituent(s) that is in non-compliance shall be installed.

(c) Water from reconstructed wells shall be tested bacteriologically and meet the same standard as new wells. When deemed necessary by the Health Officer, they shall meet the same chemical standards as new wells.

(d) Chemical, radiological, and bacteriological tests shall be the responsibility of the owner.

(e) Water from agricultural wells shall have, as a minimum, a standard agricultural analysis by a State Certified Laboratory.

Section 14.08.340 - Approval by Health Officer. No water from a new or reconstructed domestic well shall be used for domestic purposes until the well is given final approval by the Health Officer.

Section 14.08.350 - Well Conversion. Before any non-domestic well can be converted to domestic use, it must first have Department inspection and be brought into compliance with this Chapter.

Section 14.08.360 - Well Destruction. All abandoned wells shall be destroyed in such a way that they will not produce water or act as a channel for the interchange of water, when such interchange will result in significant deterioration of the quality of water in any water-bearing formations penetrated, or will present a hazard to the safety and well-being of people or animals. Destruction of a well shall consist of the complete filling of the well in accordance with the procedures prescribed in Section 23 of Chapter II of the California State Department of Water Resources Bulletin No. 74-81. Provided however, that the top fifty (50) feet shall be sealed with concrete or other approved sealing material. All abandoned wells shall be destroyed within ninety (90) days of abandonment.

Section 14.08.370 - Out of Service Wells. Any newly constructed well that has not been completed and given final approval of water quality and surface construction features within ninety (90) days of the cessation of drilling shall be declared out of service or properly destroyed. Any existing well that has not been used for a period of one (1) year shall be properly destroyed unless the owner has filed a "Notice of Intent" with the Health Officer declaring the well out of service, and declaring his intention to use the well again. As evidence of his intentions for future use, the owner shall properly

maintain the well in such a way that:

1. The well has no defects which will impair quality of water in the well or in the water-bearing formations penetrated.

2. If the pump has been removed, the well shall be covered with a watertight seal to prevent injury to persons and the entrance of undesirable water, rodents or foreign matter.

3. The well is marked so that it can be clearly seen.

4. The area surrounding the well is kept clear of brush or debris.

5. Redeclaration of intent shall be made upon request of the Health Officer.

Section 14.08.380 - Administrative Variance. The Health Officer may grant an administrative variance to the provisions of this Chapter where a determination has been made upon the basis of evidence submitted by the owner or his representative demonstrating that a modification of the well standards as provided herein will not endanger the health or safety of the consumer of the water, or the public generally, or contribute to ground water degradation, and strict compliance would be unreasonable in view of all the circumstances.

ARTICLE IV. DOMESTIC WATER SUPPLY SYSTEMS

Section 14.08.390 - Permits. No person shall construct or operate a non-public or public water system unless a petition and plans and specifications are first filed with the Department, a permit is issued as provided in this Article and such permit is not thereafter revoked, suspended or otherwise becomes invalid.

Section 14.08.400 - Application. The provisions for permit and application issuance are as provided for in the Safe Drinking Water Act, California Health and Safety Code Division 5, Part 1, Chapter 7, Water and Water Systems, Sections 4010 through 4039.5, including the latest revisions thereof.

Section 14.08.410 - Design and Construction.

(a) The design and construction of a new public system and the design and construction of changes in the distribution system of an existing public water system shall meet the minimum standards specified in the California Waterworks Standards, Title 22, California Code of

Regulations, Articles 1 through 5, Sections 64553 through 64644, including the latest revisions thereof.

(b) Public water systems not having multiple sources shall provide a minimum of two (2) days storage. (two hundred fifty (250) gallons/connection/day)

(c) All facilities of the distribution system shall be designed and constructed to withstand ample safety factors, the physical stresses to which they will be subjected and shall be free from structural or sanitary hazards. All water supply systems shall be so designed and constructed that they have an adequate capacity to continuously supply pure, wholesome, safe and potable water.

Section 14.08.420 - Modifications. No person shall make major modifications or changes in their water supply system until they first file a petition to do so, and receive an amended permit, if required, from the Kern County Health Department authorizing the modification.

Section 14.08.430 - Source Approval. All water sources used for domestic water supply must have the approval of the Health Officer. Water which is not obtained from an approved source, free from pollution, shall not be used for domestic purposes unless it is adequately purified and disinfected by artificial treatment to insure compliance with the Domestic Water Quality Monitoring Regulations contained in California Code of Regulations, Title 22, Chapter 15, Articles 1 through 9, Sections 64401 through 64501, including the latest revisions thereof.

Section 14.08.440 - Certification of Design. All new public water systems shall be designed and installed under the direction of a qualified civil engineer, duly registered in the State of California.

Section 14.08.450 - Domestic Water Quality and Monitoring. Water from public domestic water systems shall meet the requirements of, and be monitored in accordance with, the regulations established in the California Domestic Water Quality and Monitoring Regulations, Title 22, California Code of Regulations, Chapter 15, Articles 1 through 9, Sections 64401 to 64501, including the latest revisions thereof.

Section 14.08.460 - Backflow Prevention. The protection of the public water supply against actual or potential cross connections shall be as provided for in Cross Connection Regulations, Title 17, California Code of Regulations, Sections 7583, et seq., including the latest revisions thereof, or in any applicable Kern County ordinance which is enacted after the effective date of this Chapter.

Section 14.08.470 - Non-Public Systems. A water system intended to serve more than one (1) and less than five (5) connections shall be installed according to the requirements of the Health Department as outlined in "Guidelines for the Permitting of Non-Public Water Systems". Application for a permit shall be made prior to construction of the system as provided for in Section 14.08.400.

Section 14.08.480 - Operation and Maintenance.

(a) All water systems shall be operated so as to continuously provide an adequate supply of pure, wholesome, safe and potable water.

(b) All personnel responsible for operation and maintenance of a water system shall have sufficient experience and training to qualify them to properly perform their duties. Specially designated personnel shall be available for call during nights, weekends and holidays to meet emergencies.

(c) All water systems shall maintain complete and up-to-date maps of the utility system as well as results of bacteriological and chemical analyses of water, and such other data as may be required by the Health Officer.

(d) All structures, facilities and equipment of the water system shall be operated and maintained in a safe and sanitary manner and kept in good working condition.

(e) Facilities and equipment of the utility shall be kept clean and in good working condition.

(f) Repairs shall be made without undue delay.

(g) Proper equipment, tools and repair parts shall be available and in good condition for use in emergency repairs.

Section 14.08.490 - User Connection Moratorium. The Department may file a notice with the local building inspection

authority requesting that future user connections to a substandard water system be denied. This notice shall remain in effect until such time as the person responsible for the water system corrects the deficiencies and demonstrates the ability to reliably and safely serve existing and/or additional customers. This notice may be filed within thirty (30) days after the water system has been notified of the proposed action. It is the responsibility of the water system to notify each customer (active or inactive) of the pending moratorium.

ARTICLE V. INSPECTIONS, ENFORCEMENT, AND APPEALS

Section 14.08.500 - Inspections.

(a) The Health Officer or his duly authorized representatives, including the Agency, may conduct inspections at any time to insure compliance with the requirements of this ordinance. The Health Officer may prescribe mandatory inspection of domestic well projects, and of projects on which he deems it necessary. The stage at which each inspection is required shall be set forth in the permit.

(b) It shall be unlawful for any person to continue to work on a project past the stage at which an inspection has been prescribed pursuant to this Section or the permit until such inspection by the Health Officer has been completed or waived. A permittee, or one acting on his behalf, shall make an inspection appointment with the Health Officer at least twenty-four (24) hours prior to the estimated inspection time. However, the failure of the Health Officer to make any inspection shall not be deemed a waiver of any future inspections, or any of the enforcement provisions of this Chapter.

(c) Unless otherwise specified or required, each well under construction shall receive a minimum of three inspections:

1. Site
2. Annular seal
3. Final

(d) After the work on a well has been completed, the Health Officer shall be so notified by the person performing the work and the Health Officer shall conduct a final inspection thereof, unless inspection has been waived by the Health Officer.

(e) The Health Officer may request receipts, and/or

affidavits to be submitted when certain inspections are waived.

(f) No water from a new, deepened or reconstructed well shall be used for domestic purposes until a final inspection is made and the well and water quality are approved by the Health Officer.

Section 14.08.510 - Emergency Work. Should persons or property or a well be threatened by a sudden, unforeseen impairment in the quantity or quality of ground water so that it becomes necessary to continue work, or to replace or modify or increase the existing supply, and a permit or inspection cannot be obtained because the Department's offices are not open, the well may be constructed or reconstructed without a permit or without an inspection, provided no other property is served by the well than was served before the emergency work became necessary. All work done under such emergency conditions shall comply with the requirements of this Chapter. In all such cases, the person who caused the work to be done shall file a statement with the Department during the next regular business day following the emergency work, indicating the reasons for the emergency work. The Department shall inspect the well and order the person who caused the emergency work to be done to perform such other and further work, if any, as may be necessary to bring the well into conformity with the requirements of Articles II and III of this Chapter. The terms of such an order shall be deemed permit conditions within the meaning of Section 14.08.120 of this Chapter.

Section 14.08.520 - Permit Not Required. No permit is required to install, replace or repair a pump on an existing well or to redevelop an existing well.

Section 14.08.530 - Delay in Processing Permit. If an application for construction or reconstruction of a well has not been granted or denied within ten (10) business days of the filing of the application with the Department, the Department shall mail to the applicant, before the close of such day, a written status report of the application. If during such time period the Department has not requested from the applicant additional information relevant to the processing of the application, the applicant shall be entitled to appeal such delay in processing the permit application to the Board of

Supervisors in the manner provided in Section 14.08.590 of this Article.

Section 14.08.540 - Stop Work Order. Whenever the construction, deepening, reconstruction or destruction of any well is being carried out contrary to the requirements of this Chapter, the Health Officer shall order work to stop by posting a notice to desist at the well site. It shall be unlawful to do further work until the Health Officer determines that the necessary corrections have been made. It shall be unlawful to perform any work for which a permit has been granted pursuant to this Chapter without complying with the conditions of such permit.

Section 14.08.550 - Disposal Wells. It shall be unlawful to dispose of any material into a domestic well or any abandoned well unless approval is first obtained from the Agency having jurisdiction over such matters.

Section 14.08.560 - Declaration of Nuisance. All wells, constructed, reconstructed, deepened, destroyed or placed out of service after the effective date of this Chapter, not in accordance with the terms of this Chapter, are hereby declared public nuisances which may be abated in accordance with the provisions of this Article. Any existing wells which the Health Officer declares to be a pollution hazard, contamination hazard or a safety hazard may be declared a nuisance.

Section 14.08.570 - Abatement Order. Whenever the Health Officer determines that a nuisance as defined in Section 14.08.078 of this Chapter exists, he may issue the landowner a written order to abate such a nuisance. The order shall state the conditions productive of the nuisance and the time determined by the Health Officer to be reasonable to accomplish such abatement, but not less than two (2) weeks from the date of such notice. It shall also state that unless the nuisance is abated or a notice of appeal filed with the Clerk of the Board of Supervisors, the Health Officer will abate the nuisance and the cost of such abatement may be added to the tax roll as a special assessment against the property.

Section 14.08.580 - Notice; Personal Delivery; Mailing; Posting. The order of abatement shall be mailed to the owner or owners of the premises as their names and addresses appear upon the last equalized property tax assessment roll and either personally served upon an adult person occupying the premises, or if such person cannot be served, by posting such order of abatement in a conspicuous place on the premises. In the event that a nuisance is not abated in accordance with the order of abatement, the Health Officer may proceed to abate the nuisance.

Section 14.08.590 - Appeal of Denial or Conditions or Order of Abatement. If the Department denies an application for a permit, or issues a permit subject to conditions which the applicant believes to be unreasonable, or gives an order of abatement, the applicant may appeal the decision of the Department to the Board of Supervisors. The notice of appeal shall set forth each and all grounds of objection to the decision appealed. The Board of Supervisors shall forthwith file a copy of the notice of appeal with the Department. The Board of Supervisors shall, within thirty (30) days after the receipt of a written appeal, hold a hearing to determine whether the permit shall be issued to the applicant, and if a permit is to be issued, the terms and conditions under which it shall be issued. Such a hearing shall be conducted in accordance with Section 14.08.610 and may be continued from time to time by the Board. The decision of the Board of Supervisors shall be rendered within seven (7) days after the conclusion of the hearing and the decision shall be final as to all matters determined. Notice of the decision shall be given as provided in Section 14.08.620.

Section 14.08.600 - Judicial Review of Decision. Judicial review of a decision of the Board of Supervisors made after a hearing pursuant to this Article, if the decision is to deny the permit or to issue the permit subject to conditions asserted to be inappropriate, shall be made pursuant to Section 1094.6 of the Code of Civil Procedure of the State of California. The method of judicial review, the time limits for judicial review and all of the other provisions of said Section 1094.6 shall govern such judicial review. The Board of

Supervisors shall give written notice to the applicant that the time within which judicial review must be sought is governed by said Section 1094.6 of the Code of Civil Procedure.

Section 14.08.610 - Hearing; Conduct. At the date and time set, a public hearing shall be held before the Board of Supervisors. The owner and any other person requesting such hearing may be represented by counsel. The Board of Supervisors shall hear all pertinent evidence offered by all interested persons. The technical rules of evidence shall not be applicable to the hearing. All persons giving evidence shall be sworn before testifying. The owner and any other person requesting such hearing may employ a certified stenographic reporter to report the hearing. The Board may continue said hearing from time to time.

Section 14.08.620 - Hearing; Decision. At the conclusion of the hearing, if the Board of Supervisors determines that a public nuisance exists, it shall thereupon order the nuisance abated no sooner than thirty (30) days following the mailing by the Clerk of the notice of the Board's decision. The Board shall determine the manner in which the nuisance shall be abated. Such notice shall be sent by regular mail to the person requesting the hearing at the address set forth in such request, and to any other person who files a request therefor with the Clerk.

Section 14.08.630 - Abatement. If a nuisance is not abated or a hearing sought within the time specified in this Article, or if after a hearing, a nuisance is not abated, the Health Officer may proceed to abate the nuisance by force account contract.

Section 14.08.640 - Accounting. The Health Officer shall file with the Clerk of the Board of Supervisors a report specifying the work performed, the itemized and total cost of the work, a description of the real property upon which the well is or was located, and the names and addresses of the owners as their names appear in the latest equalized property tax assessment roll.

Section 14.08.650 - Hearing; Accounting. A hearing before the Board of Supervisors shall be held on the report described in Section 14.08.640 at which time any protests or objections thereto will

be heard. The Clerk of the Board of Supervisors shall mail notice of the hearing to the owner or owners of record at least ten (10) days prior to the hearing. The Board of Supervisors shall determine at the hearing the correct charge to made for the work. The owner or owners of record shall be given notice by mail of the determination of the Board of Supervisors, which notice shall inform the owner or owners that the costs may become a lien against the property as provided herein. If such costs are not paid within thirty (30) days of mailing of the notice of determination by the Board of Supervisors, the costs shall be assessed upon the property involved forthwith as a special assessment and shall be a lien on the property for the amount thereof from the time of the mailing of the notice of determination.

Section 14.08.660 - Punishment. Violation of any section of this Chapter is a misdemeanor and is punishable by a fine of not less than one hundred dollars ($100) nor more than one thousand dollars ($1000) or by punishment of both a fine and imprisonment in the county jail not to exceed six (6) months.

Appendix C

Description of San Joaquin River Settlement

Central Valley Project
FRIANT DIVISION

FRIANT
WATER USERS AUTHORITY

About The Friant Division

THE LAND, ITS CROPS AND ITS PEOPLE

- **The Central Valley Project's Friant Division service area** includes one million acres of the world's richest farmland in portions of Merced, Madera, Fresno, Tulare and Kings counties which annually produces about $2.5 billion in gross agricultural production with a tremendous variety of crops and that amount turns over and expands as it passes through the economy. Numerous communities depend on Friant water supplies either directly — such as the cities and towns of Fresno, Friant, Orange Cove, Lindsay, Strathmore and Terra Bella — or indirectly from groundwater recharge from irrigation.

- **The 15,000 mostly small Friant Division family farmers** have, largely thanks to the availability of Friant project water, accomplished what was asked of them by the federal government when the CVP was being developed. They have created the most productive agricultural region in the world.

- **All water diverted** into the Friant service area has been beneficially used for irrigation and municipal purposes.

PRINCIPAL PROJECT FEATURES

- **Friant Dam and Millerton Lake** on the San Joaquin River northeast of Fresno.

- **The 152-mile Friant-Kern Canal** from Friant to the Kern River in Bakersfield.

- **The 36-mile Madera Canal** that runs northwest to Ash Slough, east of Chowchilla.

FRIANT DIVISION CONTRACTORS AND AGENCIES

- **Twenty-eight districts and cities**, all along the southern San Joaquin Valley's East Side, have CVP-Friant water service contracts with the U.S. Bureau of Reclamation.

- **Eight agencies** (six districts, two counties) have Cross-Valley Canal exchange contracts.

- **The Friant Water Users Authority** represents 22 of these agencies. The FWUA was formed in 1985 under the state's joint exercise of powers law to operate and maintain the Friant-Kern Canal.

- **The new Friant Water Authority**, which has 20 member agencies, assumed operation and maintenance of the Friant-Kern Canal June 30, 2004.

- **The Madera-Chowchilla Water and Power Authority** operates and maintains the Madera Canal.
- **The U.S. Bureau of Reclamation**, an agency of the Interior Department, operates and maintains Friant Dam and administers the Central Valley Project, including determining the Friant Division's water supply availability.

FRIANT WATER DELIVERIES AND RELEASES

- **On average, the Friant Division annually** delivers approximately 1.3 million acre-feet of water. Some parts of the service area rely totally on Friant Division water as their sole source of supply. Other parts of the region are blessed with good quality aquifers allowing for groundwater recharge during wet years which can be then drawn upon during dry years (what is known as the *conjunctive use* of surface water and groundwater sources). The Friant Division is unique among Bureau of Reclamation projects in it uses a two-class system of water delivery:
    - **Class 1** water is the "firm" supply, the first 800,000 acre-feet of project water to develop behind Friant Dam. It is delivered to parts of the service area that have limited or no access to groundwater supplies and as a base supply to other districts.
    - **Class 2** water develops only after it becomes evident to the Bureau of Reclamation that all Class 1 demands can be met (usually in average or above-average water years). It is delivered to districts that can rely on groundwater. Class 2 water is typically used to replenish the groundwater through "in-lieu" recharge, providing growers with surface water in-lieu of using their wells, and through direct recharge. Friant has 1.4 million acre-feet of Class 2 water under contract, although the amount of Class 2 water varies from that amount to none at all, depending on the water year's runoff; it averages 400,000 acre-feet. For certain limited times (usually when flood releases are being made), the U.S. Bureau of Reclamation makes available full supplies of Class 2 water and occasionally provides water for use outside of normal Reclamation Law restrictions under Section 215 of the Reclamation Reform Act.
- **Friant Dam Riparian Flow Releases** to the San Joaquin River for 38 miles downstream from Friant Dam average more than 100,000 acre-feet of water supply each year.
- **Flood releases from Friant Dam** average more than 200,000 acre-feet each year as modeled over the last 80 years with actual flood releases exceeding an average of 400,000 acre-feet over the last 30 years. This water can't be put to use in the Friant Division due to limited storage and conveyance facilities. During the spring and summer of 2006, approximately 1.2 million acre-feet of water was lost to flood releases.

- **Groundwater is a crucial part** of the overall Friant Division supply. Much of the Friant Division relies upon a combination of groundwater and surface water to meet all crop needs. The Friant Division came into service between 1944-56 and has been successful in arresting the serious condition of groundwater overdraft that existed prior to the project although a critical groundwater overdraft still exists in parts of the service area and in other parts of the southern San Joaquin Valley.

WHERE FRIANT WATER COMES FROM

- **Friant water users depend** upon the San Joaquin River and water rights obtained in the late 1930s by the U.S. Bureau of Reclamation, prior to Friant Dam's construction. One of these agreements requires delivery of 840,000 acre-feet of a substitute supply of CVP water each year to the West Side "Exchange Contractors", which hold historic rights to San Joaquin River water, through the Delta-Mendota Canal. That exchange makes diversions at Friant Dam possible.
- **Although Friant Dam** is frequently cited as the sole contributor to diminished San Joaquin River flows and resulting anadromous fishery losses, significant flows were diverted beginning in the 1860s and 1870s, long before Friant Dam was built (between 1939-44), at Mendota Dam and Sack Dam on the San Joaquin Valley's West Side. Records slow that the river was often dried up downstream from the Sack Dam diversion. Construction of San Joaquin Light and Power's Kerchkoff Dam near Auberry in 1916 blocked upstream fish passage and high Sierra Nevada salmon spawning. Later, 10 additional upstream dams and diversion facilities were built, mostly before Friant Dam was completed.

FRIANT'S POLICY OF SEEKING SOLUTIONS

Friant agencies are engaged in a number of other activities that have outstanding potential to benefit the San Joaquin River. They include:

- **The San Joaquin River Group Authority's** Vernalis Adaptive Management Program and river fish flows.
- **The San Joaquin River Water Quality Management Group** as it works on improvements to flow and water quality.
- **A Water Quality Exchange Program** being pursued with the Metropolitan Water District of Southern California that addresses concerns regarding drinking water quality for more than 20 million Californians as well as potential positive water supply impacts to the Friant service area.
- **The CalFed Bay-Delta Program** and its many studies and activities related to the Bay-Delta Estuary.

About The Friant Division

- **The Upper San Joaquin Basin Storage Investigation** being conducted by the U.S. Bureau of Reclamation and California Department of Water Resources, including the proposed Temperance Flat Dam and Reservoir.
- **Development of restoration strategies** for the San Joaquin River, including a number of important studies and inventorying activities involving federal, state and stakeholder agencies and groups, that continued even after an earlier four-year settlement process with the NRDC coalition ended.
- **A commitment by Friant leaders** to address problems and issues by attempting to work constructively with others with differing views. As a result, Friant has forged excellent, productive working relationships agencies such as MWD and Westlands Water District with which Friant at one time had significant differences. The same policy made it possible for Friant to work closely with NRDC and its environmental plaintiffs for four years on possible San Joaquin River enhancement solutions and now has resulted in a settlement of the litigation, plus a commitment to work together to achieve the Restoration Goal, Water Management Goal and related activities and needs related to the San Joaquin River. Friant is a strong supporter of environmental values and San Joaquin River restoration. But Friant also takes pride in what has been created over the past half century along the valley's East Side thanks to a dependable water supply, and federal and state commitments made so long ago.

Please See "Friant Division Facts," Next Page

FRIANT
WATER USERS AUTHORITY

Case Evolution

The settlement presented to the Federal Court on September 13, 2006, is intended to resolve a court case that began as a dispute over renewal of federal water supply contracts for San Joaquin Valley farmers and evolved over 18 years to become a debate over the nature and future of the San Joaquin River.

In the late 1980s, irrigation districts within the Central Valley Project's Friant Division were moving to renew long-term water service contracts that were then expiring. Friant districts believed the United States had pledged when it executed the original 40-year contracts that there would be a continuous supply of water for Friant as long as it was put to beneficial use. In 1988, as the United States Department of the Interior was in the process of renewing the first Friant contract, that of the Orange Cove Irrigation District, objections were raised by the environmental community. The Natural Resources Defense Council (NRDC) and a coalition of other environmental and commercial fishing plaintiffs initiated litigation that challenged the contract renewals. Since then, the environmentalists amended their complaint several times, raising many complicated legal issues.

In recent years, though, the dispute has centered on a state fishery protection law, Section 5937 of the California Fish & Game Code. This state law requires dam owners and operators to release "sufficient" water to operate a fish passageway or "maintain in good condition" the fish in the river below the dam. The dispute centered on whether this state law applied to the federal project and, if so, whether releasing the amount of water needed to satisfy the state law would conflict with the laws authorizing the dam.

In August 2004, the court ruled that Section 5937 imposes a continuing duty to release sufficient water from Friant Dam into the San Joaquin River to restore former historic salmon runs and fishery conditions. The court did not determine how much water would be needed to satisfy the state law. Rather, the court set the case for a trial in February 2006 to determine the amount of the releases. In 2005, the parties began preparing for that trial and gained valuable new scientific information about possible restoration strategies.

In summer 2005, Senator Dianne Feinstein and House Water and Power Subcommittee Chairman George Radanovich began a non-partisan effort to bring the parties together to achieve a mutually agreeable settlement. This represented the second try to settle the case. The first set of settlement negotiations took place in 1999 - 2002, during which time the parties conducted many fishery and water supply related studies.

Even though this first four-year round of negotiations proved unsuccessful with the parties ending up going back to court, a foundation for future discussions was laid.

Case Evolution

New negotiations began during the summer of 2005. Talks were frequent and just as often difficult but progress, although slow, proved to be steady.

A key breakthrough occurred when, at the urging of Senator Feinstein and Chairman Radanovich, the parties agreed on a significant compromise: In exchange for restoration of the river below Friant Dam, Friant's water loss for the fishery's needs would be capped at certain amounts. Even though the settlement will result in use of a portion of the Friant water supply that the farmers really can't afford to lose, the compromise removed what promised to stretch into years of continued uncertainty over the Friant water supply and economic and social well-being of the eastern San Joaquin Valley. It also provided means of attempting to recover, re-use and recirculate water in an attempt to mitigate impacts upon Friant users.

By April 2006, the parties were able to inform the court that agreement had been achieved on numerous issues, including restoration goals, water flows, ways of managing and recovering water and a host of other issues. At the end of June, attorneys for the parties reported that they had agreed to a settlement in principle. The agreement, covering 20 years, and possibly longer, is now public as a result of filing the document with the court.

Questions and Answers

Who are the parties to the Settlement?

The agencies and organizations that are party to the San Joaquin River litigation Settlement are principally the plaintiffs' coalition led by the Natural Resources Defense Council (NRDC), the U.S. Bureau of Reclamation and Friant Water Users Authority. (A complete list of plaintiffs and defendants may be found in the separate joint briefing document "The Parties".)

What are the broad objectives of the Settlement?

The Settlement includes two objectives. The first is a commitment to restore flows and salmon to the San Joaquin River between Friant Dam and the Merced River confluence. The settlement also recognizes that water is the lifeblood for both salmon and the people of the San Joaquin Valley – it is a resource that must be shared. Thus, the settlement also provides opportunities for Friant Division long-term water contractors to mitigate water supply impacts resulting from water releases called for under the Settlement.

How much water must be released to restore salmon?

The settlement requires specific releases of water from Friant Dam to the confluence of the Merced River, designed primarily to meet the various life stage needs for spring and fall run Chinook salmon. The release schedule assumes continuation of the current average Friant Dam release of 116,741 acre feet, with additional flow requirements depending on the year type. For example, approximately 247,000 acre feet would be released in most dry years, whereas about 555,000 acre feet would be released in wet years.

How will this impact Friant water supplies?

Friant completed an extensive modeling of the water delivery impacts that would come from the Settlement and concluded that in the absence of mitigation measures, implementation of the Settlement would be expected to reduce Friant Division long-term water contractor deliveries, on average, by about 170,000 acre feet each year (15 % of the 1,150,000 acre feet of average deliveries to Friant Division long-term contractors). Through creative water management strategies, Friant will work to minimize the impact of these delivery reductions. An important element of the settlement, however, is that tools will be developed and implemented to reduce or avoid these water supply impacts by utilizing surplus water primarily to enhance groundwater programs, and also developing programs to return water to Friant water users through recapture, recirculation, transfers and exchanges.

How quickly will flows and salmon be returned to the river?

Interim flows will begin in the fall of 2009 and full restoration flows would begin no later than January 2014. Salmon will be reintroduced no later than December 31, 2012 in the upper reaches.

What other restoration measures does the Settlement require?

There are many physical improvements within and near the San Joaquin River that will be undertaken to fully achieve the river restoration goal. The improvements will occur in two separate phases that will focus on a combination of water releases from Friant Dam, as well as structural and channel improvements.

How does the San Joaquin River restoration project compare to other river restoration projects?

This historic effort to restore the San Joaquin River is one of the most significant and ambitious river restoration projects in the West. It covers 153 miles of the San Joaquin River from Friant Dam to the mouth of the Merced River, and involves not only restoring flows to approximately 60 miles of dry river bed, but also significant channel and fish passage improvements. The settling parties are unaware of any other river restoration project involving changes of this magnitude.

What role will the State of California play in implementing the Settlement?

The State of California has expressed strong support for this Settlement and has pledged cooperation and the financial resources of the State to help it succeed. Through the Department of Water Resources, Department of Fish & Game, the Resources Agency, and CalEPA, the state has entered into a Memorandum of Understanding ("MOU") with the Settling Parties that outlines an important, collaborative role for the state in the planning, design, funding, and implementation of the actions called for by the Settlement.

Who benefits from a restored San Joaquin River?

Beyond the direct environmental benefits of achieving the restoration goal, and the benefit of planning certainty for the 15,000 family farms that rely on Friant water for some or all of their water needs, other significant public benefits are expected to result from the settlement, including downstream water quality benefits and increased recreational opportunities. In its MOU with the settling parties, the State of California acknowledged the public benefits of restoring the San Joaquin River, emphasizing that restoration will provide broad benefits to the environment, to the federal, State and local governments, and to millions of Californians.

How much will implementing the restoration goal under the Settlement cost?

The Settling Parties have carefully studied San Joaquin River restoration for many years and, as part of this settlement, have identified the actions and highest priority projects necessary to achieve restoration as provided in the settlement. Preliminary cost estimates to complete these actions and projects were developed ranging from $250 million to $800 million. The largest variables in this range are the assumptions as to the specific type and extent of levee work that may be required in connection with some of the projects. The high-end estimate of $800 million assumes that concrete slurry walls, a very costly type of levee stabilization, would be required throughout the areas where physical improvements are undertaken, whereas the low-end estimate of $250 million assumes that less costly levee requirements would apply. The California Department of Water Resources, which has responsibilities related to levees and flood protection, has reviewed the settlement and provided its own preliminary cost estimate in the range of approximately $350 million to $570 million. More precise cost estimates will be completed in the course of project-specific planning activities, which will happen as part of Settlement implementation.

Where will the money come from to support the settlement?

Funding for the restoration and water management objectives will be drawn from a combination of federal appropriations, state bond initiatives and current environmental contributions from farmers and cities served by Friant Dam. The draft legislation incorporated into the settlement provides authorization for up to $250 million in federal appropriations. In addition, the settlement dedicates the “Friant Surcharge”, a Central Valley Project Improvement Act (CVPIA) environmental fee of $7 per acre foot of water charged to Friant Contractors (because of a lack of water releases to the river) under the CVPIA for use by the program. It also permits Settlement monies to be used for the Water Management and Restoration goals. Friant Contractors’ contributions are limited to Restoration Fund and Surcharge payments. California’s Prop. 84 on the November 7th ballot includes $100 million to implement the settlement. The parties also believe several of the projects called for in the settlement could qualify for funding under one or more of the infrastructure bonds on the November ballot. The Settlement provides for bonding, guaranteed loans or other financing using annual payments for debt service. It anticipates State of California financial participation. Taken together, it is expected these funding sources and financing strategies will provide sufficient funding to fully implement the settlement.

What was the basis of the lawsuit when it was filed in 1988?

The NRDC Coalition originally challenged the U.S. Department of the Interior’s proposal to renew Friant Division 40-year water service contracts without an Environmental Impact Statement. NRDC’s complaint was subsequently amended to include other claims, including a claim under the Endangered Species Act, and a claim alleging that the operation of Friant Dam violates California Fish & Game Code Section 5937, which requires dams to release sufficient water to keep fish in good condition below the dam. It was the latter claim that became the focus of the litigation in recent years. All of these claims are resolved by the current settlement.

Why did you decide to settle?

The Settling Parties believe that commitments under the agreement and the cooperative approach toward restoration provide an historic opportunity to restore the San Joaquin River in a manner broadly acceptable to water contractors who have been operating under a cloud of uncertainty regarding their water supply due to pending litigation for the past 18 years. Working together to face this environmental and water management challenge is the best way to ensure that restoration proceeds expeditiously and with broad public support.

How have other stakeholders been involved?

The settling parties have dedicated substantial time and effort to reaching out to the many stakeholders who have an interest in the future of the San Joaquin River. Through months of negotiations and consultations with third parties, the settling parties have worked to ensure that the benefits of restoration can be realized without harming third parties, and where appropriate the settlement has been modified to incorporate the perspectives and interests of others. The settling parties do not believe or intend that restoration will have material adverse impacts on any third parties. The settling parties are committed to ongoing outreach and engagement with other stakeholders in implementing the settlement.

What else needs to happen for the settlement to be successfully implemented?

The parties must secure court approval for the settlement to take effect, and are filing a joint motion seeking U.S. District Court approval. In addition, because the settlement will be implemented primarily by the United States Departments of Interior and Commerce, federal legislation is being proposed to authorize these agencies to implement the settlement. A draft of this authorizing legislation was negotiated by the parties and incorporated into the settlement.

FRIANT
WATER USERS AUTHORITY

Other Settlement Features

There are many other aspects to the settlement agreement, which includes the following provisions:

Management and Oversight

RESTORATION ADMINISTRATOR

- **A Restoration Administrator Position** is to be established to help implement the agreement and advise the Interior Department on how the river Restoration Hydrographs are to be implemented, when Buffer Flows may be needed, river channel and fish passage improvements, reintroduction of salmon, interim flows for data collection purposes, targets, goals and milestones for successful implementation of the fishery program and coordination of flows with downstream tributary fishery efforts. Appointment will be for a six-year term.

TECHNICAL ADVISORY COMMITTEE

- **A Technical Advisory Committee** will be created to advise the Restoration Administrator. It will include two representatives from each of the plaintiffs and Friant defendants as well as two members mutually agreed upon, but none are to be federal employees. Terms are to be for three years.

THIRD PARTIES

Other Settlement Features

- **Opportunities for input from third parties** with an interest in the river and its restoration will be made available. Public participation will also be welcomed in various programs and as part of the environmental review process. The Interior Department will be able to enter into Memorandums of Understanding with third parties.

The Program

NO CHANGES IN FLOWS THROUGH 2025

- **No changes in scheduled Restoration Flows** are anticipated through December 31, 2025. During the first six months of 2026, requests to increase or decrease flows can be made to the U.S. District Court, which would refer the issue to the State Water Resources Control Board. Before any changes could be made, the State Board would have to consider the success of the Restoration and Water Management goals, economic and environmental impacts, and reasonableness of the proposed change under the California Constitution.

THE FUNDING PLAN

- **The Restoration and Water Management goals and activities will require a significant financial investment**. To fund them, the Settlement dedicates the $7 per acre foot "Friant Surcharge" (approximately $8 million per year) and up to $2 million of Restoration Fund Payments, all assessed to and paid by Friant water users under the Central Valley Project Improvement Act, for use by the program. It also dedicates the capital repayment of CVP water rates paid by Friant contractors to the program for nine years and permits Settlement monies to be used for the Water Management and Restoration goals. Friant program contributions are capped and committed prospectively at current Restoration Fund and Surcharge Payment levels. The Settlement provides for bonding, guaranteed loans or other financing using annual payments for debt service. It anticipates State of California fiscal participation.

LONG-TERM WATER SERVICE CONTRACT AMENDMENTS

- **When the Friant Division's long-term renewal contracts were enacted** in 2001, they included a stipulation requiring necessary contract amendments to reflect and be consistent with any Settlement agreement. Such a provision is part of the Settlement and long-term contracts are kept in place. No further National Environmental Act or Endangered Species Act compliance actions for the contracts are required.

RESOLUTION OF DISPUTES

Other Settlement Features

- **Procedures are included for the parties to attempt to resolve disputes** by meeting and conferring. Should that be unsuccessful, services of a neutral third party are to be used. Finally, the parties could turn to the U.S. District Court.

FEDERAL LEGISLATION

- **Certain Interior Department actions called for in the settlement** require Congressional authority. An exhibit to the agreement contains legislative language that will be introduced in Congress to implement the Settlement. It is referred to as the "San Joaquin River Settlement Act." Passage of this legislation in substantially the same form as the exhibit is critical because any party could void the Settlement if the legislation were not enacted.

STATE INVOLVEMENT

- **Although the State of California is not a party** to the litigation or Settlement agreement, agencies under Governor Schwarzenegger's administration including the California Department of Water Resources and California Department of Fish and Game, have expressed a strong desire to participate in implementation of the San Joaquin River program. A Memorandum of Understanding defining the state's role has been drafted as an appendix to the Settlement agreement.

FRIANT
WATER USERS AUTHORITY

Restoration Goal

Restoring the San Joaquin River and its fishery between Friant Dam and the Merced River confluence is going to be a big job. In this agreement, initially covering 20 years, the Natural Resources Defense Council and its coalition, along with the Friant Water Users Authority and its members and the United States have spotlighted many physical improvements in and near the river as well concurring on a schedule of eventual Restoration Flows that will vary significantly depending upon the type of water year. It is an agreement that is rational and reasonable, even though it is going to cost Friant water users a portion of their historic water supply. It is scientifically based. Here, broadly, are key objectives:

THE INTERIOR DEPARTMENT'S ROLE

The Central Valley Project, of which Friant Dam and the Friant Division are parts, is federally-developed and owned. Not surprisingly, the Interior Department (which oversees the U.S. Bureau of Reclamation, the CVP's administering agency) is assigned a key role under the Settlement. (The actual Settlement text refers to "the Secretary" in assigning federal tasks; this is the Secretary of the Interior or his designee.) Interior is to "promptly commence activities pursuant to applicable law and provisions of this Settlement" in order to implement river improvements deemed necessary to restore a fishery. Those activities will depend upon funding authorized by Congress or obtained from other sources.

Necessary Improvements

Restoration Goal

There are many physical improvements within and near the river that are deemed necessary to fully achieve the Restoration Goal. All are to be developed and implemented in accordance with federal and state laws and regulations.

PHASE 1 IMPROVEMENTS

These parties anticipate these highest priority San Joaquin River improvements can be accomplished by 2011-13 (with all environmental studies and other required reviews to be completed by 2009 unless unforeseen events beyond control of the parties make that schedule unachievable). The projects include:

- **Creation of a bypass channel around Mendota Pool**, in western Fresno and Madera counties where a small dam impounds water delivered from another source – the Delta-Mendota Canal – to supply four West Side water agencies known as the Exchange Contractors. This bypass channel would mitigate a problem migrating salmon would face in arriving in Mendota Pool and finding unfamiliar water of Delta origin rather than Sierra water from the San Joaquin River and a myriad of pumping and diversion structures. This channel would bypass the pool and Mendota Dam and be capable of conveying at least 4,500 cubic feet per second of flow. A control structure would have to be constructed at the new divide of the San Joaquin River and the bypass channel.

- **Modifying channel capacity** (including new floodplain and related riparian habitat) to be able to convey at least 4,500 cubic feet per second within the existing San Joaquin River channel between the Chowchilla Bypass Bifurcation (diversion) and Mendota Pool, west of Fresno. This reach of the river (known as Reach 2B) now has severe limitations in conveying high flows because of deteriorated privately-owned and maintained levees. (Currently, this reach is dry except during flood release events.)

- **Modifying channel capacity** to ensure at least 475 cubic feet per second can flow through several miles of river (known as Reach 4B) north of Dos Palos that has carried no flows at all for nearly 50 years. (All river flows for the past half century have been diverted into the East Side Bypass flood control channel. The Old River is overgrown with brush and trees and its levees are deteriorated.)

- **Modifying a headgate structure** at the head of Reach 4B (the Old River) to enable and control higher flows than are now possible.

- **Modifying the Sand Slough Control Structure** through which San Joaquin River water passes into the East Side Bypass north of Dos Palos in order to ensure fish passage. (Typically, this reach is dry except during flood release events.)

- **Screening of the Arroyo Canal water diversion** on the San Joaquin River immediately upstream from a small structure known as Sack Dam, east of Dos Palos, to prevent entrainment of anadromous fish.
- **Modifying Sack Dam** to ensure fish passage. (Currently, Reach 4A downstream from Sack Dam is dry except during flood release events; upstream between Sack Dam and Mendota Dam, Reach 3 now conveys irrigation water delivered at Mendota Pool from the Delta-Mendota Canal.)
- **Modifying the East Side Bypass and Mariposa Bypass** flood control channels to provide anadromous fish passage on an interim basis until completion of improvements contemplated in Phase 2. If necessary, a suitable low-flow channel would be included.
- **Installing seasonal barriers to prevent** adult anadromous fish from entering false migration pathways near Salt and Mud sloughs, north and northeast of Los Banos.

PHASE 2 IMPROVEMENTS

These projects and activities are considered high priorities but the Settlement intends for Phase 2 improvements to be planned and implemented so Phase 1 projects are not delayed. It is anticipated Phase 2 improvements would be completed by the end of 2016. The projects include:

- **Enlargement of the now-unused Old River** (Reach 4B) and new floodplain and related riparian habitat to a capacity of 4,500 cubic feet per second, unless agencies determine that project would not substantially enhance Restoration Goal achievement, in which case the bypass system would be used instead. This would include modifications to the Sand Slough Control Structure.
- **Modifying the Chowchilla Bypass Bifurcation Structure** east of Mendota if that project is found to be necessary.
- **Filling and/or isolating the "highest priority" gravel mining pits** along the San Joaquin River on the north side of Fresno, based upon the relative potential for reducing juvenile salmon mortality.
- **Additional channel or structural improvements** (such as fish screening, restoration of side channel habitat and spawning gravel augmentation) as determined.

Fishery Water Releases

Restoration Goal

Water releases from Friant Dam are a crucial Settlement element to achieve the Restoration Goal. Approximately 17 miles of river channel (between Gravelly Ford and Mendota Pool) have been typically without flows (except for flood releases) since the Central Valley Project's Friant Division became fully operational more than 50 years ago. The 38 river miles between Friant Dam and Gravelly Ford have had constant flows of water released from Friant Dam to meet demands of historical riparian users. Approximately 43 miles of river channel (between Sack Dam and the confluence of Bear Creek have also been without flows due in part to historical downstream irrigation diversions (except during flood releases) and re-routing of flood releases from the river to the flood control system at the Sand Slough Control Structure.

THE RESTORATION FLOWS

The new San Joaquin River Restoration Flows, like the existing Riparian Flows, are to be provided from Millerton Lake's CVP supply that Friant Division Long-Term Contractors would otherwise be able to obtain for their agricultural and municipal customers. This is what makes the Settlement's Water Management Goal not only an equal part of the settlement but so crucial to existing eastern San Joaquin Valley water users who depend upon the Friant system.

Restoration Flows are an important Settlement component. The "Base Flows" called for by the agreement generally represent considerably less water than many had previously supposed might be required for restoration and are based upon six hydrographs developed by an expert for the NRDC coalition plaintiffs.

There is also provision for "Buffer Flows" of an additional 10% on top of the hydrograph amounts if it is determined extra water is needed. If channel conveyance (seepage) losses are greater than anticipated, water obtained from willing sellers would be used. The Restoration Flows listed in the settlement include the existing Riparian Flow releases from Friant Dam. The Settlement makes clear there is to be no effect or limitation on Friant Dam flood management operations.

THE HYDROGRAPHS

The six hydrographs cover a variety of flow situations in different locations and at various times of the year (to meet needs of salmon) under six separate types of water year. Flexibility in managing these releases is included with the additional 10% "Buffer Flows" and other provisions. There are also provisions for "flushing flows" to enhance gravel conditions for spawning in two of the wetter types of water years.

The six types of water years listed by the Settlement hydrographs all include existing San Joaquin River riparian releases (averaging 117,000 acre-feet per year). The types of year are based upon what was actually experienced in terms of natural flow runoff during water years (October 1-September 30) from 1922-2004.

The water year types and total restoration releases (subject to an additional 10% of "Buffer Flows") include:

- **"Wet years,"** classified in the Settlement as the wettest 20% of the water years. **Restoration release:** 555,568 acre-feet.
- **"Normal wet years,"** classified as the next wettest 30% of water years. **Restoration release:** 356,281 acre-feet.
- **"Normal dry years,"** the next 30% of the water years. **Restoration release:** 247,876 acre-feet.
- **"Dry years,"** the next 15% of the water years. **Restoration release:** 184,021 acre-feet.
- **"Critical (dry) years,"** the remaining 5% of water years. These are divided into **"critical high (dry) years," restoration release:** 70,795 acre-feet; and **"critical low years,"** less than 400,000 acre-feet of unimpaired San Joaquin River runoff; **restoration release**, 0 acre-feet.

EXAMPLES OF FRIANT WATER SUPPLY IMPACTS

There is no question that Friant Division water service contractors and their agricultural and municipal customers will have to deal with water supply effects resulting from the settlement. Friant water users will be making a major water supply contribution to the Restoration Goal and Restoration Flows. For instance, an analysis of overall Friant water deliveries shows:

- **Under current average conditions**, 1,281,000 acre-feet of Central Valley Project is used annually.
  - **Under the Settlement**, Friant's total average annual deliveries would be reduced by 242,000 acre-feet (19%), to 1,039,000 acre-feet.
- **Under average dry year conditions**, Friant currently delivers 629,000 acre-feet of water.
  - **Under the Settlement**, Friant's average annual dry year deliveries would be reduced by 145,000 acre-feet (23%), to 484,000 acre-feet. Some Friant districts, using actual water supply data from the past two decades, have determined their water supplies stand to be reduced as a result of Settlement provisions by even greater percentages under dry year and other circumstances.

WHEN RESTORATION FLOWS ARE TO BEGIN

Full Restoration Flows are to begin no later than January 1, 2014, providing time for channel improvements to be constructed.

IF FULL RESTORATION FLOWS CAN'T BEGIN AS SCHEDULED

The Settlement addresses a number of conditions and possible remedies, including a provision that as much of the scheduled Restoration Flow as possible should be released, depending upon channel constraints.

INTERIM FLOWS

Interim flows are to begin a few years before the Full Restoration Flows, in the fall of 2009. They are to be limited to experimental purposes, and by channel capacity and construction issues.

The Parties

Agencies and organizations that are parties to the settlement in the San Joaquin River litigation known as *Natural Resources Defense Council, et. al. v. Rodgers, et. al*. are listed below:

PLAINTIFFS

Natural Resources Defense Council, The Bay Institute of San Francisco, Trout Unlimited of California, California Sportfishing Protection Alliance, California Trout, Friends of the River, Nor-Cal Fishing Guides and Sportsmen's Association, Pacific Coast Federation of Fishermen's Associations, San Joaquin Raptor Rescue Center, Sierra Club, Stanislaus Audubon Society Inc., United Anglers of California, California Striped Bass Association, and National Audubon Society.

FEDERAL DEFENDANTS

U.S. Bureau of Reclamation. U.S. Department of the Interior, U.S. Department of Commerce, National Marine Fisheries Service and U.S. Fish and Wildlife Service. (*Rodgers* in the litigation's formal title refers to the current Mid-Pacific Regional Director of the U.S. Bureau of Reclamation, Kirk Rodgers.)

FRIANT PARTIES

Arvin-Edison Water Storage District, Chowchilla Water District, Delano-Earlimart Irrigation District, Exeter Irrigation District, Friant Water Users Authority, Ivanhoe Irrigation District, Lindmore Irrigation District, Lindsay-Strathmore Irrigation District, Lower Tule River Irrigation District, Madera Irrigation District, Orange Cove Irrigation District, Porterville Irrigation District, Saucelito Irrigation District, Shafter-Wasco Irrigation District, Southern San Joaquin Municipal Utility District, Stone Corral Irrigation District, Teapot Dome Water District, Terra Bella Irrigation District and Tulare Irrigation District.

OTHER FRIANT DIVISION LONG-TERM CONTRACTORS

In addition to the Friant agencies named above, the parties below have water service contracts with the U.S. Bureau of Reclamation for Friant Division water supplies but are not parties to the litigation. The Settlement will apply to these agencies:

City of Fresno, City of Orange Cove, City of Lindsay, County of Madera, Fresno County Waterworks District No. 18, Fresno Irrigation District, Garfield Water District, Gravelly Ford Water District, International Water District and Lewis Creek Water District.

FRIANT
WATER USERS AUTHORITY

San Joaquin River Case History

DATE	EVENT
1860-1880	Irrigation development is started on the San Joaquin River by the cattle barons Miller and Lux who construct a series of canals radiating from the river onto San Joaquin Valley-West Side lands. The earliest versions of two river structures obstructing salmon movement appear. These are Mendota Dam near Mendota and the confluence of the San Joaquin River with Fresno Slough, and Sack Dam east of the later site of Dos Palos.
1900-1920	Agricultural development in the Friant service area exhausts local water resources, causing a severe water crisis in the area between Madera County and the Tehachapis, threatening about 200,000 acres of farmland with reversion to desert.
1912-1914	Pacific Light and Power Corporation (later Southern California Edison Company) begins initial development of the Big Creek Hydroelectric Project, which eventually include Florence, Edison, Huntington and Shaver lakes, and Mammoth Pool, as well as several power plants. These projects represent the first large-scale water storage activity on the San Joaquin River system.
1916	A new Mendota Dam is constructed to impound Mendota Pool.
1916	Kerckhoff Dam is completed on the San Joaquin River north of Auberry by the San Joaquin Power and Light Company (later PG&E). The dam blocks all migration of salmon into spawning areas in the higher Sierra Nevada. Water is diverted into a tunnel to be utilized downstream to generate electricity resulting in several river miles being dewatered downstream from Kerckhoff Dam.
1928	More than 15 years before Friant Dam is built, California Department of Fish and Game reports that there are "very few" salmon remaining in the San Joaquin River above the Merced River. The "historical" salmon fishery that once existed has been severely depleted.
1931	California Water Plan submitted to Legislature. Plan calls for construction of Central Valley Project. Key to CVP is building Shasta Dam to import Sacramento River water to replace San Joaquin River water use north of Mendota Pool, to allow construction of Friant Dam and the Madera and Friant-Kern Canals in order to preserve existing agricultural development in what is now the Friant Division service area from reversion to desert conditions. The CVP Act makes no provision for reservation of water in the San Joaquin River to preserve salmon runs above Merced River.
1933	California Legislature and voters enact California Central Valley Project Act, declaring it to be in the public interest. Principal features include Shasta Dam and Friant Dam and its canal system. Act calls for water at Friant Dam to be used primarily for irrigation and secondarily for other beneficial uses, such as fish propagation.
1933-35	California unable to fund construction of CVP due to Great Depression. California legislators ask federal government for help in completing the Water Plan.
1934	President Roosevelt approves feasibility report calling for the federal construction of the Central Valley Project as a federal Reclamation project. Feasibility report lists great public benefit of providing irrigation water to support existing agricultural development in the Friant service area.

San Joaquin River Case History

Since 1935 Congress makes repeated appropriations of hundreds of millions of dollars for the construction of Friant Dam and canals serving Friant Division as irrigation works, and federal government obtains assignment of pending applications to appropriate water from San Joaquin River at Friant.

1939 Exchange contracts are executed to make water for Friant Division available for appropriation.

1939 Actual construction work on Friant Dam commences. A crowd of 50,000 attends the groundbreaking ceremony.

Late 1930s Salmon counts at Mendota Dam fish ladder range from 3,000-7,000 fish per year. California Department of Fish and Game official writes letter stating that spawning gravels in San Joaquin River below Friant Dam can accommodate about 15,000 salmon.

1928-1944 Flow records maintained by the state demonstrate that, at certain times of year, the river is dry downstream of the Sack Dam, about 86 miles below Friant Dam. The dam becomes partly operational in 1944.

Early 1940s Despite efforts to screen canal intakes at Mendota Pool, the fall run of salmon essentially disappears above the mouth of the Merced River, except in extremely wet years when occasional individual salmon are encountered above Mendota Pool.

1944 Millerton Lake fills initially. Friant Dam completed with exception of drum gates and other appurtenant works, which are delayed by material shortages during World War II. First diversions made into Madera Canal.

1945 Fish and Game Code § 5937 (related to the need for dam operators to provide fishery flows downstream of a dam) made applicable to the United States for the first time.

1948-55 Bureau of Reclamation executes long-term water service contracts with Friant Division under the Reclamation Act. Contracts have 40-year term and begin to expire in the late 1980s. Reclamation signs a contract with the California Department of Fish and Game and provides the water supply for the San Joaquin River trout hatchery.

1947 Downstream water users file *Rank v. Krug* seeking to enjoin the appropriation of water for Friant Dam.

Early 1950s Series of cases is brought before the Court of Claims and other courts by downstream water users seeking compensation for the loss of their water rights.

1948 First deliveries are made through the Friant-Kern Canal. Full Friant Division diversions begin to occur as the Friant-Kern Canal is extended toward and into Tulare and Kern counties. Flows decrease or cease in portions of the San Joaquin River upstream from the Merced River. This event is the latest of many physical and operational changes that have reduced numbers of salmon and steelhead trout in the San Joaquin River and its major tributaries, the cumulative result of a number of different actions, taken independently by many different parties over several decades.

1950 United States Supreme Court decides *United States v. Gerlach Live Stock Co*., holding Friant Dam's purpose is irrigation, not navigation, and that the United States must condemn downstream water rights to acquire water for appropriation for Friant Division. Decision makes it clear that a cost of the construction of the project will be a riverbed that is generally dry at some point between Friant and Mendota Pool.

1950 California Fish and Game officials request California Attorney General to resolve dispute between them and California Water Resources officials as to whether California Fish and Game Code § 5937 takes precedence over California and Federal Central Valley Project Acts and requires water to be set aside in the San Joaquin River to protect salmon runs in river.

1951 California Attorney General issues published opinion ruling that Fish and Game Code § 5937 does not require that water that is needed for full operation of the Friant Division of the Central Valley Project must be set aside for salmon. The State and Federal Central Valley Project

	Acts take precedence over Fish and Game Code § 5937 at Friant Dam.
1954	Court in *Rank v. Krug* enjoins Water Rights Board from acting on United States' applications for appropriative water rights permits for Friant Dam. Ultimately, the *Rank v. Krug* litigation determines the amount of water that the Bureau will release from Friant Dam to satisfy prior water riparian claims (the "Gravelly Ford" releases). Following that decision, the Bureau has released water from Friant Dam to satisfy the Gravelly Ford releases; in the past decade, these releases have exceeded 100,000 acre-feet per year. These releases keep in good condition a wide variety of fish for 37 miles below the dam.
1958-1959	Injunction lifted. State Water Rights Board conducts year-long evidentiary hearing on United States' applications to appropriate water for Friant Division at Friant Dam. Department of Fish and Game files protest claiming that unless water is reserved in the San Joaquin River to restore former historical salmon runs below Friant Dam, appropriation will be illegal under Fish and Game Code § 5937. Fish and Game vigorously participates in hearing, introducing over 100 exhibits and weeks of expert testimony advocating water must be reserved in river for the salmon.
1959	State Water Rights Board issues Water Rights Decision D-935. The decision dismisses the protest of California Department of Fish and Game as "not in the public interest at this time." It permits the United States to appropriate the water that Fish and Game sought to have reserved for restoration of the salmon runs. The State determines that the water sought by Fish and Game for salmon restoration is instead available for appropriation. It grants permanent appropriative water rights to the full amount of water put to reasonable beneficial use for irrigation and domestic use in the Friant Service Area on condition that United States provide certain quantities of water for City of Fresno and Fresno Irrigation District and others. Decision D-935 determines that it is in the public interest to permit the full use of Friant Dam, canals, and the Delta-Mendota works contemplated by the Central Valley Project Acts. Decision recognizes there will be a certain minimum flow of water in river at Gravelly Ford, a point more than 37 miles below the dam.
Since 1959	Bureau of Reclamation operates Friant Dam in accordance with permits granted by State of California. In reliance upon water rights granted by State, people of Friant Division invest in land, many planting permanent crops, and put water appropriated at Friant to reasonable beneficial use, without waste, up to the quantities specified in the permits.
1960s-70's	Acting at request of California Legislature, California Department of Fish & Game assesses impact of Friant Dam on salmon fishery. Official report DFG lodges with Legislature concludes that the cost of attempting to restore the salmon fishery in the San Joaquin River above the mouth of the Merced River would be so great, and the chances of total or near total failure so high, that the Legislature should not attempt to do so, but should focus on improving salmon habitat in tributaries to San Joaquin River.
1969	Congress passes National Environmental Policy Act.
1970	Bureau of Reclamation requests issuance of license on one of the water rights permits for Friant Dam. No action has ever been taken by State Water Resources Control Board on this application.
1973	Congress passes Endangered Species Act.
1988	Bureau of Reclamation and Friant Contractors begin signing long-term water service contract renewals. The Orange Cove Irrigation District is the first to sign a 40-year renewal contract.
Dec. 1988	Natural Resources Defense Council, Sierra Club, a commercial fishermen's group, and other environmental and fishing plaintiffs challenge the long-term contract renewals in a lawsuit.

San Joaquin River Case History

Oct. 1992 Congress passes Central Valley Project Improvement Act. Up to 800,000 acre-feet of water is to be made available for fish and wildlife. Regarding the San Joaquin River, the CVPIA expressly provides that "The Secretary [of Interior] shall . . . develop a comprehensive plan, which is reasonable, prudent and feasible, to address fish, wildlife, and habitat concerns on the San Joaquin River, including but not limited to the streamflow, channel, riparian habitat, and water quality improvements that would be needed to reestablish where necessary and to sustain naturally reproducing anadromous fisheries from Friant Dam to its confluence with the San Francisco Bay. . . ." However, the CVPIA further provides that until Congress has authorized the Secretary to implement a "reasonable, prudent, and feasible" plan, "the Secretary shall not, as a measure to implement this title, make releases for the restoration of flows between Gravelly Ford and the Mendota Pool and shall not thereafter make such releases as a measure to implement this title without a specific Act of Congress authorizing such releases." The San Joaquin River "between Friant Dam and the Mendota Pool" is expressly exempted from the CVPIA's requirement to double anadromous fish production. Instead, Friant contractors are required to pay an escalating surcharge on each acre-foot of water provided to them; this surcharge is added to the CVPIA's Restoration Fund. The measure is signed into law by the first President Bush as part of a much larger Reclamation water projects bill.

June 1995 Court enters order holding that Defendants were not required to comply with the National Environmental Policy Act before renewing the long-term contracts, but finding that the government erred by not adequately consulting with the wildlife protection agencies under the Endangered Species Act.

Jan. 1997 Trial Court declares the Friant long-term renewal contracts invalid, finding that the Bureau had not adequately consulted with the wildlife agencies as required by the ESA. The Court dismisses the state law fishery protection claim (Section 5937) as premature and enters Judgment in favor of Plaintiffs.

Sept. 1998 Ninth Circuit issues a decision upholding the lower court's judgment on the ESA claim, but reinstating the Section 5937 claim. The Ninth Circuit directs the lower court to undertake further proceedings to determine ". . . whether § 5937 is applicable to the Friant dam under state law" and "whether the actual application of § 5937 is inconsistent with the CVPIA." The Court of Appeal notes, "It has yet to be determined how much water release would be required under § 5937 and whether that would be consistent with the CVPIA."

1999-2003 The Friant Water Users Authority and its member districts engage in settlement discussions, efforts and studies with the NRDC and other plaintiffs.

Jan. 2001 United States signs long-term, 25-year renewal contracts with many Friant contractors. The contracts expressly incorporate the terms of any judgment or settlement of the case.

April 2003 Settlement negotiations between the plaintiffs and Friant defendants collapse when the parties are unable to agree on a cap for the amount of water released to the river.

Aug. 2003 Plaintiffs file Seventh Amended Complaint alleging ESA, NEPA, Reclamation Law and CVPIA violations, seeking to invalidate long-term water service contract renewals, and § 5937 claim alleging continuing duty to release enough water from Friant Dam to restore former salmon runs above the Merced River.

Aug. 2004 Distinguishing prior authority to the contrary, the Court holds that § 5937 imposes a continuing duty to release sufficient water from Friant Dam into the San Joaquin River from Friant Dam to restore historic salmon runs and fishery conditions. The Court does not decide what remedy, if any, is appropriate. Rather, the Court withholds this issue for a separate "remedy" trial.

Early 2005 The Court schedules the remedy trial to begin on February 14, 2006. The Court

orders the parties to begin exchanging discovery by June 15, 2006.

June 15, 2005 The parties begin discovery by exchanging their "initial disclosures" of documents and witnesses.

July 28, 2005 The court enters an Order finding that the January 2001 renewal of long-term, 25-year CVP contracts represented a violation of the ESA. The decision does not conclude what remedy, if any, is to be imposed.

August 2005 Preparing for the remedies trial on the state fishery protection law (Section 5937) claim, the parties exchange expert reports and learn more about the scientific bases of each side's position on river restoration.

August 2005 Senator Dianne Feinstein and House Water and Power Subcommittee Chairman George Radanovich ask the parties to look for some means of compromising and reaching a settlement. A series of informal discussions begins.

Jan. 2006 With "substantial progress" being made, the Court vacates all dates on the case's calendar, including the February 14 trial date.

January, 2006 Governor Schwarzenegger writes to Interior Secretary Gale Norton to "express my strong support for this potential settlement to restore the San Joaquin River in a reasonable and practical manner." The Governor indicates his administration "stands ready to assist the parties in this important effort and to assure the integration of the settlement into broader resource strategies."

June 30, 2006 Negotiators for the FWUA, NRDC and the Federal Government tell the United States District Court that the parties have come to agreement on all salient points in the complex case.

June 30, 2006 Negotiators announce that they have reached agreement on the terms of the settlement and that the accord is ready to be recommended to all of the case's parties. Negotiators for the state and the settling parties reach agreement on the text of a memorandum of understanding regarding the federal and state roles in implementing the settlement, one that will be recommended to respective clients.

July-Aug. 2006 As individual entities that are parties to the litigation take action to approve the Settlement, confidential briefings are made to San Joaquin River stakeholder groups that were not parties.

Sept. 13, 2006 Settlement agreement is filed in U.S. District Court in Sacramento by the NRDC and its fellow plaintiffs, the Friant defendants and the United States.

News Release

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For Release On: September 13, 2006

Agreement Signals Start to Historic San Joaquin River Restoration

Settlement Ends Years of Litigation; Sets Stage for Salmon Reintroduction, Water Supply Certainty

SACRAMENTO, California, September 13, 2006

An historic agreement to restore water flows for salmon in the San Joaquin River below Friant Dam near Fresno while undertaking one of the West's largest river restoration efforts was announced today by the Natural Resources Defense Council (NRDC), Friant Water Users Authority (FWUA) and U.S. Departments of the Interior and Commerce.

The settlement, filed this morning in U.S. District Court in Sacramento, ends an 18-year legal dispute over the operation of Friant Dam and resolves longstanding legal claims brought by a coalition of conservation and fishing groups led by NRDC. It provides for substantial river channel improvements and sufficient water flow to sustain a salmon fishery upstream from the confluence of the Merced River tributary while providing water supply certainty to Friant Division water contractors.

Historically, Central California's San Joaquin River supported large salmon populations, including the southernmost Chinook salmon population in North America. Since Friant Dam became fully operational in the late 1940s, approximately 60 miles of the river have been dried up in most years, eliminating salmon above the river's confluence with the Merced River.

The Settlement Agreement is based on two goals and objectives:

1. A restored river with continuous flows to the Sacramento-San Joaquin River Delta and naturally reproducing populations of Chinook salmon.
2. A water management program to minimize water supply impacts to San Joaquin River water users.

The Settling Parties will work together on a series of projects to improve the river channel in order to restore and maintain healthy salmon populations. Flow restoration is to be coordinated with these channel improvements, with spring and fall run Chinook salmon populations reintroduced in approximately six years. At the same time, the Settlement limits water supply impacts to Friant Division long-term water contractors by providing for new water management measures that are to be undertaken by the U.S. Bureau of Reclamation, the Interior Department agency that administers the Central Valley Project. The Settling Parties believe that commitments under the agreement and the cooperative approach toward restoration provide an historic opportunity to restore the San Joaquin River in a manner broadly acceptable to water contractors who have been operating under a cloud of uncertainty regarding their water supply due to pending litigation for the past 18 years.

The agreement provides that long-term Friant Division water service contracts be amended to conform the contracts to the terms of the settlement. It also includes draft federal legislation authorizing the Departments of the Interior and Commerce to implement the settlement. NRDC and FWUA will ask Congress to consider and act upon the draft legislation in the days ahead.

"This is the beginning of a historic restoration that will reintroduce salmon to the San Joaquin River as well as address water supply issues and provide certainty for thousands of Central Valley farmers and residents," said Ronald D. Jacobsma, Consulting General Manager of the Friant Water Users Authority. "We're eager to get started putting the pieces in place to take this from a plan to reality."

"Today, environmental and fishing groups are joining with Friant farmers and federal agencies to bring a beleaguered river back to life," said Hal Candee, senior attorney for NRDC. "Restoring flows and salmon to the San Joaquin River will provide broad benefits to the environment and to millions of Californians. We expect history will record this as one of the greatest environmental comeback stories ever."

"This monumental agreement provides certainty to San Joaquin Valley farmers who rely on Central Valley Project water deliveries for their crops while returning flows and salmon runs back to the San Joaquin River. The Department of the Interior stands ready to meet its commitments in this historical agreement and let a truly collaborative process begin towards a restored river for all," said Mark Limbaugh, assistant secretary for water and science, Department of the Interior.

Restoration Goal

At the heart of the settlement is a commitment to provide continuous flows in the San Joaquin River to sustain naturally reproducing Chinook salmon and other fish populations in the 153-mile stretch of the river between Friant Dam and the Merced River. Accomplishing this goal will require funding and constructing extensive channel and structural improvements in many areas of the river, including some that have been without flows (except for occasional flood releases) for decades.

Water Management Goal

Recognizing that the settlement's restoration flows will reduce the amount of water available for diversion at Friant Dam, The settlement also includes provisions to protect water availability for the 15,000 small farms that currently rely on these supplies. One million acres of the most productive farmland in the country as well as many towns and cities along the southern San Joaquin Valley's East Side receive all or a major portion of their water supplies from Friant Dam. The settlement recognizes the importance of this water to those farms and calls for development of water management solutions to provide these users water supply certainty for the long term. Such a program would include a flexible combination of recirculation, recapture, reuse, exchange and/or transfer programs. Additional storage such as groundwater banking will also be explored.

Phased Approach
Restoring continuous flows to the approximately 60 miles of dry river will take place in a phased manner. Planning, design work, and environmental reviews will begin immediately, and interim flows for experimental purposes will start in 2009. The flows will be increased gradually over the next several years, with salmon being re-introduced by December 31, 2012. The settlement continues in effect until 2026, with the U.S. District Court retaining jurisdiction to resolve disputes and enforce the settlement. After 2026, the court, in conjunction with the California State Water Resources Control Board, would consider any requests by the parties for changes to the restoration program.

Federal Court Approval and Authorizing Legislation
The parties are filing a joint motion seeking U.S. District Court approval of the settlement. Concurrently, the parties are seeking congressional approval of legislation authorizing the Secretaries of Interior and Commerce to implement the settlement. A draft of this authorizing legislation was negotiated by the parties and incorporated into the settlement.

Restoration Funding
The settling parties have carefully studied San Joaquin River restoration for many years, and as part of the settlement have identified the actions and highest priority projects necessary to achieve the restoration goal. These include expanding channel capacity, improving levees, and making modifications necessary to provide fish passage through or around certain structures in the river channel. The settlement identifies a number of funding sources to support implementation of these projects, including current environmental contributions from farmers and cities served by Friant Dam, state bond initiatives and authorization for federal contributions.

More specifically, the settlement dedicates the "Friant Surcharge", a Central Valley Project Improvement Act (CVPIA) environmental fee of $7 per acre foot of water delivered to Friant Contractors that is expected to average about $8 million per year, and up to $2 million of other Restoration Fund Payments annually made by water users under the CVPIA for use by the program.

It also dedicates the capital component of water rates paid by Friant Division water users to the program for nine years and permits settlement monies to be used for the Water Management and Restoration goals. Ongoing Friant program contributions are committed and capped at current Restoration Fund and Surcharge Payment levels. Enactment of the authorizing legislation in conjunction with the settlement could make an additional $250 million in federal contributions available. The settlement provides for bonding, guaranteed loans or other financing using annual payments for debt service. It anticipates fiscal participation by the State of California, as well.

The settlement negotiations were convened a year ago by U.S. Senator Dianne Feinstein and House Water and Power Subcommittee Chairman George Radanovich, who urged the parties to put aside their differences and develop a framework to restore the river in a manner that would provide water supply certainty to the Friant farmers who depend on San Joaquin River water.

Senator Dianne Feinstein stated: "I am hopeful that today's settlement will help ensure that the San Joaquin will once again become a living river and the hard-working men and women in the Friant service area who grow much of our nation's fruits and vegetables will continue to have a stable water supply. I believe the parties involved in these negotiations came up with a workable solution. Water is one of the most precious of California's resources and the only way we can continue to prosper as a State is to work for solutions that improve our water supply, restore our environment and our water quality, and protect us from floods."

"Today is a momentous step given the contentious 18-year history of the lawsuit. I commend the parties for all of their hard work and for the commitment of Senator Feinstein to help drive this process," said Congressman George Radanovich. "I look forward to conducting an oversight hearing with my colleagues in the House on the settlement and draft legislation. The hearing will give Members, the parties to the settlement and third-parties an opportunity to provide input as we lay the foundation for movement of a bill."

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The Natural Resources Defense Council is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has 1.2 million members and online activists nationwide, served from offices in New York, Washington, Los Angeles and San Francisco.

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 Western States. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at http://www.usbr.gov.

The Friant Water Users Authority serves 22 southern San Joaquin Valley member water agencies that are supplied with water from the Central Valley Project's Millerton Lake behind Friant Dam near Fresno through the Friant-Kern and Madera canals. Visit our website at www.fwua.org.

FRIANT
WATER USERS AUTHORITY

Summary Of The Stipulation Of Settlement

Of
NATURAL RESOURCES DEFENSE COUNCIL, et al.,
v.
KIRK RODGERS, et al.
UNITED STATES DISTRICT COURT

EASTERN DISTRICT OF CALIFORNIA
CIV NO. S-88-1658 – LKK/GGH

This document provides a summary of the elements of the Stipulation of Settlement ("Settlement") of the above-referenced litigation.

1. **GOALS**: The Settlement includes two parallel goals. The first, the Restoration Goal, is to restore and maintain a self-sustaining salmon population below Friant Dam to the confluence of the Merced River. The second, the Water Management Goal, is to reduce or avoid adverse water supply impacts to all of the Friant Division long-term water contractors. These parallel goals are set forth in paragraph 2 of the Settlement.

2. **RESTORATION GOAL**: Implementation of the Restoration Goal includes three essential elements. First, certain improvements providing for channel capacity, related flood protection, fish passage and fish screening are required. Second, flow releases at Friant Dam are required to create conditions conducive to restoration. Finally, fish are required to be reintroduced into the upper San Joaquin River.

    a. **Channel Improvements**: Paragraph 11 of the Settlement identifies certain Phase 1 and Phase 2 improvements to prepare the River to receive the Restoration Flows and reintroduced fish.

        i. Phase 1 Improvements by December 31, 2013:
            1. Mendota Pool bypass.
            2. Increase channel capacity between the Eastside bypass diversion and Mendota Pool to 4500 cfs.

3. Increase channel capacity below the Sand Slough control structure to 475 cfs.
4. Modify the Sand Slough control structure to provide for fish passage and appropriate routing of water.
5. Screen the Arroyo Canal diversion.
6. Modify Sack Dam to provide for fish passage.
7. Modify the Eastside and Mariposa bypass channels to provide appropriate low-flow conditions and fish passage.
8. Provide appropriate seasonal fish barriers to screen fish at Salt and Mud Sloughs.

ii. Phase 2 Improvements by December 31, 2016:
1. Increase channel capacity below the Sand Slough control structure to 4500 cfs unless determined not to substantially enhance achievement of the Restoration Goal.
2. Modify the Eastside Bypass diversion structure to provide appropriate fish screening and passage.
3. Isolate critical gravel pits below Friant Dam.

b. **Restoration Flows**: Paragraph 13 of the Settlement sets forth the provisions of the Settlement for implementation of the Restoration Flows.

i. Hydrographs: Paragraph 13 incorporates Exhibit B, which specifies the extent of the Restoration Flows in a series of hydrographs (seasonal flow releases from Friant Dam) for specified water year types (critically dry to wet). The hydrographs are the foundation for the Restoration Flows.

ii. Buffer Flows: Paragraph 13 provides that the Restoration Flows specified in the hydrographs may be augmented by Buffer Flows of up to 10 %.

iii. Augmentation Flows: Paragraph 13 provides that the Restoration Flows can be further augmented by acquisition of water from willing sellers.

iv. Interim Flows: Paragraph 15 provides that Interim Flows for experimental purposes may be initiated beginning in late 2009 provided that such Interim Flows do not exceed then existing channel capacity or interfere with channel work required by Paragraph 11.

v. Initiation of Restoration Flows: Full Restoration Flows are to begin on January 1, 2014. If construction is not completed, there are certain default provisions designed to preserve water for later use to achieve the Restoration Goal.

vi. Flexibility: Exhibit B specifies certain procedures to flexibly manage the Restoration Flows in ways that account for temperature and biological factors and to avoid adverse affects on other downstream fishery programs.

c. **Reintroduction of Fish**: Paragraph 14 of the Settlement provides that the Fish & Wildlife Service shall submit an application for a permit to reintroduce salmon to the National Marine Fisheries Service ("NMFS") and NMFS shall issue a decision on such application by April 30, 2012. Paragraph 14 provides that the Restoration Goal includes reintroduction of fall and spring run salmon pursuant to such permit by December 31, 2012. It is anticipated that NMFS will provide incidental take exemptions through use of one or more provisions of the Endangered Species Act.

d. **Reopener**: Paragraph 20 of the Settlement sets forth a procedure by which any party may seek to modify the Restoration Flows after December 31, 2026. It requires a filing with the Court and a referral to the State Water Resources Control Board. Additionally, it requires a number of specific factual findings to be made by the SWRCB.

3. **WATER MANAGEMENT GOAL**: Implementation of the Water Management Goal includes two critical elements. First, it requires the development and implementation of a plan to recirculate, recapture, reuse, exchange, or transfer water released for Restoration Flows. Second, it creates a Recovered Water Account that provides an opportunity for Friant Division long-term contractors to recover water they have lost to Restoration Flows at a reduced water rate in certain wet hydrologic conditions.

a. **Plan for Recirculation**: Paragraph 16 of the Settlement provides that the plan for recirculation must not have adverse impacts on the Restoration Goal, downstream water quality, or downstream fisheries programs. It must be consistent with all applicable laws, regulations and standards. It cannot affect the Secretary's ability to meet existing contractual obligations and must be consistent with agreements between the United

States and the State of California regarding operations of the CVP and the State Water Project.

b. **Recovered Water Account**: Paragraph 16 provides for the creation of an account that tracks the water Friant Division long-term contractors provide toward Restoration Flows. Any contractors that provide such water will be able to purchase water for $10 an acre foot during certain wet conditions when water is available that is not necessary to meet contractual obligations or Restoration Flows. This provision is designed to foster increased water banking and management programs to reduce the water supply impacts of the Settlement.

4. **STATE PARTICIPATION**: The Settlement contemplates that the State of California will be a necessary participant in implementation of many provisions. To that end, the Parties have negotiated a memorandum of understanding with certain State agencies that specifies how the Parties and the State will integrate their activities to implement the Settlement. It is contemplated that the State will provide technical and funding resources to this effort and that specific agreements will be negotiated with the State regarding specific actions required by the Settlement.

5. **FUNDING**: Paragraph 21 of the Settlement sets forth a number of very specific provisions related to funding the Settlement. It includes provisions relating to the character of the capital investment, limitations on Friant Division long-term contractor payments, identification of existing funding resources and additional appropriations authorization.

   a. **Costs are Nonreimburseable**: The Settlement provides that the costs of the Settlement will not add to the capital obligations of the CVP.

   b. **Commitment and Limit on Friant Contributions**: The Settlement provides that Friant Division long-term water contractors will continue to pay the CVPIA Restoration Charge and Friant Surcharge for the life of the Settlement. It further provides that the funding provisions set forth in the Settlement shall be the limit of their financial obligation to the Settlement.

   c. **Friant Surcharge**: The CVPIA imposed a special surcharge on water delivered to Friant users. Only Friant users pay this charge. The Settlement provides that the CVPIA Friant Surcharge payments shall be dedicated to the implementation of the Settlement.

d. **Capital Payments**: The Settlement provides that the capital repayment portion of the Friant water rate payments shall be dedicated to the Settlement for a period of 9 fiscal years.

e. **Restoration Payments**: The CVPIA imposed a Restoration Fund charge on all water delivered by the CVP. Friant users also pay this charge. The Settlement provides that up to $2 million annually of the Friant CVPIA Restoration Charge payments will be made available to the Settlement.

f. **Additional Appropriations Authorization**: The Settlement authorizes additional appropriations authority for implementation of the Settlement of $250 million. It should be noted that some of the identified sources of funding discussed above are not subject to the appropriations ceiling or to annual appropriations and may not be subject to scoring for budget allocation purposes.

g. **Revenue Bond Authority**: The Settlement authorizes the Secretary of the Interior to enter into agreements with subdivisions of the State of California to provide certain revenue streams to support a revenue bond issue. This discretion creates the opportunity to front load some of the funding streams to assist in implementing the Settlement.

h. **State Funding**: As discussed above, the Settlement anticipates State funding. In addition to existing State resources (i.e. Prop 13 & Prop 50), there are specified and unspecified sources of funding included in bond measures to be considered by the voters of California this November.

6. **OTHER CLAIMS FOR RELIEF**: The Settlement resolves all claims pending in the existing litigation, including those challenging the validity of the Friant Division long-term renewal contracts, except attorneys' fees and costs.

7. **NON PARTY PARTICIPATION IN SETTLEMENT**: The Settlement acknowledges that implementation will require a series of agreements of various forms with agencies, entities and individuals who are not parties to the litigation. Paragraph 19(b) provides that the Secretary of the Interior will provide for coordination with interested third parties (including third parties who own or control lands or facilities affected by the implementation of the Settlement), and for public participation in Settlement implementation. Paragraph 10 specifically contemplates that such agreements will be negotiated. Additionally, provisions

of the MOU with the State contemplate joint efforts to provide mechanisms for non party participation in the implementation of the Settlement.

SUMMARY OF FUNDING PROVISIONS

FRIANT SURCHARGE

- Is expected to generate a minimum annual average of $8 million per year.
- Will raise at least $160 million during the first 20 years of the Restoration project and will continue thereafter as well.

RESTORATION FUND PAYMENTS

- Friant currently pays $11 million annually.
- Up to $2 million of such payments will be available.
- Will generate up to $40 million in the first 20 years of the Restoration project and will be available thereafter as well.

FRIANT CAPITAL PAYMENTS

- Friant contractors currently pay an average of $10 million per year towards their CVP capital repayment obligation.
- The Settlement allocates 9 years of such payments to the Restoration project.
- Will generate $90 million for the Restoration project.

APPROPRIATIONS AUTHORIZATION

- The Settlement Authorizes appropriations of $250 million.

TOTAL FUNDING PROVIDED

- $450 million have been provided for in the Settlement.
- At least $160 million Friant Surcharge payments, up to $40 million of Restoration fund Payments and $250 million in authorized appropriations.
- Additional State funding from bonds and/or appropriations is not included in the total funding noted above.

FRIANT
WATER USERS AUTHORITY

Water Management Goal

The other primary objective of the San Joaquin River litigation Settlement is the Water Management Goal. The Water Management Goal is to reduce or avoid adverse water supply impacts to Friant Division Contractors. As part of the Settlement, water supplies used by the 28 Friant Division contractors for the last half century will be re-directed down the San Joaquin River to support the fishery restoration program. Friant's agricultural and municipal customers are dependent upon these supplies to support farms and cities in the Friant Division.

It is crucial to Friant water users that tools be developed and implemented under the Settlement to return water supplies used in restoration to the Friant Division. Models estimate water available to Friant water contractors could on average decrease approximately 19% or 242,000 acre-feet (a.f.) from the current average of 1,281,000 a.f. (An acre-foot of water covers a football field one foot deep). In dry years, when water supplies are already inadequate, supplies could be reduced by as much as 23% or 145,000 a.f. from an average dry year supply of 629,000 a.f. Although the Settling Parties are pledging to do everything possible to implement activities under the Water Management Goal, Friant may have to explore other means of developing water supply to minimize supply impacts over the long haul should the tools developed prove inadequate.

THE INTERIOR DEPARTMENT'S ROLE

The Interior Department and its U.S. Bureau of Reclamation, which administers the CVP and operates and maintains Friant Dam, are to immediately begin working with the environmental coalition led by NRDC and the Friant water users on ways and means of implementing the Water Management Goal.

Those efforts are to include:

- **A plan for recirculation, recapture, reuse, exchange or transfer** of the Interim Flows and Restoration Flows to reduce or avoid impacts to all Friant Division water deliveries. Means of funding activities are to be included in the plan. A number of concepts will be developed as to how any or all of these activities could be accomplished physically. The Settlement says that any such activities cannot adversely affect the Restoration Goal, downstream water quality or fisheries and must comply with various laws and agreements.

- **A Recovered Water Account** program to make water available to all Friant Division long-term contractors that provide water for Interim Flows or Restoration Flows for the purpose of reducing or avoiding impacts of such flows on contractors. Water deliveries under this provision are expected to be used primarily to support feasible groundwater programs.

    - Although complex and technical, these provisions will permit each long-term Friant contractor's Recovered Water Account to accrue one acre-foot of water for each acre-foot of reduction in water deliveries.

    - If "buffer flows" are required, Friant contractors will be credited in their account with 1.25 acre-feet of water for each one acre-foot reduction in water deliveries.

    - Water will be made available to contractors only in wet years when it is not needed for Restoration Flows or water contractor obligations, at a reduced cost of $10 per acre-foot. Those funds are to be deposited in a Restoration Fund that is to be established under federal legislation authorizing settlement implementation.

Confluence of Merced River

Merced River

Stevinson

Stanislaus County

Merced County

Gustine

Mud Slough

Confluence of Bear Creek

Bear Creek

R5 R4B

Mariposa Bypass

Eastside Bypass

Salt Slough

Old River Channel

Mariposa Bypass Control Structure

To Bear Creek

San Joaquin River Channel

Mariposa Bypass Channel

Eastside Bypass Structure

Mariposa Bypass Structure

Eastside Bypass Channel

Sand Slough Control Structure

Eastside Bypass

Chowchilla Bypass

Old San Joaquin River

San Joaquin River

SJR Headgates

Chowchilla River

Chowchilla

Los Banos

R4B R4A

Sack Dam and Arroyo Canal

Arroyo Canal

San Joaquin River

Los Banos Reservoir

R4A R3

Sack Dam

Chowchilla Bypass

Bifurcation Control Structure

Chowchilla Bypass

San Joaquin River

San Joaquin River

Gravel Pits

Millerton Lake

Friant Dam

Madera

Firebaugh

Lone Willow Slough

R3 R2B

Mendota Dam

R2B R2A

Gravelly Ford

Madera County

Fresno County

Herndon

City of FRESNO

R2A R1B

R1B R1A

Mendota

Mendota Pool & Proposed Bypass

Bypass

DAM

Pool

Sources: Teale Data Center; U.S. Bureau of Reclamation; Jones & Stokes

Legend

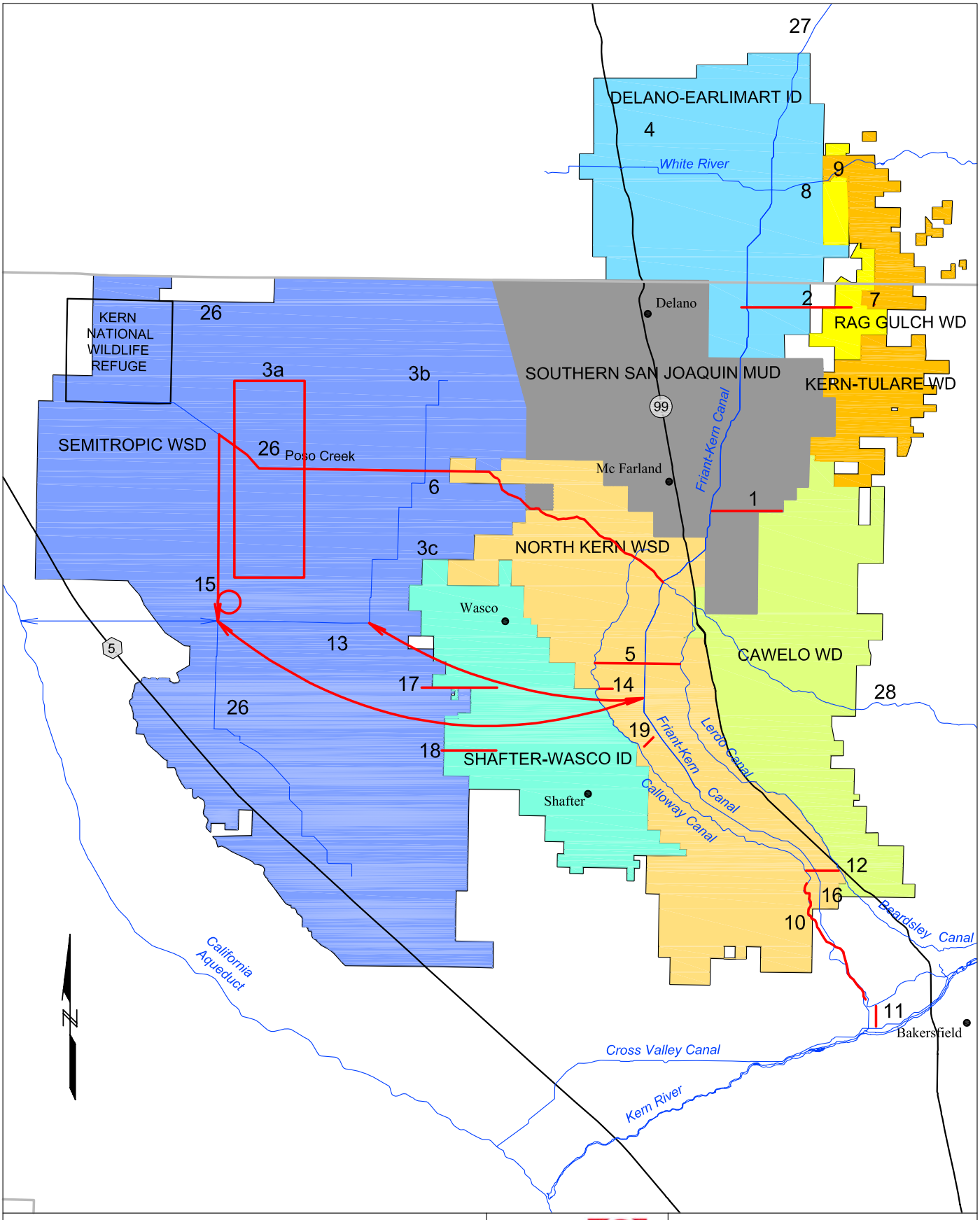
- **Reach 1**
  - Isolation of gravel pits
- **Reach 2**
  - Fish passage modifications to structures
  - River channel capacity modifications
  - Construction of Mendota Pool bypass
- **Reach 3**
  - Fish passage & screening modifications
- **Reach 4**
  - Fish passage modifications to structures
  - River channel capacity modifications
- **Reach 5**
  - Seasonal barriers for Salt & Mud S loughs
- **San Joaquin River Flood Control Bypass Channel**
  - Fish passage modifications to structures
  - Bypass channel capacity modifications
- Phase 1 Activities
- Phase 2 Activities
- Phase 1&2 Activities

San Joaquin River Settlement Activities

FRIANT WATER USERS AUTHORITY

Appendix D

Project Summary Descriptions



Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Proposed Project Components
Poso Creek Regional Management Group		June 2007 Appendix D

No. 01 Connect Friant-Kern Canal Turnout to Cawelo's North System

1.0 Summary

Project Type	Water Supply Reliability and Groundwater Level Enhancement
Project Sponsor	Cawelo Water District and Kern-Tulare Water District
Location	
Estimated Conveyance Capacity	
Project Descriptor	Increased water reliability by constructing additional facilities to access alternative supplies
Estimated Cost (2006 dollars)	$4,280,000

2.0 Project Description

Connect the Friant-Kern Canal with Cawelo's Lateral N-5 with up to four miles of 36-inch diameter pipeline. Diversion from the Friant-Kern Canal would rely on the turnout at Hanawalt Avenue and it would require the construction of a 40 cfs pumping plant at the Friant-Kern Canal to lift water from the canal into Cawelo. This connection would allow Cawelo to divert and deliver CVP-Friant water from time to time, which would replace the use of pumped groundwater. At this time, Cawelo cannot directly take advantage of water available in the Friant-Kern Canal. In addition, it creates the potential to deliver water into Kern-Tulare's South System, thereby facilitating the movement of water between these two districts to improve water management.

Starting at the Friant-Kern Canal at the existing outlet on the east side of the canal bank just south of Hanawalt Road, construct a 40 cfs pumping plant and a 36" diameter pipeline, extending approximately 3 miles east to Zerker Road. This would also provide for a connection to Cawelo Water District's proposed Western Service Area pipeline, which extends south approximately three (3) miles to a proposed regulation reservoir.

Construction and installation of the following:

- Traveling trash screen in the canal over the outlet grate plus fencing and power.
- Locate outlet stub and connect to pump wells.
- Install pumps and motor control center to include SCADA to Cawelo.
- Install up to 4 miles of 36" diameter pipeline from canal along south side of Hanawalt to Zerker Road.
- Install connection to Cawelo at location to be specified.

This facility could be in cooperation with several different participants of the IRWMP.

Figure 1 shows the location and extent of the Project.

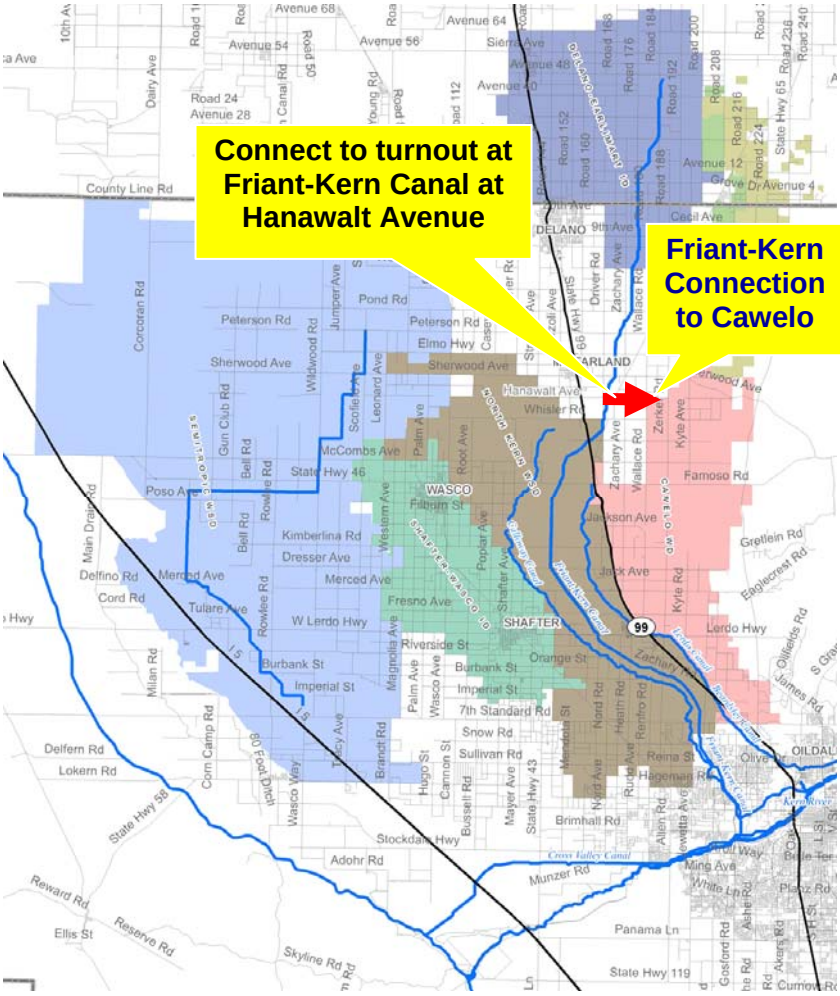


Figure 1. Location of Project

Background

Introduction

The Cawelo Water District (Cawelo) is a part of this statewide project, located in the southern portion of California's fertile San Joaquin Valley. Cawelo supplies irrigation water to over 45,000 acres of grapes, citrus, almonds and pistachios. Cawelo was formed in 1965 for the purpose of obtaining water supplies to supplement the pumping of groundwater for irrigation. Importing surface water has slowed the rate of decline of groundwater levels, but stabilizing the overdraft will require additional surface water supplies. If the groundwater supply beneath Cawelo can be increased and stabilized, it will provide a more dependable water supply in years when surface water supplies are limited.

Prior to formation of the District, water for irrigation was obtained almost exclusively from groundwater, resulting in a decline of groundwater levels averaging about ten feet per year. At the time the District was formed, approximately 38,200 acres within the District were under full irrigation. With the formation of the District and creation of a public entity, contracts for the purchase and importation of supplemental surface water were entered in 1972 with the Kern County Water Agency for State Water Project water and in 1976 with the City of Bakersfield for Kern River water.

The District constructed extensive facilities during 1974 and 1975 for the purpose of conveyance and distribution of the imported surface water supplies within the District. The District issued long-term general obligation bonds and obtained construction loans in the total amount of $27,667,500 for the construction of conveyance and distribution facilities. Repayment of the bonds and loans will conclude in year 2017.

The Project will improve water supply reliability and groundwater levels through providing a direct tie to the Friant-Kern Canal.

Land Use

The total area of Cawelo is 44,967 acres of which 32,870 acres are within the distribution system service area. Those lands within the District but outside the service area depend exclusively on groundwater for their irrigation water supply. The crop pattern within the District has changed quite dramatically during the past 25 years from row crops to permanent plantings. Currently, about 85 percent of the irrigated lands of the District contain permanent plantings of grapes, citrus, deciduous fruits and nuts.

Water Supply

CVP Water

Cawelo is not a CVP contractor; however, there are times when flood waters are available in the Friant-Kern Canal. In this regard, Cawelo has entered into temporary contracts for diversion and use of CVP-Friant water, typically available during very "wet" periods. Currently, the plumbing is not in place to allow Cawelo to directly take advantage of these water supply opportunities. The proposed Project would provide a direct tie to this source of supply.

SWP Water

Cawelo has a contract for 38,200 acre-feet of SWP water. Direct delivery of SWP water to Cawelo is currently accomplished by conveyance from the California Aqueduct via the Cross Valley Canal to Pump Station "A", where it is lifted into North Kern's Beardsley Canal (which changes name to the Lerdo Canal at North Kern's southern boundary). Under agreement with North Kern, the water is conveyed in the Lerdo Canal to Cawelo's Pump Station "B", where the water is lifted one more time into Cawelo's service area. It should be noted that from time to time, primarily during the peak irrigation season, Cawelo's delivery of SWP water is limited by the capacity of Pump Station "A". Therefore, the completion of this Project will relieve a conveyance constraint on their delivery system.

Demand

Water demand for the 45,000 acres of irrigated agriculture is 141,600 acre-feet of water. Of this amount, 100 acre-feet is for water transmission losses and effective participation provides 10,600 acre-feet leaving a demand of 130,900 acre-feet.

The applied water demand for crops grown in Cawelo ranges from 1.35 acre-feet per acre for field crops to 4.35 acre-feet per acre for alfalfas, with an average annual applied water demand of 3.01 acre-feet per acre, based upon the 1993 crop survey.

Conjunctive Management

Conjunctive use of both surface water and groundwater supplies enables the long-term economic survival of irrigated agriculture within Cawelo. Cawelo's efforts in accomplishing these goals have been limited by the high costs of adding distribution system and the unavailability of additional surface water supplies. Cawelo's capacity to implement conjunctive management may be advanced as a result of this Project.

3.0 Project Operation

Project Operation in a Wet Year like 2006

During wet years, the District will deliver an additional 5,000 acre-feet to irrigated lands and 2,000 to 3,000 acre-feet into spreading ponds. Without this Project, deliveries will be made with groundwater and water would not be available for recharge.

Project Operation in a Dry Year like 2004

During dry years, the District will deliver water from available sources and exchanges. If demands are greater than water supplies, groundwater will be pumped by the District and private landowners. As a result of increased deliveries and recharge abilities resulting from this Project, water levels will be at a higher level than previous years. This will provide increased yields and reduced pumping costs to both the District and private landowners.

4.0 Goals and Objectives

Associated benefits include:

- Water supply reliability (greater capture of available CVP supplies)
- Operational flexibility
- Increased groundwater recharge potential
- Reduce groundwater overdraft

5.0 Project's Consistency with IRWMP Objectives and Strategies

The Project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Enable flexibility between SWP and CVP contractors by providing additional operational opportunities and conveyance facilities for exchanges and conjunctive use programs between participants.

7.0 Project Screening Priority within the IRWM Plan

This Project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

Cost Estimate	
Connection to F-K Canal	$250,000
Pump Station	$1,200,000
36” Pipeline	$2,200,000
Connection to Conduit “E”	$60,000
ROW, Legal, Engineering	$570,000
Total	**$4,280,000***

*This cost estimate includes engineering; but, does not include administration and contingencies.

9.0 Schedule

April 2007 through Sept 2007	Complete Engineering Studies, CEQA
July 2007 through November 2007	Secure Project Funding
October 2007 through March 2008	Prepare Engineering Design
October 2007 through December 2007	Land Acquisition
January 2008 through July 2008	Construction

No. 02 Ninth Avenue Pipeline

1.0 Summary

Project Type	Increase in-lieu delivery capability
Project Sponsors	Kern-Tulare and Rag Gulch Water Districts
Location	Along Ninth Avenue from the Friant-Kern Canal, east for 4 ½ miles
Estimated Conveyance Capacity	Approximately 35 cfs
Project Descriptor	Increase District water delivery capability to conserve groundwater resources for dry years and increase energy efficiency of distribution system
Estimated Cost (2006 dollars)	$8,000,000

2.0 Project Description

The purpose of the Ninth Avenue Pipeline Project is to expand the Districts' distribution system capability to enable the Districts to deliver surface water and reduce groundwater pumping at times when adequate water supplies are available. This reduced groundwater pumping will serve to improve groundwater conditions for use during water short years, resulting in higher groundwater levels, higher well yields, and reduced groundwater pumping costs. The Project will also reduce energy requirements by increasing the efficiency of the Districts' distribution system and reduce energy demands by pumping less groundwater.

The Project consists of the facilities shown in Figure 1 and described below:

- 35 cfs turnout from the Friant-Kern Canal
- 1,200 horsepower pumping plant
- 4 ½ miles of 36-inch pipeline
- 400 horsepower booster pumping plant
- 36-inch inlet to Cecil Reservoir

Figure 1 Shows the location and extent of the Project.

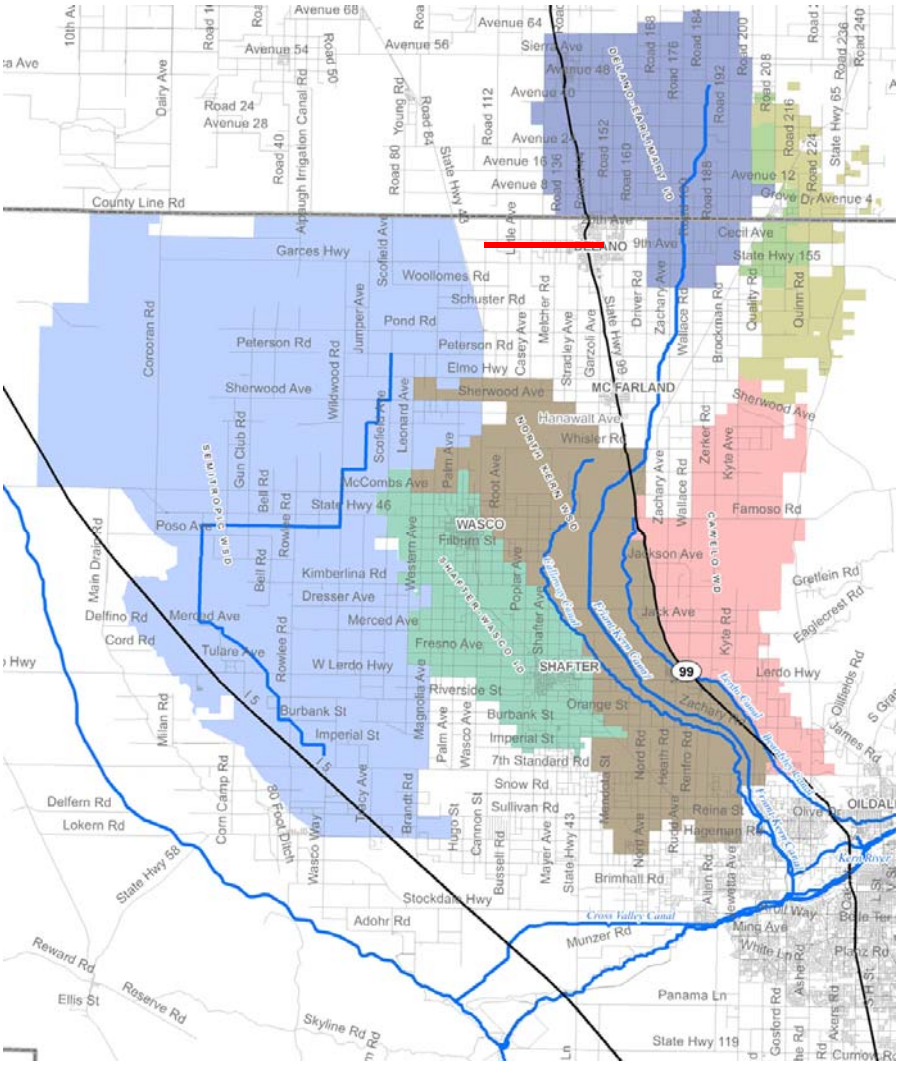


Figure 1. Location of Project

These facilities will increase the delivery capability of the District's Woollomes/Cecil distribution system from 34,000 gpm to 50,500 gpm. This additional capacity will increase the delivery capability to 12,786 acres within the Woollomes/Cecil service area from 2.7 gpm/ac to 4.0 gpm/ac. It is estimated that the Project will provide an additional 8,300 acre-feet to existing irrigation demands currently served with groundwater when adequate water supplies are available.

In addition to improving delivery capability, the proposed Project will reduce electrical loads within the Districts. These reduced electrical loads will be a result of increasing the efficiency of the distribution system by installing premium efficiency motors and reducing velocities in existing facilities and reducing groundwater pumping. The total annual energy savings from the Project is estimated at 4,700,000 kWh, with a resulting savings of approximately $550,000 per year. An additional significant benefit, not reflected in the above cost savings, is the ability to use a portion of the increased pumping capacity off-peak. The ability to run pumps off-peak is not presently available because the District's distribution system runs at maximum capacity during the summer months. However, with additional pumping capacity, and existing reservoirs, there will be opportunities to turn on additional pumps off-peak and reduce energy use during peak periods. Also not reflected in this estimate is the energy savings associated with reduced pumping lifts and increased well yields as a result of the Project.

Need for Project

The Districts have significant concerns with regard to future water supplies. Three of these concerns are.

1. Federal and state regulatory actions in delta have severely limited the ability of the Districts to receive their CVP water supplies.
2. The initial term of the contract with the City of Bakersfield ends on December 31, 2011. The ability of the Districts to receive a reliable supply of Kern River is uncertain beyond 2011.
3. A coalition of environmental groups has settled a lawsuit against the federal government related to water supply contracts in the Friant Division of the CVP. The result of this settlement will reduce the ability of the Districts to purchase Friant Class 1, Class 2, and Section 215 water supplies.

In an effort to mitigate for these concerns with regard to future water supplies, the Districts have identified several management objectives as part of their ground water management plan. One of these management objectives is to improve distribution facilities to maximize the delivery capability of surface water when it is available to save groundwater resources for future years.

Background

Water Supply

Kern-Tulare Water District (Kern -Tulare) has a contract with the Bureau of Reclamation for an annual supply of 40,000 acre-feet from the CVP. Rag Gulch Water District (Rag Gulch)has a contract for an annual supply of 13,300 acre-feet. DWR conveys water under this contract through the California Aqueduct to Tupman. Water is then conveyed through the Cross Valley Canal, where it is either delivered to the Friant-Kern Canal or exchanged with Arvin-Edison Water Storage District (Arvin-Edison) for water available in the Friant-Kern Canal.

The Districts contract annually for Section 215 Water. The Districts also purchase Class 1 and Class 2 Friant water supplies from Friant Contractors on an as-available basis. Occasionally, there are flood flows available from the Friant-Kern Canal, which the Districts also purchase.

Kern-Tulare has a contract with the City of Bakersfield for an average annual supply of 20,000 acre-feet of Kern River water. Rag Gulch has a similar contract for an average annual supply of 3,000 acre-feet. Water under these contracts is delivered to the Kern County Water Agency Improvement District No. 4 in exchange for State Water Project water. The SWP water is conveyed through the Cross Valley Canal, where it is either delivered to the Friant-Kern Canal or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

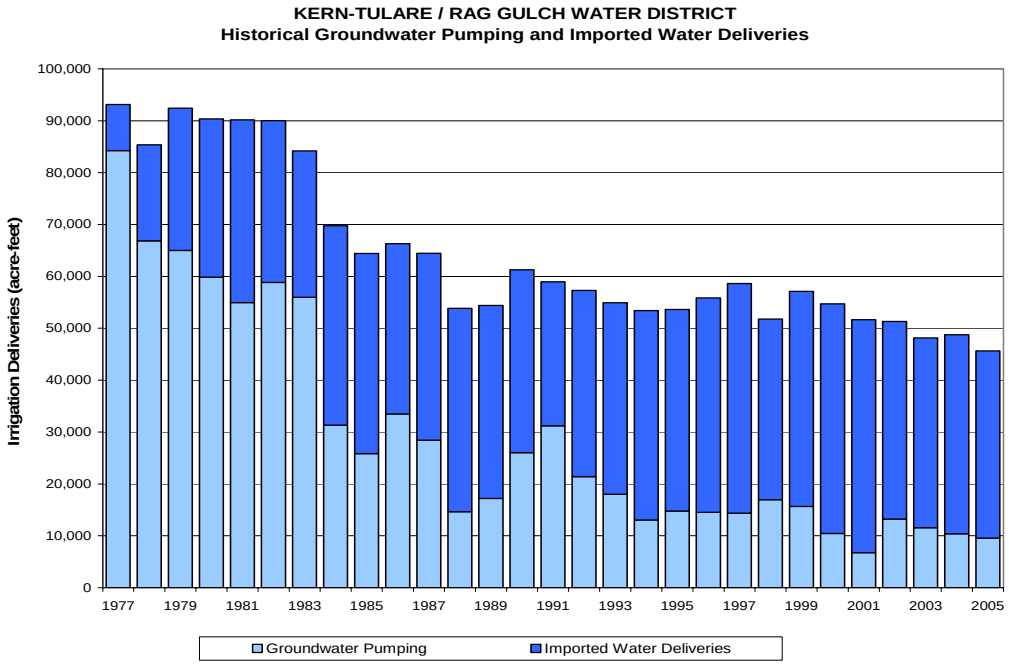
Land Use

The Districts provide no domestic or residential water supplies. All irrigated lands are planted to high-value permanent crops. A summary of land use in 2005 is presented in the table below.

2005 Land Use (acres)			
	Kern-Tulare	Rag Gulch	Total
Almonds	702	133	835
Apples	5	0	5
Blue Berries	0	89	89
Cherries	98	0	98
Grapes	3,626	3,271	6,897
Grapefruit	10	0	10
Kiwi	201	0	201
Lemons	125	0	125
Olives	204	0	204
Oranges	5,913	885	6,798
Persimmons	17	0	17
Pistachios	1,626	270	1,896
Pomegranates	25	0	25
Total Irrigated	12,552	4,648	17,200
Non-irrigated	4,563	1,306	5,869
Total	17,115	5,954	23,069

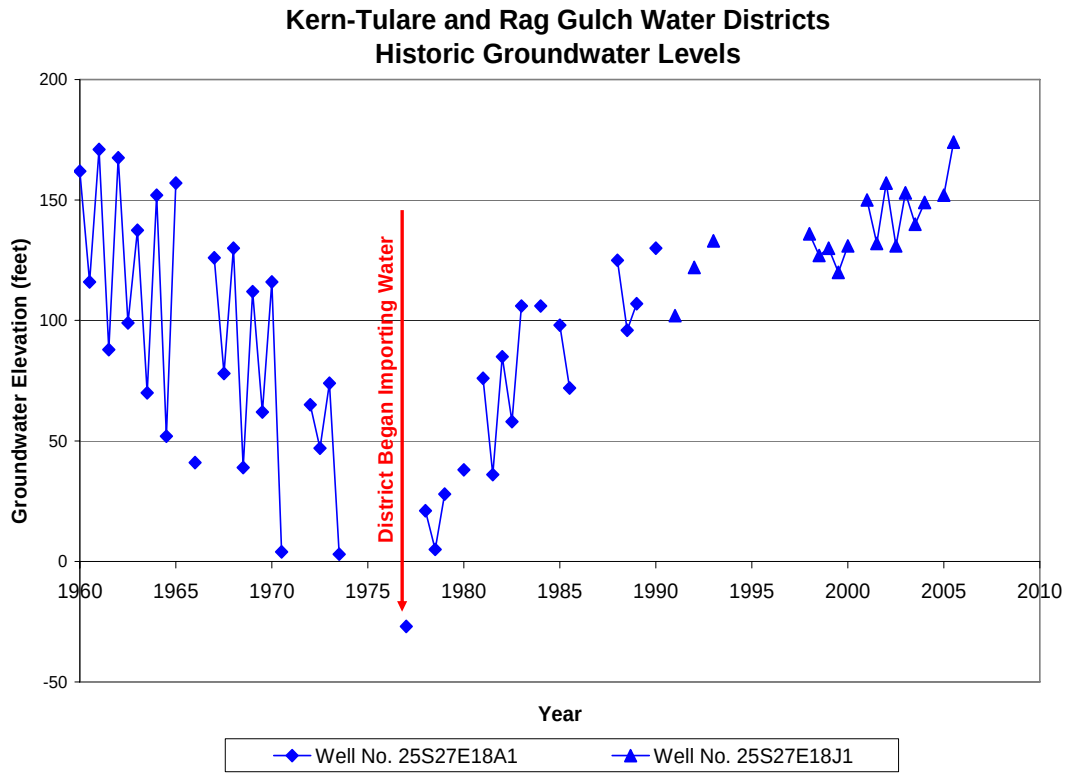
Irrigation Demand

The figure below illustrates the portion of irrigation demands satisfied with imported water and that portion satisfied with groundwater pumping over the past 29 years. As shown, irrigation demands have decreased and the imported water deliveries have increased over time. The decrease in irrigation demand is due to improved irrigation methods and lands being taken out of production. The increase in imported water deliveries is due to distribution system improvements.



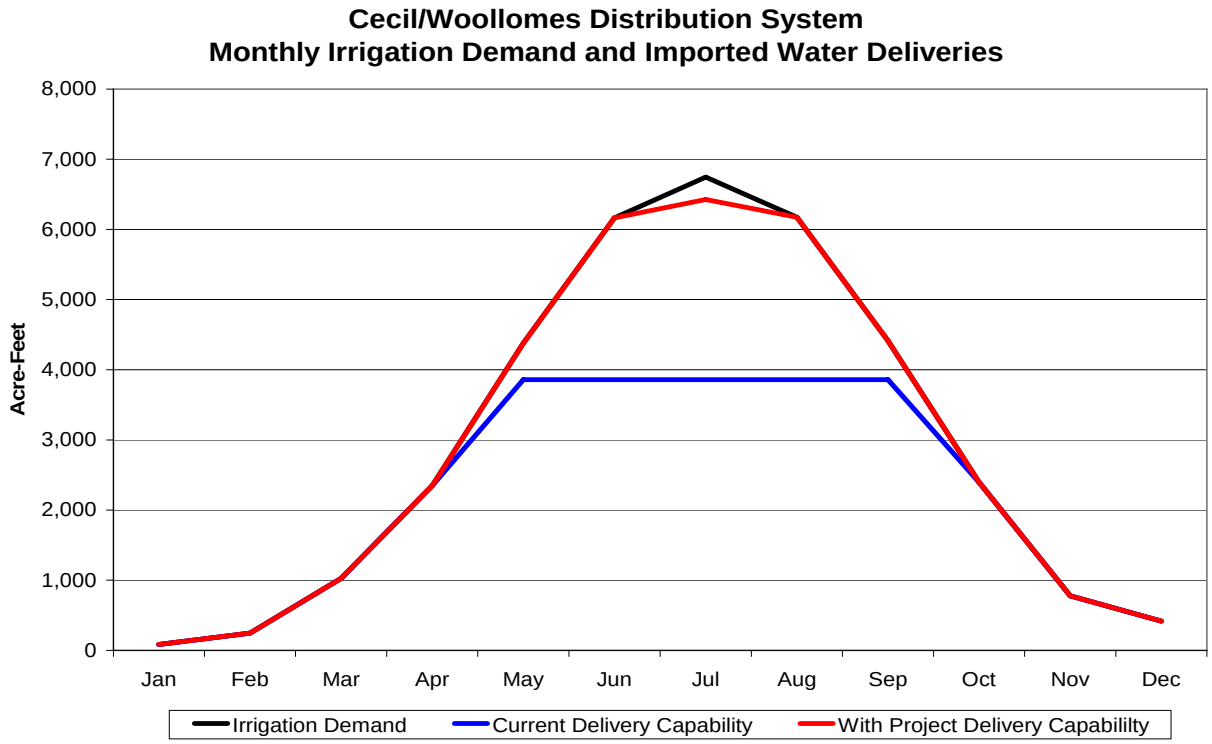
Groundwater

A hydrograph of groundwater elevations from 1960 to date is presented in the figure below. This hydrograph is located near the center of the Districts and is representative in showing changes in groundwater levels throughout the Districts. Groundwater levels within the Districts were falling at a rate of approximately 10 feet per year prior to 1977. As a result of these declining groundwater levels, groundwater quality was degrading and subsidence of the land surface was occurring. Groundwater conditions have steadily and dramatically improved since 1977 as a result of the Districts' importation of irrigation water into the area.



Distribution System

The Districts' distribution system is inadequate to fully satisfy irrigation demands within the service area. As a result, irrigation deliveries are prorated during the summer months and water users rely upon privately owned wells, even in the wettest of years. As shown in the figure below, by increasing the delivery capability of the Woollomes/Cecil distribution system from 2.7 gpm per acre to 4.0 gpm per acre, the annual extraction from privately owned wells could be reduced from 8,600 to 300 acre-feet.



Expansion of distribution system capability, used in conjunction with the Districts reservoirs, will reduce on-peak pumping. A reduction in on-peak pumping will reduce energy costs to water users.

3.0 Project Operation

Project Operation in Wet Years

During wet years, the Districts will deliver an additional 8,200 acre-feet to irrigated lands that, without the Project, would have been supplied with groundwater. The Project will also increase the energy efficiency of the Districts' distribution system resulting in reduced energy costs to water users.

Project Operation in Dry Years

During dry years, the Districts will deliver water from available sources. If there is not enough District water supply to meet irrigation demands, District water supplies will be allocated based upon acreage within the service area. Allocated water supplies will cause water to rely upon privately owned wells. As a result of previous years of increased delivery resulting from the Project, water levels will be higher than they otherwise would have been. These increased water levels will result in increased well yields and reduced pumping costs which will be beneficial during dry years.

4.0 Goals and Objectives

The primary goal of this Project is to increase distribution system capacity. Associated Project benefits include:

- Water supply reliability through groundwater recharge
- Conjunctive management of surface and groundwater resources
- Improved energy efficiency
- Reduced energy use and costs

5.0 Project's Consistency with IRWMP Objectives and Strategies

The Project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Expanded delivery capability, in conjunction with groundwater banking and expanded regional conveyance facilities serves to better manage the Region's water resources.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

An estimate of the cost to implement this Project is shown below. These costs will be refined as further engineering studies are conducted.

Ninth Avenue Pipeline	$4,500,000
Ninth Avenue Pumping Plant	$1,200,000
Friant-Kern Turnout	$400,000
Booster Pumping Plant	$400,000
Tie to Cecil Reservoir	$200,000
Subtotal	$7,300,000
ROW, Legal, Engineering	$1.700,000
Total	$8,000,000

9.0 Schedule

November 2006 through December 2006:	Complete Engineering studies
January 2007 through February 2008:	Secure Project funding
March 2008 through June 2008:	Prepare Engineering Design
July 2008 through September 2008:	Land Acquisition
October 2008 through March 2009:	Construction

No. 03a Stored Water Recovery Unit In-Lieu Service Areas

1.0 Summary

Project Type	Water Supply Reliability and Groundwater Level Enhancement
Project Sponsor	Semitropic Water Storage District
Location	**See Figure 1 and 2**
Project Descriptor	Increased water supply reliability and groundwater level improvement through distribution system improvements to provide surplus surface water deliveries
Estimated Cost (2006 dollars)	Total = $43.0 million

2.0 Project Description

Construction of the main conveyance facilities for Semitropic's Stored Water Recovery Unit (SWRU) creates the potential to deliver surface water (when available) to lands currently relying exclusively on pumped groundwater. In this regard, about 12,000 acres in the north-central portion of Semitropic have been identified. Service would require the construction of irrigation distribution systems consisting of booster pumping plants and buried pipeline laterals. Three systems, located along the north-south alignment, would be required to ensure adequate pressure within the service area (see Figure 2 for approximate location).

Distribution pipelines will be constructed from the North-South Canal and Pipeline to provide surface water deliveries to the existing land that has been dependent upon groundwater pumping. The actual size and length of the distribution pipelines will be dependent upon the amount of land served by each distribution lateral. Construction of the distribution pipeline and farm turnouts will be the same as described in Section 4.3.4. "Distribution Facilities" of the 1994 DEIR [1994 DEIR, pp 4-21 through 4-23, Figures 4-8 and 4-9].

The location of the distribution system will be coordinated with each landowner to minimize the amount of disruption to farming operations. The typical surface disturbance will be temporary and will occur in cultivated fields. The presence of the distribution system will not preclude the use of the land overlying the pipeline for farming purposes.

It is anticipated that these facilities would be constructed as needed by the banking partners, to expand the put capacity of the bank. Conditions under which this optional in-lieu area would be served would be the same as the District's existing in-lieu service area. It would include the lands that have a farming history, with the landowner having executed a water service contract similar to that used for the existing in-lieu area.

Figure 1 and Figure 2 show the extent and location of the project.

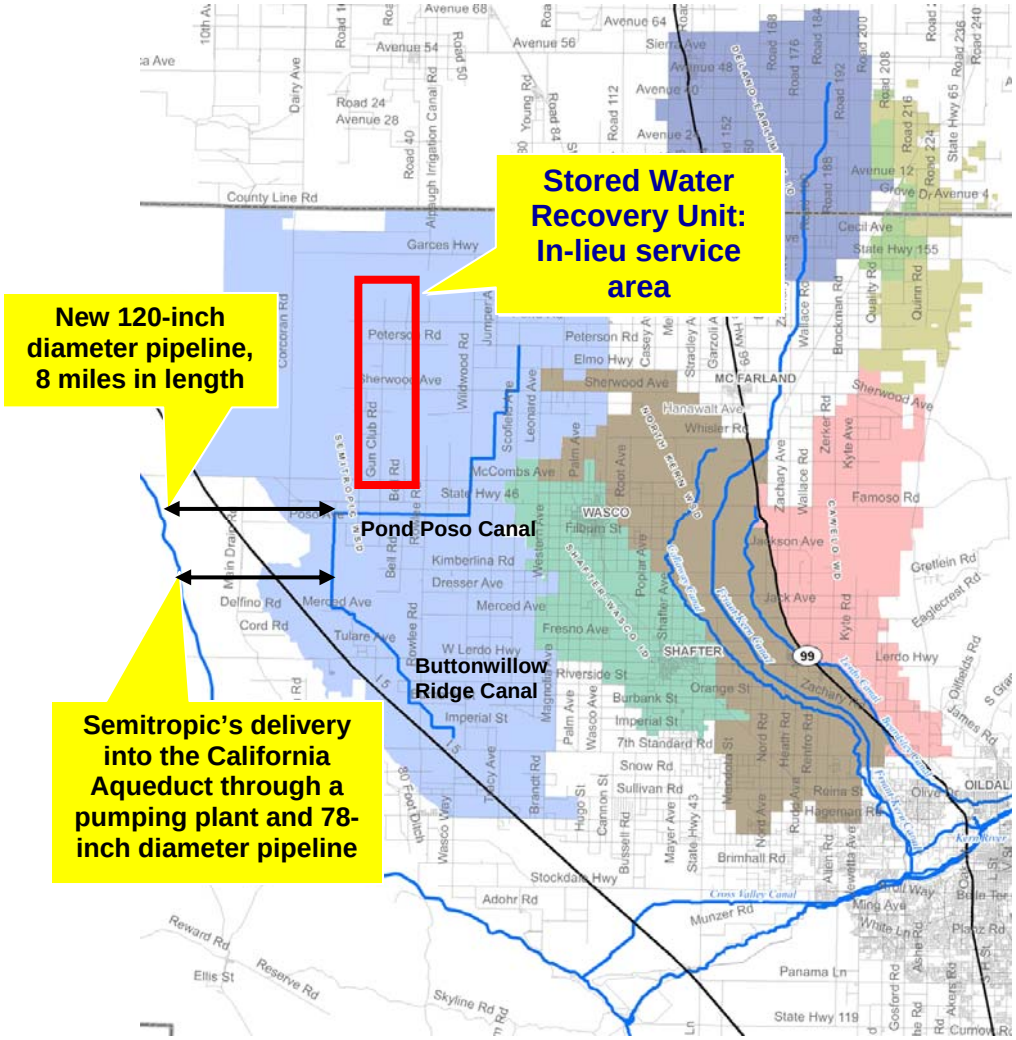


Figure 1: Location of Project

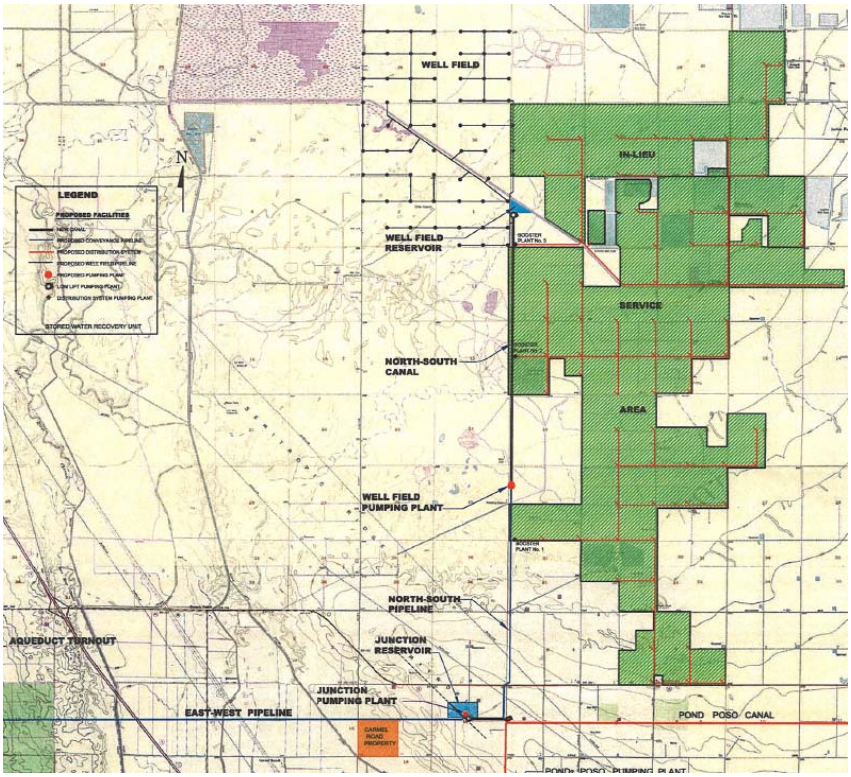


Figure 2: Schematic of the Stored Water Recovery Unit

Background

Introduction

Semitropic is located in Kern County, approximately 20 miles northwest of Bakersfield, in the western San Joaquin Valley. The farmers in the area relied solely on groundwater until 1973, when they began importing surface water from the SWP. While the SWP imports significantly reduced groundwater use, they did not eliminate it. The 1987-1992 droughts, with reduced SWP deliveries, led to declining water levels causing Semitropic to search for ways to take advantage of available underground storage (estimated at 2 million acre feet).

Semitropic is in the process of implementing a groundwater banking program. The program includes a separate storage and recovery area termed the Stored Water Recovery Unit project. In wet years, banking partners will utilize surplus water available in the California Aqueduct for Semitropic irrigation demands in place of pumping groundwater. This substitution will allow for in-lieu recharge for the groundwater basin allowing water levels to increase. Subsequently, when precipitation and water supply conditions are dry or significantly below normal, banking partners will be able to draw on stored or banked groundwater for delivery to southern California water customers. Production for stored water may range as high as 420 cfs, and in most case will involve delivery through transmission in the California Aqueduct.

Land Use

Semitropic is composed almost entirely of agricultural users and serves approximately 127,420 acres of irrigated land out of 222,120 acres within its boundaries. Semitropic has an arid climate and precipitation averages about four inches per year. A significant portion of the district overlies a useable groundwater basin.

Water Supply

No major surface streams enter or cross the Semitropic area. The naturally occurring water resources are principally underground. A minor stream, Poso Creek, crosses the District area and the Kern River, along with Poso Creek, constitutes the principal historical sources of the underground stored water. Some limited artificial recharge takes place in spreading ponds, but most of the groundwater recharge occurs through the percolation of applied water from irrigation and subsurface flows. The basin primarily relies on "in lieu" recharge to replenish groundwater supplies.

Local Surface Water

Since the late 1800's, surface water diverted from the Kern River for irrigation of lands easterly of Semitropic (later incorporated in the North Kern Water Storage District) sustained groundwater movement into the Semitropic area. This aspect may have been limited prior to the lowering of Semitropic area groundwater levels resulting from development occurring subsequent to the 1930's. Surface water imported and applied from the federal Central Valley Project in the Shafter-Wasco irrigation District which adjoins Semitropic on the east, has contributed to underflow into the Semitropic area since the 1950's.

Poso Creek, originating in the foothills to the east, enters the Semitropic area at a point approximately four miles north of Wasco. Generally, the runoff in Poso Creek is diverted upstream of the District and/or percolates before reaching the District. Only in years of abundant water supply does runoff from this source reach Semitropic. Following the locally wet winter of 1978, the District constructed a diversion works in the right (northerly) bank of Poso Creek to divert water on an as-available basis into the Pond-Poso Canal. Semitropic applied for and received a permit for this diversion from the State Water Resources Control Board (Permit No. 0175538 issued February 1979). Also, when and as water becomes available in the Friant-Kern Canal of the Central Valley Project, Semitropic has arranged for release of this water into Poso Creek for diversion into the Pond-Poso Canal.

The Kern River flows from its canyon in the Sierra Nevada Mountains to the east of Bakersfield and follows a southwesterly path toward the Buena Vista Lake area southerly of Semitropic. Overflow channels extend northwesterly and northerly, the historical Jerry Slough passing through Semitropic and the Kern River Flood Channel running northerly near the westerly boundary of Semitropic.

Kern River water supplies reaching the valley floor are primarily utilized for irrigation under long-standing water rights and agreements. Runoff from this source varies widely from year to year, the maximum annual recorded amount having been some 2.5 million acre-feet in 1916, 1969, and 1983. The minimum was about 177,000 acre-feet in 1961 and the average being about 738,000 acre-feet per year.

Isabella Dam and Reservoir (storage capacity of 570,000 acre-feet) was completed on the Kern River in 1954. Prior to that time and prior to the construction of the Kern River – California Aqueduct Inter-tie (in 1977) much of the Kern River overflow flowed to the trough of the Valley and ponded in the Buena Vista-Kern Lake area, higher flows overflowing to Goose Lake and Tulare Lake. In particular, prior to

completion of Isabella Dam, overflows from the Kern River also flowed throughout the Buttonwillow Improvement District via Jerry Slough. Historically, these occurrences provided an increment of recharge to ground waters underlying the District. Isabella Dam and Reservoir, couple with subsequent improvements, have effectively precluded entrance of Kern River flood flows through Jerry Slough.

Physically, Semitropic is capable of taking delivery of Kern River water via (a) Poso Creek, (b) the inter-tie between Buena Vista Water Storage District's East Side Canal and the Semitropic's Intake Canal, and (c) turnouts to certain Semitropic lands from Buena Vista's East Side Canal. Buena Vista's Main Drain and the Semitropic's Intake Canal Water from Semitropic from these sources is limited not only by the availability of water supply but also by the availability of unused conveyance capacity in facilities of Buena Vista and North Kern. This latter connection, while serving other purposes as well, would allow Semitropic to divert and utilize more Kern River water on those infrequent occasions when it is available.

State Water Project

The Kern County Water Agency's contractual supply of State Water has been allocated and committed by contract to several public water districts within the Agency including Semitropic and its improvement districts. Three separate water supply contracts were entered into with the Kern County Water Agency for State Water Project water, one for Semitropic and one for each of the improvement districts. The water supplies available under these contracts are "firm water" and "surplus water". The maximum annual entitlement of firm water, totaled for the three contracts is 158,000 acre-feet per year. In addition, under full operating conditions (year 1990 and beyond) up to 25,100 acre-feet per year of surplus water would be available subject to SWP water supply conditions from year to year.

It should be noted that the contracts with the Kern County Water Agency provide that the Agency is not obligated to deliver more than 28,440 acre-feet per month through the District's turnout, which is equivalent to 18 percent of the maximum entitlement of firm water of 158,000 acre-feet per year. It is further noted that the Agency contract with the State limits the Kern County Water Agency as a whole to 18 percent of its maximum annual entitlement.

In addition to contractual entitlements to SWP water, Semitropic through its contracts with the Kern County Water Agency has taken advantage of opportunities to purchase locally unused SWP water. This water, when available, referred to as agricultural pool water, is excess to the needs of one or more member units of the Agency in a given year and is returned or pooled with the Agency which markets this water to other member units. With regard to agricultural pool water, the District has been a buyer rather than a seller in recent years.

Central Valley Project (Federal water)

Semitropic does not, at the present time, have a contractual water supply from the federal Central Valley Project (CVP). However, the District has, for several years, secured a water supply from this source. The District, in conjunction with KCWA and other public water districts within Kern County, initiated the preparation (in 1987) of an environmental document regarding the diversion of water from the Delta. This effort was subsequently put on hold in anticipation of the release of the Bureau of Reclamation's marketing EIS.

This latter document, made public in early 1989, did not make an allocation of water to any of the interested water districts in Kern County. If a water supply is ultimately secured from this source, either interim or long term, it could be wheeled in the California Aqueduct to the District's turnout. Also, it is noted that the District has utilized water which has conveyed in the Friant-Kern Canal and thence via

Poso Creek and or the Shafter-Wasco Irrigation District interconnection during years of abundant water supply on the San Joaquin River.

Demand

The total demand for irrigation water varies from year to year depending on the irrigated acres and the types of crops in production. The total demand for irrigation water may reach up to 450,000 acre-feet per year.

Kern River water supplies reaching the valley floor are primarily utilized for irrigation under long-standing water rights and agreements. Runoff from this source varies widely from year to year, the maximum annual recorded amount having been some 2.5 million acre-feet in 1916, 1969, and 1983. The minimum was about 177,000 acre-feet in 1961 and the average being about 738,000 acre-feet per year. Isabella Dam and Reservoir (storage capacity of 570,000 acre-feet) was completed on the Kern River in 1954. Prior to that time and prior to the construction of the Kern River – California Aqueduct Inter-tie (in 1977) much of the Kern River overflow flowed to the trough of the Valley and ponded in the Buena Vista-Kern Lake area, higher flows overflowing to Goose Lake and Tulare Lake. In particular, prior to completion of Isabella Dam, overflows from the Kern River also flowed through the Buttonwillow Improvement District via Jerry Slough. Historically, these occurrences provided an increment of recharge to ground waters underlying the District. Isabella Dam and Reservoir, couple with subsequent improvements, have effectively precluded entrance of Kern River flood flows through Jerry Slough.

Physically, Semitropic is capable of taking delivery of Kern River water via (a) Poso Creek, (b) the inter-tie between Buena Vista Water Storage District's East Side Canal and the Semitropic's Intake Canal, and (c) turnouts to certain Semitropic lands from Buena Vista's East Side Canal. Water from Semitropic from these sources is limited not only by the availability of water supply but also by the availability of unused conveyance capacity in facilities of Buena Vista and North Kern water storage districts. An additional tie-in is currently under study whereby a physical connection would be made between Buena Vista's Main Drain and the Semitropic's Intake Canal. This latter connection, if constructed, while serving other purposes as well, would allow Semitropic to divert and utilize more Kern River water on those infrequent occasions when it is available.

Conjunctive Management

Semitropic has been managing its groundwater resources since its formation in 1958. The groundwater management plan formalized the goals and objectives evidenced by Semitropic's conjunctive use management practices, which have evolved over many years of operations. Through these practices, Semitropic has managed its groundwater and surface water resources to the benefit of its landowners, the groundwater basin, and California. It is noted that many of the groundwater management plan goals and objectives had been implemented before the plan's formal adoption.

From Semitropic's formation in 1958 to 1973, area farmers relied solely on groundwater for irrigation. In 1973, they began importing surface water from the SWP to mitigate groundwater overdraft. To further this management objective, Semitropic searched for ways to take advantage of an estimated 2 million acre-feet of aquifer storage. In the late 1980's and early 1990's, Semitropic began the process of finding water-banking partners. In 1994, it entered into an MOU with five other local districts to create the Water Bank. Since 1973, Semitropic has, through its management practices, stabilized groundwater levels, delivered more than 5 million acre-feet of surface water, stored more than 1 million acre-feet for banking, and recovered some of the stored water for return to its Banking Partners.

The goal of the groundwater management plan is to, at the least cost, preserve, enhance, or augment the resource as necessary to mitigate the present level of overdraft in the regional groundwater basin. The goals are implemented through five major basin management objectives, as follows:

- Maintain groundwater levels at economically viable pumping lifts for the agricultural uses (economy) of the area;
- Control the degradation of groundwater quality and enhance quality where practicable;
- Limit inelastic subsidence;
- Preserve the historical flows of Poso Creek into the area;
- Operate the groundwater banking program to benefit Semitropic's landowners, without adversely affecting the water supplies of any Semitropic landowners or landowners in neighboring districts.

3.0 Project Operation

In September, at the end of the irrigation season, the on-farm wells could continue to operate for recovery of previously stored water.

Project Operation in a Wet Year like 2006

During the irrigation season, all of the existing ground water wells within the 12,000 acre service area would remain off and 42,000 acre-feet of water would be imported into the service area.

Project Operation in a Dry Year like 2004

Some minor amounts of water may be imported during limited availability of Article 21, but for most of the year agricultural deliveries would be made from on-farm wells.

4.0 Goals and Objectives

In the late 1990's, Semitropic pursued planning for an expansion of its Water Bank through the Stored Water Recovery Unit. The facilities for the In-Lieu Service Area fall under Phases II and III of the SWRU project. When implemented, the primary goal of the Stored Water Recovery Unit is to replace groundwater pumping with surface water for water supply reliability and groundwater level improvements. Associated project benefits include:

- Enhances water supply reliability during drought years
- Provides an effective water management tool
- Reduces groundwater pumping lifts for agricultural water users
- Increased conjunctive use potential

5.0 Project's Consistency with IRWMP Objectives and Strategies

The facilities in the SWRU In-Lieu Service Areas are important elements in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

The Stored Water Recovery Unit also provides conveyance to and from existing service areas lying to the east and also from Poso Creek.

7.0 Project Screening Priority within the IRWM Plan

This project provides ground water management, water supply reliability and conjunctive management of surface and groundwater. This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

System X (southerly system to be built first) = $14.9 million
System Y (middle system to be built second) = $10.2 million
System Z (northerly system to be built last) = $17.9 million
Total = $43.0 million

9.0 Schedule

Next phase (System X) is ready for construction in 2007.

No. 03b Expand P-1030 In-Lieu Service Area

1.0 Summary

Project Type	Water Supply Reliability and Groundwater Level Enhancement
Project Sponsor	Semitropic Water Storage District Southern San Joaquin MUD
Location	Pond Poso Canal station 1030, T25S, R24E Sections 4, 5, & 9
Estimated Conveyance Capacity	28 cfs in-lieu delivery
Project Descriptor	P-1030 Distribution System Phase 2
Estimated Cost (2006 dollars)	$5,000,000

2.0 Project Description

The first phase of the P-1030 system was completed in April 2007. Extra capacity was included in the original system design. A 45" blind flange is located in the south east corner of the projected expanded service area and one empty bay was included for a future pump at the P-1030 Pumping Plant. Once the land has succeeded in meeting the eligibility requirements for surface water service final design can commence.

Facilities include 1) expanding by 1,280 acres an existing in-lieu distribution system, plus 2) a 1000 foot long interconnecting pipeline with Southern San Joaquin MUD's delivery system.

3.0 Project Operation

In September, at the end of the irrigation season, the on-farm wells would continue to operate for recovery of previously stored water.

Project Operation in a Wet Year like 2006

During the irrigation season, all existing on-farm wells would be left off and 4,500 acre-feet of water would be imported into this service area.

Project Operation in a Dry Year like 2004

Some minor amounts of water may be imported during limited availability of Article 21, but for most of the year agricultural deliveries would be made from on-farm wells.

4.0 Goals and Objectives

The facilities for this component of the In-Lieu Service Area fall under the Semitropic groundwater banking project. The primary goal of the Semitropic groundwater banking program is to replace

groundwater pumping with surface water for water supply reliability and groundwater level improvements. Associated project benefits include:

- Enhances water supply reliability during drought years
- Provides an effective water management tool
- Reduces groundwater pumping lifts for agricultural water users
- Increased conjunctive use potential

5.0 Project's Consistency with IRWMP Objectives and Strategies

The facilities of this component in the SWRU In-Lieu Service Area are important elements in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This service area provides conveyance to the Southern San Joaquin MUD portion of the study area.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The estimated cost (in 2006 dollars) for implementing this project is $5 million.

9.0 Schedule

Project can be ready for construction in 2008 and be completed within three years.

No. 03c P-565 New In-Lieu Service Area Enhancement of Existing "Beta" System and Interconnection with North Kern Water Storage District

1.0 Summary

Project Type	Water Supply Reliability and Groundwater Level Enhancement
Project Sponsor	Semitropic Water Storage District North Kern Water Storage District
Location	Pond Poso Canal station 565, T26S, R24E Sections 20, 21, 22, 23, 27, 28, & 29
Estimated Conveyance Capacity	75 cfs in-lieu delivery plus 50 cfs conveyance to existing "Beta" System and/or into North Kern's Canal
Project Descriptor	P-565 Distribution System
Estimated Cost (2006 dollars)	$15,000,000

2.0 Project Description

The Pond-Poso Improvement District of the Semitropic Water Storage District will construct the P-565 Distribution System to enhance its existing recharge, banking and recovery capability with the construction of an additional 3,630 acres of surface water delivery service area for use in-lieu of pumping groundwater. The project consists of two pump stations, pumps, motors, electrical equipment, 63,389 lineal feet of distribution pipeline and 15 farm turnouts. It will provide an additional capacity of 50 cfs plumbed into the back end of an existing distribution system ("Beta" System) to relieve capacity constraints, and interconnections with a North Kern Water Storage District canal delivery system. The project will add to the Districts ability to recharge/bank water for future use by our banking partners, and to reduce to amount of overdraft on the groundwater basin.

Background

This project was identified in CEQA documents for Semitropic Water Bank and the Project has been completely designed with plans and specifications shelved pending funding availability.

3.0 Project Operation

Project Operation in a Wet Year like 2006

All existing on-farm wells would be left shut off and an estimated 15,000 acre-feet of water would be imported into this service area.

Project Operation in a Dry Year like 2004

Some minor amounts of water may be imported during limited availability of Article 21 water, but most of the year agricultural deliveries would be made from on-farm wells. In September, at the end of the irrigation season, the on-farm wells would continue to operate for recovery of previously stored water.

4.0 Goals and Objectives

In the late 1990's, Semitropic pursued planning for an expansion of its Water Bank. The facilities for this part of the In-Lieu Service Area when implemented, support the primary goal to replace groundwater pumping with surface water for water supply reliability and groundwater level improvements. Associated project benefits of this component include:

- Enhances water supply reliability during drought years
- Provides an effective water management tool
- Reduces groundwater pumping lifts for agricultural water users
- Increased conjunctive use potential

5.0 Project's Consistency with IRWMP Objectives and Strategies

The facilities of this component in the groundwater bank are important elements in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

50 cfs of capacity has been added for delivery into another service area and/or delivery into North Kern Water Storage District.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The estimated cost (in 2006 dollars) for implementing this project is $15 million.

9.0 Schedule

This component of the in-lieu service area is ready for construction in 2007.

No. 04 G-W Banking North of DEID with Pixley ID

1.0 Summary

Project Type	Groundwater banking
Project Sponsors	Delano-Earlimart Irrigation District
Location	To be determined within Pixley Irrigation District
Estimated Conveyance Capacity	To be determined
Project Descriptor	Increased water supply reliability through groundwater banking
Estimated Cost (2006 dollars)	To be determined

2.0 Project Description

The Delano-Earlimart Irrigation District (DEID) and Pixley Irrigation District (PID) Board of Directors have approved the preparation of a reconnaissance level report of alternatives for a proposed groundwater bank and extraction facilities in PID and conveyance facilities for return of banked/pumped groundwater to DEID. The study will determine the potential feasibility of jointly developed facilities to deliver Friant Division Central Valley Project (CVP) water available to DEID to PID for banking in the groundwater aquifer below PID and for subsequent extraction and return delivery to DEID during dry years. The feasibility is to be analyzed at a reconnaissance level of detail as to costs, hydro-geological factors and other considerations affecting potential feasibility.

DEID and PID are currently working with the consultant engineer to refine the parameters of the conceptual program (and by doing so, refine the ultimate scope-of-work) by establishing analysis guidelines and desired research objectives. After pertinent research is completed, the consultant engineer intends to suggest two alternative project locations, to be narrowed to one location to be investigated. The proposed project location (well field location and return pipeline alignment) will be determined through discussion with DEID and PID staff as to possible site specific benefits and obstacles. The selected site will be evaluated based on estimates of construction costs (costs analyzed both with construction by contractor and, alternatively by District forces), potential project yield and on-going operation and maintenance costs.

Background

Introduction

Located in southern Tulare County and northern Kern County, and immediately adjacent to and west-northwest of Kern-Tulare and Rag Gulch Water Districts, Delano-Earlimart was organized in 1938 to address declining groundwater levels. Delano-Earlimart is immediately northeast of the City of Delano and is crossed from north to south by the Friant-Kern Canal. Also extending through the middle of the District in an east-west direction is the White River.

Delano-Earlimart was organized to contract for imported surface water supplies, with particular emphasis on the Friant Division of the CVP. It has the additional responsibility of conjunctively managing surface water and groundwater supplies to ensure an adequate water supply for water users within the District.

Land Use

Delano-Earlimart encompasses 56,500 acres of which 46,000 acres are irrigated.

Water Supply

Delano-Earlimart has a contract with the U.S. Bureau of Reclamation for CVP water to serve 56,500 acres within its boundaries. The source of this surface water supply is the Friant Division of the CVP, which develops its supply from the San Joaquin River, with storage provided by Millerton Lake. The water is transported to the District through the Friant-Kern Canal. The surface water supply is used conjunctively with the underlying groundwater. Delano-Earlimart's contract entitlement consists of 108,800 acre-feet of Class 1 water and 74,500 acre-feet of Class 2 water, for a total of 183,300 acre-feet. The long-term average surface water supply available to the District is estimated at 135,000 acre-feet. The Class 1 water is storable (for use within a given year) and is considered a firm water supply. The Class 2 water supply is non-storable water and must be used when it is available.

Distribution System

Delano-Earlimart's distribution system has nine separate takeouts from the Friant-Kern Canal. It is fully pipelined and a metered closed system with basically no discharges or losses. Two-thirds of the District is gravity delivery, one-third requires pressure created from pumping. The district recently completed a $3 million turnout renovation project.

3.0 Project Operation

Project Operation in Wet Years

During wet years, Delano-Earlimart will deliver available surface water from the Friant-Kern Canal to the proposed spreading facilities.

Project Operation in Dry Years

During the dry years, Delano-Earlimart will recover previously banked water from project wells located in Pixley ID or through and exchange of surface water.

4.0 Goals and Objectives

The primary goal of this project is to increase distribution system capacity to take additional wet year supplies. Associated project benefits include:

- Water supply reliability through groundwater banking
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with IRWMP Objectives and Strategies

The Project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Expanded delivery capability to groundwater banking provides operational flexibility and expanded regional conveyance facilities serves to better manage the Region's water resources.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

DEID and PID are currently working with the consultant engineer to identify two alternative project locations (well field location and return pipeline alignment); therefore, costs cannot be provided until the alternatives are identified and evaluated.

9.0 Schedule

The expected delivery date for the final report is the summer of 2007.

No. 05 G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities East of the Friant-Kern Canal

1.0 Summary

Project Type	Water Supply Reliability
Facility Sponsors	North Kern Water Storage District and Delano Earlimart Irrigation District Kern-Tulare Water District Rag Gulch Water District
Location	Turnout at Snow Road and pumpstation and conduit with 4 deepwells west of Friant-Kern Canal between Kimberlina and Highway 46
Estimated Facility Conveyance Capacity	150 cfs turnout, 150 cfs pump station and conduit and 24 cfs deep wells
Project Descriptor	Increased water reliability by providing increased groundwater banking
Estimated Cost (2006 dollars)	$17,470,000

2.0 Facility Description

A new pumpstation and conduit will be built to facilitate pumping water from the Calloway Canal into the Lerdo Canal so the easterly recharge facilities of the North Kern Water Storage District will become available for recharge opportunities with Friant-Kern supplies. The existing turnout from the Friant-Kern Canal does not have enough capacity to simultaneously serve both the westerly and easterly recharge facilities of North Kern. A new turnout would be built to deliver water into the Calloway Canal at Snow Road to serve the westerly demands of North Kern allowing the existing turnout to be used to supply the new pump station and conduit to convey water to the easterly recharge facilities of North Kern. Four deep wells would be built to recover and deliver water into the Friant-Kern Canal. The following figure indicates the location and extent of the facilities. Figure 1 shows the location and extent of the Project.

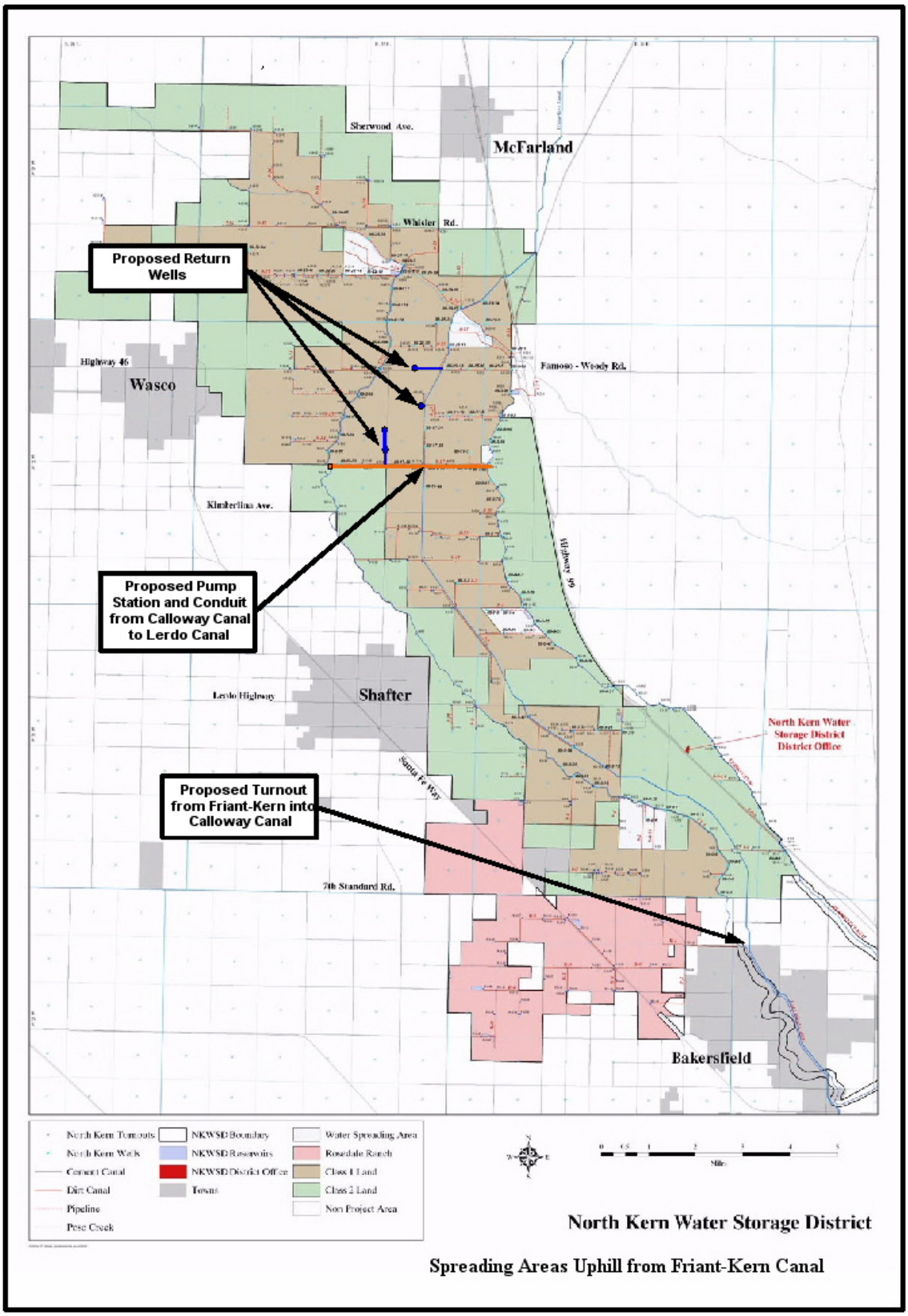


Figure 1. Project Location

Background

Introduction

North Kern and Delano Earlimart in 2006 entered into a pilot water banking program in the fall of 2006. It is anticipated that 30,000 acre-feet of water will be brought into North Kern. This will result in a 27,000 acre-foot supply to be returned to Delano-Earlimart under mutually agreeable conditions. North Kern and Delano Earlimart desire to firm up the ability to bring in and return water by the addition of input and output capacities.

Land Use

The North Kern is situated in the San Joaquin Valley portion of Kern County and encompasses about 60,000 acres. North Kern is shown on Figure 1-1 of the Report, along with other water agencies in the San Joaquin Valley portion of Kern County. Figure 1-1 also shows the major water conveyance facilities within Kern County. North Kern is fully developed to irrigate agriculture, with almonds and grapes accounting for over one-half of the cropped area.

Water Supply

A description of DEID's water supply is provided in the Background section of Project No. 04 G-W Banking North of DEID with Pixley ID.

While North Kern is not a permanent CVP contractor, it has entered into temporary contracts for diversion and use of CVP-Friant water, typically available during very "wet" periods. Currently, diversions are limited to the Calloway Canal; however, the proposed improvements would allow a portion of this water to be lifted into the Lerdo Canal at a location which provides the maximum utility to North Kern, i.e., it is the high point of North Kern's gravity distribution system. In addition, North Kern has an arrangement with Kern-Tulare and Rag Gulch water districts whereby they will deliver, from time to time, a portion of the supplies available to them in the Friant-Kern Canal. The efficiency of this arrangement will also be improved for the same reason as just described, i.e., the utility of this supply will be improved.

Groundwater

North Kern owns and operates more than 70 wells which are distributed throughout its area. When North Kern is not fully utilizing its wells for in-District purposes, they are available for other purposes. In this regard, North Kern has used its wells from time to time to provide water to neighboring water agencies (Shafter-Wasco Irrigation District and Cawelo Water District) under exchange arrangements. The proposed improvements in the Project would enhance North Kern's flexibility in this regard, by allowing pumped groundwater to be delivered into the Friant-Kern Canal from time to time under exchange arrangements. The new pumpstation conduit from the Calloway to the Lerdo Canal would also allow deepwells further west that discharge into the northwest Calloway Canal to be pumped into the Friant-Kern Canal.

Conjunctive Management

Historical surface water supplies of North Kern have ranged from less than 10,000 acre-feet in a "dry" year to nearly 400,000 acre-feet in a very "wet" year. Owing to the highly variable Kern River supply, North Kern has been "forced" to regulate available surface water supplies from times of surplus ("wet" years) to times of need ("dry" years). This regulation has been accomplished, to a large extent, through use of the underlying groundwater reservoir. During "wet" years on the Kern River, significant deliveries of surface water are made to irrigation and spreading (for groundwater recharge). For the purpose of groundwater recharge, North Kern principally makes use of about 1,500 acres of recharge basins (water spreading areas). In "wet" years, more than 200,000 acre-feet of water has been directed into recharge basins for replenishment of the groundwater aquifer. During "dry" years, deliveries of surface water to irrigation are greatly reduced and groundwater pumping is significant. Extraction of groundwater by means of District wells has ranged from zero to more than 80,000 acre-feet in one year. North Kern has successfully operated its conjunctive use for 50 years and, through the proposed improvements to existing facilities, seeks to enhance its existing conjunctive use operations. The underlying groundwater is part of the larger groundwater basin which underlies the southern San Joaquin Valley.

3.0 Facility Operation

Facility Operation in a Wet Year like 2006

This facility would have allowed water from the Friant Kern Canal which was available in 2006 to be used in the North Kern and Cawelo's direct and in-lieu recharge facilities served off of the Lerdo Canal.

Facility Operation in a Dry Year like 2004

In 2004, the Kern River April-July runoff was 48% of average and deep wells were run to make up for the shortages to North Kern Water Storage District. The deep wells added as a part of this project will be plumbed as the North Kern banking project with Kern-Tulare and Rag Gulch wells are plumbed to deliver water either into the Friant-Kern Canal or to North Kern's canals. In addition, given the connection to the Calloway Canal in the northwest portion of North Kern there are additional deep wells that will become available in the non-peak irrigation months that may be pumped up to the Friant-Kern or Lerdo Canal thru the new pump station conduit.

4.0 Goals and Objectives

The primary goal of this facility to provide additionally groundwater banking regulation of Friant-Kern and Kern River supplies. Associated facility benefits include:

- Water supply reliability through system redundancy and flexibility
- Water conservation
- Energy savings
- Conjunctive management of surface and groundwater resources

5.0 Facility's Consistency with IRWMP Objectives and Strategies

The facility is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Facilities in the Poso Creek IRWMP Region

The facility, in an addition to the 2006 System Operations Improvement Project, is being proposed in conjunction with the facility to interconnect between the Calloway and Lerdo Canals (Project No. 12) and the plan to improve six miles of the Calloway Canal lining (Project No. 10). Projects No. 10 and 12 are also a part of the 2006 System Operations Improvement Project.

Note: Another possibility exists to delete the last two miles of Project No. 13 and in its place double the size of the Calloway to Friant Congestion (1st half of this Project No. 05).

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

Costs include a new Friant-Kern Canal turnout, four deep wells and delivery pipelines. The estimated costs presented are preliminary pending additional facility development.

Estimated cost:	$11,681,600
Contingencies at 30%	$ 3,504,480
Subtotal	$15,186,800
Eng., Adm. Etc. at 15%	$ 2,277,900
Total	**$17,470,000**

9.0 Schedule

Currently in the design phase; ready for construction by 2009.

No. 06 Pond Poso Spreading Grounds
Unit of the Semitropic Groundwater Bank

1.0 Summary

Project Type	Groundwater Banking
Project Sponsor	Semitropic Water Storage District
Location	Shown on Figure 1
Project Descriptor	Increased water supply reliability through groundwater banking
Estimated Cost (2006 dollars)	$12,000,000

2.0 Project Description

Starting in 2004, consideration has been given to improving the operation of the Semitropic Groundwater Bank by developing the ability to store surface water delivered by Pond-Poso Canal. This project is now referred to as the Pond-Poso Spreading Grounds, Unit of the Semitropic Groundwater Bank. These facilities would allow capture and spreading of surface water when available. In addition, the facilities would be operated to regulate flows on the Pond-Poso Canal. Figure 1 shows the project location. Actual construction would cover only a portion of the project location and would be constructed in phases.

The location of the Pond-Poso Spreading Grounds is in Kern County approximately four miles north and two miles west of the City of Wasco. Figure 2 shows the limits of the proposed project. The project will cover up to 4 ¼ sections within a 15-section area. The 15-section area includes Sections 2 through 11, and Sections 14 through 18 of Township 26 South, Range 24 East, Mount Diablo Meridian. Phase 1 consists of the majority of 2 ¼ sections: the south half of Section 8, the southwest quarter of Section 9, the west half of Section 16, and Section 17. Two parcels have been excluded from this area: the south half of the southwest quarter of the northwest quarter of Section 16; and the 5 acres in the southeast quarter of the southwest quarter of Section 16.

Water would be delivered to the project from the Pond-Poso Canal which divides the site. The project would provide the District with the ability to take deliveries of surface water for direct recharge. It may also operate as a short-term reservoir to regulate available supplies with the water being returned to Pond-Poso Canal after temporary storage.

The project would include supply facilities (canals, pipelines and pumps) to deliver water from the Pond-Poso Canal, diked spreading grounds, supply pipelines and pumps, return structures (to Pond-Poso Canal), overflow structures (to Poso Creek), production wells and monitoring wells and a well collection system to return water to the Pond-Poso Canal.

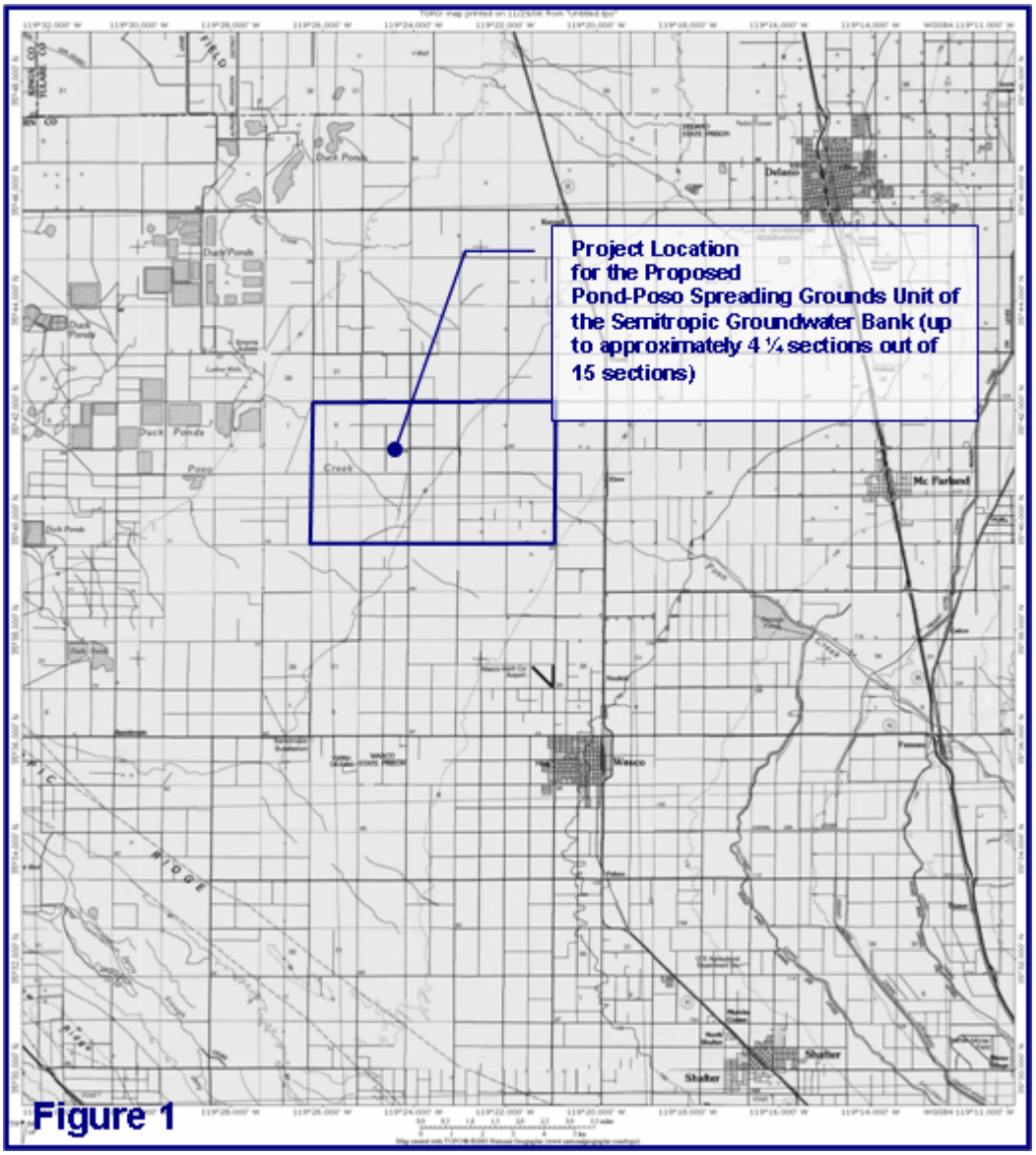

Project Location
for the Proposed
Pond-Poso Spreading Grounds Unit of
the Semitropic Groundwater Bank (up
to approximately 4 ¼ sections out of
15 sections)
Duck Ponds
Poso
Creek
Delano
Mc Farland
Wasco
Shafter
RIDGE

Figure 1

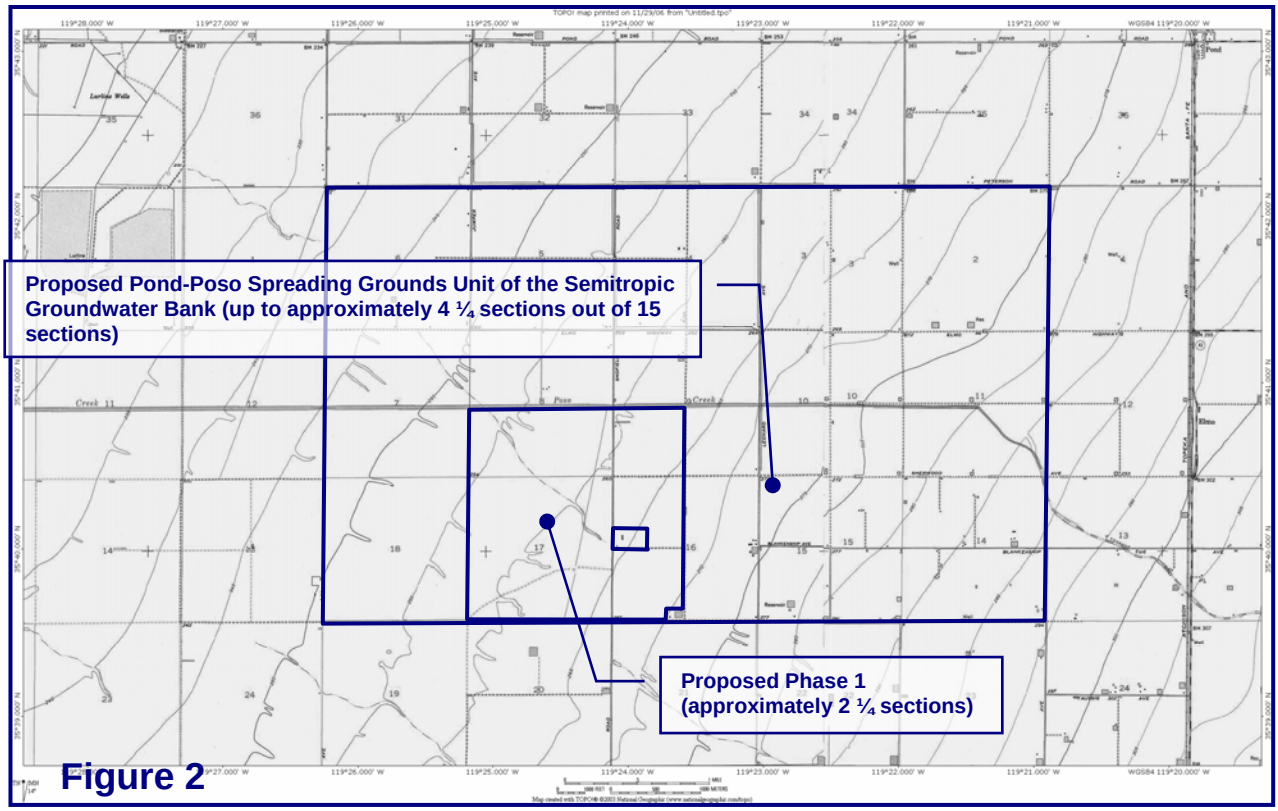


Figure 2

Background

See Project No. 3a Stored Water Recovery Unit In-Lieu Service Areas for a description of Semitropic.

The Semitropic Water Storage District, acting on behalf of its Semitropic Improvement District, has developed the Semitropic Groundwater Bank to provide long-term underground storage of surplus water and to enhance groundwater levels. The groundwater bank was implemented in 1994 in cooperation with California water entities that have contracted for storage space in the groundwater bank (banking partners). Today, the banking partners are Metropolitan Water District of Southern California, Santa Clara Valley Water District, Alameda County Water District, Zone 7 Water Agency, and Vidler Water Company, Newhall Land & Farming Company, Castaic Lake Water Agency and Poso Creek Water Company LLC.

The Semitropic Groundwater Bank has a defined capacity of 1.65 million acre-feet. Water from the State Water Project entitlements and other supplies that are not immediately needed to meet demands of the banking partners, is stored within the groundwater bank in what is known as the "Put" operation (i.e. surplus water is put into the groundwater bank for later use). This water is put into the groundwater bank through "in lieu" recharge. In lieu recharge is a method whereby contracting farmers agree to take imported surface water in-lieu of operating their farm wells. By not operating the farm wells, the groundwater that would be utilized for irrigation remains in storage and accumulates over time. When needed, typically during dry years, the stored water is recovered for return to the banking partners in what is referred to as the "Take" operation (i.e. water is taken out of storage for use).

Implementation of the Groundwater Bank required improvements to Semitropic's water distribution system, including conveyance, canal capacity improvements, expansion of the District's surface water service area, and development of recovery and return systems. Construction of some of these improvements continues.

The initial facilities were planned and evaluated in a report entitled "1992 Improvements Project" prepared by Bookman-Edmonston Engineering, Inc (Semitropic Improvement District of Semitropic Water Storage District 1991). This five-volume report is commonly referred to as the Project Report. The Project Report divided the project into three elements: Water Banking, Water Conservation, and Energy Development. The Semitropic Groundwater Bank was developed as a unit of the Water Banking Element. Within this element, provisions were made for future modifications of the program under the heading of "Other Water Banking Arrangements". With regard to these future provisions, the Project Report stated the following: "This Unit contemplates the development and implementation of water banking arrangements with banking partners who have yet to be identified. These arrangements could rely on existing facilities and/or expansion of the District's conveyance, distribution, and groundwater recovery facilities."

The firm recovery capacity of the groundwater bank as initially conceived and implemented was 90,000 acre-feet per year. Subsequently, in evaluating dry year operations, it was concluded that the banking partners operations would be significantly improved if the stored water could be recovered over approximately three years, which would require a higher recovery capacity. This led to the development of the Stored Water Recovery Unit of the Groundwater Bank. In January 2000, a Supplement to the 1994 EIR (Semitropic Water Storage District 2000) was certified which addressed development of the Stored Water Recovery Unit.

The Supplemental EIR (SEIR) evaluated and mitigated the environmental impacts associated with the construction and operation of 65 recovery wells, District and landowner wells, approximately 15 miles of conveyance pipeline, two regulating basins and pump plants, and other appurtenant facilities. It also evaluated operation of the Groundwater Bank in a manner that permitted storage in excess of the original one million acre-feet storage capacity.

Two methods were proposed for increasing the program capacity. One was development of a new in-lieu distribution system adjacent to the proposed well field that would add 40,000 to 50,000 acre-feet per year of capacity. Another method considered to facilitate the storage of water supplies above and beyond the initially-defined capacity of the Groundwater Bank was to allow participants to continue banking water, even though their accounts may be fully utilized. This recognized that the concept of "defined capacity" was not dependent upon a physical limitation to store water, but was a contractual element by which capacity was allocated.

Three addenda have been prepared and certified by the District. In 2002, an Addendum to the SEIR was prepared to evaluate the Groundwater Bank with a clarified defined storage capacity of 1.65 million acre-feet (Semitropic Water Storage District 2002). In 2004, the Second Addendum to the SEIR proposed increasing the diameter of a proposed pipeline from 96 inches to 120 inches, reconfiguring a regulating pond and replacing proposed pipe with canal (Semitropic Water Storage District 2004). In March 2005, the First Addendum to the EIR and Third Addendum to the SEIR evaluated the operational change of regulating water available to the District in both the Kern Water Bank and Pioneer Project (Semitropic Water Storage District 2005).

3.0 Project Operation

Project Operation in Wet Years

The Pond Poso Spreading facilities would allow capture and spreading of surface water when it is available. It also adds capacity during the time when surface water is available in excess of the in-lieu demand to match the supply.

Project Operation in Dry Years

The Pond Poso Spreading facilities add absorptive capacity for surface water delivered outside of the irrigation season demand for the in-lieu service area. The spreading grounds provide sites for recovery wells that have less impact to other wells in the area.

4.0 Goals and Objectives

The Pond Poso Spreading Grounds will improve the operation of the Semitropic Groundwater Bank by developing the ability to store surface water delivered by the Pond-Poso Canal. In addition, the facilities would be operated to regulate flows on the Pond-Poso Canal.

5.0 Project's Consistency with IRWMP Objectives and Strategies

The direct recharge facilities of the SWRU are important elements in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Expanded direct recharge capacity, in conjunction with delivery capacity and expanded regional conveyance facilities serves to better manage the Region's water resources.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The estimated cost (in 2006 dollars) for implementing the Project is $12 million.

9.0 Schedule

November 2006	"Notice of Intent to Adopt a Negative Declaration" was published
Winter 2006-2007	Construction
January 2007	CEQA certification

Construction started in 2007. Phases of this project are to be completed in 2008 and 2009.

No. 07 Rag Gulch G-W Banking Project

1.0 Summary

Project Type	Groundwater banking
Project Sponsors	Rag Gulch Water District
Location	South of Cecil Avenue, 5 miles east of the Friant-Kern Canal (section 5, T.25S, R.27E.)
Estimated Conveyance Capacity	Approximately 30 cfs
Project Descriptor	Increased water supply reliability through groundwater banking
Estimated Cost (2006 dollars)	$2,000,000

2.0 Project Description

The benefits from the Rag Gulch Banking Project include improved water supply reliability through increased conjunctive use of surface water and groundwater. The District has identified approximately 80 acres of lands located within the District's service area as a potential candidate for a groundwater banking project.

Water can be conveyed from the Friant-Kern Canal in existing facilities to the District's Cecil Reservoir. The potential spreading site is located adjacent to Cecil Reservoir. From Cecil Reservoir, a new turnout and a 36-inch pipeline would be constructed to the spreading facility.

The project will bank approximately 4,000 acre-feet per year during times when excess water supplies are available and produce approximately 3,000 acre-feet per year during years of inadequate water supplies.

Need for Project

The Districts (Kern-Tulare and Rag Gulch), have significant concerns with regard to future water supplies. Three of these concerns are:

1. Federal and state regulatory actions in the Delta have severely limited the ability of the Districts to receive their CVP water supplies.
2. The initial term of the contract with the City of Bakersfield ends on December 31, 2011. The ability of the Districts to receive a reliable supply of Kern River is uncertain beyond 2011.
3. A coalition of environmental groups has settled a lawsuit against the federal government related to water supply contracts in the Friant Division of the CVP. The result of this settlement will reduce the ability of the Districts to purchase Friant Class 1, Class 2, and Section 215 water supplies.

In an effort to mitigate for these concerns with regard to future water supplies, the Districts have identified several management objectives as part of their groundwater management plan. One of these management objectives is to develop groundwater recharge and/or banking programs within the Districts' boundaries.

Background

Water Supply

Kern-Tulare has a contract with the Bureau of Reclamation for an annual supply of 40,000 acre-feet from the CVP. Rag Gulch has a contract for an annual supply of 13,300 acre-feet. DWR conveys water under this contract through the California Aqueduct to Tupman. Water is then conveyed through the Cross Valley Canal, where it is either delivered to the Friant-Kern Canal or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

The Districts contract annually for Section 215 Water. The Districts also purchase Class 1 and Class 2 Friant water supplies from Friant Contractors on an as-available basis. Occasionally, there are flood flows available from the Friant-Kern Canal, which the Districts also purchase.

Kern-Tulare has a contract with the City of Bakersfield for an average annual supply of 20,000 acre-feet of Kern River water. Rag Gulch has a similar contract for an average annual supply of 3,000 acre-feet. Water under these contracts is delivered to Kern County Water Agency Improvement District No. 4 in exchange for State Water Project (SWP) water. The SWP water is conveyed through the Cross Valley Canal, where it is either delivered to the Friant-Kern Canal or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

Land Use

The District provides no domestic or residential water supplies. All irrigated lands are planted to high-value permanent crops. A summary of land use in 2005 is presented in the table below.

2005 Land Use (acres)			
	Kern-Tulare	Rag Gulch	Total
Almonds	702	133	835
Apples	5	0	5
Blue Berries	0	89	89
Cherries	98	0	98
Grapes	3,626	3,271	6,897
Grapefruit	10	0	10
Kiwi	201	0	201
Lemons	125	0	125
Olives	204	0	204
Oranges	5,913	885	6,798
Persimmons	17	0	17
Pistachios	1,626	270	1,896
Pomegranates	25	0	25
Total Irrigated	12,552	4,648	17,200
Non-irrigated	4,563	1,306	5,869
Total	17,115	5,954	23,069

3.0 Project Operation

Project Operation in Wet Years

During wet years, the Districts will deliver approximately 4,000 acre-feet to the proposed spreading facilities. Water will be pumped in existing facilities from the Friant-Kern canal to the spreading site. The source of this water will likely be 215 water, flood waters available from the Friant-Kern Canal, and water purchased from Friant Contractors.

Project Operation in Dry Years

During dry years, the Districts will recover approximately 3,000 acre-feet of previously banked water from project wells. These wells will discharge water into Cecil Reservoir to reduce reliance upon water supplies from the Friant-Kern canal.

4.0 Goals and Objectives

The primary goal of this project is to increase distribution system capacity. Associated project benefits include:

- Water supply reliability through groundwater banking
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with IRWMP Objectives and Strategies

The Project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Expanded delivery capability, in conjunction with groundwater banking and expanded regional conveyance facilities serves to better manage the Region's water resources.

7.0 Project Screening Priority within the IRWM Plan

This project does not meet the Regional Management Group's pre-screening criteria for Tier 1 or Tier 2 Projects. Therefore, it is considered a Deferred Project that will not be recommended for inclusion in implementation proposals.

8.0 Cost Estimate

Costs include 80 acres of land, 2 wells, earthwork, surveying and structures. The estimated costs presented are preliminary pending additional facility development.

Land Acquisition	$700,000
Wells	$800,000
Earthwork, survey, structures	$300,000
Contingencies	$200,000
Total	$2,000,000

9.0 Schedule

Engineering studies were conducted from October 2006 through December 2006. During the engineering studies, it was determined that the spreading sites are not feasible at this time. However, this project was evaluated as part of the IRWMP so credit was given to all the in-kind service work that went into the studies as part of the IRWMP. The priority for these projects will obviously be deferred, which is less than the screening priority for Tier 1 and Tier 2 projects and a construction schedule will not be proposed.

No. 08 White River G-W Banking for DEID

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsor	Delano-Earlimart Irrigation District
Location	South of White River, East of the Friant-Kern Canal
Estimated Conveyance Capacity	
Project Descriptor	Increased water reliability through groundwater banking
Estimated Cost (2006 dollars)	To be determined

2.0 Project Description

The potential exists to develop groundwater banking in the vicinity of the White River. This potential is being studied; accordingly, the first step would be to complete the conceptual-level feasibility study to size the facilities and assess the project yield.

The project description and operation is expected to be similar to Project No. 09 White River Groundwater Banking for Rag Gulch Water District.

Background

For background information, refer to Project No. 4, G-W Banking North of DEID with Pixley ID.

3.0 Project Operation

Project Operation in a Wet Year like 2006
During wet years, DEID will deliver available supplies from the Friant-Kern Canal to the facilities.

Project Operation in a Dry Year like 2004
During dry years, DEID will recover water by extracting groundwater stored beneath DEID.

4.0 Goals and Objectives

The primary goal of this project is to increase distribution system capacity. Associated project benefits include:

- Water supply reliability through groundwater banking
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with IRWMP Objectives and Strategies

The Project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Expanded delivery capability to groundwater banking provides operational flexibility and expanded regional conveyance facilities serves to better manage the Region's water resources.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

Available when feasibility study is completed.

9.0 Schedule

Feasibility study will be completed in 2007.

No. 09 White River G-W Banking in Rag Gulch

1.0 Summary

Project Type	Groundwater banking
Project Sponsors	Rag Gulch Water District
Location	South of White River, 2 to 3 miles east of the Friant-Kern Canal (south half of section 12, T.24S, R.26E.)
Estimated Conveyance Capacity	Approximately 45 cfs
Project Descriptor	Increased water supply reliability through groundwater banking
Estimated Cost (2006 dollars)	$2,300,000

2.0 Project Description

The benefits from the White River Banking Project include improved water supply reliability through increased conjunctive use of surface water and ground water. The District has identified approximately 120 acres of lands located within the District's service area that are an excellent candidate for a groundwater banking project. Percolation tests have been conduced and the preliminary results indicated that a recharge rate of over 0.4 feet per day can be sustained.

Water can be conveyed from the Friant-Kern Canal in existing facilities to the spreading site along Road 208. The capacity of existing facilities to Road 208 in the vicinity of the spreading site is about 45 cfs. From Road 208, a new turnout and a 48-inch pipeline would be constructed to the spreading facility.

The project will bank approximately 6,000 acre-feet per year during times when excess water supplies are available and produce approximately 3,000 acre-feet per year during years of inadequate water supplies.

Need for Project

The Districts (Kern-Tulare and Rag Gulch), have significant concerns with regard to future water supplies. Three of these concerns are:

1. Federal and state regulatory actions in delta have severely limited the ability of the Districts to receive their CVP water supplies.
2. The initial term of the contract with the City of Bakersfield ends on December 31, 2011. The ability of the Districts to receive a reliable supply of Kern River is uncertain beyond 2011.
3. A coalition of environmental groups has settled a lawsuit against the federal government related to water supply contracts in the Friant Division of the CVP. The result of this settlement will reduce the ability of the Districts to purchase Friant Class 1, Class 2, and Section 215 water supplies.

In an effort to mitigate for these concerns with regard to future water supplies, the Districts have identified several management objectives as part of their ground water management plan. One of these management objectives is to develop groundwater recharge and/or banking programs within the Districts' boundaries.

Background

Water Supply

Kern-Tulare has a contract with the Bureau of Reclamation for an annual supply of 40,000 acre-feet from the CVP. Rag Gulch has a contract for an annual supply of 13,300 acre-feet. DWR conveys water under this contract through the California Aqueduct to Tupman. Water is then conveyed through the Cross Valley Canal, where it is either delivered to the Friant-Kern Canal or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

The Districts contract annually for Section 215 Water. The Districts also purchase Class 1 and Class 2 Friant water supplies from Friant Contractors on an as-available basis. Occasionally, there are flood flows available from the Friant-Kern Canal, which the Districts also purchase.

Kern-Tulare has a contract with the City of Bakersfield for an average annual supply of 20,000 acre-feet of Kern River water. Rag Gulch has a similar contract for an average annual supply of 3,000 acre-feet. Water under these contracts is delivered to Kern County Water Agency Improvement District No. 4 in exchange for State Water Project water. The SWP water is conveyed through the Cross Valley Canal, where it is either delivered to the Friant-Kern Canal or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

Land Use

The Districts provide no domestic or residential water supplies. All irrigated lands are planted to high-value permanent crops. A summary of land use in 2005 is presented in the table below.

2005 Land Use (acres)

	Kern-Tulare	Rag Gulch	Total
Almonds	702	133	835
Apples	5	0	5
Blue Berries	0	89	89
Cherries	98	0	98
Grapes	3,626	3,271	6,897
Grapefruit	10	0	10
Kiwi	201	0	201
Lemons	125	0	125
Olives	204	0	204
Oranges	5,913	885	6,798
Persimmons	17	0	17
Pistachios	1,626	270	1,896
Pomegranates	25	0	25
Total Irrigated	12,552	4,648	17,200
Non-irrigated	4,563	1,306	5,869
Total	17,115	5,954	23,069

3.0 Project Operation

Project Operation in Wet Years

During wet years, the Districts will deliver approximately 6,000 acre-feet to the proposed spreading facilities. Water will be pumped in existing facilities from the Friant-Kern canal to the spreading site. The source of this water will likely be 215 water, flood waters available from the Friant-Kern Canal, and water purchased from Friant Contractors.

Project Operation in Dry Years

During dry years, the Districts will recover approximately 3,000 acre-feet of previously banked water from project wells. These wells will discharge water into the existing distribution system along Road 208 to reduce reliance upon water supplies from the Friant-Kern Canal.

4.0 Goals and Objectives

The primary goal of this project is to increase distribution system capacity. Associated project benefits include:

- Water supply reliability through groundwater banking
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with IRWMP Objectives and Strategies

The Project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Expanded delivery capability, in conjunction with groundwater banking and expanded regional conveyance facilities serves to better manage the Region's water resources.

7.0 Project Screening Priority within the IRWM Plan Region

This project does not meet the Regional Management Group's pre-screening criteria for Tier 1 or Tier 2 Projects. Therefore, it is considered a Deferred Project that will not be recommended for inclusion in implementation proposals (see Section 9.0).

8.0 Cost Estimate

Costs include 120 acres of land, 2 wells, earthwork, surveying and structures. The estimated costs presented are preliminary pending additional facility development.

Land Acquisition	$1,000,000
Wells	$800,000
Earthwork, survey, structures	$300,000
Contingencies	$200,000
Total	$2,300,000

9.0 Schedule

Engineering studies were conducted from October 2006 through December 2006. During the engineering studies, it was determined that the spreading sites are not feasible at this time. However, this project was evaluated as part of the IRWMP so credit was given to all the in-kind service work that went into the studies as part of the IRWMP. The priority for these projects will be Deferred, which is less than the screening priority for Tier 1 and Tier 2 projects and a construction schedule will not be proposed.

No. 10 Calloway Canal Improvements

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsors	North Kern Water Storage District and Cawelo Water District
Location	Area C on Figure 1
Estimated Conveyance Capacity	Up to 1,000 cfs
Project Descriptor	Increased water reliability by providing access to alternative supplies (SWP and Kern River) to areas of demand
Estimated Cost (2006 dollars)	$29.9 million

2.0 Project Description

Under this project the following would be constructed:

- Line 6 miles of Calloway Canal South of District
- Construct up to 4 low-lift pumping plants

The Lerdo Canal (known as the Beardsley Canal south of 7th Standard Rd.) is concrete lined from its point of diversion on the Kern River to North Kern Water Storage District's (North Kern) southern boundary and is North Kern's primary conveyance facility. The Calloway Canal is only used when there is insufficient capacity in the Lerdo Canal; accordingly, the Calloway Canal goes unused, and is dry, except during very wet years. The Calloway Canal is an unlined, gravity facility which diverts water from the Kern River infrequently and conveys it north into North Kern. It is a relatively flat canal with a nominal design capacity of 1,000 cfs.

As a result of construction of facilities under related Poso Creek IRWMP projects (see Calloway Canal to Lerdo Interconnection and Calloway Canal to Cross Valley Canal Interconnection), a portion of the Calloway Canal will be used more frequently, and in both forward and reverse directions. When operated in a forward direction to, as an example, enhance deliveries to Cawelo Water District (Cawelo), losses could be significant and additional operation and maintenance costs would be incurred if the Calloway remained an unlined canal. When the canal is operated in reverse flow, and water is diverted from the Calloway Canal to the Cross Valley Canal, it would involve reversing the flow in the Calloway Canal from the 8-1 Lateral to the location of the proposed intertie with the Cross Valley Canal, a distance of about six miles. This will require the construction of up to four low-lift pumping plants to pump over existing canal structures. Each pumping plant would be designed with a nominal capacity of up to 500 cfs.

Because this six-mile portion of the Calloway Canal would be operated more frequently, seepage losses and operational costs in the Calloway over this six-mile reach could be significant, absent lining this portion of the Canal. Further, as the areas adjoining this reach of the Calloway Canal continue to urbanize, it will be much easier to maintain a lined canal in such areas. Accordingly, it is proposed to

construct a lining for this portion of the Canal which would reduce seepage losses and reduce operation and maintenance costs. While there are different lining alternatives, concrete lining would likely be used. No additional rights-of-way would be required for these improvements. Figure 1 shows the location and the extent of the project.

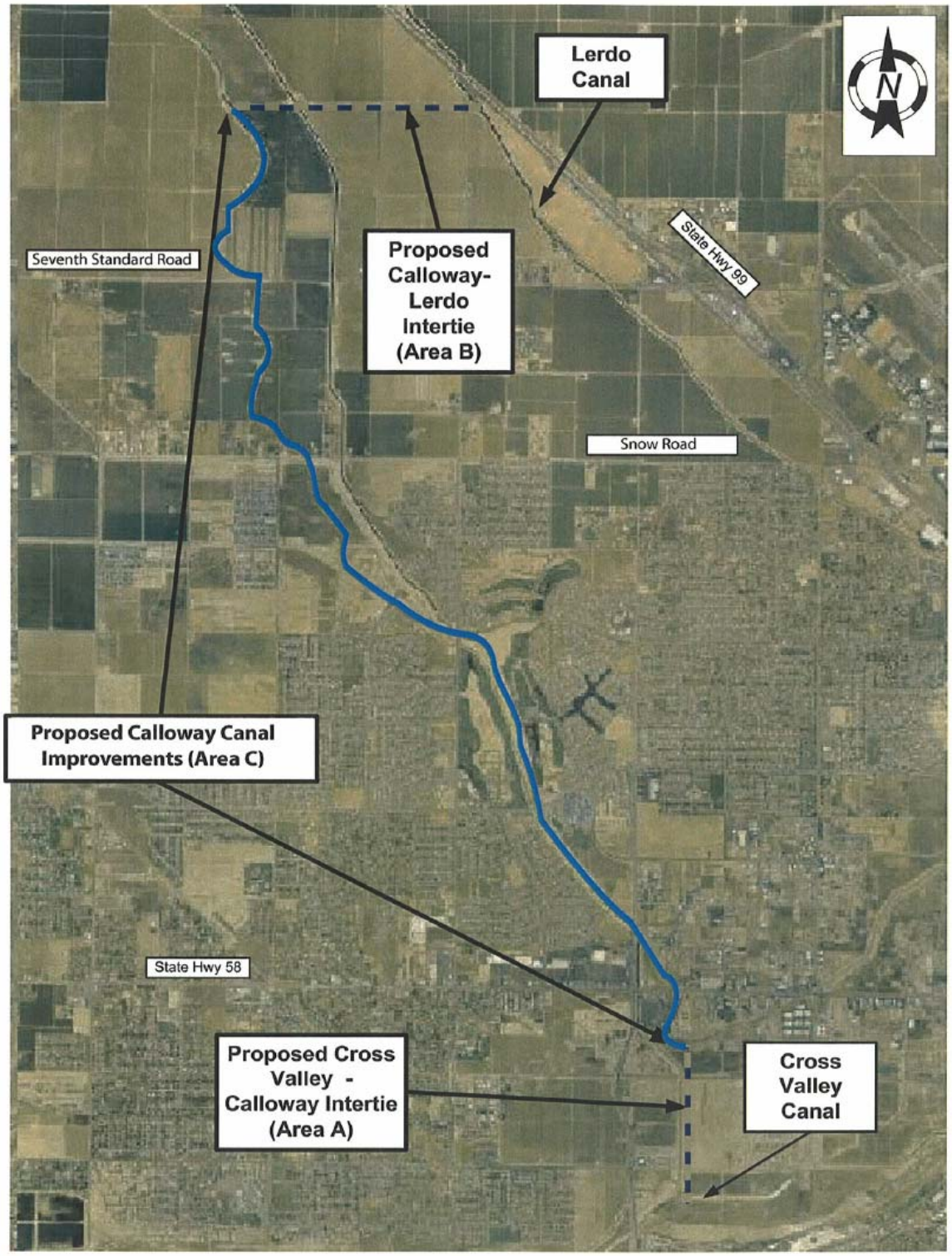


Figure 1. Project Location

Background

Introduction

North Kern and Cawelo Water District (Cawelo, its immediate neighbor to the east) have been cooperating in the use of conveyance facilities for over 30 years. In addition, North Kern has engaged in mutually beneficial exchanges of water supplies with Improvement District No. 4 of the Kern County Water Agency (ID-4) (North Kern's neighbor to the southeast) for many years. Based on this experience, North Kern has formulated a plan to enhance the flexibility and efficiency of its operations as well as those that it coordinates with, Cawelo and ID-4. In particular, certain conveyance improvements have been identified, which involves the construction of two interties between existing conveyance facilities; one between North Kern's Calloway Canal and the Cross Valley Canal (Calloway-CVC Intertie), and one between the Calloway Canal and North Kern's Lerdo Canal (Calloway-Lerdo Intertie). While separate features, they are linked by the Calloway Canal, to which improvements are also proposed (Calloway Canal Improvements).

Land Use

The irrigable lands in North Kern are divided into two classes. Class 1 lands include about one-half of North Kern's total area of roughly 61,050 acres and they receive a water supply developed almost entirely by the District. North Kern provides its Class 1 landowners a dependable water supply by coordinating its Kern River water, its use of storage space in Isabella Lake, water purchases, and the use of its wells. Class 2 lands, comprised of the remaining half of the District, receive a water supply primarily from wells and pumping plants owned and operated by the landowners themselves that draw water from the underground supply that is replenished by the District.

Based on a land use survey conducted in 2004, about one-third of North Kern's irrigated acreage was developed to row crops, or fallow. Principal row crops included cotton, wheat, and alfalfa, which collectively comprise about two-thirds of all row crop acreage. Similarly, the two principal permanent crops are almonds and grapes, which together account for about 87 percent of all acreage developed to permanent crops.

The total area of Cawelo is 45,000 acres of which 38,540 acres are within the distribution system service area. Those lands within the District but outside the service area depend exclusively on groundwater for their irrigation water supply. The crop pattern within the District has changed quite dramatically during the past 25 years from row crops to permanent plantings. Currently, about 85 percent of the irrigated lands of the District contain permanent plantings of grapes, citrus, deciduous fruits and nuts.

Water Supply

SWP Water

Cawelo has a contract for 38,200 acre-feet of SWP water. Direct delivery of SWP water to Cawelo is currently accomplished by conveyance from the California Aqueduct via the Cross Valley Canal to Pump Station "A", where it is lifted into North Kern's Beardsley Canal (which changes name to the Lerdo Canal at North Kern's southern boundary). Under agreement with North Kern, the water is conveyed in the Lerdo Canal to Cawelo's Pump Station "B", where the water is lifted one more time into Cawelo's service area. With the proposed improvements in North Kern's 2006 System Operations Improvement Project, it would be possible to convey water into the Lerdo Canal without using Pump Station "A". This would provide some redundancy and additional flexibility, which would improve the reliability of

Cawelo's imported surface water supply. Respecting flexibility, it is noteworthy that from time to time, primarily during the peak irrigation season, Cawelo's delivery of SWP water is limited by the capacity of Pump Station "A". The proposed improvements could alleviate this limitation.

In addition, there would be the opportunity to increase operational efficiency from time to time. In particular, to the extent that Cawelo is diverting SWP water, and North Kern has a commensurate irrigation demand in its southwesterly service area which is being met with its Kern River water (conveyed via the 8-1 Lateral), SWP water could be delivered to the southwesterly service area, with a like amount of North Kern's Kern River water left in the Lerdo Canal for diversion and use by Cawelo.

Historically, North Kern has engaged in exchange arrangements with ID-4 of the Kern County Water Agency. Under these arrangements, North Kern has delivered a portion of its Kern River supply to ID-4 in exchange for delivery of a like amount of ID-4's SWP water supply to North Kern. Direct delivery of ID-4's SWP water to North Kern has required use of Pump Station "A" to lift the water into North Kern's Beardsley Canal. Capacity in Pump Station "A" for this type of operation is on an as-available basis only. The proposed improvements would allow direct delivery of ID-4's SWP water to North Kern without reliance on available capacity in Pump Station "A". This would increase the reliability and, to some extent, the efficiency of this arrangement for North Kern.

CVP Water

Cawelo is not a CVP contractor; however, there are times when either surplus or flood waters are available in the Friant-Kern Canal. In this regard, Cawelo has entered into temporary contracts for diversion and use of CVP-Friant water, typically available during very "wet" periods. Currently, the plumbing is not in place to allow Cawelo to directly take advantage of these water supply opportunities. The proposed improvements in the Project would provide a direct tie to this source of supply.

While North Kern is not a permanent CVP contractor, it has entered into temporary contracts for diversion and use of CVP-Friant water, typically available during very "wet" periods. Currently, diversions are limited to the Calloway Canal; however, the proposed improvements would allow a portion of this water to be lifted into the Lerdo Canal at a location which provides the maximum utility to North Kern, i.e., it is the high point of North Kern's gravity distribution system. In addition, North Kern has an arrangement with Kern-Tulare and Rag Gulch water districts whereby they will deliver, from time to time, a portion of the supplies available to them in the Friant-Kern Canal. The efficiency of this arrangement will also be improved for the same reason as just described, i.e., the utility of this supply will be improved.

Groundwater

North Kern owns and operates more than 70 wells which are distributed throughout its area. When North Kern is not fully utilizing its wells for in-District purposes, they are available for other purposes. In this regard, North Kern has used its wells from time to time to provide water to neighboring water agencies (Shafter-Wasco and Cawelo) under exchange arrangements. The proposed improvements in the Project would enhance North Kern's flexibility in this regard, by allowing pumped groundwater to be delivered into the Cross Valley Canal from time to time under exchange arrangements. Additionally, it would allow similar arrangements with ID-4.

3.0 Project Operations

Project Operations in a Wet Year like 2006

In wet years, on both the Kern River and State Water Project, the water loss savings and reverse flow benefits of this project do not appear to be significant.

Project Operations in a Dry Year like 2004

In dry years, the low water loss feature of this project provides a benefit in transporting water to the districts. In addition, this facility provides both a low loss conduit and reverses flow capacity. During the winter, early spring, and fall months, the districts had surplus deep well capacity. This facility would have allowed the districts to exchange deep well water during off-peak energy rate periods to local State Water Project districts in return for water during summer peak energy periods, both expanding the districts ability to supply themselves and wisely managing energy loads. If 2004 had been substantially dryer on the State Water Project, the facility would have allowed the districts to use available deep well capacity to supplement the needs of State Water Project Contractors. For additional information, see the description contained in Project No. 12, Calloway Canal to Lerdo Canal Interconnection.

4.0 Goals and Objectives

The primary goal of this project is to improve the Calloway Canal through lining which will enable the optimal performance of delivering water in either direction which would include State Water Project, Friant-Kern Canal supplies and North Kern groundwater. Associated benefits include:

- Water supply reliability through system redundancy and flexibility
- Water conservation
- Energy savings
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with Poso Creek IRWMP Objectives and Strategies

This project is an important element in implementation of the Poso Creek IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

The project is being proposed in conjunction with projects to interconnect the Calloway Canal to the Lerdo Canal and the Cross Valley Canal to the Calloway Canal. Implementation of this project is dependent upon completion of the two interconnections mentioned above.

7.0 Project Screening Priority within the Poso Creek IRWMP Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

Costs include the concrete lining of 6 miles of existing Calloway Canal for 1,000 cfs flow, plus four canal reverse flow pumping plants, all at 500 cfs. The estimated costs presented are preliminary.

Estimated cost:	$18,572,000
Contingencies at 40%	$7,429,000
Subtotal	$26,001,000
Eng., Adm. Etc. at 15%	$3,900,000
Total	$29,901,000

9.0 Schedule

CEQA completed;
Own R/W;
Project in design phase.

No. 11 Calloway Canal to Cross Valley Canal Interconnection

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsor	North Kern Water Storage District and Cawelo Water District
Location	Adjacent to the Friant-Kern Canal in the west one-half of Section 28, T.29S., R.27E.
Estimated Conveyance Capacity	Varies, up to 1000 cfs
Project Descriptor	Increased water reliability through a bidirectional interconnection to allow canal interchange of Kern River and SWP supplies
Estimated Cost (2006 dollars)	$11.3 million (canal) to $17.2 million (pipeline)

2.0 Project Description

The proposed project is a bidirectional connection that would allow SWP water to be conveyed into North Kern and Kern River water to be delivered into the Cross Valley Canal. It would connect the Calloway Canal to the Cross Valley Canal (near Pumping Plant 6) with a one-mile open channel or pipeline with a capacity of up to 1,000 cfs. Improvements include tie-in structures at each end, a turnout/turnin at the Cross Valley Canal, and a check structure at the Calloway Canal. An associated project proposes improvements to be made to about six miles of the Calloway Canal (extending north to North Kern's Lateral 8-1) to facilitate reverse flow (i.e., moving water from North Kern to the Cross Valley Canal). The improvements would likely include lining the Calloway Canal over this reach and constructing two or three low-lift pumping plants.

The District does not have existing rights-of-ways. Accordingly, rights-of-way would be acquired for the channel and/ or pipeline; a strip about 150 to 200 feet in width, and almost one mile in length. If a channel is constructed, it would likely be flat, inasmuch as it is planned to have the capability to move water in either direction, i.e., from the Calloway into the Cross Valley Canal, or from the Cross Valley Canal into the Calloway Canal. The turnout/turnin structure would be gated to control flow. Flow control at the check structure would be accomplished with removable weir boards. Metering would be located at the Cross Valley Canal. Figure 1 shows the location and extent of the project.

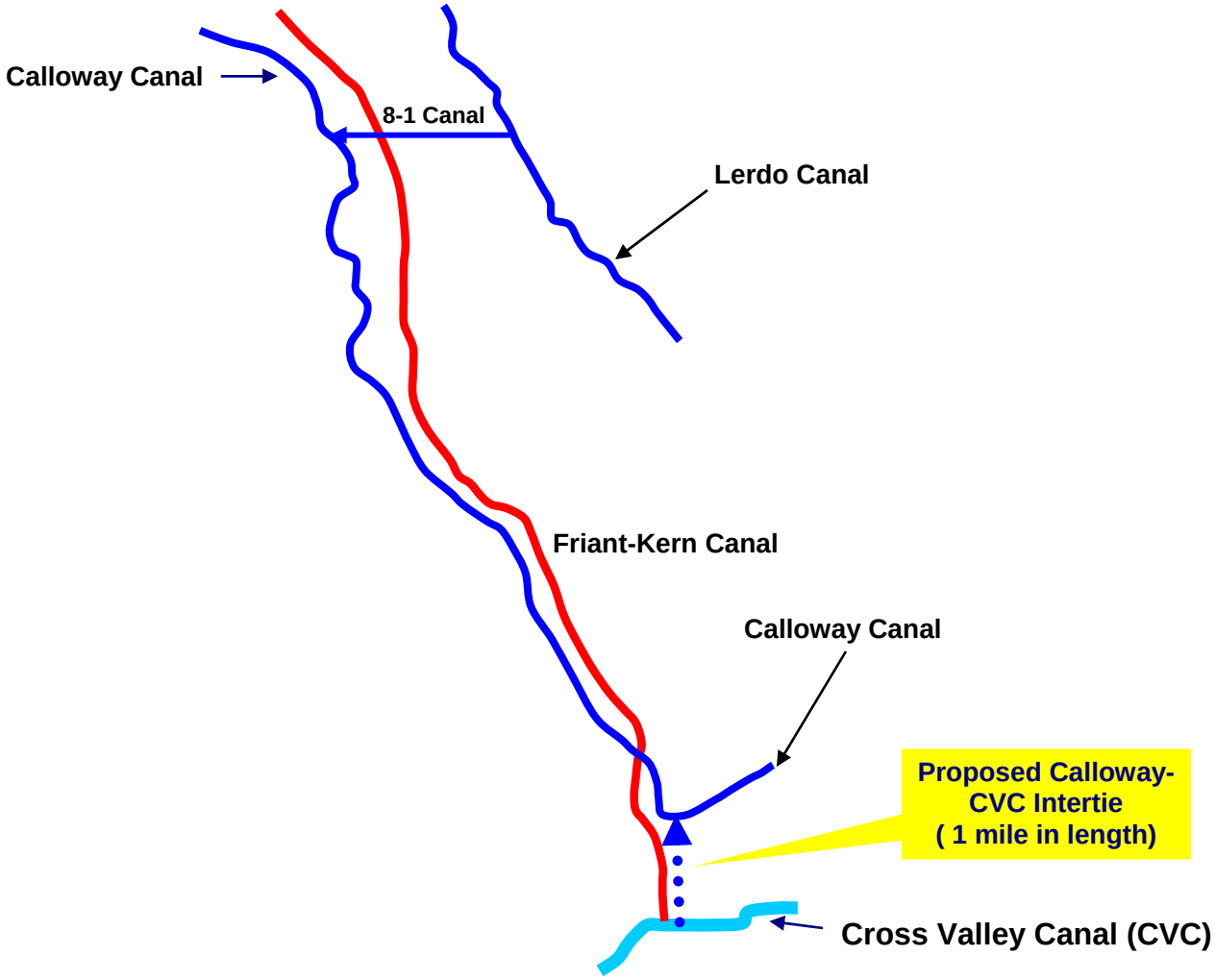


Figure 1. Project Location

Background

For background information, refer to the description contained in Project No. 10, Calloway Canal Improvements.

3.0 Project Operations

Project Operation in a Wet Year like 2006

In 2006, there were substantial amounts of State Water Project Water that could not come into North Kern and Cawelo's direct and in-lieu recharge facilities due to capacity constraints in the existing Cawelo's Pump Station "A" at the terminus of the Cross Valley Canal. This facility will reduce the impacts of this capacity constraint.

Project Operation in a Dry Year like 2004

In 2004, the Kern River April-July runoff was 48% of the average and deep wells were run to make up for the shortages to North Kern's and Cawelo's Kern River supplies. The State Water Project allocation was 65%. This facility would have allowed the districts additional capacity for access to dry year supplies.

4.0 Goals and Objectives

The primary goal of this project to interconnect the Cross Valley and Calloway Canals is to allow SWP to be conveyed into North Kern and allow Kern River water to be delivered into the Cross Valley Canal. Associated benefits include:

- Water supply reliability through system redundancy and flexibility
- Water conservation
- Energy savings
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with IRWMP Objectives and Strategies

This project is an important element in implementation of the Poso Creek IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship to Other Projects in the Poso Creek IRWMP Region

The project is being proposed in conjunction with the project to interconnect the Calloway and the Lerdo Canals and the plan to improve six miles of the Calloway Canal.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The estimated preliminary costs for implementing the interconnection between the Calloway and Cross Valley Canals are presented in the following table. For comparison, both a pipeline and canal alternative are presented.

	Pipeline Alternative	Canal Alternative
Estimated Cost:	$10,697,000	$7,001,000
Contingencies at 40%	$4,279,000	$2,800,000
Subtotal	$14,976,000	$9,801,000
Eng., Adm. Etc. at 15%	$2,246,000	$1,470,000
Total	$17,222,000	$11,271,000

9.0 Schedule

CEQA done
Do not own R/W (yet)
Preliminary design not finished
Need CVC extension shutdown for Phase I connection

No. 12 Calloway Canal to Lerdo Canal Interconnection

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsors	North Kern Water Storage District and Cawelo Water District
Location	East-west alignment along the alignment of North Kern's Lateral 8-1 (closely following the southern boundaries of sections 25 and 30, T.28S., R.26 and 27E., respectively)
Estimated Conveyance Capacity	Varies, up to 500 cfs
Project Descriptor	Increased water reliability by providing access to alternative supplies (SWP and Kern River) to areas of demand
Estimated Cost (2006 dollars)	$21,790,000

2.0 Project Description

North Kern Water Storage District (North Kern), near the head of its system, has an open ditch which heads on the Lerdo Canal and discharges into the Calloway Canal. This facility, referred to as the "8-1 Lateral", is 1.5 miles in length and conveys water from east (the Lerdo Canal) to west (the Calloway Canal) by gravity, with the natural fall being on the order of 50 feet. Currently, there is no way to convey water from the lower elevation Calloway Canal to the higher elevation Lerdo Canal.

Accordingly, the proposed project would parallel a portion of the 8-1 Lateral with one or two pipelines to facilitate pumping water from the Calloway Canal into the Lerdo Canal. In this regard, the 8-1 Lateral siphons under the Friant-Kern Canal en route from the Lerdo Canal to the Calloway Canal. It is planned to enlarge the 8-1 Lateral and reverse the flow in the reach extending from the Calloway Canal to the Friant-Kern Canal. At the Friant-Kern Canal, a pumping plant would be constructed to lift the water to the Lerdo Canal through the new pipeline(s) extending from the Friant-Kern Canal to the Lerdo Canal, a distance of about one mile. Temporary construction rights-of-way would be acquired for this one-mile reach; about 50 feet in width, and located immediately adjacent to the District's existing rights-of-way. The pumping plant and pipeline(s) would have a nominal design capacity of up to 500 cfs.

Figure 1 below shows the location and extent of the project.

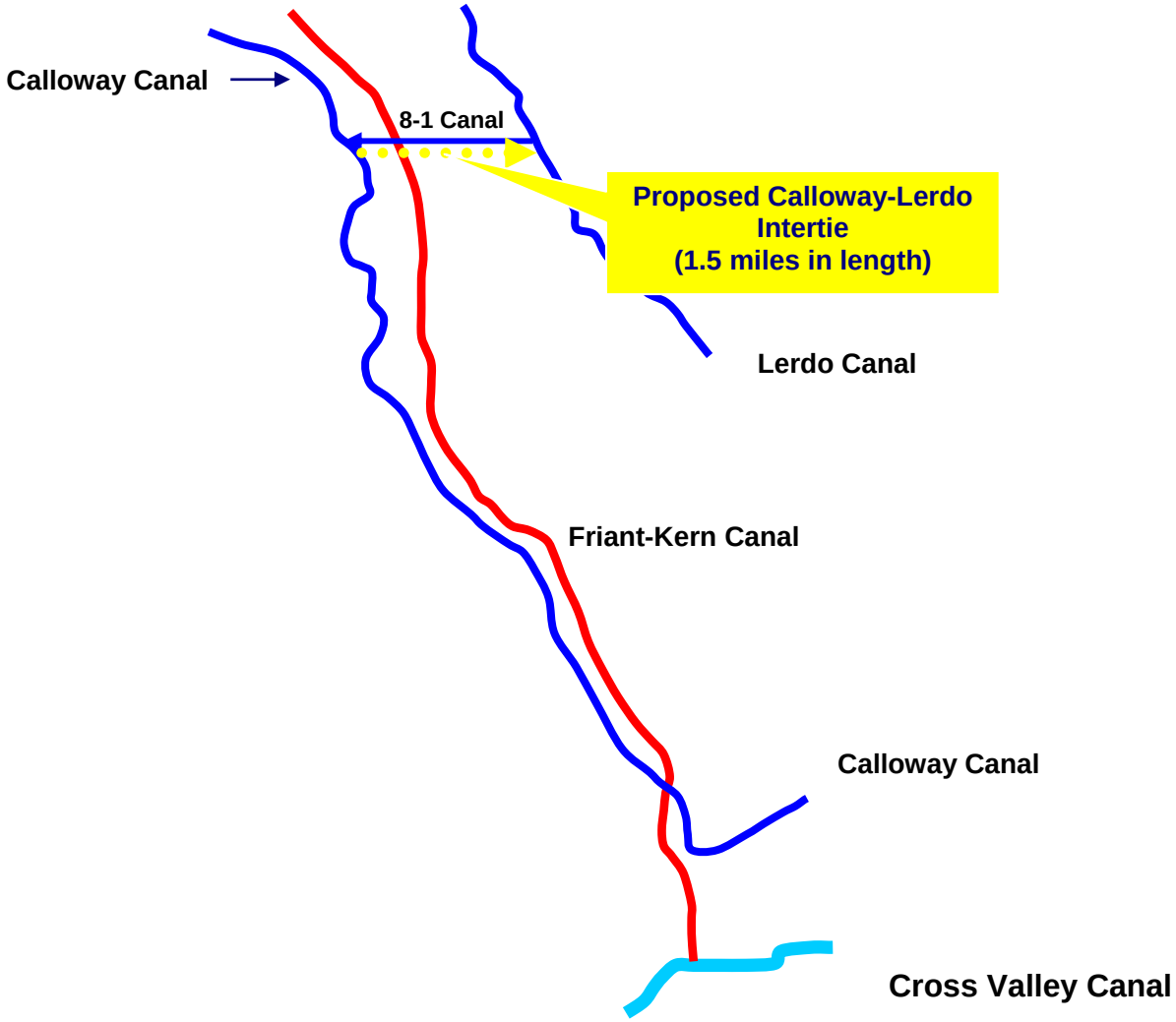


Figure 1. Project Location

Background

For background information, refer to description contained in Project No. 10 Calloway Canal Improvements.

3.0 Project Operation

Project Operation in a Wet Year like 2006

In 2006, a substantial amount of State Water Project water was available that could not come into the North Kern and Cawelo's direct and in-lieu recharge facilities due to capacity constraints in the existing Cawelo's Pump Station "A" at the terminus of the Cross Valley Canal. This project, in conjunction with Calloway Canal/Cross Valley Canal Interconnection (NK-2), will significantly reduce this bottleneck with respect to supplies to those areas served off of the Lerdo Canal.

In addition, this project would have allowed water from the Friant-Kern Canal, which was available in 2006, to be used in the North Kern and Cawelo's direct and in-lieu recharge facilities.

Project Operation in a Dry Year like 2004

In 2004, the Kern River April-July runoff was 48% of the average and deep wells were run to make up for the shortages to North Kern and Cawelo's Kern River supplies. The State Water Project allocation was 65%. This project would have allowed the districts additional capacity for access to dry year supplies to be used in the Lerdo Canal service area.

4.0 Goals and Objectives

The primary goal of this project to interconnect the Cross Valley and Calloway Canals is to allow SWP to be conveyed into North Kern and allow Kern River water to be delivered into the Cross Valley Canal. Associated project benefits include:

- Water supply reliability through system redundancy and flexibility
- Water conservation
- Energy savings
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is an important element in implementation of the IRWMP and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

The project is being proposed in conjunction with the project to interconnect between the Calloway and the Lerdo Canals and the plan to improve six miles of the Calloway Canal lining.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

Costs include one mile of pipeline, one-half mile concrete lined canal, and pumping plant at Friant-Kern Canal, all 500 cfs. The estimated costs presented are preliminary pending additional project development.

Estimated Construction Cost:	$14,449,000
Contingencies at 30%	$4,335,000
Engineering	$1,315,000
Construction Management	$1,691,000
Total	$21,790,000

9.0 Schedule

Project is in design phase. CEQA is completed. District owns the R/W. Preliminary design finished.

No. 13 Multi-District Conveyance Facility

1.0 Summary

Project Type	Water Supply Reliability Conjunctive Management of Surface Water and Groundwater Resources Water Quality Improvement and Protection Water Transfers
Project Sponsor	Semitropic Water Storage District
Beneficiaries	Local Water Districts SWP and CVP contractors Banking Partners
Location	Shown in Figure 1
Estimated Conveyance Capacity	Up to 300 cfs
Project Descriptor	Large conveyance facility to connect the California Aqueduct with the Friant-Kern Canal
Estimated Cost (2006 dollars)	$55 to $85 million depending on alternative; some components overlap with other IRWMP projects

2.0 Project Description

Three different alignments were identified and five alternatives were developed and evaluated. Each alternative would utilize a portion of the East-West Pipeline, currently under construction as part of the first phase of Semitropic's Stored Water Recovery Unit (SWRU).

Two of the alignments, with a 300 cfs two-way conveyance, would convey water from the California Aqueduct to the Friant-Kern Canal. It would use a portion of the Pond-Poso Canal alignment; as a result, an increase in the capacity of the canal will be required. At least 12 miles of additional open canal or pipeline, with a capacity of 300 cfs, will be needed depending on the route selected for conveyance. Pumping plants will be required along the route of conveyance to move the water from west to east.

The third alignment would provide conveyance of water from the Friant-Kern Canal to the California Aqueduct (1-way) with a capacity of about 200 cfs. This alignment would convey Friant-Kern Canal water through reaches of Poso Creek to the SWRU's Well Collector. From there, water would be delivered to the California Aqueduct by using the SWRU's North-South Canal and Pipeline as well as its East-West Pipeline.

The location of the Project is shown in Figure 1.

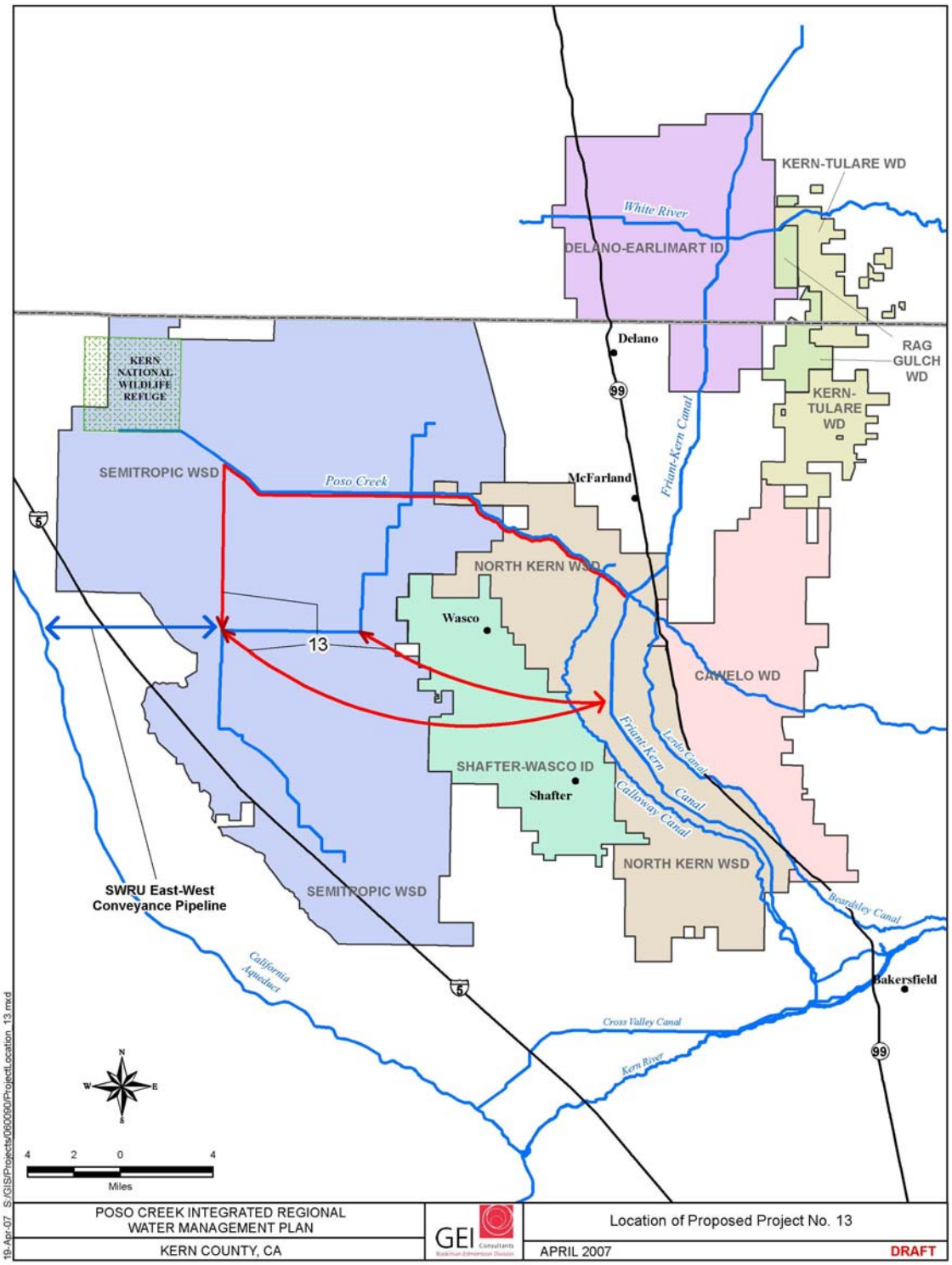


Figure 1. Project Location

Background

For background information, refer to the description contained in Project No. 3a, Stored Water Recovery Unit In-Liu Service Areas.

3.0 Project Operations

Project Operation in a Wet Year like 2006

Water will flow from east to west if Article 21 water is not available and supplies from the Friant-Kern Canal are available. Water will flow from west to east if supplies are not available from the Friant-Kern Canal.

Project Operation in a Dry Year like 2004

During the summer, water will flow from west to east for irrigation purposes. During the fall and winter, water will flow from east to west for recovery of previously stored banking water.

4.0 Goals and Objectives

The goal is to provide a transmission facility to make greater use of surplus water existing in either the SWP or CVP by making such surplus supplies available to larger areas of demand. Two of the water sources to meet agricultural needs in Kern County are supplied from 1) the California Aqueduct, and 2) the Friant-Kern Canal. Construction of a large conveyance facility across the Valley to connect these two water supplies would provide a number of local, regional, and statewide benefits. These benefits would be the result of water transfers, water quality improvements, and water supply improvements (through groundwater banking). Associated project benefits include:

- Water supply reliability through groundwater banking and exchanges
- Greater yields of both projects through conjunctive management
- Increased flexibility in water deliveries

5.0 Project's Consistency with Poso Creek IRWMP Objectives and Strategies

The project is an important element in implementation of the Poso Creek IRWMP and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the region.

6.0 Relationship to Other Projects in the Poso Creek IRWMP Region

Additional in-lieu service can be made along the alignment of the pipeline in areas of Shafter-Wasco that are currently ineligible to receive CVP water.

7.0 Project Screening Priority within the Poso Creek IRWMP Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term

implementation proposals. Meets all five of the strategies identified as the highest priorities for Project implementation.

8.0 Cost Estimate

Concept level cost estimates for each alternative are presented in the following table.

Alternative	Reach 1 (Pipe)	2 (Canal)	3 (Pipe)	3 (Canal)	Total
	(in millions)				
1	$ 8.5	$ 18.2	$ 35.1		$ 61.8
2	$ 8.5	$ 18.2		$ 29.6	$ 56.3
3	$ 8.5	$ 14.6	$ 35.1		$ 58.2
4	$ 8.5	$ 14.6		$ 29.6	$ 52.7

Note: Costs contain allowance of 20 percent contingency plus 15 percent engineering, legal, admin.

The costs for each alternative were broken down into three different reaches: Reach 1, Reach 2, and Reach 3. The estimate for Reach 1 is the cost to upsize the East-West Pipeline to have a capacity of 300 cfs. Reach 2 is the canal that would connect the East-West Pipeline to Lateral 384. From the Lateral 384, Reach 3 would convey water to the Friant-Kern Canal. No costs were developed for Alternative 5.

This project's concept level cost estimate is retained within this project description to retain consistency with past engineering design completed for this project. Other projects contained in this IRWMP have some overlap with this project; therefore, some of the costs will be covered if and when other projects are constructed.

9.0 Schedule

Depending on alternative, some components of this project are ready for construction in 2008.

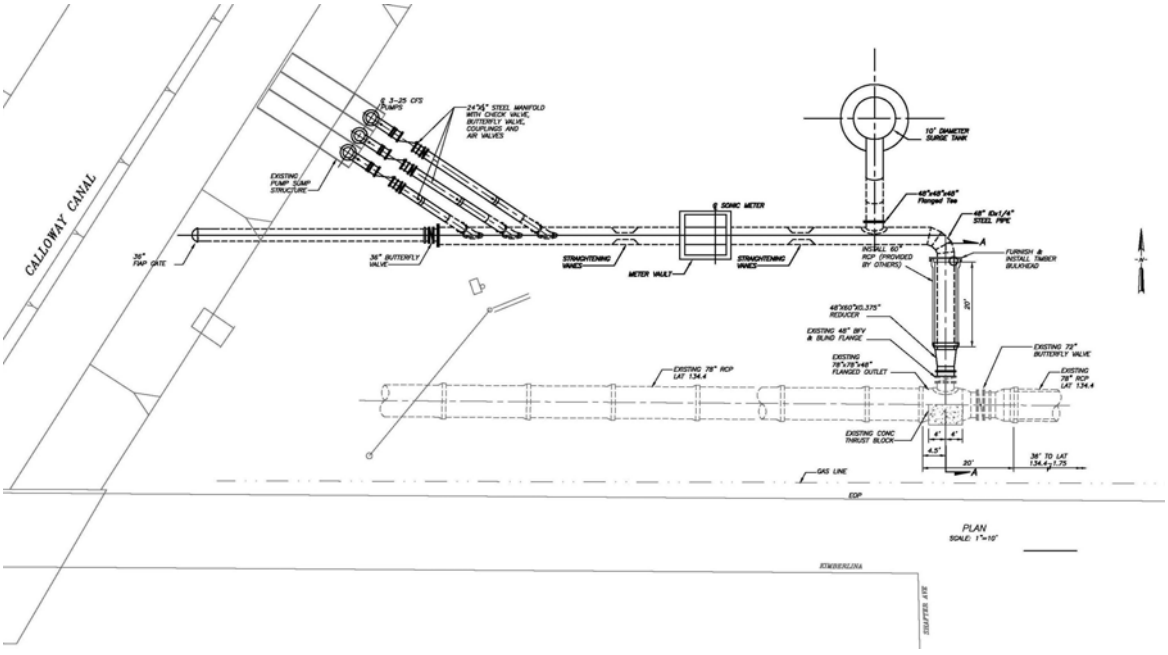
No. 14 North Interconnection between North Kern/Shafter-Wasco

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsors	North Kern Water Storage District and Shafter-Wasco Irrigation District
Location	See map at beginning of Appendix
Estimated Conveyance Capacity	75 cfs
Project Descriptor	Increased water reliability by providing access to alternative supplies
Estimated Cost (2006 dollars)	$1,140,000

2.0 Project Description

The proposed project is a bidirectional connection, with a pumped capacity of 75 cfs, which would connect the Calloway Canal to Shafter-Wasco's Lateral 134.4. The connection consists of approximately 180 ft of 48-inch diameter pipe and 120 ft of 24-inch diameter pipe, both with a pumped capacity of 75 cfs. Physical features required for this interconnection includes 180 ft of 48-inch diameter pipe, 120 ft of 24-inch diameter pipe, three 100 hp pumps and motors, and manifold to connect to an existing 48-inch tee in Lateral 134.4. A stand tank may be needed for surge protection.



Background

Introduction

North Kern Water Storage District (North Kern) was formed in 1935 under the provisions of Division 14 of the California Water Code. It is located north of the Kern River and comprises some 60,000 acres (exclusive of Rosedale Ranch Improvement District) of intensively farmed, highly productive agricultural lands. The district lies between Bakersfield on the south and Delano on the north and between Highway 99 on the east and Wasco and Shafter on the west.

Located immediately adjacent to and east of Semitropic Water Storage District (Semitropic), Shafter-Wasco Irrigation District (Shafter-Wasco) was organized in 1937 to address rapidly diminishing groundwater supplies. Shafter-Wasco surrounds the cities of Shafter and Wasco and is crossed by the Central Valley Highway (Highway 43). It is bounded to the east by the Calloway Canal. The northern boundary generally corresponds with Highway 46 and the southern boundary generally corresponds with Seventh Standard Road.

Land Use

The irrigable lands in North Kern are divided into two classes. Class 1 lands include about one-half of North Kern's total area of roughly 61,050 acres and they receive a water supply developed almost entirely by the district. North Kern provides its Class 1 landowners a dependable water supply by coordinating its Kern River water, its use of storage space in Isabella Lake, water purchases, and the use of its wells. Class 2 lands, comprised of the remaining half of the district, receive a water supply primarily from wells and pumping plants owned and operated by the landowners themselves that draw water from the underground supply that is replenished by the district.

Shafter-Wasco lands are used almost entirely for irrigated agriculture, 34,140 acres, of which 31,350 acres are irrigated.

Water Supply

North Kern Water Storage District

North Kern conjunctively uses surface water and groundwater to meet the irrigation water requirements of its landowners. In particular, its highly variable surface supply is regulated, in part, in the underlying groundwater basin. The surface water that is placed in groundwater storage is subsequently pumped as groundwater by both North Kern and its landowners to meet their irrigation water requirements. North Kern's primary source of surface water is the Kern River, whose waters have been utilized under a schedule of long-standing diversion rights. This supply has been supplemented from time to time by water from Poso Creek, which transverses the northern portion of the district and contributes, primarily through infiltration, to the underlying groundwater supply.

When the district was organized in 1935, the Kern River was unregulated. The construction of the Corps of Engineer's Isabella Dam and Reservoir in the 1950s and North Kern's purchase of conservation space therein improved seasonal regulation of the Kern River. North Kern executed an agreement in 1964 for the long-term right to store water in a portion of Isabella Reservoir's conservation space. North Kern's share varies by contract from 24 percent to 34 percent of the available conservation space and reaches a minimum of about 48,000 acre-feet during the winter carryover period.

North Kern supplies the irrigation water requirements of about one-half of its lands from both surface water and groundwater sources. Growers in the remaining one-half of the District rely almost exclusively on groundwater pumped by farmer owned and operated wells (i.e., those not controlled by North Kern). However, North Kern delivers surface water through its facilities to some of these lands on an as-available basis, also referred to as "in-lieu deliveries."

During "wet" years, surface water supplies are sufficient to satisfy irrigation water requirement for the surface water service area and provide substantially larger amounts of spreading water for groundwater storage. Conversely, during the "dry" years, North Kern has been required to pump groundwater to supplement available surface supplies for the surface water service area. Accordingly, groundwater pumping from District wells has varied from no pumping in "wet" years to 77,000 acre-feet in "dry" years.

Surface water is delivered through approximately 130 miles of unlined canals heading at two diversion points on the Kern River, 20 miles of pipeline, and 20 miles of lined canal. The district's principal supply artery, and most upstream diversion, is the Beardsley-Lerdo system. This system is entirely gravity flow and consists of the diversion structure or headwords on the Kern River, 9.5 miles of concrete-lined canal (The Beardsley Canal) between the headworks and the district's southern boundary, followed by an unlined canal section (the Lerdo Canal) that continues along North Kern's eastern or "high" side. Up to 850 cfs has been conveyed through the Beardsley Canal and delivered into the District, and this represents the practical maximum delivery in this system. By agreement with Cawelo, Cawelo may use up to 240 cfs of this capacity and the City of Bakersfield has the right-of-use of up to 100 cfs. The second point of diversion, 4.5 miles downstream of the first, is the Calloway Headworks, which services the relatively large, unlined section of the Calloway Canal. This facility is also entirely gravity flow and extends for 10.4 miles before entering North Kern at Seventh Standard Road. This "wet-year" facility has a capacity of 1,000 cfs at the headworks. However, its ability to deliver water into North Kern is somewhat less because losses can be significant, particularly for diversions and deliveries of relatively short duration. The City of Bakersfield has a right-of-use up to 425 cfs of this capacity.

Kern River water is delivered to the surface water service area to the extent that there is a coincident demand. However, Kern River water that exceeds the immediate irrigation requirements is introduced directly underground through the use of about 1,500 acres of recharge basins at four sites: Poso Creek (when it is not flowing naturally) and three other controlled-flow facilities. These facilities, and Poso Creek, have combined to directly recharge up to 24,000 acre-feet in one month and 222,000 acre-feet in one year (1980).

In years of deficient water supply, continuity of delivery to the surface water service area is maintained by the operation of 68 wells owned and operated by North Kern. Fifty wells were constructed as part of North Kern's 1950 project. Since then, wells have been added to maintain and enhance the 10,000 acre-feet per month of planned production for the District's well field. During the driest years, the well field is operated at or near capacity for the nine-month period from February through October. Conversely, there are years in which available surface supplies are adequate and the well field is not used at all.

Shafter-Wasco Irrigation District

Shafter-Wasco has a contract with the U.S. Bureau of Reclamation (USBR) for CVP water to serve 27,100 acres within its boundaries. The source of this surface water supply is the Friant Division of the CVP, which develops its supply from the San Joaquin River, with storage provided by Millerton Lake. The water is transported to the District through the Friant-Kern Canal. The surface water supply is used conjunctively with the underlying groundwater. Shafter-Wasco's contract entitlement consists of 50,000 acre-feet of Class 1 water and 39,600 acre-feet of Class 2 water, for a total of 89,600 acre-feet. The long-

term average surface water supply available to the District is estimated at 69,000 acre-feet. The Class 1 water is storable (for use within a given year) and is considered a firm water supply. The Class 2 water supply is non-storable water and must be used when it is available.

Shafter-Wasco's primary purpose is to contract for surface water supplies, with particular emphasis on the Friant Division of the CVP. It has the additional responsibility of conjunctively managing surface water and groundwater supplies to ensure an adequate water supply for water users.

3.0 Project Operation

Project Operation in a Wet Year like 2006

In a wet year, when there are surplus supplies available off of the Friant-Kern Canal, the facility would be run in a mode into the Calloway Canal. From there, supplies can be delivered to the North Kern's direct and in-lieu recharge facilities downstream of the connection. In a wet year, if there are any supplies available to North Kern that may be delivered to USBR designated excess lands, this facility is a means of moving such water into Shafter Wasco's north system.

Project Operation in a Dry Year like 2004

In a dry year, the facility may be used to deliver North Kern deepwell produced water to Shafter-Wasco. Deliveries would be made either in return of a prior year Shafter-Wasco banked supply or for North Kern to delivery off-peak season water in exchange for peak season water for energy and supply management purposes.

4.0 Goals and Objectives

The primary goal of connecting the Calloway Canal to Shafter-Wasco's Lateral 134.4 is to allow bidirectional delivery of water between North Kern and Shafter-Wasco. Associated benefits include:

- Water supply reliability through system redundancy and flexibility
- Conjunctive management of surface and groundwater resources

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This additional connection frees upon capacity on other Friant interconnections.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0. Cost Estimate

The estimated planning costs for implementing the interconnection between the Calloway Canal and Shafter-Wasco's Lateral 134.4 are presented in the following table.

Construction				756,378
Engineering Construction Management	7% 9%			52,946 68,074
Total without contingency				877,398
Capital Cost, 2006 price level	30%			1,140,000

9.0 Schedule

CEQA not completed;
Do not own all R/W, but cooperating with NKWSD landowner;
Preliminary design completed;
Does not require SWID shutdown;
Ready for construction by 2009.

No. 15 Pilot Arsenic Treatment Plant

1.0 Summary

Project Type	Water Quality Improvement
Project Sponsor	Semitropic Water Storage District
Location	Adjacent to Junction Reservoir and Pumping Plant site southwest of Highway 46 and Gun Club Road
Estimated Conveyance Capacity	50 cfs (ultimate plant capacity up to 500 cfs)
Project Descriptor	Pilot treatment plant to demonstrate feasibility of full scale facility to remove arsenic from groundwater
Estimated Cost (2006 dollars)	$20.5 million

2.0 Project Description

Groundwater in many areas, particularly on the west side of the Central Valley, contains concentrations of arsenic that exceed the lowered maximum contaminant level for arsenic of 10 parts per billion. Accordingly, pumping this groundwater into the California Aqueduct as part of a groundwater banking arrangement is potentially problematic. Given this observation and the possibility of even a lower MCL in the future, it is prudent to consider arsenic removal in order to maintain the area's significant groundwater banking capabilities. While it is possible to accomplish the return of previously banked water by exchange from time to time, the only way to guarantee return during times of need is by pumping groundwater and delivering it into the California Aqueduct. However, it is important to note that water pumped into the Aqueduct is raw water commingling with raw untreated water. This mixture will subsequently be treated by downstream agencies before being delivered as a potable supply. The regulations on introducing a raw water supply for mixing in the Aqueduct are currently being developed.

In order to mitigate arsenic concentrations in stored water recovery for delivery into the California Aqueduct, it may be necessary to construct an Arsenic Removal Treatment Plant. The nominal treatment plant capacity is anticipated at a level ranging from 250 to 500 cfs. Based on an evaluation of arsenic treatment technology by Boyle Engineers (February 2006), it is envisioned that optimal treatment will consist of co-precipitation with ferric chloride, followed by membrane filtration. However, prior to construction of a full scale Arsenic Removal Treatment Plant, it would be prudent to construct an initial demonstration plant with a capacity of 50 cfs. Some of the facilities, e.g. the rapid mix and flocculation basins, constructed for the proposed pilot arsenic treatment facility would be utilized in the full scale facility.

Figure 1 and Figure 2 shows the location and extent of the project.

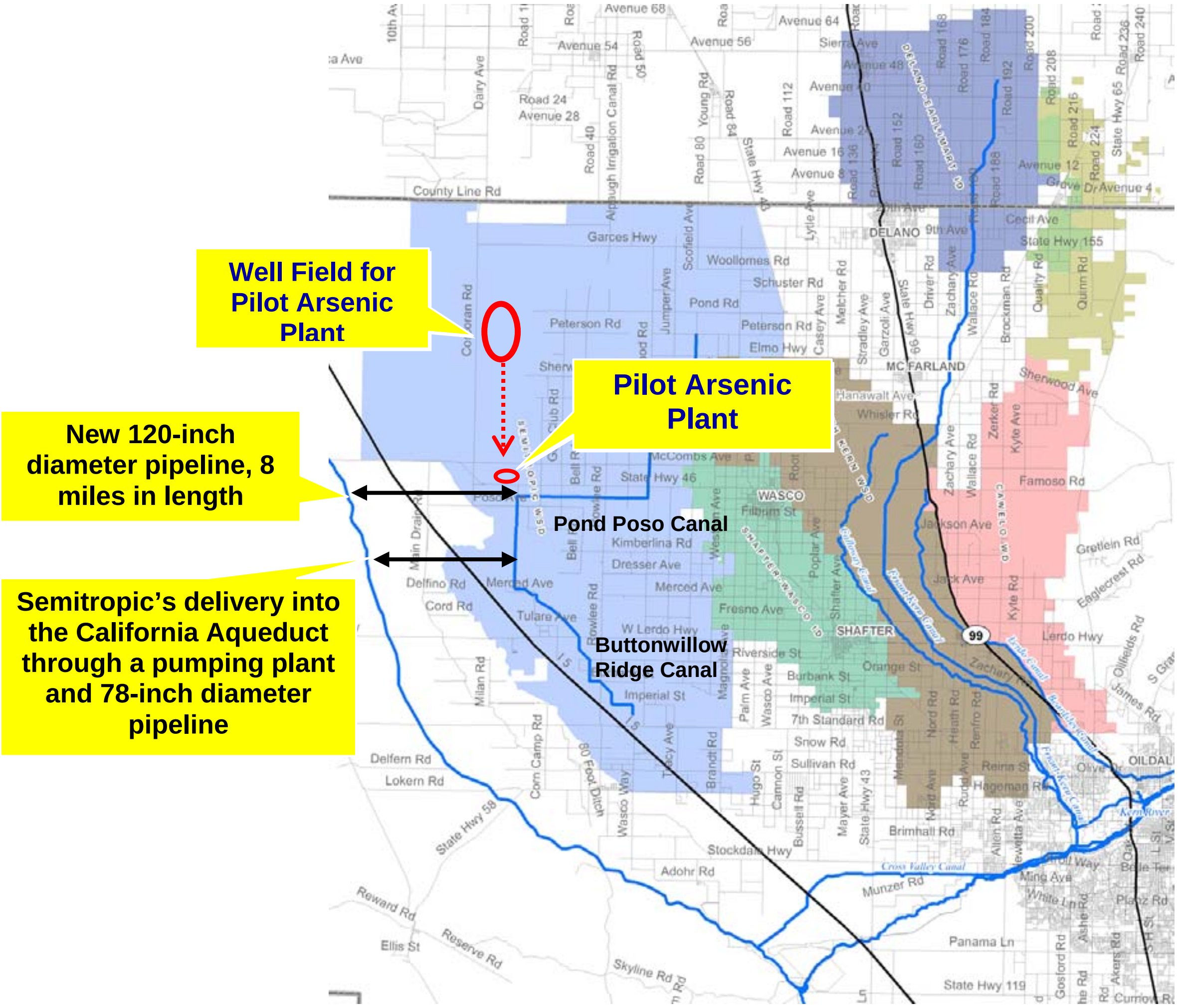

Well Field for Pilot Arsenic Plant
Pilot Arsenic Plant
New 120-inch diameter pipeline, 8 miles in length
Semitropic's delivery into the California Aqueduct through a pumping plant and 78-inch diameter pipeline
Pond Poso Canal
Buttonwillow Ridge Canal

Figure 1

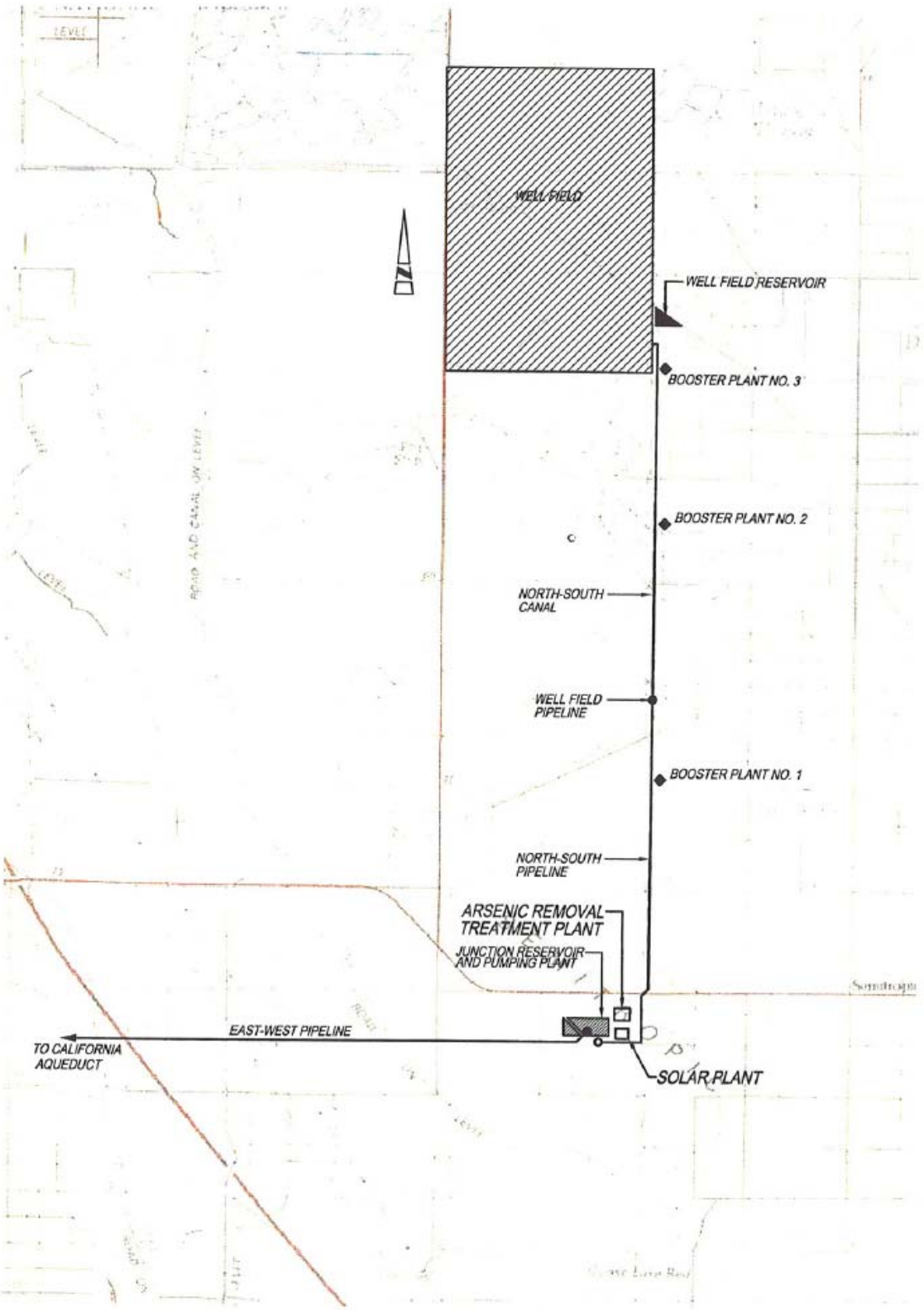

WELL FIELD
WELL FIELD RESERVOIR
BOOSTER PLANT NO. 3
BOOSTER PLANT NO. 2
NORTH-SOUTH CANAL
WELL FIELD PIPELINE
BOOSTER PLANT NO. 1
NORTH-SOUTH PIPELINE
ARSENIC REMOVAL TREATMENT PLANT
JUNCTION RESERVOIR AND PUMPING PLANT
EAST-WEST PIPELINE
TO CALIFORNIA AQUEDUCT
SOLAR PLANT

Figure 2

Background

For background information, refer to the description contained in Project No. 3a, Stored Water Recovery Unit In-Lieu Service Areas.

Raw produced groundwater from the area of this project contains arsenic concentrations up to about 60 micro-grams/liters, many times the acceptable potable standard of 10 micro-grams/liters. Introduction of raw water containing excess concentrations of arsenic into the California Aqueduct to be commingled with other raw water supplies is problematic. Even though blending in the Aqueduct and subsequent treatment by agencies diverting from the Aqueduct before delivery as municipal supplies will result in finished water meeting the arsenic concentration limit, the resulting sludge from the water treatment plants is anticipated to be hazardous thereby requiring disposal in a hazardous waste landfill licensed to receive such wastes. The policy regarding introduction of raw water into the California Aqueduct which contains constituent concentrations above acceptable standards (even though subsequent treatment will be applied) is currently under review. Forthcoming regulations regarding this issue are also in the process of being developed. However, it is anticipated that treatment of the water supply produced from the Stored Water Recovery Unit (SWRU)) prior to introduction into the California Aqueduct will be required to be treated for arsenic removal.

This project will support the ultimate construction of a larger arsenic removal plant which in turn will make the SWRU project feasible. Such a project will implement conjunctive management of surplus imported water supplies during periods of high runoff for groundwater storage and subsequent production during dry hydrologic periods. Therefore, this project supports the implementation of a conjunctive management program.

3.0 Project Operation

The project would provide positive water quality impacts by reducing arsenic concentrations in recovered stored groundwater. In addition, treatment would reduce levels of vanadium, a natural occurring element, which is of concern at high levels (groundwater tests indicated concentrations up to 170 mcg/l, compared to a proposed state action level of 15 mcg/l). No other water quality constituent was identified which needed to be treated.

As indicated above, the ultimate plant capacity for the SWRU is 500 cfs, although depending on the final form and content of the forthcoming policy and regulations regarding acceptable arsenic levels in waters introduced to the California Aqueduct, a smaller ultimate plant may be feasible. The pilot arsenic treatment plant to demonstrate the adequacy of treatment of the full size plant is 50 cfs.

4.0 Goals and Objectives

Constructing a pilot arsenic treatment plant will demonstrate the feasibility of constructing a full scale plant to enable Semitropic to introduce produced stored groundwater of acceptable quality in the California Aqueduct during periods when surface water supplies are limited. This outcome will support the goal of increasing the District's water supply reliability. Additional benefits of the project include:

- Increased flexibility and reliability of surface water deliveries
- Increased groundwater recharge
- Improved capacity to distribute groundwater during dry and critical years
- Additional capacity to meet water needs outside of the District

- Improved water quality of produced stored groundwater by removing high arsenic and vanadium levels
- Implementation of conjunctive management to increase reliability of District water supplies

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This proposed project is integrated with proposed IRWMP Project No. 3a, Stored Water Recovery Unit In-Lieu Service Areas infrastructure construction.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

Based on an evaluation report by Boyle Engineering (2006) for arsenic renewal technology, the estimated capital cost for an initial demonstration plant of 50 cfs is $20.5 million. This would include facilities which would support a larger treatment plant up to 500 cfs. The following table presents Boyle's cost opinion of construction for the pilot plant and alternative capacity full scale plants.

Construction Cost Opinion

	50 cfs	250 cfs	420 cfs	500 cfs
Coagulation	$1,994,000	$3,670,000	$4,077,000	$4,129,000
Filtration	13,458,000	36,510,000	53,120,000	64,710,000
Backwash	1,253,000	2,486,000	3,559,000	4,405,000
Subtotal, Treatment Plant	$16,705,000	$42,666,000	$60,756,000	$73,334,000
Engineering, Legal, Administrative	1,300,000	3,400,000	4,900,000	5,900,000
Contingency	2,500,000	5,100,000	7,300,000	8,800,000
Opinion of Construction Cost	$20,505,000	$51,166,000	$72,956,000	$88,037,000

Annual operating costs were not estimated for the pilot plant. However, annual O&M costs for a 250 cfs facility are estimated to be $550,000 when not operating, and approximately $60 per acre-foot when being utilized.

9.0 Schedule

As indicated above, regulatory policies and regulations for introducing groundwater supplies into the California Aqueduct to be commingled with other Aqueduct supplies are currently being addressed and under development. Accordingly, the proposed pilot demonstration plant for arsenic removal has the planning study completed. Conceptual design is also completed and the pilot project is read for construction in 2008.

No. 16 Reverse Flow in the Friant-Kern Canal

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsor	Shafter-Wasco Irrigation District Southern San Joaquin Municipal Utility District Kern-Tulare Water District Rag Gulch Water District Delano-Earlimart Irrigation District
Location	Various locations along the Friant-Kern Canal (Shafter Check, Poso Check & Woollomes Check)
Estimated Conveyance Capacity	250 cfs at each check
Project Descriptor	Increased water reliability by providing improved conveyance opportunities for water contractors
Estimated Cost (2006 dollars)	$1,000,000 plus

2.0 Project Description

An inter-connection between the Cross Valley Canal and the Friant-Kern Canal (FKC), which can facilitate the movement of water in either direction, is currently being pursued by the Kern County Water Agency. The bi-directional intertie between the two canals includes the improvements necessary to move water from the Cross Valley Canal into the Friant-Kern Canal. Under this mode of operation, it is necessary to reverse the normal direction of flow in the Friant-Kern Canal for some distance to the north. Reversing the normal direction of flow requires pumping over existing canal check structures; namely, the Shafter Check, the Poso Check, and the Woollomes Check (listed in order from south to north). These improvements would permit direct deliveries to the following districts:

- Shafter-Wasco Irrigation District
- Southern San Joaquin Municipal Utility District
- Kern-Tulare Water District
- Rag Gulch Water District
- Delano-Earlimart Irrigation District

To physically deliver water to Kern-Tulare, Rag Gulch, or Delano-Earlimart requires pumping over three check structures—the Shafter Check, the Poso Creek Check, and the Lake Woollomes Check. To physically deliver water to Shafter-Wasco requires pumping over two check structures—the Shafter Check, and the Poso Creek Check. To physically deliver water to Southern San Joaquin MUD requires pumping over one check structure—the Shafter Check.

Once water is delivered into the FKC, it can be delivered to a variety of locations through intercept exchanges. Under the intercept exchange scenario, water is pumped backwards in the FKC to offset

deliveries that would otherwise be satisfied from Millerton Reservoir. Thus creating a supply in Millerton Reservoir that could be delivered anywhere on the Friant-Kern Canal, the Madera Canal, or released down the San Joaquin River.

While alternative design concepts have been considered, the conveyance of water from the Cross Valley Canal into the Friant-Kern Canal is based on the construction of a canal-side pumping plants on the south side of each check structure. Each pumping plant would include several pumps, the discharges from which would manifold into a single pipeline for discharge into the Friant-Kern Canal on the north side of each check. Based on a preliminary evaluation of the canal hydraulics, the existing canal prism should be adequate, without modification, to convey the design flow of 250 cfs to each of the reverse flow pumping plants. In fact, it appears that flows up to about 500 cfs could be accommodated within the existing, lined canal prism. The principal items of work at each check are summarized as follows:

- Reinforced concrete sump structure on the south side of the check
- Pumps, motors, and valves
- Pump discharge manifold and discharge pipe

3.0 Project Operation

Project Operation in Wet Years

It is assumed that during wet years there are adequate water supplies in Millerton Reservoir to meet all demands from the Friant-Kern Canal, therefore, the facilities will likely sit idle

Project Operation in Dry Years

During dry years, it is estimated that up to 200,000 acre-feet of water can be delivered in reverse flow through the FKC. This water can be used to serve a variety of demands. The source of this water supply could be from banking projects on the Kern Fan, State Water Project or Central Valley Project water from the California Aqueduct, or Kern River Water.

4.0 Goals and Objectives

The primary goal of this project is to increase opportunities to deliver water from the California Aqueduct to users along the Friant-Kern Canal. Associated project benefits include:

- Increased flexibility to provide water supplies to local water districts
- Increased water supply reliability
- Facilitates water exchanges
- Reduced groundwater overdraft
- Facilitates SJR Environmental flows

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of improving infrastructure to increase water management opportunities.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Expanded delivery capability, in conjunction with groundwater banking and expanded regional conveyance facilities serves to better manage the regions water resources.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The estimated cost is $250,000 per check structure, plus engineering and environmental for a total of $1,000,000. This is a rough estimate and it is anticipated it may cost more.

9.0 Schedule

November 2006 through June 2007:	Complete environmental on intertie
December 2007 through March 2008:	Construct intertie (during scheduled FKC shut down)
May 2007 through November 2007:	Complete environmental on reverse flow structures
December 2007 through March 2008:	Construct on reverse flow structures (during scheduled FKC shut down)

No. 17 Shafter-Wasco/Semitropic Interconnection on Kimberlina Road

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsors	Shafter–Wasco Irrigation District and Semitropic Water Storage District
Location	See Figure 1 attached
Estimated Conveyance Capacity	
Project Descriptor	Increased water reliability by constructing facilities to enhance water banking and exchange
Estimated Cost (2006 dollars)	$12,218,000

2.0 Project Description

The 36-inch interconnection between Semitropic Water Storage District's (Semitropic) Pond-Poso Canal and Shafter-Wasco Irrigation District's (Shafter-Wasco) North System has been very successful, facilitating water banking and exchange arrangements between the two districts. There is the potential to expand the capability to move water back and forth. In this regard, Semitropic constructed a new pipeline distribution system, Semitropic's P-384 System, a few years ago that creates the possibility of connecting that system with Shafter-Wasco's main (North System) lateral through the proposed construction of up to four miles of 60-inch pipeline along Kimberlina Road.

Figure 1 shows the location and extent of the project.

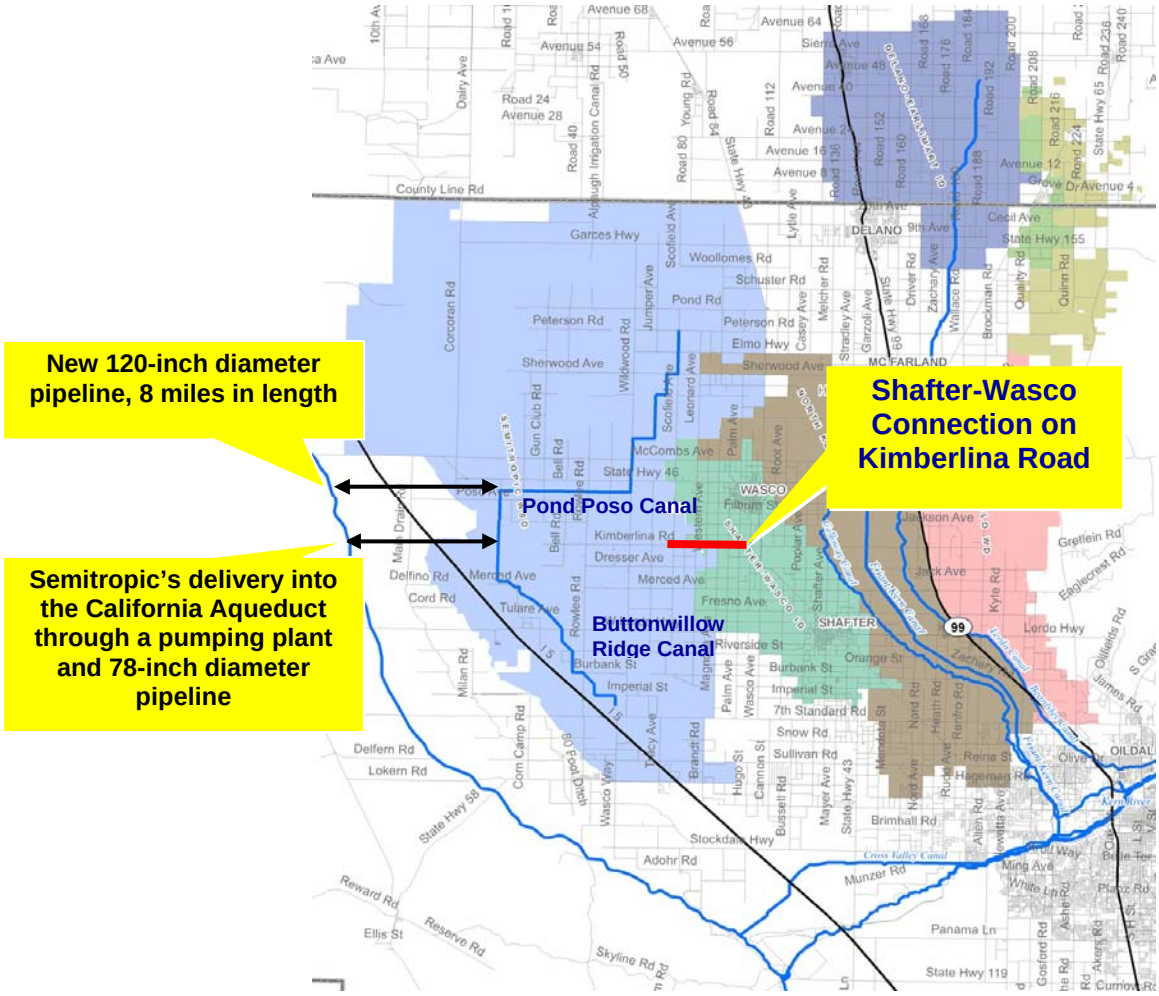


Figure 1. Location of Project

Background

Introduction

Shafter-Wasco is located immediately adjacent to and east of Semitropic. Shafter-Wasco was organized in 1937 to address rapidly diminishing groundwater supplies. It encompasses 38,000 acres, of which 32,000 acres are irrigated. Shafter-Wasco surrounds the cities of Shafter and Wasco and is crossed by the Central Valley Highway (Highway 43). It is bounded on the east by the Calloway Canal. The northern boundary generally corresponds with Highway 46 and the southern boundary generally corresponds with Seventh Standard Road.

Shafter-Wasco's primary purpose is to contract for surface water supplies, with particular emphasis on the Friant Division of the CVP. It has the additional responsibility of conjunctively managing surface water and groundwater supplies to ensure an adequate water supply for water users.

Land Use

Shafter-Wasco Irrigation District

The district encompasses 34,140 acres, of which 31,350 acres are irrigated.

Semitropic Water Storage District

The District lands are utilized almost entirely for agricultural purposes with the larger part of such utilization being irrigated agriculture. For the years 1984 through 1991, the most extensive cropping throughout this period has been cotton. Alfalfa, hay and grains, and deciduous trees (mostly almonds) make up the majority of the remaining cropping within the District.

Water Supply

No major surface streams enter or cross either district. The naturally occurring water resources are principally underground. As discussed later, Poso Creek, a minor stream, crosses the Semitropic area. This stream, in conjunction with the Kern River, constitutes the principal historical sources of replenishment for the groundwater supply beneath these districts.

SURFACE WATER

Since the late 1800's, surface water diverted from the Kern River for irrigation of lands easterly of the districts (later incorporated in the North Kern Water Storage District) sustained groundwater movement into both districts. This aspect may have been limited prior to the lowering of groundwater levels in both districts which resulted from irrigation development occurring subsequent to the 1930's. Imported surface water applied from the Federal Central Valley Project in both Shafter-Wasco and the Southern San Joaquin Municipal Utility District, have contributed to underflow into Semitropic across its easterly boundary since the 1950's.

Poso Creek

Originating in the foothills to the east, Poso Creek enters Semitropic at a point approximately four miles north of Wasco. The runoff in Poso Creek is generally diverted upstream of the District and/or percolates before reaching the District's boundary. Runoff from this source only reaches the District in years of abundant water supply. Following the locally wet winter of 1978, Semitropic constructed a diversion works on the northerly bank of Poso Creek to divert water on an as-available basis into the Pond-Poso Canal. The District applied for and received a permit for this diversion from the State Water Resources Control Board (Permit No. 0175538 issued February 1979). Also, as water becomes available in the Friant-Kern Canal of the Central Valley Project, the District has arranged for release of this water into Poso Creek for diversion into the Pond-Poso Canal.

Kern River

The Kern River flows in a west-southwesterly direction from its canyon in the Sierra Nevada Mountains. Its course extends across the northeast corner of Bakersfield and then follows a southwesterly path toward the Buena Vista Lake area. Two overflow channels, referred to as the Jerry Slough and the Kern River Flood Channel, extend in northwesterly and northerly directions, respectively. The Jerry Slough is

located centrally in the Buttonwillow Improvement District while the Kern River Flood Channel's location is closer to the District's westerly boundary.

Kern River water supplies which reach the valley floor are primarily utilized for irrigation under long-standing water rights and agreements. Runoff from this source varies widely from year to year; the maximum annual recorded amount having been some 2.5 million acre-feet in 1916, 1969, and 1983, the minimum of about 177,000 acre-feet in 1961, and the average being about 738,000 acre-feet per year. Isabella Dam and Reservoir (storage capacity of 570,000 acre-feet) were completed on the Kern River in 1954. Prior to that time and prior to the construction of the Kern River-California Aqueduct Intertie (in 1977), much of the Kern River overflow flowed to the Valley trough and ponded in the Buena Vista-Kern Lake area. During peak periods, the river overflow would travel further to Goose Lake and Tulare Lake. One of the routes which the Kern River overflows would travel crosses the Buttonwillow Improvement District area and is referred to as the Jerry Slough. Historically, these flows provided an increment of recharge to groundwater underlying Semitropic. Isabella Dam and Reservoir, coupled with subsequent downstream improvements, have effectively precluded entrance of Kern River flood flows through Jerry Slough.

Semitropic is physically capable of taking Kern River water deliveries via (1) Poso Creek, (2) the intertie between Buena Vista Water Storage District's East Side Canal and the District's Intake Canal, and (3) turnouts to certain District lands from Buena Vista's East Side Canal. Water for Semitropic from these sources is limited not only by the availability of water supply but also by the availability of unused conveyance capacity in certain Buena Vista and North Kern district facilities. An additional tie-in is currently under study whereby a physical connection would be made between Buena Vista's Main Drain and the District's Intake Canal. This latter connection, if constructed, would allow Semitropic to divert and utilize more Kern River water on those infrequent occasions when it is available. Shafter-Wasco, through arrangements with the neighboring North Kern Water Storage District, has received Kern River water for irrigation use.

State Water Project

The Kern County Water Agency's contractual supply of State Water Project (SWP) water has been allocated by contract to public water districts within the Agency including Semitropic Water Storage District and its Improvement Districts. Semitropic entered into three separate water supply contracts with the Kern County Water Agency for State Water Project water, one for Semitropic Water Storage District and one for each of the Improvement Districts. The water supplies available under these contracts include "firm water" and "surplus water". The total maximum annual entitlement of firm water for the three contracts amounts to 158,000 acre-feet per year. In addition, under full operating conditions (i.e., full build up of contractual entitlements, effective 1990 and beyond), up to 25,100 acre-feet per year of surplus water would be available.

It should be noted that the contracts with the Kern County Water Agency have provisions such that the Agency is not obligated to deliver more than 28,440 acre-feet per month through Semitropic's turnout. This amount is equivalent to 18 percent of the maximum annual entitlement of firm water. It is further noted that the Kern County Water Agency contract with the State limits the Agency as a whole to 18 percent of its maximum annual entitlement.

In addition to contractual entitlements to SWP water, Semitropic has taken advantage of opportunities to purchase locally unused SWP water through its contracts with the Kern County Water Agency. This water, commonly referred to as agricultural pool water, is excess to the needs of one or more member units of the Agency in a given year and is returned to or pooled with the Agency. The Agency then markets this pool water to other member units.

Central Valley Project

Shafter-Wasco has a contract with the United States Bureau of Reclamation (USBR) for Central Valley Project (CVP) water to serve 27,100 acres within its boundaries. The District's contract entitlement consists of 50,000 acre-feet of Class 1 water and 39,600 acre-feet of Class 2 water, for a total of 89,600 acre-feet. The long-term average surface water supply available to the District is estimated at 69,000 acre-feet. The Class 1 water is storable (for use within a given year) and is considered a firm water supply. The Class 2 water supply is non-storable water and must be used when it is available. The source of this surface water supply is the Friant Unit of the CVP which develops its supply from the San Joaquin River, with storage provided by Millerton Lake. The water is transported to the District through the Friant-Kern Canal. The surface water supply is used conjunctively with the underlying groundwater.

Semitropic does not, at the present time, have a contractual water supply from the Federal Central Valley Project. However, the District has, for several years, attempted to secure a water supply from this source, including exhaustive efforts to clarify Reclamation Law regarding commingling provisions. In 1986, the Bureau and the District executed a one-year contract for 40,000 acre-feet of Central Valley Project water. However, no diversion permit was issued by the State Water Resources Control Board so the water was not delivered. The District, in conjunction with the Kern County Water Agency and other public water districts located within Kern County, initiated the preparation (in 1987) of an environmental document regarding the diversion of water from the Delta. This effort was subsequently suspended in anticipation of the release of the Bureau of Reclamation's water marketing Environmental Impact Statement. This latter document, made public in early 1989, did not make an allocation of water to any of the interested water districts within Kern County. If a water supply is ultimately secured from this source, either interim or long term, it could be wheeled in the California Aqueduct to the District's turnout. Also, it is noted that the District has utilized water which was conveyed in the Friant-Kern Canal and thence via Poso Creek during years of abundant water supply on the San Joaquin River. In 1993, Semitropic purchased Section "215" water which was available early in the year.

Surface Water Quality

The quality of Kern River water as it enters the San Joaquin Valley is excellent, generally less than 100 milligrams per liter of total dissolved solids, making the water suitable (from mineral quality standpoint) for both domestic and irrigation uses. The quality of Friant-Kern Canal water is also excellent, generally less than 100 milligrams per liter of total dissolved solids. The salinity of SWP water is generally in the range of 200 to 400 milligrams per liter of total dissolved solids, a higher but satisfactory range for most domestic and agricultural uses. Other constituents in these three water supplies, such as boron, nitrates, etc. are generally well within acceptable limits for agricultural or municipal use.

GROUNDWATER

The irrigated agriculture located in Semitropic and Shafter-Wasco was developed with essentially full reliance upon groundwater supplies. These district lands overlay an extensive and thick body of valley alluvium generally containing groundwater available for and adaptable to extraction by large irrigation wells.

Shafter-Wasco Irrigation District

The decline in the groundwater table was very gradual until 1921 when the increased pumping depth necessitated the replacement of centrifugal pumps by turbine pumps. There was a progressive lowering of groundwater levels which averaged 2.3 feet per year from 1921 to 1949.

The depth to groundwater underlying the District averaged 144 feet when the first deliveries of CVP-Friant water were made to Shafter-Wasco in 1957. The groundwater level continued to decline to a low of 272 feet in 1977. The continued use of surface water in lieu of groundwater pumping and the subsequent wetter hydrology, evidenced a recovery to a depth of 210 feet in 1987. Groundwater levels again declined during the recent drought, this time resulting in an average depth of 267 feet. Respecting groundwater quality, total dissolved solids concentrations in the lower, confined aquifer system are reported by KCWA to be less than 500 ppm.

Semitropic Water Storage District

As a result of intensifying agricultural development and associated groundwater extractions, groundwater levels generally experienced a steady decline (in large-scale proportions) beginning in the 1940's. SWP water deliveries to Semitropic began in the mid to late 1970's and resulted in groundwater pumping reductions. Subsequently, groundwater levels rose significantly and, more recently, during the recent drought period, water levels have fallen. Over the long-term, there is an average overall decline, particularly in the portions of Semitropic outside of the contract surface water service area.

Wells developed for irrigation historically encountered groundwater of poor to unusable mineral quality in certain areas of Semitropic. One of the most notable of these areas extends along the Buttonwillow Ridge from the vicinity of the Intake Canal southeasterly to Seventh Standard Road. Another is located in the developed lands extending northwesterly from the Intake Canal area. Irrigated lands located in these areas receive SWP water service through the BID, thereby mitigating the water quality problems.

3.0 Project Operation

Project Operation in a Wet Year like 2006

In wet years, when there is excess non-project water available from the California Aqueduct through Semitropic's distribution system to Shafter-Wasco's ineligible and eligible lands. This water will be used in-lieu of groundwater pumping by District growers. These facilities can also be used by Semitropic to receive water from east side sources, such as, 215 water from the Friant-Kern Canal. These facilities will be available to help in recirculation of San Joaquin River water as a result of the water management requirement of the San Joaquin Settlement Agreement. These facilities can also be used to convey Shafter-Wasco's high flow water into Semitropic's banking program

Project Operation in a Dry Year like 2004

In dry years, these facilities will be used to return Shafter-Wasco's prior year banked water from Semitropic or other purchase west-side water available to the District.

4.0 Goals and Objectives

The most serious water supply problem facing Shafter-Wasco is the overdraft of its groundwater supply and under-utilization of its surface water supply. Water users recharge the surface water to the groundwater supply in above-average water years by using surface water to meet their irrigation requirements and not pumping from the groundwater supply. Some surface water is also recharged to the groundwater supply through deep percolation.

The primary goal is to interconnect Semitropic's P-384 System and Shafter-Wasco's main North System lateral, which would allow conveyance between Semitropic's Pond-Poso Canal and Shafter-Wasco's North System. Associated benefits include:

- Operational flexibility for water deliveries
- Increased water supply reliability
- Increased conjunctive use to enhance groundwater levels
- Potential exchanges between SWP and CVP

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is an important upgrade of the inter-connection facilities that tie the State Water Project to the Friant-Kern Canal which is an important element in this IRWM Plan and meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's benefits and objectives of managing the areas groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This project adds conveyance capacity for exchanges between supplies and absorptive capacity within the Region.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The project consists of 18,480 linear feet of 60-inch reinforced concrete pipe (RCP) beginning at the District's existing Pumping Plant P384-B1 site including a booster pumping plant with a bypass line and ending at the tie-in to Shafter-Wasco's Lat. 134.4. There is also a booster pumping plant half mile east of the tie-in site at the end of Shafter-Wasco's Lat. 134.4, which is used to get water into the Friant-Kern Canal. This plant also has a bypass line. Both plants are rated 100 cfs with 70' TDH. There is a bidirectional sonic meter at the beginning of this intertie pipeline.

Estimated costs based on 2006 dollars:

18,480 linear feet. of 60-inchRCP with sonic meter in meter vault:	$5,982,000
Booster pumping plant No. 1:	$1,314,000
Booster pumping plant No. 2:	$1,557,000
Total	$8,853,000
Contingencies @ 20%	$1,771,000
Subtotal	$10,624,000
Eng., legal, and adm. @ 15%	$ 1,594,000
Total	**$12,218,000**

9.0 Schedule

Preliminary design is completed. Projected ready for construction in 2008.

No. 18 Shafter-Wasco/Semitropic Interconnection on Madera Avenue

1.0 Summary

Project Type	Water Supply Reliability
Project Sponsor	Shafter-Wasco Irrigation District
Location	See Figure 1 attached
Estimated Conveyance Capacity	
Project Descriptor	Increased water reliability by constructing facilities to enhance water banking, wheeling and exchanges
Estimated Cost (2006 dollars)	$4,781,000

2.0 Project Description

This project would be a physical connection between Shafter-Wasco Irrigation District's (Shafter-Wasco) Lateral 137.2 System and Semitropic Water Storage District's (Semitropic) B-230 System, both of which are pipeline distribution systems. It would move water in either direction (i.e., to or from each district), which would facilitate water banking, water purchases, water exchanges, and water wheeling arrangements. The interconnection pipeline between the two systems would be a two-mile-long, 36-inch pipeline connecting the end of the 39-inch diameter main transmission pipeline of Semitropic's B-230 System with Shafter-Wasco's Lateral 137.2-7.1N, a 33-inch pipeline located along Palm Avenue.

In addition, a fully operational intertie would include a booster pumping plant.

Figure 1 shows the location and extent of the project.

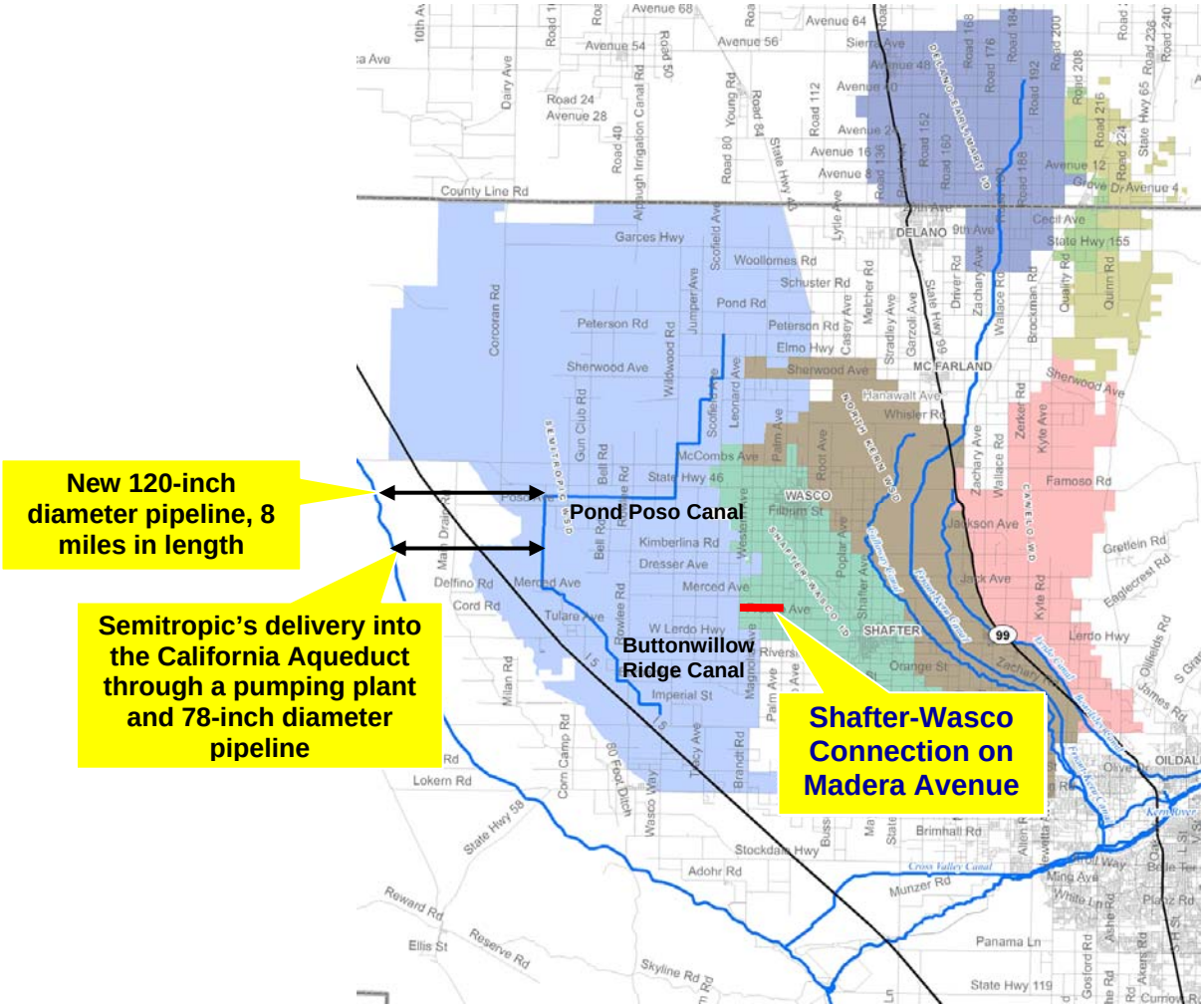


Figure 1. Location of Project

Background

Introduction

The Shafter-Wasco is located immediately adjacent to and east of Semitropic. Shafter-Wasco was organized in 1937 to address rapidly diminishing groundwater supplies. It encompasses 38,000 acres, of which 32,000 acres are irrigated. Shafter-Wasco surrounds the cities of Shafter and Wasco and is crossed by the Central Valley Highway (Highway 43). It is bounded on the east by the Calloway Canal. The northern boundary generally corresponds with Highway 46 and the southern boundary generally corresponds with Seventh Standard Road.

Shafter-Wasco's primary purpose is to contract for surface water supplies, with particular emphasis on the Friant Division of the CVP. It has the additional responsibility of conjunctively managing surface water and groundwater supplies to ensure an adequate water supply for water users.

There is an existing 36-inch pipeline intertie between the irrigation distribution systems of Shafter-Wasco Irrigation District (Shafter-Wasco) and Semitropic Water Storage District (Semitropic). In particular, this

interconnection is located one-half mile north of Highway 46 and connects Semitropic's Pond-Poso Canal with Shafter-Wasco's Lateral 134.4 System. Since its construction in 1995, this facility has facilitated water banking, exchange, wheeling, and sales arrangements between the two districts by accommodating gravity deliveries from Shafter-Wasco to Semitropic and pumped deliveries (through a pumping plant constructed as a part of the interconnection project) from Semitropic to Shafter-Wasco. For example, this facility allows Shafter-Wasco to make better use of its contractual supply of CVP-Friant water by regulating (through a banking arrangement with Semitropic) "wet-year" water to "dry-year" water. Based on the operational success of this interconnection, another interconnection has been proposed by Shafter-Wasco.

See Shafter-Wasco/Semitropic Inerconnection on Kimberlina Road (Project No. 17).

3.0 Project Operation

Project Operation in a Wet Year like 2006

In wet years, when excess non-project water is available from the California Aqueduct through Semitropic's distribution system it can be delivered to Shafter-Wasco's ineligible and eligible lands. This water will be used in-lieu of groundwater pumping by District growers. These facilities can also be used by Semitropic to receive water from east side sources, such as, 215 water from the Friant-Kern Canal. These facilities will be available to help in recirculation of San Joaquin River water as a result of the water management requirement of the San Joaquin Settlement Agreement. These facilities can also be used to bank Shafter-Wasco's high flow water into Semitropic's banking program.

Project Operation in a Dry Year like 2004

In dry years, these facilities will be used to return Shafter-Wasco's prior year banked water from Semitropic or other purchase west-side water available to the District. The delivery of surface supplies will allow for reduced groundwater pumping.

4.0 Goals and Objectives

The most serious water supply problem facing Shafter-Wasco is the overdraft of its groundwater supply and under-utilization of its surface water supply. Water users recharge the surface water to the groundwater supply in above-average water years by using surface water to meet their irrigation requirements and not pumping from the groundwater supply. Some surface water is also recharged to the groundwater supply through deep percolation.

The primary goal of this project is to allow conveyance between the two pipeline distribution systems. Associated benefits include:

- Operational flexibility for water deliveries
- Increased water supply reliability
- Increased conjunctive use to enhance groundwater levels
- Potential exchanges between SWP and CVP

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is an important upgrade of the inter-connection facilities that tie the State Water Project to the Friant-Kern Canal which is an important element in this IRWMP and meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's benefits and objectives of managing the areas groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This project adds conveyance capacity for exchanges between supplies and absorptive capacity within the Region.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The project consists of 10,600 linear feet of 36-inch reinforced concrete pipe (RCP) beginning at the end of the District's existing Lat. B-230 including a booster pumping plant with a bypass line and a bidirectional sonic meter. This plant is rated 50 cfs with 60' TDH. Pipeline ends at a tie-in to Shafter-Wasco's Lat. 137.2-7.1N with two isolation valves at both ends of the tie-in.

Estimated costs:

10,600 lin. ft. of 36" RCP with isolation valves:	$2,100,000
Booster pumping plant with bypass line and meter:	$1,364,000
Total	$3,464,000
Contingencies @ 20%	$ 693,000
Subtotal	$4,157,000
Eng., legal, and adm. @ 15%	$ 624,000
Total	**$4,781,000**

9.0 Schedule

Preliminary design is completed;
CEQA is not completed;
District does not own all R/W;
Anticipated to be ready for construction in 2008.

No. 19 South Interconnection between North Kern/Shafter-Wasco

1.0 Summary

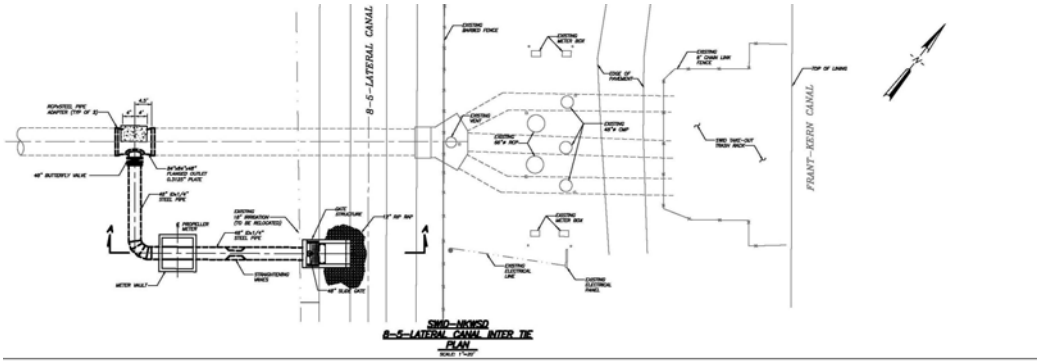
Project Type	Water Supply Reliability
Project Sponsors	North Kern Water Storage District and Shafter-Wasco Irrigation District
Location	See map at beginning of Appendix
Estimated Conveyance Capacity	50 cfs
Project Descriptor	Increased water reliability by providing access to alternative supplies
Estimated Cost (2006 dollars)	$600,000

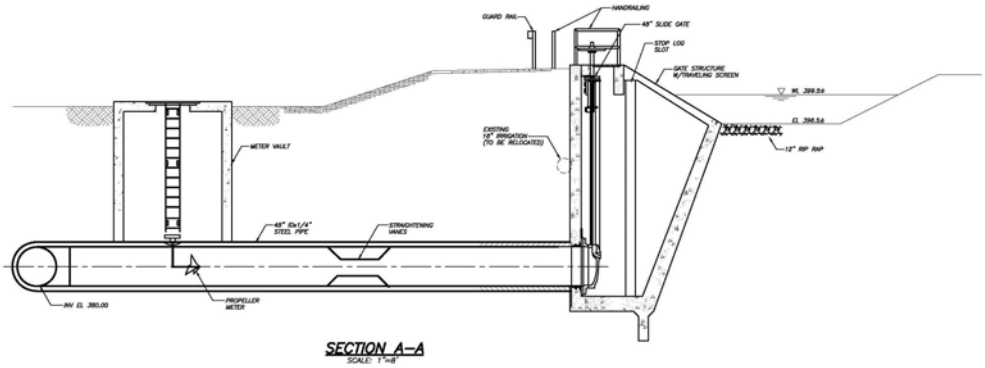
2.0 Project Description

The proposed project would connect North Kern's "8-5" ditch to Shafter-Wasco's Lateral 137.2. The interconnection would be a one-way, 50 cfs, gravity pipeline connection and a gated turn-out structure from the "8-5" ditch would be required.

Background

For background information refer to Project No. 14, North Interconnection between North Kern/Shafter-Wasco





3.0 Project Operation

Project Operation in a Wet Year like 2006

In a wet year, if there are any supplies available to North Kern that may be delivered to USBR designated excess lands, this facility provides a means of moving such water into Shafter Wasco's south system.

Project Operation in a Dry Year like 2004

In a dry year, this facility may be used to return water stored underground in North Kern facilities by delivery of North Kern's deepwell produced water to Shafter-Wasco. Deliveries can be made either in return of a prior year Shafter-Wasco banked supply or for North Kern's delivery of off-peak season water for peak season water for energy and supply management purposes.

4.0 Goals and Objectives

The primary goal of connecting North Kern's "8-5" ditch to Shafter-Wasco's Lateral 137.2 is to allow for operational flexibility that may enhance conjunctive use. Associated benefits include:

- Increased water supply reliability through system redundancy and flexibility
- Increased conjunctive management of surface and groundwater resources
- Energy savings through delivery of surface supplies in-lieu of pumping groundwater

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability and in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

The connection allows for increased conjunctive use of local and imported surface supplies with the groundwater by providing additional opportunities for exchanges that allow for energy savings and enhancing the groundwater levels in the Region.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The estimated planning costs for implementing the interconnection between North Kern's "8-5" ditch and Shafter-Wasco's Lateral 137.2 are presented in the following table.

Construction				397,484
Engineering	7%			27,824
Construction Management	9%			35,774
Total without contingency				461,081
Capital Cost, 2006 price level	30%			600,000

9.0 Schedule

Preliminary design is completed;
CEQA is not completed;
District does not own all R/W;
Requires SWID shutdown;
Projected ready for construction in 2008.

No. 20 Energy Usage

1.0 Summary

Project Type	Water Supply Costs
Project Sponsor	Semitropic Water Storage District
Location	Poso Creek IRWMP Region
Estimated Conveyance Capacity	
Project Descriptor	
Estimated Cost (2006 dollars)	Not estimated

2.0 Project Description

For a related project background, see Project No. 3a - Stored Water Recovery Unit In-Lieu Service Areas.

An example of an energy usage project is Semitropic's contract with Shell Solar to install a 1 MV Solar Generation Facility across the 4-½ acre project to control rising energy costs. PG&E's Self-Generation Incentive Program provided half of the $6 million needed to install the solar project. Semitropic now is able to offset more expensive utility power and potentially could sell excess electricity to the power grid if generation exceeded in-District pumping demand.

It is estimated that five percent of the District's total energy needs are now being met through the solar system. Savings amount to 15.5 cents per kilowatt hour during the afternoon in the summer months. Semitropic has plans to install more of the latest solar technology that may be concentrated photo voltaic. Over the expected 25-year lifespan of the panels, the predicted energy savings for the District should reach $3.3 million. Annually, the system is projected to deliver 1.7 million KWH of electricity.

A second energy usage project example of supplemental generation is the use of hydroelectric generation on intake pipeline entering the District such as Semitropic's Pump-Back Pipeline (and in the future the SWRU 120" East-West Pipeline). Also, other sources of energy can be connected to the system to provide more reliable electrical service and opportunities to participate in load shedding programs offered by the electrical utility.

Much of the water delivered within the study area requires substantial amounts of energy either to be pumped from the underground or conveyed and distributed through delivery systems to the end user (or both). Because the water facilities operated can be significantly different between wet and dry years, a lot of duplication of electrical service occurs. This duplication of service can be partially avoided by tying facilities together and using common electrical facilities. Thus, wells that run in dry years and distribution pumping plants that run in wet years can use common electrical facilities. An example of this is Semitropic's 40 miles of electrical distribution system to both wells and pumping plants. Additionally, once the systems are tied together, supplemental energy generation can be added.

A third example is described in Project No. 13. In-lieu recharge also results in energy savings. When water is delivered on the surface in-lieu of a grower pumping a well, it equates to savings in electrical energy.

3.0 Project Operation

Project Operation in Wet Years
Electrical load shifts to distribution pumping plants.

Project Operation in Dry Years
Electrical load shifts to groundwater recovery wells.

4.0 Goals and Objectives

Reduced costs and more reliable electrical service.

5.0 Project's Consistency with IRWMP Objectives and Strategies

Helps control water supply costs and other resource management strategies.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Electrical facilities may impact the operation of most other structural components of the Plan.

7.0 Project Screening Priority within the IRWM Plan

Considered for Project Integration. This Project meets the Regional Management Group's pre-screening criteria for Tier 2 Projects. Therefore, it is considered a Tier 2 Project that will be recommended for inclusion in implementation proposals beyond the Tier 1 timeframe of 3 years and for funding opportunities that relate to energy savings.

8.0 Schedule

Probably longer than 3 years.

No. 21 Joint Powers Authority

1.0 Summary

Project Type	Governance
Project Sponsor	IRWMP Participants
Location	Two or more Participants
Project Descriptor	Provide a Governance Organization
Estimated Cost (2006 dollars)	Unknown but expected to be minor

2.0 Project Description

Regional Management Group members will consider forming a Joint Powers Authority (JPA), as needed, for implementing projects that would benefit from this method of governance. Joint Powers Authorities are separate public entities created when two or more public agencies come together for a particular mission or purpose.

Section 6500 et. seq. of the California Government Code allows for the formation of joint powers authorities. As stated, "If authorized by their legislative or other governing bodies, two or more public agencies by agreement may jointly exercise any power common to contracting parties, even though one or more of the contracting agencies may be located outside this state. The agreements shall state the purpose of the agreement or the power to be exercised. They shall provide for the method by which the purpose will be accomplished or the manner in which the power will be exercised."

Many of the projects proposed in this plan involve two or more IRWMP Participants. Many of these projects will need a formal form of organization to provide for construction, operation, maintenance and water supply. Also, the equity between partners must be determined and maintained. These could be handled on an ad hoc basis by agreements between parties specific to the project, separate JPAs for each project between the active participants or possibly one JPA including all of the participants with each project having separate terms or agreements.

Construction of some features will involve one or more agencies and be located in one or more districts. A definite agreement and form of governance needs to be established to provide for construction. It is probably that construction will be by contracting which requires a legal entity to perform the service. A JPA is one method of accomplishing this. Maintenance of the facility must also be covered by some form of agreement along with ownership and liability.

The operation of the facility must be determined and agreed to before construction. Also, the water supply must be determined. Many of the projects will take surplus water from one entity for either direct use or groundwater recharge. In some cases it will be necessary to keep track of that water because of water rights. The water will need to be returned at a later date. Some type of accounting is required and this needs to be done with some overall oversight by the project participants. A JPA may be the proper vehicle to perform this function.

Background

3.0 Project Operation

Project Operation in Wet Years
The organization which may be a JPA will have as a primary function the ability to quickly recognize and put extra surplus water to either direct use or into groundwater storage. The direct use results in in-lieu recharge. The organization needs to be quick to act as water supply conditions change in order to maximize the absorption of water in the Region. The organization also needs to able to maintain the equity between the participants. One of the primary functions of the Poso Creek IRWMP is to be able to absorb surplus year water from more than one source and a governance vehicle is needed for this purpose.

Project Operation in Dry Years
In dry years, the organization which may be a JPA, will need to be able to move water between districts and/or return stored water as needed to either the project participants or in some cases into the California Aqueduct or possibly the Friant-Kern Canal as part of a water banking activity. Again, equity between participants and maintenance of water reliability is the key.

4.0 Goals and Objectives

The goals and objectives of a JPA, if this is the chosen vehicle of governance, is to operate and provide governance of the joint regional facilities. The matters in the objectives may include financing, contracting for construction, setting operating goals including maximizing the use of surplus water. An additional goal will be the banking of water for entities outside of the Region.

5.0 Project's Consistency with IRWMP Objectives and Strategies

This Project is the means to carry out the IRWMP objectives and strategies. If a JPA is chosen as the governance method, then it can be the method for carrying out the objectives.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

A JPA, if chosen, can be a single JPA including all of the Participants or more than one JPA with project participants being included as appropriate. It appears that a single JPA can provide the greatest benefit as it can easily take advantage of added projects as they are constructed. It will also simplify the administration and ability to add projects.

The main purpose of the Poso Creek IRWMP is to import wet year water. A single JPA may have the advantage of being able to act quickly when water is available and to provide a decision making forum so that opportunities are not lost. Experience has shown that the imported water supply changes rapidly and it is expected that the changes may be even more frequent in the future. Flexibility becomes a major factor in being able to use the surplus water.

Again, one of the major factors will be to keep equity between partners. Also important will be to keep an ownership make on the water so as to not trespass on any water rights issues. It is believed that this latter item can be successfully carried out as water is shifted in time only.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The development of one or more JPAs is not expected to be a large cost. It would be included in the administrative budgets of the participants. Once a JPA is formed there are certain administrative expenses that occur. It is not possible to determine these at this time but they are minor and would fall within the range of the existing normal administrative costs. Portions of these administrative costs would be allocated to the separate projects as appropriate.

9.0 Schedule

The Schedule of this Project is dependent upon Project 22, Institutional Agreements and Governance for IRWMP Implementation. A governance decision needs to be made and a JPA may follow. The appropriate time to create a JPA is within six months from the time of initiation of any contracts based on implementation proposals.

No. 22 Institutional Agreements and Governance for the Poso Creek IRWMP Implementation

1.0 Summary

Project Type	Organizational
Project Sponsor	Poso Creek IRWMP Regional Management Group
Location	Poso Creek IRWMP Region
Estimated Conveyance Capacity	N/A
Project Descriptor	Institutional Arrangements
Estimated Cost (2006 dollars)	$100,000 or more

2.0 Project Description

The development of many of the projects of the Poso Creek IRWMP will require some form of agreement between participants and it may be beneficial for additional CEQA/NEPA documents to ensure the water districts can operate quickly when implementing exchanges. Some of the projects can be implemented by one participant and separate agreements or joint participation is not needed. Other projects involve two entities for implementation and it is only required that there be agreement between those two participants. Furthermore, some of the regional projects are all inclusive and a form of governance is required. As part of each implementation grant proposal, a form of governance will be proposed that is appropriate for the suggested set of projects. The logical steps to be followed are to 1) determine the type of governance needed for the collection of proposed project, 2) choose what type of agreements are applicable and if a JPA is a preferred method, 3) make the necessary arrangements, and 4) include in the implementation proposal.

Background

3.0 Project Operation

Project Operation in Wet Years

The Poso Creek IRWMP is developed to operate in wet years and take advantage of the surplus water that may be available. The need is for a fast acting flexible organization that can put the surplus water to use when available with out loss of opportunity. Use may be by direct application in-lieu of pumping groundwater or it may be surface spreading. With the three primary sources of surface water (State, Friant and Kern River), the timing of supplies may be different and by increasing the size of the area of use by interconnecting projects and with the proper agreements, a greater amount of surface water can be used in wet years. It is our experience that flexibility and facilities provide a means of obtaining surplus water. The very large groundwater basin in the Region provides the storage space to accommodate the water for later dry year usage.

The water districts in the area have operated conjunctive use programs for many years. The projects included in this plan only expand the potential for conjunctive use between districts to the benefit of not only the Region but to the whole state.

Project Operation in Dry Years

Water stored in wet years by the increased facilities will allow for greater reliability during the dry years. Future plans may even allow for the later transfer of previously stored water into the California Aqueduct and Friant-Kern Canal for banking for outside interests.

4.0 Goals and Objectives

The goal of this Project is to provide the vehicle for the physical projects proposed and selected. The objectives of the Project are the basic objectives of the Project as a whole. The three main objectives are water reliability, competitive water costs and water quality protection. As noted, the three surface water supplies reaching the area and the large groundwater basin are a major asset in providing a conjunctive use program that is beneficial to the Region and also to the State.

5.0 Project's Consistency with IRWMP Objectives and Strategies

This Project is to provide the organizational structure to help manage the implementation of projects to meet the objectives of the IRWMP and is to identify additional environmental documentation needs for water exchange and water banking agreements that will develop to meet the IRWMP objectives and strategies.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This Project is to help manage the projects and objectives to be implemented.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The cost of this element could be considerable and may involve some joint contract preparation and procedural matters. An estimate of $100,000 has been provided for the joint costs of this element to develop the initial EIR documents for proposed projects and additional water banking operations. Any costs of the participants above this amount will be determined as part on-going proposals and tasks developed by the Poso Creek IRWMP Regional Management Group.

9.0 Schedule

Remaining CEQA needs for implementation of projects is part of this non-structural project and a CEQA/NEPA document that covers the water exchanges and water banking agreements between districts that involves CVP and SWP may be needed to implement the larger projects contained in this IRWMP.

No. 23 Groundwater Banking for Parties Outside of Poso Creek IRWMP Region

1.0 Summary

Project Type	Groundwater banking and conjunctive use
Project Sponsor	IRWMP Participants
Location	IRWMP Region
Estimated Conveyance Capacity	Involves all surface water imported
Project Descriptor	Groundwater Banking of water for areas outside of the IRWMP
Estimated Cost (2006 dollars)	Not determined

2.0 Project Description

Groundwater banking in the Poso Creek area on behalf of outside Parties is currently being accomplished by Semitropic Water Storage District (Semitropic). The original Semitropic program to bank 1,000,000 acre-feet is fully subscribed and has banked nearly 1,000,000 acre-feet. The banking partners deliver water to Semitropic through the California Aqueduct and the water is stored primarily through in-lieu means by Semitropic. When a call occurs by the banking partner, Semitropic can return the water by either leaving entitlement water in the California Aqueduct or by actually pumping previously stored groundwater into the California Aqueduct. Semitropic has an additional program under development that will store up to 650,000 acre-feet and return the water to the California Aqueduct from a planned well field. The return would be by means of a 7 mile long, 120-inch diameter pipeline that has become operational in May of 2007.

The long-standing cooperation between Regional Management Group members exists because of their shared groundwater supplies and common interests. In 1995, Semitropic commenced implementation of a groundwater bank for one million acre-feet. At the end of 2006, almost one million acre-feet was in groundwater storage. The amount of storage available for water banking has since been increased to 1.65 million acre-feet. In this regard, it is noted that the storage capacity of the groundwater basin is substantially larger than the amount that has been earmarked for water banking.

Banking programs similar to Semitropic are possible in the Region. There is a need in the state for banking of wet year water and it appears that this need will increase in the future. The Region is in an ideal location with three separate surface water supplies and a very large groundwater basin that is accessible. In general, the groundwater is of good quality for return to the California Aqueduct.

Banking of water for outside interests has several benefits, 1) It benefits the Region with higher water tables and less expensive water costs, 2) It increases the water delivered on the surface decreasing the use of energy to pump the groundwater, 3) It provides a source of income for the banking service which is reflected in lower water costs for the growers in the Region, 4) The increased storage of water increases the water reliability for the area, and 5) The program benefits the outside banking partners as they gain

storage at a significant less cost and with less environmental constraints then surface reservoirs. Banking partners can be suppliers of municipal water, irrigation water or environmental water. There is less loss of water from the groundwater basin compared to a surface reservoir. The program benefits the State as it is consistent with the CALFED Bay- Delta Program.

Background

3.0 Project Operation

Project Operation in Wet Years

The banking project would take water from outside banking partners during wet years and either replace pumping by in-lieu means or percolate the water directly to the underground. Typically, a banking partner is credited with 90 percent of the water delivered considering losses at 10 percent. This ten percent mostly remains in the basin and goes to make up accumulated overdraft. Wet year operations are complicated by the short notice of water deliveries based on the timing of precipitation. As conditions change the Region must be able to react to the changes to take advantage of the supply. Experience has shown that even during normal or even less than normal years there can be water banked by some parties because of there own situation and supply. Banking partners are from all over the State, therefore, a groundwater bank adds the advantage of a diversity in supply.

Project Operation in Dry Years

During dry years, when outside banking partners call for water it can be returned by entitlement and/or direct delivery into the California Aqueduct, or by various direct delivery and exchanges involving conveyance using the Friant-Kern Canal, the Cross Valley Canal, and the Kern River. The new Semitropic 120-inch East-West Conveyance Pipeline can be used to deliver stored water back to the California Aqueduct. Some of the other planned facilities will make it possible to deliver water to other locations.

4.0 Goals and Objectives

The goals and objectives of outside banking are to bring more water into the Region on a conjunctive use basis for banking. When banked water is returned there is an increase in stored water of 10 percent of the banked water. During the time the water is in storage the water levels in the Region are higher and pumping costs are less. As water is cycled in and out by the banking partners there is an added residual of water. The banking projects do require funds from the partners to build added facilities to import water. These facilities are used to the advantage of the Region to bring in non-banking water that becomes available during some times of most years. All of these factors add to an increased reliability in water supply. They also reduce the cost to the growers to help them maintain there economic place in the world market.

5.0 Project's Consistency with IRWMP Objectives and Strategies

The banking of water for outside parties is consistent with the conjunctive use operations that are practiced and have potential for increase in the Poso Creek IRWMP.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

The water banking with outside parties can make use of many of the projects included in this Plan. This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals. It is recognized that this Project is not considered a higher priority than constructing the structural projects of the Poso Creek IRMWP Region; hence, it will be considered as a project to be integrated in with the structural measures in implementation proposals.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

Not determined for the planning document. As future Third-party banking arrangements are being considered as an integrated solution to the Region's needs.

9.0 Schedule

Third-party banking agreements will be considered as part of implementation proposals.

No. 24 Optimize the Region's Pumping Lifts

1.0 Summary

Project Type	Groundwater Management
Project Sponsor	IRWMP Participants
Location	Poso Creek IRWMP Region
Estimated Conveyance Capacity	N/A
Project Descriptor	Optimizing pumping within the Poso Creek IRWMP Region
Estimated Cost (2006 dollars)	Not provided

2.0 Project Description

Benefits to the area could be developed by choosing the location of pumping. The vehicle to choose the pumping location requires an overall management agency to make decisions and to maintain equity between pumpers. Transfer facilities must be in place to move water from area pumped to point of use.

The location of pumping can create benefits from several different aspects. These can be:

1. Use of the most efficient wells and pumps
2. Use of the lowest lift pumps to use less energy
3. Pumping in areas of high groundwater to provide space for future spreading
4. Control migration of poor quality water
5. Potentially remove poor quality water

This project could be developed with cooperation of the overlying Districts and the pumpers. It would need to provide benefits to all and it is reasonable to determine that it will. This is similar to pumping operations developed for two large irrigation districts in Arizona after CAP water became available. The wells were operated by the district to the benefit of all producers.

The benefits of this program are lower costs, minimal capital outlay, and less energy consumed and create opportunities to store more wet-year water.

Background

3.0 Project Operation

Project Operation in Wet Years

Deliver surface water to in-lieu areas with a priority to shut off wells with greatest lifts.

Project Operation in Dry Years

Pump with high efficient and low lift wells from areas within the Poso Creek IRWMP Region with low pumping lifts to water service areas with higher pumping lifts. Base the decision on which well to use on pumping lifts plus the energy to convey the water and not solely on district boundaries.

4.0 Goals and Objectives

The goal of this project is to optimize the pumping lifts within the Poso Creek IRWMP Region.

5.0 Project's Consistency with IRWMP Objectives and Strategies

Helps control water supply costs.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This project will be practiced indirectly by implementing many of the projects listed in the Poso Creek IRWMP. It is challenging to control the priority of each district's pumping without an umbrella agency in charge of all wells production, which is not likely to happen soon.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 2 Projects. Therefore, it is considered a Tier 2 Project that will be recommended for inclusion in implementation proposals beyond the Tier 1 timeframe of 3 years.

8.0 Cost Estimate

Not estimated at this time.

9.0 Schedule

This project is in the conceptual planning phase at this time and it is estimated to take longer than three years before it would be a priority to the Region.

No. 25 Enhance Groundwater Monitoring and/or Modeling

1.0 Summary

Project Type	Groundwater Management
Project Sponsor	IRWMP Participants
Location	Poso Creek IRWMP Region
Estimated Conveyance Capacity	
Project Descriptor	Improvements to enhance groundwater monitoring to help manage groundwater resources
Estimated Cost (2006 dollars)	$37,600 - $51,900, Phase I

2.0 Project Description

This project would enhance groundwater modeling by reducing uncertainty in estimates of crop evapotranspiration (ET) that substantially influence groundwater modeling results and by quantifying the spatial distribution of ET across the IRWMP Region to increase the spatial sensitivity of water balance and groundwater modeling efforts.

Background

Exiting groundwater monitoring and modeling efforts started prior to 1995, when Semitropic began implementation of the Semitropic Groundwater Banking Program. The Program is a long-term water storage program designed to enhance groundwater conditions, increase operational reliability and flexibility, and optimize the distribution and use of available water resources between Semitropic and potential banking partners. A groundwater monitoring program was established in 1994 to develop information so that any adverse impacts of the water banking project could be mitigated. The monitoring program is overseen by a committee made up of Semitropic Water Storage District, adjoining districts, and banking participants. Kern County Water Agency and the California Department of Water Resources are interested parties and participate in committee activities. Monitoring has included water level measurements in monitoring wells and groundwater quality (including salinity and nitrate) evaluations. The monitoring program includes the following (Semitropic Biennial Groundwater Monitoring Report, 1999):

- Semi-annual water level measurements in numerous water supply and monitoring wells
- Continuous water level measurements in selected monitoring wells and monthly water level measurement in other wells
- Annual water quality sampling of selected actively used water supply wells, and more frequent sampling of some monitoring wells
- Preparation of semi-annual (spring and fall) water-level elevation maps with the direction of groundwater flow indicated on the maps
- Preparation of water-level hydrographs for many wells
- Preparation of a water-level change map for Spring 1995-Spring 1999 for use in evaluating the 1995-98 water banking activities
- Preparation of a biennial groundwater monitoring report by third-party consultant

Semitropic's groundwater monitoring committee is comprised of representatives from Semitropic and the following (*adjacent districts who share the groundwater basin):

- Alameda County Water District
- Buena Vista Water Storage District*
- California Department of Water Resources
- Kern County Water Agency
- Lost Hills Water District**
- Metropolitan Water District of Southern California
- Newhall Land & Farming Company
- North Kern Water Storage District*
- Rosedale-Rio Bravo Water Storage District*
- Santa Clara Valley Water District
- Shafter-Wasco Irrigation District**
- Southern San Joaquin Municipal Utility District*
- Vidler Water Company
- Zone 7 Water Agency

In addition to the Semitropic Monitoring Committee activities, Kern County Water Agency helps to maintain a groundwater level database. Each member district of the Poso Creek IRWMP has an adopted groundwater management plan which describes their individual monitoring efforts. Semitropic and North Kern have cooperatively expanded a regional MODFLOW model, initially developed by North Kern, to benefit both of their areas.

3.0 Project Operation

This Project would be implemented using a phased approach, designed to cost-effectively enhance existing groundwater modeling efforts. In the first phase, an improved method of estimating consumptive use using remote sensing would be applied to validate the currently used method for a normal year. Annual ET estimates would be compared to current estimates to identify potential biases in the current estimation methods. Pending review of the results and assessment of the impact of differences in computed ET on groundwater modeling, additionally annual ET estimates would be developed for wet and dry years (Phase II). Ultimately, if found to greatly enhance groundwater modeling efforts, the improved ET estimation procedures could be implemented each year (Phase III).

Background on ET Method

The remainder of this section provides additional background information on the proposed approach to improve ET estimates.

Impact of Flow Path Uncertainties in Water Balances: The groundwater model for the Poso Creek IRWMP area relies upon a surface layer (i.e., vadose zone) water balance to estimate groundwater recharge. In simplified terms, applied water, groundwater pumping, and precipitation compose the inflows to the surface layer while total consumptive use (crop ET), soil surface evaporation, surface runoff, and deep percolation (recharge) compose the outflows from the surface layer. The balance of estimated inflows with outflows results in a change in soil moisture storage, which is typically assumed to be zero over the course of an entire year. Thus, it is possible to estimate deep percolation (or recharge) based on the water balance:

Deep Percolation = Applied Irrigation Water + Precipitation
– Crop ET – Soil Evaporation – Change in Storage – Surface Runoff

Uncertainties in the individual components of the water balance contribute to the overall uncertainty in the "closure" term, in this case deep percolation. To illustrate the impact of uncertainty in individual water balance components on the closure term, consider a hypothetical example of a simple district-scale annual water balance for irrigated lands. Water balance components and corresponding uncertainties have been estimated to examine potential uncertainties in estimated deep percolation (Table 1).

Table 1. Hypothetical Irrigated Lands Water Balance to Estimate Deep Percolation.

Component	Category	Annual Flow Volume (ac-ft)	Confidence Interval %	Confidence Interval ac-ft, ±
Applied Water (AW)	Inflow	1,100,000	5	55,000
Precipitation (P)	Inflow	200,000	15	30,000
Crop Evapotranspiration (ET)	Outflow	1,000,000	15	150,000
Surface Runoff (SR)	Outflow	0	NA	NA
Deep Percolation (DP)	Closure	300,000	54	162,558

Uncertainties resulting from the combination of water balance components are estimated based on the assumption that errors are independent and random. For each component, the total uncertainty, in acre-feet) is estimated based on an estimate of the percent uncertainty (e.g., the 95th percentile confidence interval). The uncertainty for each component is calculated as the uncertainty as a percentage multiplied by the estimated value. For example, based on estimated uncertainty in applied water of 5% and an estimated total value of 1.1 million acre-feet, the total uncertainty is 55 thousand acre-feet (55 kaf = 1.1 maf x 5%).

For the closure term, the total uncertainty in acre-feet is estimated as the root mean square of the uncertainties in the individual water balance components. For Table 1, the total uncertainty in the deep percolation estimate is estimated as follows:

$$\delta DP = \sqrt{\delta AW^2 + \delta P^2 + \delta ET^2 + \delta SR^2} \qquad [1]$$

where δDP is the uncertainty in deep percolation, δAW is the uncertainty in applied water, δP is the uncertainty in precipitation, δET is the uncertainty in crop ET, and δSR is the uncertainty in surface runoff. Note that because it has been estimated for the example that no surface runoff occurred, uncertainty in surface runoff does not influence the calculation.

The 54 percent uncertainty in deep percolation presented in Table 1 is calculated from the total uncertainty of 162,558 ac-ft determined from Equation 1, divided by the estimated deep percolation (300,000 ac-ft). These procedures are described in greater detail by Clemmens and Burt (Accuracy of Irrigation Efficiency Measurements, J. Irrig. and Drain. Eng., 125, 97. 1997).

This example does not represent the Poso Creek IRWMP Region per se, but provides a reasonable evaluation of the potential impact on water balance uncertainties of refining crop ET estimates using the remotely sensed energy balance. Based on the example, total consumptive use accounts for approximately 77 percent of the total applied water and precipitation (1 out of 1.3 million acre-feet). Relatively small uncertainties in these components (i.e., 5 % for surface inflows and 15% for consumptive

use) result in large uncertainty in the closure term, deep percolation. In fact, the resulting uncertainty in the closure term (+/- approximately 160 thousand acre-feet) is more than half of the quantity to be estimated (300 thousand acre-feet deep percolation).

In order to estimate the impact of improved estimates of consumptive use on the closure term from the example water balance, consider the impact of reducing the annual uncertainty in crop ET to 5%. The resulting estimate of deep percolation from irrigated lands and adjusted uncertainty is shown in Table 2.

Table 2. Hypothetical Irrigated Lands Water Balance to Estimate Deep Percolation, Following Refinement of Crop ET Estimates.

Component	Category	Annual Flow Volume (ac-ft)	Confidence Interval	
			%	ac-ft, ±
Applied Water	Inflow	1,100,000	5	55,000
Precipitation	Inflow	200,000	15	30,000
Crop Evapotranspiration	Outflow	1,000,000	5	50,000
Surface Runoff	Outflow	0	NA	NA
Deep Percolation	Closure	300,000	27	80,156

For the example, it is assumed that the refined crop ET (Table 2) was found to have the same value as the crop ET using the Kc x ETo approach or other traditional means. In practice, it is possible that differences in the estimated ET would be found due to biases in the traditional estimation method.

By comparison of uncertainties in deep percolation prior to and following refinement of ET estimates, refined crop ET estimates resulted in a reduction in the uncertainty in deep percolation 80,000 acre-feet, or 50% for the example. This example illustrates the substantial impact uncertainties in primary water balance components (e.g., inflows and consumptive use) can have on lesser, but important, water balance closure terms.

Uncertainty in Current ET Estimation Methods: The standard method of estimating consumptive use in California is based on the Kc x ETo approach, whereby a crop- and time-specific crop coefficient (Kc) is multiplied by the consumptive use of a well-watered reference crop such as grass (ETo). For the Poso Creek IWRMP water balance, ET estimates have been developed based on estimates of crop ET provided by the Irrigation Training and Research Center (ITRC) for water balance purposes. Monthly ET estimates are provided for unique combinations of ETo zone, irrigation method, crop, and year type. Year types are wet years, dry years, and normal years.

Uncertainties resulting from the Kc x ETo approach vary for different time (e.g., daily, monthly, seasonal, annual) and space (e.g., field, section, district, basin, state) scales but are generally considered to be greater than 10%. Burt suggested uncertainties of 15 – 30% for the example water balance presented in his paper "Irrigation Water Balance Fundamentals," presented at the USCID Conference on Benchmarking Irrigation System Performance Using Water Measurement and Water Balances held in San Luis Obispo during March 1999. Clearly, the large uncertainties that result from the Kc x ETo approach have the potential to result in large uncertainties in water balance closure terms such as groundwater recharge.

Remotely Sensed Energy Balance: A relatively new method (developed over the last 20 years) is being used throughout the west to improve ET estimates for water resources management through the use of multispectral satellite imagery to solve the surface energy balance. The Surface Energy Balance

Algorithm for Land (SEBAL®) is the oldest and most validated method of developing remotely-sensed estimates of ET. A conceptual diagram of the surface energy balance is provided in Figure 1.

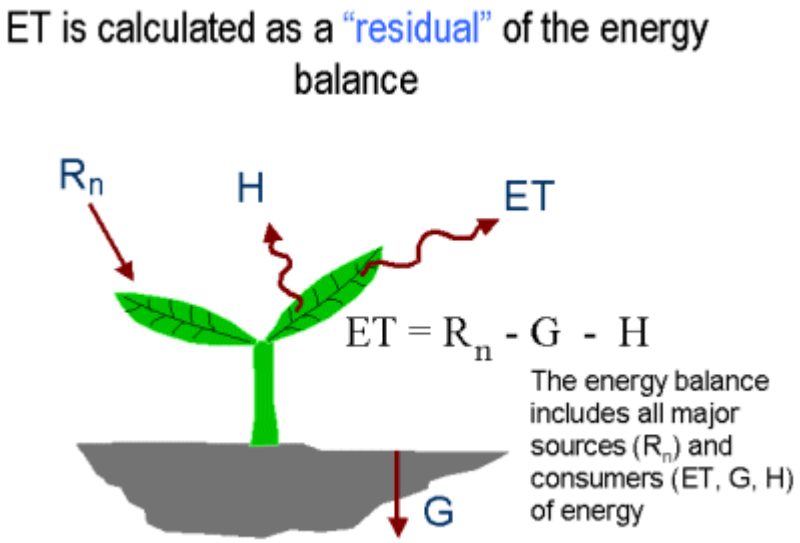


Figure 1. Surface Energy Balance to Estimate Evapotranspiration.

As depicted in Figure 1, SEBAL balances the net incoming radiant energy from the Sun (R_n) with the combined energy flux to the soil (G) and to the air (H) to find the energy used to vaporize water (ET). SEBAL computes ET for each pixel in a satellite image by applying radiative, aerodynamic and energy balance physics in 25 computational steps. Knowledge of land use and crop types is not needed, since all information, with exception of ground-based weather data, is obtained from the satellite image. SEBAL inherently accounts for the effects of salinity, deficit irrigation, disease, poor plant stands, and other factors that represent real-world conditions. These influences are nearly impossible to factor into standard ET estimation methods without detailed information describing individual fields. Byproducts of the SEBAL analysis include biomass production, reference ET (ETo) and Potential ET (ETp). SEBAL offers three distinct advantages compared to the generally accepted "K_c x ET_0" method for computing ET:

- SEBAL computes actual evapotranspiration (ETa), inherently accounting for the effects of salinity, deficit irrigation, disease, poor plant stands, etc., on the actual ET flux. These influences are nearly impossible to factor into the standard Kc x ETo computation.
- The acreage of water-using land is observed directly from the satellite image, so accurate land use is implicit to the process. These features overcome the typical difficulty of assembling accurate records of irrigated areas and cropping patterns, especially for historical analyses.
- SEBAL does not need crop type to solve the energy balance, so records of cropping patterns are not needed.

The resulting digital ETa and biomass production image data can be imported into GIS for spatial analysis and combined with land use and other data. High spatial resolution (30m) enables analysis within irrigated fields, for example to assess water use uniformity.

The SEBAL model has been validated in the United Sates in California, Idaho, New Mexico, and Oklahoma as well as worldwide. ET estimates for a single satellite overpass (one set of image data) agree within 20% of intensive ground-based measurements (e.g., lysimeters, surface renewal techniques, etc.) while seasonal and annual estimates of ET across a series of images agree within 5% of ground-based estimates. A detailed review of SEBAL validation studies is provided by Bastiaanssen et al. (SEBAL

Model with Remotely Sensed Data to Improve Water Resources Management Under Actual Field Conditions, J. Irrig. and Drain. Eng., 131, 85. 2005).

Remote sensing of ET in California has been recommended by the CalFed Bay-Delta Authority's Independent Panel (of scientists) on Appropriate Measurement of Agricultural Water Use. According to the panel, "Current approaches to measuring crop water consumption rely on indirect methods applied infrequently, a practice that means [the State's] estimates of crop consumption—a significant portion of California's total water use—are not validated and could include significant error. The Panel's recommended approach—using satellite-generated remote sensing to measure crop consumption—is expected to yield significantly better estimates than current practices." It is expected the improved estimates would increase confidence in annual calculations of ET and would reduce biases, if any, existing in current estimates.

4.0 Goals and Objectives

The goal of this project is to enhance groundwater modeling by improving the estimation of consumptive use for agricultural, natural, and urban areas within the Poso Creek IRWMP Region, resulting in an improved surface layer water balance used to estimate groundwater recharge. Specific goals of this project are to (1) identify and correct biases in current consumptive use estimates; (2) reduce uncertainties in groundwater recharge estimates; and (3) increase understanding of the spatial variability in groundwater recharge as influenced by varying crop ET at field, section, and district scales.

It is anticipated that improved consumptive use estimates will enhance groundwater modeling activities, supporting the achievement of groundwater level and water quality goals.

5.0 Project's Consistency with IRWMP Objectives and Strategies

Improved understanding of the consumptive use of water across agricultural, natural, and urban landscapes within the Poso Creek IRWMP Region underlies all seven of the planning objectives identified by improving the fundamental water balances used to quantify how, when, where, and how much water enters and leaves the various components of the hydrologic system.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This Project indirectly supports the range of other projects by providing greater confidence in existing analyses used to guide water management decisions.

7.0 Project Screening Priority within the IRWM Plan

This Project meets the Regional Management Group's pre-screening criteria for acceptable Projects by enhancing groundwater management and the ongoing water management measures practiced within the Region. The project can be implemented in the near-term since it is in support of a high priority strategy, groundwater management. Otherwise, it is recognized that it is a non-structural measure and may not be one of the highest priorities for this Region. Thus, it is considered a Tier 1 Project that will be recommended for integration in near-term implementation proposals.

8.0 Cost Estimate

Development of remotely-sensed ET estimates using SEBAL requires purchase of satellite imagery, processing of the imagery and application of the SEBAL model, and integration of the results into groundwater modeling activities. The estimated cost of satellite imagery purchase and application of SEBAL is summarized in Table 6. These estimates were provided by SEBAL North America, a remote sensing company in Davis, California (www.sebal.us).

Two options are listed in Table 6. In the first option, images would be processed to provide ET estimates for the growing season only (approx. April – October). In the second option, images would be processed for the entire year (January – December). In both cases, some preliminary evaluation is needed to identify available satellite image data as cloudy weather during winter and early spring could interfere with this method of estimating ET.

Table 6. Estimated Cost of Seasonal and Annual ET Estimates from SEBAL.

Option	Description	Satellite Platform	Number of Image Dates	Image Cost	Processing Cost	Total Cost
1	Daily, monthly, and seasonal consumptive use and biomass production at 0.25-acre scale for Poso IRWMP Region	Landsat 5 TM	8	$3,400	$34,200	$37,600
2	Daily, monthly, and annual consumptive use and biomass production at 0.25-acre scale for Poso IRWMP Region	Landsat 5 TM	12	$5,100	$46,800	$51,900

9.0 Schedule

This project could be initiated at any time and would consist of the following key tasks:

- Phase I (approximately 6 months total – total cost $37,600 to $51,900 for one season or full year depending on the number of images selected)
    - Select period of analysis and obtain required data (satellite imagery and ground-based weather observations), 1 month required.
    - Apply SEBAL to develop monthly and seasonal estimates of ET at the pixel (0.25 acre) scale for the Poso IRWMP Region, typical year, 2 months required.
    - Evaluate results and compare to existing ET estimates for agricultural, urban, and natural environments, 3 months required.
        - Identify biases in existing ET estimation methods and apply corrections
        - Evaluate impact on planning and water management activities
- Phase II, if chosen (total cost $75,200 to $103,800 for two additional full seasons or years depending on the number of images selected)
    - Select periods of analysis and obtain required data (satellite imagery and ground-based weather observations), 1 month.
    - Apply SEBAL to develop monthly and seasonal estimates of ET at the pixel (0.25 acre) scale for the Poso IRWMP Region, wet and dry years, 3 months required.
    - Evaluate results and compare to existing ET estimates for agricultural, urban, and natural environments, 3 months required.
        - Identify biases in existing ET estimation methods and apply corrections

        - Evaluate impact on planning and water management activities
- Phase III, if chosen (total cost $37,600 to $51,900 per season or full year depending on the number of images selected)
    - Obtain required data (satellite imagery and ground-based weather observations) on a monthly basis, ongoing.
    - Apply SEBAL to develop monthly estimates of ET at the pixel (0.25 acre) scale for the Poso IRWMP Region each year, ongoing.
    - Integrate results into water balances and groundwater modeling to guide water management decisions, ongoing.

No. 26 Wildlife Improvement Projects in IRWMP Region

1.0 Summary

Project Type	Wildlife Enhancement
Project Sponsor	Semitropic WSD and North West Kern Resource Conservation District
Location	Within Semitropic's new In-Lieu Service Area
Estimated Conveyance Capacity	To be sized for habitat needs
Project Descriptor	Improvements to enhance wildlife habitat through weir, reservoir and interconnection facilities construction
Estimated Cost (2006 dollars)	Not determined at this time; The costs will include only the conveyance facilities needed from the new groundwater banking area conveyance facility to the designated habitat location

2.0 Project Description

Semitropic's new groundwater banking region is also doubling as part of Semitropic's Wildlife Improvement District. In 2004, the District's Board of Directors voted to establish the wildlife venture to exclusively serve the needs of wildlife interest. The formation of the Wildlife Improvement District enables Semitropic to secure funding for construction of facilities and project management that private entities normally find hard to accomplish.

Semitropic has proposed and submitted its own Habitat Conservation Plan to cover 4,000 acres in the northwest portion of the District. Most of this land will be dedicated to permanent habitat. Another aspect of the Improvement District is a joint program with Ducks Unlimited and the landowners that is officially known as the Goose Lake Wetland Improvement Project.

The following activities are included in this project:

- Adjustable weir on Poso Creek west of Pintail Slough.
- Off-channel reservoir (this could double as the wellfield reservoir for the Stored Water Recovery Unit).
- Interconnections between Goose Lake Canal and Semitropic (at 120-inch East-West Pipeline), Goose Lake Canal and Poso Creek, and Kern National Wildlife Refuge and Semitropic.
- The West East Pintail Slough (WEPS) connects the Goose Lake Canal at the north side of the Kern National Wildlife Refuge with the existing Pintail Slough and Alpaugh Canal providing flood protection and wildlife water supplies to the members of the Semitropic Wildlife Improvement District.

- The Pond-Poso Spreading Grounds (identified as Project No. 6) can be enhanced with trees and vegetation provided under the Wildlife Habitat Incentive Program for enhanced wildlife purposes.

Background

The Importance of Wetlands

At one time, Kern River tributary Jerry Slough and the bed of Goose Lake provided a wetlands environment that supported varied and diverse wildlife. These waterways, together with the original Kern River floodway and Poso Creek, pass through Semitropic's service area, making it vastly important for the District to take measures to sustain these precious wetlands environments.

Due to this unique environment, there were once more than 50 privately owned duck clubs within the District, 21 of which are still active. In addition, the Federal Kern National Wildlife Refuge, 16 sections in size, is located mostly within Semitropic's service area. There is also an area of about 34,000 acres of undeveloped land in the northwest part of the district that is considered prime uplands habitat.

Preserving Habitats

In order to consolidate various activities, such as securing water supplies for duck clubs, the Semitropic Board in 2004 approved the formation of the Semitropic Wildlife Improvement District, which is intended to exclusively serve the needs of wildlife interests. This will provide a focal point and a means to accomplish common wildlife improvement objectives. It also provides the benefits of using a public agency in securing funds, construction of facilities and project management that individual or private entities, such as duck clubs, find hard to do individually.

In addition, Semitropic has acquired approximately 4,000 acres of prime habitat land in the northwest part of the district for preservation and groundwater storage purposes. The District has proposed and submitted its own Habitat Conservation Plan, which proposes to dedicate most of this land to permanent habitat. Mitigation credits will be sold to accomplish this goal.

In 1992, the Semitropic Board of Directors included a proposed multi-purpose environmental program in its project election process. Landowners overwhelmingly approved a multitude of programs, including the Goose Lake Wetland Improvement Project.

North West Kern Resource Conservation District (NWKRCD)

NWKRCD has been organized for the protection and conservation of soil and water resources in the district boundaries, which encompass about 595,000 acres. The eastern area encompasses the lower reaches of Poso Creek. Starting in the general areas of Knob Hill on the south and Mt. Poso on the north, Poso Creek runs through the entire district in a northwesterly direction and outlets into the Kern National Wildlife Refuge. The western boundary parallels the drainage through the valley for approximately 15 miles south from the Kern-Kings county line. The north is bounded by Kings and Tulare Counties. The southern part is bounded by Buena Vista and Rosedale-Rio Bravo Resource Conservation Districts.

In 1940, the California Public Resources Code was amended to allow landowners to cooperatively organize soil conservation districts to serve private and non-federal lands. In 1972, the names of soil conservation districts were changed to resource conservation districts. The Pond Poso and the Shafter-Wasco Resource Conservation Districts were consolidated as the Pond-Shafter-Wasco Resource Conservation Districts. Subsequently, it became known as the North West Kern Resource Conservation District.

NWKRCD is authorized to cooperate with and receive assistance from:

- U.S. Department of Agriculture (MOU dated November 22, 1971)
- Natural Resources Conservation Service (NRCS) (MOU dated December 1, 1971)
- County of Kern Mutual Subdivision
- Extension Service (through the County of Kern)
- DWR
- U.S. Army Corps of Engineers (Corps)
- Farm Services Agency (MOU dated July 1, 1988)

The NWKRCD was established to help farmers, ranchers and others to make the best use of their natural resources and to enable local programs that conserve soil and water, prevent soil erosion, and control floodwaters and sediment damage. These basic policies are still in effect; however, the role of the RCD has expanded to include assistance to the county and towns that lie within and adjacent to the district. The sources of water in the NWKRCD are wells and surface water supplied through the Friant-Kern Canal, the California Aqueduct, the Kern River, and Poso Creek. A total of approximately 216,000 acres in irrigation districts lie within the NWKRCD.

Among the long-range goals of the NWKRCD are the following:

- Provide technical assistance and information so that every acre of land within the NWKRCD is treated according to its individual needs and capabilities.
- Extend public awareness programs by educating the general public on the importance of maintaining a sound soil and water resource base and how it relates to them.
- Educate the public so that it will acquire the skills, knowledge, and attitudes necessary to make wise soil and water conservation and land use decisions.
- Actively support conservation efforts and programs of cooperating agencies and civic groups, and request support from elected officials from a Mobile Lab and NWKRCD programs.

3.0 Project Operation

The operation of these projects is to supply water for wildlife enhancement. The quantity will vary depending on the year type.

4.0 Goals and Objectives

Enhancement of wetland and upland wildlife communities.

5.0 Project's Consistency with IRWMP Objectives and Strategies

Aesthetic, water quality and flood control enhancements can be improved with the implementation of these projects.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Conveyance facilities used for in-lieu water service can double for conveying water to and from these projects.

7.0 Project Screening Priority within the IRWM Plan

Considered for project integration. This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

To be determined by Semitropic. The costs will include only the conveyance facilities needed from the new groundwater banking area conveyance facility to the designated habitat location.

9.0 Schedule

Components of this project will be ready for construction within three years. Some areas may develop later as the Stored Water Recovery Unit is developed.

No. 27 Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region

1.0 Summary

Project Type	Water Management
Project Sponsor	Delano-Earlimart Irrigation District Shafter-Wasco Irrigation District Friant Water Users Authority
Location	
Estimated Conveyance Capacity	
Project Descriptor	
Estimated Cost (2006 dollars)	

2.0 Project Description

This proposed project relates to the environmental water management measures that will need to be implemented in support of the Friant Water Authority's report describing the San Joaquin River (SJR) Restoration Settlement Potential Programs and Projects: The report was titled the *SJR Restoration Program, Water Management Goal, Recirculation, Recapture of Restoration Flows And Mitigation of Water Supply Reductions. Potential Programs and Projects*.

Background

The following statements are from the Friant report mentioned in the above Project Description.

> On September 13, 2006, the Parties to Natural Resources Defense Council, et al., v. Rodgers, et al., No. CIV-S-88-1658-LKK/GGH executed a Stipulation of Settlement that resolved 18 years of litigation regarding releases of water from Friant Dam on the SJR for the purpose of restoring the River below the Dam and a salmon fishery therein. The Settlement calls for enactment of Federal legislation to authorize the Department of Interior to undertake certain provisions of the Settlement.
>
> The Settlement includes two principal and equal goals. The Restoration Goal includes a number of physical improvements within and along the River channel, water releases based upon hydrographs that vary by water year type, and reintroduction. The Water Management Goal includes provisions for development of a plan for recirculation, recapture or reuse water released for restoration purposes and implementation of a Recovered Water Account to make water available at a significantly reduced price to Friant Contractors that have provided water to meet Restoration Flows. One purpose of the Recovered Water Account is to foster expanded groundwater recharge and banking programs during wet hydrologic conditions that will have the effect of offsetting losses resulting from Restoration Flows.
>
> Following the Settlement date and during the development of the Poso Creek IRWMP, Senator Feinstein asked the Friant Water Users Authority to provide her a list of the types of projects the Authority and its member intend to implement to take advantage of the provisions of the Water Management Goal. This report is a preliminary attempt to identify a range of projects that could

facilitate recirculation, recapture and reuse of Restoration Flows and a list of potential projects Authority member Districts intend to undertake to take advantage of the Recovered Water Account or to otherwise mitigate the impacts of Restoration Flow releases.

Similar to operations study completed for this IRWMP that was used to estimate the amount of water supply that could be gained by implementing projects, the following was mentioned in the Friant report. It is very important to note that the quantities of water that can be developed by the individual projects identified in this preliminary report cannot simply be added to determine the total quantity of offset water. The quantities are maximums and the aggregate quantity of water that will be developed by implementation of some or all of these projects will be limited by available water from the rivers, capacity in conveyance facilities and appropriate pro-ration of such supplies and capacities. More detailed operations studies will be required to determine a total supply that can be generated to offset water delivery reductions resulting from implementation of the Restoration Flows.

Limited SJR Restoration Program fishery flows are to start in 2009 and sustained full fishery flows are envisioned to begin in 2013. Water users plan to use this time wisely to work expeditiously with the Secretary of the Interior in developing and implementing the water management program called for in the Settlement. The Settling Parties agree this is necessary to reduce or fully avoid water supply impacts that might otherwise occur.

Fully implementing the Water Management Goal of the Settlement is essential to maintain the vibrant economy and healthy communities supported by Friant water supplies.

3.0 Project Operation

Project Operation in Wet Years
As mentioned in the Background, one purpose of the Recovered Water Account is to foster expanded groundwater recharge and banking programs during wet hydrologic conditions that will have the effect of offsetting losses resulting from Restoration Flows.

Project Operation in Dry Years
Groundwater banked during wet hydrologic conditions will help offset water released for river restoration.

4.0 Goals and Objectives

The Water Management Goal includes provisions for development of a plan for recirculation, recapture or reuse water released for restoration purposes and implementation of a Recovered Water Account.

5.0 Project's Consistency with IRWMP Objectives and Strategies

The project is consistent with the IRMWMP objectives to maintain or enhance water supply reliability and environmental resources within and outside of the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Conveyance facilities designed to deliver Recovered Water Account water can double for conveying water to and from participating districts.

7.0 Project Screening Priority within the IRWM Plan

This project meets the Regional Management Group's pre-screening criteria for Tier 1 Projects. Therefore, it is considered a Tier 1 Project that will be recommended for inclusion in near-term implementation proposals.

8.0 Cost Estimate

The cost of this project is uncertain; this project is in response to the loss of historical supplies from outside this Region.

9.0 Schedule

Dependent on SJR Restoration Program

No. 28 - Pipeline Connecting Friant-Kern Canal in Support of Flood Storage Reservoir in Poso Creek Drainage

1.0 Summary

Project Type	Conjunctive Management
Project Sponsor	IRWMP Participants Kern County Water Agency
Location	Poso Creek drainage area east of Hwy 65
Estimated Conveyance Capacity	To be determined
Project Descriptor	Water supply reliability
Estimated Cost (2006 dollars)	To be determined

2.0 Project Description

The proposed project is to connect the Friant-Kern Canal to the proposed 50,000 acre-foot flood storage reservoir in the Poso Creek drainage area east of State Hwy 65. The exact size and location of the interconnection facility has yet to be determined, and may include a direct connection to the Friant-Kern Canal or a combination of interconnections of existing conveyance facilities in North Kern Water Storage District (North Kern), Cawelo Water District (Cawelo) and other IRWMP districts. The east side of the connection may include a penstock pipeline for power generation from the Poso Creek flood storage reservoir and a pump station for possible storage of Friant, Kern River or SWP water in the Poso Creek reservoir.

Background

3.0 Project Operation

Project Operation in Wet Years

Depending on the year type, the project may allow flood water from Millerton to be temporarily stored in the Poso Creek Flood control facility and delivered during a time of higher demand. The interconnection pipeline can be used for power generation and regulated deliveries when water is in storage from natural flows into the Poso Creek reservoir. Cawelo, North Kern and Semitropic Water Storage District (Semitropic) along with a handful of landowners have rights to the natural flow from Poso Creek. There may be opportunities for Kern River and SWP water to be stored into the Poso Creek facility for regulation also.

Project Operation in Dry Years

1. Store water if available from Millerton due to early run-off to be delivered later in the year.
2. Store Kern River flows if available for delivery later in the season.
3. Store Article 21 SWP water if available for delivery later in the season.

4.0 Goals and Objectives

The interconnection pipeline will help the Poso Creek IRWMP participants to temporarily store and reregulate supplies available to the participants to better use available water supplies. Power may be generated if a hydro electric generator is included in the project.

5.0 Project's Consistency with IRWMP Objectives and Strategies

The Project may in the future provide an important element in implementation of the IRWM Plan and in meeting the Plan's central objective of enhancing local and regional water supply reliability. It may also help in addressing the Plan's objectives of managing groundwater and surface water resources within the Region.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

Possible interconnections with Cawelo, North Kern, Poso Creek, in order to capture all water supplies available to the Poso Creek participants. This Project would expanded regional conveyance facilities which serves to better manage the Region's water resources.

7.0 Priority within the IRWM Plan Region and within the Proposal

This Project does not meet the Regional Management Group's pre-screening criteria for Tier 1 or Tier 2 Projects because it will not be ready for implementation within 6 years. Therefore, it is considered a Deferred Project that will not be recommended for inclusion in implementation proposals ahead of Tier 1 and Tier 2 projects (see description in Section 9.0 below).

8.0 Cost Estimate

Projected range of $25 to $100 million; to be determined in future pre-feasibility study.

9.0 Schedule

The priority for this project is 'Deferred', which is less than the screening priority for Tier 1 and Tier 2 projects, therefore a construction schedule will not be proposed. The estimated schedule for the Poso Creek Flood Storage facility is at least 10 years out.

No. 29 Assist Economically-Disadvantaged Communities – Enhance Water Supply and Treatment Facilities

1.0 Summary

Project Type	Water Supply
Project Sponsor	Poso Creek IRWMP Regional Management Group
Location	The cities of Delano, McFarland, Shafter, and Wasco, along with unincorporated communities of Earlimart, Lost Hills, and Richgrove, are located within the Region,

2.0 Project Description

The Regional Management Group is aware that several of the *economically-disadvantaged* communities within the Region have drinking water supply and quality issues. The RMG is also aware, as more particularly described below, that one of the communities unsuccessfully pursued grant funding on its own. While these communities are stakeholders in the Poso Creek IRWMP, this project is a method for the participation and inclusion of these communities in the IRWM planning process for the purpose of assisting them in their pursuit of funding assistance.

The RMG also recognized that funding opportunities for the communities' drinking water supply and quality projects may exist through programs administered by other departments, such as the California Department of Public Health (CDPH). Contact was made with the CDPH to understand the criteria for eligibility of various funding programs, such as, IRWM programs under Proposition 50 and Proposition 84. The CDPH administers several grant programs and a consolidated loan program called the State's Revolving Fund (SRF).

For communities to be eligible for most of the funding, they must have at least one water quality contaminant in their supply that causes them not to meet Title 22 Drinking Water Standards, however, for some of the funding programs, the communities do not need to be part of an IRWM Plan to participate, which is the case for the CDPH SRF loan program. As for determining the severity of the water quality issue, the State uses a system for ranking the communities' drinking water supply and quality problems. The two main drinking water quality constituents of concern found in this Region are nitrates, which ranked "F" in the state-wide scale, and arsenic, which ranked a "G" ("A" was the highest ranking, or the worst drinking water supply or quality problem).

When funding for Proposition 50 started several years ago, the City of Shafter proposed a project to prepare a new planning document that evaluated the water quality, supply and geography of the Shafter Regional Water System and prioritizes the development of water infrastructure for areas within City limits and unincorporated areas served by the City municipal water distribution system. The study would evaluate groundwater quality beneath the City of Shafter, system operations, and best management

practices (BMPs). Such a proposed project would study the water demand, water quality, and geology to determine water quality trends. The work items would include obtaining and reviewing water quality data for existing wells, documenting trends in water quality, obtaining well logs to evaluate geology, modeling the water system, monitoring to evaluate pollutants, and reporting on new wells in the surrounding areas. The analyses of water quality trends would include coordination with local water and irrigation districts.

Other communities have either completed projects or proposed projects similar to the City of Shafter. The following information is based on a phone contact and discussion with Ken Johnson, engineer with the Department of Public Health (559).447-3136. Ken provided information on drinking water quality issues of the *economically-disadvantaged* communities in the Region. Ken described that each community has its own unique set of issues; however, most of their drinking water quality issues are related to nitrate or arsenic in groundwater affecting wells for these communities. Ken indicated some communities have recently participated in their consolidated funding program of Proposition 50, Proposition 84 and the State Revolving Fund program (SRF), which provides a combination of state and federal funded zero-interest loans. The SRF program is a separate funding opportunity from the IRWM program.

Ken provided the following information concerning drinking water quality concerns for the following communities:

City of Delano has arsenic issues with at least one well, has tried constructing new wells and also has followed up with treatment.

City of McFarland has treated for nitrate and is building treatment for arsenic. They are not utilizing much of their treatment capacity for nitrate since they constructed a new well.

Richgrove has several operational and maintenance related issues and has two wells that are approaching MCL violations for arsenic and nitrate.

Lost Hills has recently added coagulation/filtration treatment for arsenic.

3.0 Facility Operation

Facilities would be operated by the disadvantaged communities.

4.0 Goals and Objectives

The goal of this Project is to identify the needs of the economically-disadvantaged communities within the Region and to include the communities in this IRWMP in order for them to be eligible for assistance.

5.0 Project's Consistency with IRWMP Objectives and Strategies

This project was not ranked as one of the highest priority projects that need to be implemented for the IRWMP to meet its objectives of managing groundwater and surface water within the Region. This project will provide a secondary benefit to the Region if implemented, since any improvements to individual community drinking water systems may also provide improved water supply and/or water quality to the Region. Treatment of groundwater supply for drinking water purposes is a direct benefit to the users of the system. However, it may not directly affect the highest priority objective and strategy, which is to gain back water supply reliability.

The following findings and observations with regard to the RMA were developed in this Report: (1) groundwater levels have been relatively "stable" over the last 25 years; (2) the demand for water is projected to remain about the same as in the past; and (3) less surface water is projected to be available to the Region in the future, with a commensurate increase in the reliance on pumped groundwater. Accordingly, groundwater levels will decline, with a corresponding increase in the use of power and energy resources, creating both an environmental and economic burden. With a common groundwater basin shared by all uses within the Region, any decline in water levels will be felt by all uses, i.e., there will be an adverse economic effect on both irrigated agriculture and the already *economically-disadvantaged* communities that rely on groundwater in whole or in part. By the same token, anything that is done to mitigate declines in water levels, such as projects identified in this Plan, will benefit all uses. It is noteworthy that not only do these communities rely on the common groundwater resource, but they rely on the viability of irrigated agriculture.

6.0 Relationship with Other Projects in the Poso Creek IRWMP Region

This Project relates to the rest of the proposed projects in the Region, since each of the communities' water supply is from the groundwater basin shared by the members of the Regional Management Group. Several of the communities have water supply agreements with the RMG member agencies.

7.0 Project Screening Priority within the IRWM Plan

This project does not meet the Regional Management Group's pre-screening criteria for Tier 1 projects of highest priority. However, it is considered a Tier 2 project that will be recommended for inclusion in implementation proposals that fit the scope of work the communities are proposing. As the planning efforts move beyond Proposition 50 and into Proposition 84, the RMG plans to continue to work with the communities within their Region as stakeholders. The RMG will participate in the Proposition 84 Funding Area. The RMG may also participate in a larger area planning activity through the possible joining of a Joint Powers Authority for the Tulare Lake Hydrologic Region. These larger planning efforts will include coordinating funding sources that are available for the *economically-disadvantaged* communities throughout several counties.

Appendix E

Public Involvement Documentation

Minutes for the Poso Creek IRWMP Regional Management Group Meetings

MINUTES FOR POSO CREEK IRWMP MANAGEMENT GROUP MEETING
JANUARY 5, 2006

A kickoff meeting was held this afternoon for the Poso Creek Integrated Regional Water Management Plan Group (IRWMP) at the Semitropic Water Storage District offices in Wasco, to initiate the IRWMP study. The agenda, together with handouts for the meeting, is attached to these minutes. General managers representing each of the seven members of the Regional Management Group were in attendance at this initial meeting (Will Boschman, Dana Munn, Steve Dalke, Jerry Ezell, David Ansolabehere and Brian Hockett). Also present were Paul Oshel, District Engineer for SWSD, John Jones with Developing Water Resources, Inc. and representatives for Bookman Edmonston (Dick Rhone, Naser Bateni, Ron Eid and Harold Morgan). A meeting attendance list is also attached.

Will Boschman opened the meeting by acknowledging his designation as meeting chairman and delegating his responsibility to Paul Oshel for this meeting as well as subsequent IRWMP monthly meetings. The next order of business was Paul Oshel sharing with the group that communication had been received from the Department of Water Resources (DWR) that the IRWMP planning grant had been awarded on January 3, 2006. DWR also informed SWSD that a commitment letter from the state would be forthcoming in the next day or two, followed by a grant agreement to be transmitted in the very near future. A copy of an e-mail communication from DWR reflecting this information is attached as one of the agenda handouts. Naser Bateni indicated that, based on this communication, the group was now in a position to initiate the planning study with project costs being fully reimbursable (exclusive of required local district-funded costs).

The next item of business was a review of the membership of the Regional Management Group, presentation of agency boundaries and a brief discussion of the initially identified stakeholders in the planning study. Steve Dalke noted that the northern portion of Rag Gulch Water District, located in Tulare County, was absent from the Management Group boundary map. BE responded by indicating that this correction would be made to completely define the boundaries of RGWD. The Group indicated the Kern National Wildlife Refuge is more representative as a stakeholder and therefore added it to the stakeholder list instead of the US Fish and Wildlife Service, retaining the State Department of Fish and Game, however. An initial stakeholder list is attached. It is planned to have further discussions on the role of stakeholders in the IRWMP process.

The next topic of discussion was SWSD's role as the lead agency in the planning process and its intention to retain BE as consultant to prepare the draft management plan and assist the Group throughout the planning process. All agencies in the Group supported SWSD as lead agency and concurred with the selection of BE as the planning consultant. Supporting this discussion was the consultant organizational chart (attached) which identifies tasks and associated personnel.

Subsequently discussed was a tentative list of planning objectives for the study (attached). The additional objectives of water conservation (e.g. projects such as reservoir lining and system automation) and wildlife improvement were added to the list by the Management Group with the potential of making further planning objective additions following subsequent discussions on this issue. An amended planning objectives list is attached. At this point in the meeting, Naser handed out a planning process schematic (attached) and discussed with the Group the various steps to be undertaken in the planning process. One of the districts brought up the issue of equity and cost sharing between the districts in supporting various projects to implement. Naser responded by indicating that the issue would be one of the screening criteria to apply in evaluating alternative projects for ultimate adoption as part of the plan. Naser also discussed the two-cycle process of the implementation grants to award money to partially fund proposed projects. The first cycle is now closed for proposals and requires an adopted IRWMP by the project proponents effective at the end of 2006. In view of the Poso Creek Group not proposing projects for implementation grants during the first cycle, adoption of the management plan could be deferred until June or July 2007 (when implementation grant applications will be due). Funding for first cycle implementation grants amounts to less than one-half of the total funds available under Proposition 50. Naser pointed out that the state has designed a two-step process in order to limit the detail (and corresponding effort) of the initial grant application. If an application is selected for further consideration, the state would then ask for design and feasibility details from the applicant in order to make a more thorough evaluation in comparison to competitive projects.

Discussion then focused on the status of adopted groundwater management plans by each of the agencies. It is intended that the individual district's adopted groundwater management plan can be referenced as part of the entire group's ultimate management plan for the groundwater element of the IRWMP. With this in mind, each agency indicated to what extent their current plans are compliant with AB 3030 and SB 1938. It appears that only SWSD is totally compliant and up to date with regard to its groundwater management plan. Rag Gulch/ Kern-Tulare and Cawelo indicated that their groundwater management plans are AB 3030 compliant; North Kern and Shafter-Wasco indicated that their management plans are only AB 255 compliant at this time; North West Kern RCD does not manage groundwater supplies.

Naser encouraged each of the participants to consider updating their ground water management plan as required by the bond law. Planning horizon should be based on a 25- to 30-year time frame. Projects proposed to implement this vision could be implemented in stages.

The next topic on the agenda was the budget, in-kind services accounting by the plan participants, and quarterly reporting requirements. It was indicated that the state is receptive to refinements to the schedule, workplan and budget estimates prior to the execution of the grant contracts. In response to a question, Naser informed the Group that money expended for the preparation of the application is not reimbursable under the grant, but may be accounted for as in-kind services. Group members were encouraged to

keep track of time expended on the planning process activities for subsequent accounting as in-kind services. B-E would assist in this effort by preparing a standard reporting table format for internal use to keep track of time and costs expended for eventual inclusion in the quarterly reports to the state. These reports will also include a summary of activities performed on the project, costs expended to date, and the status of the progress versus the adopted schedule. Aside from the quarterly reporting to the state, it was suggested that each agency include a regular item on their Board agendas for updating their Boards on progress.

The next item of discussion was a handout of the planning schedule (as presented in the application) and the need for an update prior to the initiation of the project. Again, the state is willing to receive an amended schedule prior to contract execution. Naser reminded participants that the schedule would have to include completion of the adopted management plan no later than June or July of 2007 in order to provide the required basis for submitting the Phase 2 implementation grant application.

The next topic of discussion was the list of projects which were initially identified for consideration during the IRWMP process. Aside from local benefits, Naser pointed out that in designing water management strategies and projects statewide benefits must also be considered to be competitive at the implementation grant level. Some additional discussion was made regarding how these proposed projects might be prioritized. One of the districts asked if a cost-benefit ratio would be used as part of the ranking process. Naser responded that the cost-benefit ratio would be one of the screening criteria in evaluating the relative value of each proposed project. Paul Oshel suggested that SWSD's wellhead treatment and well abandonment programs may also be projects worthy of consideration for inclusion in the adopted plan. The issue was raised as to the procedure to follow in adding to the list of potential projects under consideration to ultimately include in the IRWMP. It was agreed that this issue would be discussed further by the group. The group concurred that it would be helpful to begin to prepare a summary description for each of the projects in order for those not familiar with other district's proposals to become better aware of the merits of projects to consider. BE responded by indicating it had recently prepared project descriptions for a similar planning process and would provide the model examples to utilize for this purpose.

The last item of discussion was on the need for a public meeting to be advertised and held prior to the initiation of the planning process. In particular, there was discussion as to whether or not the meeting held between Group members last April (2005) qualified as the required public meeting. This public meeting by the Management Group is required to receive comments from the public on whether to prepare a IRWM plan. Paul Oshel agreed to perform additional research on this issue to confirm if public notice had been given for this prior meeting. If not, Naser recommended that a properly noticed public meeting be scheduled at the time of project initiation. This could be done at the same time as the next IRWMP meeting. Naser also reminded the Group that a properly advertised public meeting was required after the draft plan is prepared in order to receive public input.

The next Group meeting is scheduled for February 7 at 2 pm at the SWSD offices. The Group agreed to hold monthly meetings on the first Tuesday of the month unless noticed otherwise. In order to assist the management group, BE will perform the following:

1. Prepare draft minutes of this meeting
2. Update the planning schedule, budget, and work plan.
3. Prepare a form for recording in-kind services.
4. Provide a typical description format for preliminary project descriptions.
5. Revise the Management Group boundary map to include all of the Rag Gulch Water District area.

MINUTES FOR POSO CREEK IRWMP MANAGEMENT GROUP MEETING

FEBRUARY 7, 2006

A regular monthly meeting was held this afternoon for the Poso Creek Integrated Regional Water Management Plan Group (IRWMP) at the Semitropic Water Storage District offices in Wasco. The agenda, together with the handouts for the meeting, are attached to these minutes. General Managers representing five of the seven regional management group members participated, including Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman) and Steve Dalke (via telephone). Also participating were Dale Brogan, General Manager of Delano-Earlimart Irrigation District, John Jones with Developing Water Resources, Inc., and representatives for Bookman- Edmonston (Ron Eid, Naser Bateni, and Harold Morgan, with the latter two via telephone). A meeting attendance list is also attached.

- The first item of business was the discussion of the draft minutes from the January 6, 2006 IRWMP meeting. It was requested that the draft minutes be changed to indicate that the Kern National Wildlife Refuge be included as the specific stakeholder in lieu of the U.S. Fish and Wildlife Service, with the former being more specific to the regional management area. With this minor exception, the draft minutes were accepted by the group.

- The next item of business was the meeting handout of revised regional boundaries for each of the participating agencies. Revisions included extending the boundaries of Rag Gulch Water District into Tulare County.

- The next topic of discussion was the form to utilize in accounting for in-kind services by the management group members. Nasser Bateni suggested that two columns be added to include the hourly rate to be applied and the resulting total cost, based on the number of hours represented by the service description. The hourly rate should reflect salary plus benefits. It was agreed that in-kind services tables would be prepared each month by each of the participants, and would be forwarded to Harold Morgan of Bookman-Edmonston for record keeping and accounting.

- The next item of business was the project description format handout which would serve as a model for description of potential projects to include in the Poso Creek IRWMP. Paul Oshel suggested that we keep all project descriptions in a binder and use consistency in project descriptions in order to facilitate comparisons between competing projects. It was also suggested that a map showing the location of the improvements being described be attached to the project description format.

- The next topic discussed was the revised IRWMP schedule which B-E provided as a handout. It was indicated that the main revision to the schedule was the extension of the process from the end of 2006 through July of 2007.

Naser informed the group that July 2007 was the most optimistic date when applications for implementation projects would probably be filed. He reminded the group that the IRWMP needed to be adopted by July of 2007 in order to form the basis for the subsequent implementation grant application. The adopted plan will need to be submitted with the implementation grant application. Naser also provided an overview of steps one and two of the forthcoming implementation grant application process. With completion and adoption of the IRWMP, Step One is largely complete. Step Two will only be performed by agencies invited to do so based on a successful Step One application. This second step will include pre-design and feasibility elements with greater detail than the Step One application. This subsequent process will probably also include preliminary drawings of the proposed improvements.

- On January 12, 2006, Semitropic received a letter from DWR which provided conditional commitment of grant funding (a copy of the letter was provided as a handout). One of the conditions was receipt of satisfactory response to certain questions/deficiencies. B-E advised that a draft response was being prepared and that Semitropic would need to submit it during the month (February).

- Next on the agenda was the discussion of the proposed inclusion of Delano-Earlimart Irrigation District (DEID) as a member of the Management Group. In this regard, Dale noted that DEID is the largest Class 1 contractor on the Friant-Kern Canal, and that he is anticipating a reduction in this water supply as the result of ongoing litigation with the Natural Resources Defense Council to restore flows to portions of the San Joaquin River. Paul Oshel added that he believed that DEID provided a "good fit" to the existing group in view of the common groundwater basin, contiguous boundaries with Rag Gulch Water District, and additional resources.

- Regarding the definition of a "region" in the context of a regional management area, it was noted that the Tulare Lake Hydrologic Region clearly qualifies. However, in view of the impractablility of including every one within such a large area, it is appropriate to consider smaller regions having a diversity of resources but similar issues, such as a common groundwater basin. Diversity of water supplies within the selected region provides opportunities for enhancing the overall water supply reliability.

- Paul Oshel indicated that an e-mail had been sent to SSJMUD to once again invite them to join the group. However, no response had been received at the time of the meeting. Dale indicated that he would attend their Board meeting on Wednesday to answer questions and encourage participation.

- Formal action was taken by Management Group members present to include DEID as a member of the Regional Management Group, and thereby include

in the regional area all of the area within DEID. Dale indicated that a Board resolution for Delano-Earlimart would be forthcoming and B-E agreed to supply a model for such a resolution.

- The next item of business was a discussion of the status of each agency's efforts to make their groundwater management plans compliant with AB-3030 and SB-1938. Naser encouraged those who did not have their plan up to current State Water Code requirements to update them as soon as possible. He informed the group that no approval process beyond adoption by each respective board of directors was required. An alternative to individual AB-3030 plans was one regional plan jointly adopted by the group. B-E agreed to provide some of the positive and negative aspects for a joint plan versus individual groundwater management plans, at the next meeting of the participants.

- There was some discussion regarding a process to modify the list of potential projects. It was noted that B-E was continuing with individual agency interviews. B-E was tasked with the assignment to maintain the project list and prepare project descriptions for the group to ultimately review. Naser indicated that a process needed to be developed to evaluate projects according to screening criteria, based on how each project meets the Plan objectives, in order to establish priorities and ranking.

- B-E requested that each of the participants consider the matter of prioritization of projects and bring their thoughts regarding screening/ranking criteria to the next meeting.

- B-E also requested that each of the participants identify any prior studies or reports, whether formal or informal, which should be considered in the context of this planning effort. This could also include ongoing studies. It is important that this universe of documents be identified now in order to be appropriately considered.

- The status of various work items was reviewed. In this regard, it was agreed that B-E would revisit the draft of a table of contents for the report which will document the planning process and develop the IRWMP.

- The next group meeting was scheduled for March 7, 2006 and is intended to be an advertised meeting in order to receive public input. A formal public meeting would be opened and then closed in order to provide a brief presentation to the public regarding the IRWMP process as well as receive comments from the public. SWSD also agreed to advertise this meeting on its web page in addition to placing a public notice in the regional Bakersfield area newspaper.

MINUTES FOR POSO CREEK IRWMP MANAGEMENT GROUP MEETING
MARCH 21, 2006

A noticed public meeting was held this afternoon for the Poso Creek Integrated Regional Water Management Plan (IRWMP) at the Semitropic Water Storage District (SWSD) offices in Wasco. The agenda, together with handouts for the meeting, are attached to these minutes. General managers representing seven of the eight Regional Management Group members participated, including Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Steve Dalke, Brian Hockett, and David Ansolabehere. Also participating were Craig Wallace of SWSD, John Jones with Developing Water Resources, Inc., and representatives for Bookman Edmonston (Ron Eid, Naser Bateni, and Harold Morgan). A meeting attendance list is attached. No members of the public or representatives of potential stakeholders for the IRWMP were in attendance.

- The first item of business was the discussion of the draft minutes from the February 7, 2006 IRWMP meeting. With no changes proposed, the draft minutes were accepted by the Group.

- The next item of discussion was a reference to the recently transmitted correspondence to DWR in response to a letter received from that agency dated January 3, 2006. The DWR letter requested detailed responses regarding the Poso Creek IRWMP application scope, schedule, and any changes proposed by the Group since the application was initially submitted. Paul Oshel made reference to the prepared response by SWSD following reviews by Group members.

- The next item of business was an update on the potential participation in the Management Group by Southern San Joaquin Municipal Utility District. No new information was available on this agency's potential participation in the Poso Creek IRWMP.

- Also under agenda item four was a discussion of the boundaries to be used to define the regional management area. Dana Munn suggested that the SSJMUD service area be included within the management study area, even if that agency remained as a stakeholder and did not become a participant in the Regional Management Group. The Group concurred that the management study area be enlarged to include the SSJMUD service area, which would extend coverage between SWSD and Rag Gulch Water District to the Kern County boundary line. At this point in the discussion, Naser discussed how the state defines a regional area, including the justification for the selection of regional boundaries. It was pointed out that the state specifically asked for a clear definition of the management area boundaries and how they were chosen. B-E indicated that a good explanation needs to be developed, including such facts as all agencies are north of the Kern River; there is an opportunity for

interconnections of a diversity of supplies; there is a natural opportunity for conjunctive use of surface water and groundwater resources; infrastructure is shared and available for optimization between members; all members share a common groundwater basin and watershed; and institutional frameworks and ongoing activities are currently shared amongst members in management of the area's water resources. It was agreed that the regional area boundary map would be revised to include the SSJMUD area within the study boundaries.

- The next item of business was a discussion of the revised stakeholder list in view of the inclusion of Delano-Earlimart Irrigation District into the Management Group study area and the question on when to issue invitations to potential stakeholders. A revised list of potential stakeholders was distributed, which included the addition of Alpaugh Irrigation District, Deer Creek/Tule River Association, and Friant Water Authority as potential stakeholders. It was agreed that it would be prudent to make invitations to potential stakeholders as soon as practicable. It was decided that a formal letter would be prepared and sent to each potential stakeholder, providing information respecting the Management Group and the Poso Creek IRWMP process and timeline, together with a copy of the public presentation. Paul Oshel offered to prepare the initial draft of such a letter.

- The advantages and disadvantages of preparing individual groundwater management plans, as opposed to a regional groundwater management plan, were discussed. Some of the advantages of a regional plan include potential cost savings and a better presentation of the "big picture", However, it was also pointed out that there was flexibility with individual plans to better address specific issues for a given area. Jerry Ezell suggested that perhaps the Group needed both, with each having a different focus. David Ansolabehere concurred and suggested an umbrella regional plan be prepared which would contain subsets of individual plans. It was noted that a regional plan would have to be adopted by each district's board of directors.

- Under agenda item number seven, B-E encouraged the members of the Group to identify and transmit to B-E any relevant studies or reports which managers believed would be beneficial and instructive to consider in developing the draft IRWM plan. Jerry Ezell specifically identified the currently ongoing water quality study sponsored by Metropolitan Water District on potential impacts from exchanging Friant-Kern Canal deliveries with State Water Project deliveries. With regard to descriptions of proposed water projects, as currently developed, Paul Oshel requested B-E transmit a copy of all drafts for file keeping. B-E also reported to the group that Lisa Stultz from B-E's Sacramento office, who supervises GIS Projects, made a recent visit to the offices of Kern County Water Agency in order to become familiar with existing mapping resources which may

be useful for this study. Again, B-E encouraged Group members to identify and share any district-by-district mapping (hard copy and electronic) that may have some applicability to this study.

At this point in the meeting, B-E provided a handout (attached) presenting an example of a step-by-step process for selecting and prioritizing water management strategies, i.e., it is only one way of selecting and prioritizing management strategies. This handout was prepared for discussion only and is considered to be in draft form at this point in time. B-E also reminded the group that there are four water management objectives which have to be considered, including water quality, water supply reliability, ecosystem restoration, and groundwater management. Each of the water management strategies which are identified could be grouped according to short-, middle-, and long-term implementation. This discussion tool is simply a way to begin development of a process to evaluate and establish priorities for projects which are proposed for implementation to meet the objectives of the IRWMP. In the end, the priority of projects reached by the Group could be based on a combination of judgment and a negotiated process. Group members were encouraged to review the attached handout and provide a markup and comments at the next Management Group meeting in May. While the procedure that will be used by DWR in awarding implementation grant funds is unkown, it is likely that the allocation of awarded funds will be left to the local agencies.

- B-E distributed a draft of the table of contents for the IRWMP plan. B-E cautioned the Group that changes were likely in the table of contents as the plan is developed. John Jones expressed the opinion that the table of contents appeared overly extensive and would require a great deal of effort to complete. Paul Oshel responded that a thorough effort was necessary as the report would form the basis for future grant applications. Group members were encouraged to review the draft of the table of contents and provide comments at the next meeting.

- The last item of business was focused on administrative items. B-E reminded the Group that, to date, only one district had submitted an in-kind services accounting form, and that similar submittals would be needed from each agency (from beginning of the project to date). B-E agreed to prepare and distribute an in-kind services form accounting example to each agency. Some discussion also centered on the posting of future meeting agendas for the Management Group. It was noted that the meetings held by the participants were public meetings, but did not fall under the requirements of the Brown Act. Nevertheless, it was agreed by the Group that posting of the agenda at SWSD's offices would occur at least by Friday afternoon preceding the following Tuesday's meeting. The posting of the agenda on agency websites would also be explored. Finally, in closing, the Group agreed that periodic monitoring of the progress of

the IRWMP for the upper Kings Basin Water Forum would be prudent in view of this group being the only other regional water management group in the southern San Joaquin Valley.

- In view of the short time between the March meeting and the first week of April, the next regular meeting of the Poso Creek IRWMP would be held on May 2, 2006 at 2:00 p.m. in SWSD's offices.

MINUTES FOR POSO CREEK IRWMP PUBLIC MEETING
MARCH 21, 2006

A noticed public meeting was held on March 21, 2006 for the Poso Creek Integrated Regional Water Management Plan (IRWMP) at the Semitropic Water Storage District (SWSD) offices in Wasco. General managers representing seven of the eight Regional Management Group members participated, including Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Steve Dalke, Brian Hockett, and David Ansolabehere. Also participating were Craig Wallace of SWSD, John Jones with Developing Water Resources, Inc., and representatives for Bookman Edmonston (Ron Eid, Naser Bateni, and Harold Morgan). A meeting attendance list is attached. No members of the public or representatives of potential stakeholders for the IRWMP were in attendance. The purpose of this public meeting was to present an introduction of the plan process and its participants, as well as receive initial comments from either the public or stakeholders.

Paul Oshel presented a power point presentation on the purpose of the public meeting, participants and identified stakeholders for the IRWMP, proposed planning area, the scope and characteristics of the IRWMP process, the public involvement process, the forthcoming planning steps for the IRWMP preparation, important schedule dates and a contact reference for further information.

Following the presentation, Paul Oshel invited questions or comments regarding the Poso Creek IRWMP. With no comments or questions posed, the public meeting was closed and a subsequent regular IRWMP Management Group meeting was opened (see separate minutes for this subsequent meeting).

MINUTES FOR POSO CREEK IRWMP MANAGEMENT GROUP MEETING
May 2, 2006

A noticed public meeting was held this afternoon for the Poso Creek Integrated Regional Water Management Plan (IRWMP) at the Semitropic Water Storage District (SWSD) offices in Wasco. The agenda, together with handouts for the meeting, are attached to these minutes. General managers representing the eight Regional Management Group members participated, including Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Steve Dalke, Brian Hockett, Dale Brogan and David Ansolabehere. Also participating were Craig Wallace of SWSD, John Jones with Developing Water Resources, Inc., and representatives for Bookman Edmonston (Ron Eid and Harold Morgan, the latter attending by phone). A meeting attendance list is attached. No members of the public or representatives of potential stakeholders for the IRWMP were in attendance.

- The first item of business was the discussion of the draft minutes from the public hearing and regular IRWMP Management Group meeting, both held on March 21, 2006. With no changes proposed, the draft minutes for both meetings were accepted by the Group.

- The next item of discussion was the status of the grant contract which is pending between SWSD (as lead agency for the Group) and the state for grant funding of the IRWMP plan. Paul Oshel informed the Group that DWR was close to executing the contract and had forwarded a draft for consideration by SWSD. Harold Morgan pointed out that the work plan included with the contract was revised by DWR, but was based on an earlier draft of the work plan with subsequent changes not being included. DWR requested that appropriate revisions to the proposed work plan be made to reflect the changes. Paul Oshel requested that B-E to make the requested changes and forward the revised work plan back to SWSD for transmittal to DWR.

- The next item of business was an update on the potential participation in the Management Group by Southern San Joaquin Municipal Utility District. No new information was available on this agency's potential participation in the Poso Creek IRWMP. Dale Brogan of DEID has discussed the matter with SSJMUD staff on at least three occasions, without receiving positive feedback.

- Next, Paul Oshel referenced the handout of the revised regional boundaries which indicates the IRWMP planning area includes not only the physical areas for the eight Management Group members, but also the partially enclosed area of Southern San Joaquin MUD. Harold Morgan suggested that the Group discuss the potential for making the management study area boundaries straight lines rather than the currently indicated

irregular institutional boundaries for each of the involved agencies. In this regard, a question was asked respecting whether or not the entirety of DEID was included within the domain of the groundwater model which is currently being developed for SWSD. B-E indicated that, while the model does extend to the north of the Kern County line, it does not extend far enough to the north to capture all of the area included within DEID. Following additional discussion, it was agreed that the study area boundaries would not be changed.

- The next item of discussion was focused on public involvement in the IRWMP process. There was considerable discussion respecting when to invite stakeholders to participate in the process. Paul Oshel suggested that it might be less confusing by waiting to invite stakeholders to participate until the draft IRWMP plan was further developed for their consideration. Steve Dalke suggested that minutes might be sent to interested parties or stakeholders to keep them informed of progress. Paul Oshel proposed to draft a letter to potential stakeholders (with assistance from B-E) for consideration at next month's meeting.

- Item #6 on the agenda, Groundwater Management Plans, was the next order of business. It was recalled that, at the last meeting of the Group, there was some discussion respecting a regional groundwater management plan versus individual district plans. The Group concurred that it had previously agreed to update individual groundwater management plans, which may be encompassed by a regional groundwater management plan representing the entire study area. Steve Dalke informed the Group that his districts had revised their groundwater management plans, with Board adoption pending for June 20th. Dana Munn and Ron Eid indicated that North Kern had commenced preparation of an update of its groundwater management plan. B-E agreed to prepare a memorandum to report on the status of each agency's groundwater management plan.

- The next item of discussion was agenda #7 on proposed projects for inclusion and consideration in the Poso Creek IRWMP. B-E reminded the Group of its need for copies of any relevant project studies, reports, memorandums, and project descriptions. B-E also reminded the Group of its need for hardcopy or electronic versions of agency mapping efforts. Jerry Ezell noted that Ralph Sanchez of SWSD had GIS maps for Shafter-Wasco. Dale Brogan also noted that he had GIS mapping for DEID. Steve Dalke indicated that he is not comfortable with sample screening criteria, as contained in a recent Management Group meeting handout. He believed that a process whereby projects were laid out on the table for negotiations between group members would be more productive. Paul Oshel responded by indicating that a screening process would be helpful to develop for future projects submitted for future grant programs. Another comment was that everyone in the Group should benefit to some degree from the selected projects. In this regard, B-E noted that the

referenced screening criteria was just an example of a potential approach. Further, the process should be flexible and the screening criteria is primarily a tool for building a consensus. Paul Oshel suggested that the Group should begin to further develop the descriptions of the proposed projects, including benefits and costs, and that the task of focusing on specific projects should begin sooner rather than later. It was requested that B-E provide further project description development for next month's meeting.

- Item #8 on the agenda focused on the table of contents for the draft report. Harold Morgan reported that socioeconomic impacts needed to be addressed and should therefore be included in the table of contents. The Group suggested that B-E obtain a cost estimate (at least in terms of the order of magnitude) from Northwest Economic Associates.

- Item #9, regarding administration of the project, was discussed next. Harold Morgan reported that accounting for in-kind services is still pending submittal by a number of agencies. Harold Morgan reminded the Group that the grant contract will require an accounting of in-kind services as part of the funding on the IRWMP.

- The last item on the agenda for discussion was the status of the Upper Kings Basin Water Forum. Dale Brogan agreed to report on the status of the Forum's activities for the next Group meeting.

- Action items contained in the minutes for the March meeting were reviewed, and it was noted that all had been addressed. Action items for this May meeting, as noted above, included an update on individual agency groundwater management plans, the preparation of a letter to stakeholders, contact with an economic consultant, and further development of potential projects for discussion at the next meeting.

- The final order of business was the setting of the next Management Group meeting: Tuesday June 6th, at 2 pm at the SWSD offices.

MINUTES FOR POSO CREEK IRWMP MANAGEMENT GROUP MEETING
June 6, 2006

A noticed public meeting was held this afternoon for the Poso Creek Integrated Regional Water Management Plan (IRWMP) at the Semitropic Water Storage District (SWSD) offices in Wasco. The agenda, together with handouts for the meeting, are attached to these minutes. General managers representing the eight Regional Management Group members participated, including Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Steve Dalke, Brian Hockett, and Dale Brogan. Also participating were Craig Wallace of SWSD, John Jones with Developing Water Resources, Inc., and representatives for Bookman Edmonston (Ron Eid and Harold Morgan). A meeting attendance list is attached. No members of the public or representatives of potential stakeholders for the IRWMP were in attendance.

- The first item of business was the discussion of the draft minutes from the regular IRWMP Management Group meeting, held on May 2, 2006. With no changes proposed, the draft minutes for the meeting were accepted by the Group.

- The next item of discussion was the status of the grant contract which is pending between SWSD (as lead agency for the Group) and the state for grant funding of the IRWMP plan. Harold Morgan informed the Group that DWR was close to executing the contract and had requested SWSD revise the allocation of the proposed budget. Apparently, a final review of the submitted budget revealed that Grant proceeds were allocated for paying for the cost of the initial application preparation for the grant (task 0). DWR indicated that this was not an allowable expense and requested that we reallocate the budget without changing the total amount. Harold indicated that this had been done and forwarded back to DWR for review and completion of the contract.

- The next item of business was an inquiry to any of the Management Group Members on the potential participation in the Management Group by Southern San Joaquin Municipal Utility District. No new information was available on this agency's potential participation in the Poso Creek IRWMP.

- The next item of discussion (Item # 4) was focused on public involvement in the IRWMP process. Paul Oshel informed the Group that he recently heard that Senator Jim Costa discussed the regional planning process for water resources at the Kern County Water Association meeting. Senator Costa indicated that pending regional plans under development throughout the state needed to define water resources needs within the region, identify potential solutions and proposed projects, and evaluate the costs and cost/benefits of the proposed plan. Senator Costa also emphasized that

there are four primary areas that need to be considered in preparing these regional plans; water supply, water quality, environmental restoration, and flood control. Mention was made that Sherryl Lynn was the administrative assistant for Jim Costa and should probably be kept up to date on Poso Creek IRWMP process as it progresses. The Group agreed that Senator Costa as well as other state senators within the study area should be added to the stakeholder's list. Paul Oshel proposed to draft a letter to potential stakeholders (with assistance from B-E) for consideration at next month's meeting.

- Item #5 on the agenda, Groundwater Management Plans, was the next order of business. B-E agreed to prepare a memorandum to report on the status of each agency's groundwater management plan.

- The next item of discussion was agenda #6 on proposed projects for inclusion and consideration in the Poso Creek IRWMP. At this point in the meeting, B-E began a power point presentation of potential IRWMP projects. This power point presentation was prepared in response to the request made during the last Management Group meeting by Paul Oshel and others that B-E prepare additional material to describe in greater detail each of the potential projects for further discussion by the Group. Ron Eid indicated that this presentation was a working session in order to provide some equal level of understanding by Management Group members and provide feedback to B-E so it has a correct understanding of differing views of the potential projects. In reaction to an introductory slide listing specific projects, it was suggested that an additional listing be made for the generic type of infrastructure improvements (such as replacement of turnouts) which might be packaged as a separate project.

  At this point in the presentation, Dale Brogan indicated that DEID is on the verge of losing up to 30,000 acre-feet of water as a result of environmental litigation on the San Joaquin River and suggested that the various problems facing individual agencies be identified, as well as how those might be mitigated. Steve Dalke also added that his agencies were facing significant losses in Kern River supplies as a result of contract expirations. Ron Eid suggested that plumbing and infrastructure facilities were needed to meet reliable water needs as part of the ultimate solutions for these and other problems the regional plan was going to better define. John Jones suggested that banking arrangements would become more evident if plumbing was defined initially in order to create opportunities for such arrangements. Dale Brogan, again, questioned how these facilities fit into the regional need to meet problems of water supply losses and other problems facing the group. It was also suggested by one of the Group Members that opportunities for enhancing exchanges and other banking arrangements could be missed because facilities were not in place to take advantage of such opportunities. Paul Oshel suggested that the region needed to create infrastructure in order to take advantage of every

opportunity to capture available supplies. Dana Munn reinforced these thoughts by indicated that, at the current time, the Group could not see all of the possibilities which might become evident as the process and development of projects goes forward. It was finally agreed by the Group that it should proceed to review the potential projects included in the power point presentation.

Attached to these minutes is a copy of the power point presentation presented at the IRWMP Management Group meeting.

Following the presentation, it was agreed that, at the next Group meeting, each agency representative would provide in writing and be prepared to discuss in some detail his agency's assets, overall operations, issues and problems, and potential contributions to meeting the needs identified in the IRWMP process.

- Item #8 on the agenda focused on the table of contents for the draft report. Harold Morgan reported that socioeconomic impacts needed to be addressed and should, therefore, be included in the table of contents. Harold informed the Group that B-E is in the process of obtaining a cost estimate (at least in terms of the order of magnitude) from Northwest Economic Associates.

- Item #9, regarding administration of the project, was discussed next. Harold Morgan reported that accounting for in-kind services is still pending submittal by a number of agencies. Harold Morgan reminded the Group that the grant contract will require an accounting of in-kind services as part of the funding on the IRWMP.

- The last item on the agenda for discussion was the status of the Upper Kings River Basin Water Forum. No new information was provided on this item.

- Action items contained in the minutes for the March meeting were reviewed, and it was noted that all had either been addressed or were ongoing. Action items for this June meeting, as noted above, included an update on individual agency groundwater management plans, the preparation of a letter to stakeholders, contact with an economic consultant, and preparation of a written list of assets and needs by each agency.

- The final order of business was the setting of the next Management Group meeting: Wednesday, July 5th, at 2 pm at the SWSD offices.

MINUTES FOR POSO CREEK IRWMP MANAGEMENT GROUP MEETING
July 5, 2006

A noticed public meeting was held this afternoon for the Poso Creek Integrated Regional Water Management Plan (IRWMP) at the Semitropic Water Storage District (SWSD) offices in Wasco. The agenda, together with handouts for the meeting, are attached to these Minutes. General managers representing six of the eight Regional Management Group members participated, including Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Steve Dalke, and Dale Brogan. Also participating were representatives for Bookman-Edmonston (Ron Eid and Harold Morgan). A meeting attendance list is attached.

- No corrections to the minutes for the June 6, 2006 regular meeting of the Management Group were offered. Accordingly, the Minutes were accepted as drafted.

- The next item of business related to the grant contract. In this regard, Paul Oshel reported that Semitropic had received a copy of the grant contract from DWR and had executed that contract. Ron Eid indicated that it appeared that a couple of the exhibits to the contract may not reflect the latest thinking. In particular, the schedule, which is exhibit B to the contract, shows completion of the draft report in July 2006, as opposed to December 2006. Accordingly, all of the exhibits, including the scope of work, schedule, and budget, should be reviewed to confirm that they do in fact represent the most recent drafts of those documents.

- Steve Dalke distributed a copy of a news release (dated June 30, 2006) which related to the Freeport Regional Water Authority's application for Prop 50 funds. In this regard, Dana Munn suggested that we needed to seek clarification with respect to who we are competing against when it comes to Prop 50 funds. B-E indicated that they would seek this clarification and report to the Group.

- Respecting public involvement, Paul Oshel lead a discussion of a draft letter that he had prepared which would be sent to all stakeholders. There was some discussion respecting the listed planning objectives. In this regard, it was suggested that item 1 be limited to simply "water supply reliability", that item 6 be revised to read simply "environmental restoration", and that item 7 be revised to indicate simply "improve flood control". It was also suggested and agreed that the letter should reflect the names and or logos of all of the participating districts, along with signatures for each of the districts. The group wanted to emphasize that this is a collaborative planning effort, not the work of a single entity.

- Respecting ground water management plans, Steve Dalke reported that Kern-Tulare and Rag Gulch water districts adopted their updated ground

water management plan in June. In this regard, Steve provided a copy of the cover (dated June 20, 2006) indicating that the remainder of the previously provided draft report remained unchanged. Also in this regard, B-E distributed a one page tabulation indicating the status of each agency's ground water management plan. There were a couple of corrections indicated; (1) Kern-Tulare and Rag Gulch water districts never had ground water management plans under AB 255; rather, their initial plans were developed under AB 3030, (2) Delano-Earlimart's ground water management plan was also developed under AB 3030 and does not include the subsequent requirements of SB 1938. David Ansolabehere, with Cawelo Water District, was not in attendance to comment on the status of that district's ground water management plan.

- Respecting the inclusion of socio economic impacts in the draft report, B-E reported that contact had been made with Bob McCusick (formerly Northwest Economics Associates and currently Entrex). In this regard, Mr. McCusick indicated that they could do the required work but would like to have 3-4 months notice for purposes of planning for and scheduling that work to be completed. It was agreed among those in attendance that Mr. McCusick was uniquely qualified to do this work owing to his past work in the area.

- There was considerable discussion regarding allocation of costs and in-kind services. Jerry Ezell expressed concern about how the group was going to come up with over $200,000 of in-kind services. In addition to staff time for each of the individual districts, it was noted that there are two out-of-scope items which have been identified thus far, including preparation of a regional ground water management plan and evaluation of socio economic impacts. Paul Oshel suggested that, qualitatively, any out- of- pocket costs should be allocated on the basis of benefits received. However, the quantification of those benefits, particularly during this planning phase, may be difficult. Accordingly, Paul suggested that this item be the subject of additional thought and discussion. It was also noted that Semitropic fronted the monies to prepare the grant application and that, at some point in time, Semitropic would look to the other participants to share in that cost. The question was also raised as to what the effect, if any, would be on grant monies if, in the final analysis, the in-kind services fell short of the budgeted amount. B-E agreed to seek an answer to this question.

- Item 6 of the agenda was planned to involve a presentation by each of the districts in the Management Group with respect to their district assets, issues, and needs, along with submittal of a written statement in this regard. Owing to insufficient time remaining in the meeting, only one such presentation was actually made. In particular Steve Dalke presented on behalf of his districts, namely, Kern-Tulare and Rag Gulch water districts. Steve also provided an outline handout respecting his

presentation. While the presentations have yet to be made, both North Kern and Shafter-Wasco provided handouts respecting their districts. Dale Brogan indicated that he would provide a written summary for DEID late this week.

Finally, the next regularly scheduled meeting will be August 1, 2006 at 12:00. p.m. It was agreed to begin the meeting earlier to allow more time, if required, for meeting purposes.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 12 pm to 3 pm, September 5, 2006

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Regional Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on September 5th, 2006 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives for seven of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Craig Wallace (designee for Will Boschman), Dale Brogan, Steve Dalke, and David Ansolabehere. Also participating were Paul Oshel (by phone), Ron Eid and Sam Schaefer representing Bookman-Edmonston, and Rick Iger from the Kern County Water Agency (KCWA). Ron Eid called the meeting to order. The agenda, together with handouts for the meeting, are attached to these Minutes.

Agenda item 1, Minutes: A spelling correction to the draft Minutes for the August 1st, 2006 regular meeting of the Regional Management Group was noted. Accordingly, the Minutes were accepted after noting the correction.

Agenda item 3, DWR Contract Status: Item 3 was addressed prior to item 2 to allow David Ansolabehere time to setup for the Cawelo WD assets and needs presentation. Sam Schaefer noted that the first progress report was ready to be sent to the DWR and thanked all districts who provided input to the first round of In-Kind service costs. Paul Oshel provided a copy of the updated schedule to be included in the progress report in response to DWR's request for the correct schedule. The Management Group discussed the types of In-Kind services costs to track and was reminded to continue the documentation effort required by the grant.

Agenda item 2: The last of the six presentations for "District Needs, Issues, and Assets" was made by David Ansolabehere for Cawelo WD. Following Dave's presentation, discussion and questions to Dave by the Regional Management Group led to further discussion on how the IRWMP will need to describe and evaluate the expectations and needs of each district within the region. The Management Group acknowledged that the presentations provided insights about neighboring districts that will be useful in the formation of the IRWMP. A copy of Cawelo's handout (on their presentation) will be added to the previous ones submitted to Paul Oshel and are available at the Semitropic WSD.

Agenda item 4, Regional Management Group: The Management Group discussed the schedule to complete a draft IRWMP by the end of this year. The expected timing for the second cycle of implementation grants is the second half of 2007 and it will require that the Poso Creek IRWM Plan be adopted by that time. Dale Brogan mentioned this fall's election bond measure (Prop 84) is showing as "not passing" at this time in the polls. This bond measure, if passed, would provide more implementation funding, specifically designated by regions in the state.

Agenda item 4, continued: Following the planning schedule discussion, there was discussion about the need to prioritize projects as part of the planning process. The

discussion centered on the various conveyance system improvements, interconnections between districts, and groundwater recharge projects in various districts. Rick Iger of the KCWA asked the group to consider the Poso Creek Dam study. Rick indicated the first phase of the planning study was nearly complete and the second phase of planning would be funded at 500K. Also discussed was the need for districts to provide water budget information in the context of Kern County Water Agency's groundwater mediation efforts, and that Ron Eid was working with several of the districts to accomplish this effort.

Agenda item 5, Public Involvement: Ron Eid reported (on behalf of Paul Oshel) that the Invitation for Stakeholder Participation letter had been sent out. In this regard, Rick Iger noted that he had received the letter.

Agenda item 6, Groundwater Management Plans: For those districts that have not completed an update of their Groundwater Management Plans, they were reminded that they will need updates prior to the time that an implementation grant application is submitted. It was suggested by the Management Group that the updates be completed by early 2007.

Agenda item 7, Draft IRWMP: B-E/GEI handed out draft summary tables showing the linking between the IRWMP planning Objectives and Strategies, a list of considered infrastructure, and a location map. Some initial discussion and feedback was obtained from the Management Group on the summary tables and about the procedure to review these summary tables. It was suggested and agreed that B-E/GEI would send out an electronic file (Excel spreadsheet in this case) to the Management Group members for their comments and input on project descriptions. It was also suggested that two weeks would be appropriate for obtaining review and input from the Management Group members.

Ron Eid and Sam Schaefer of B-E/GEI reported to the Management Group that five chapters of the IRWMP are now in draft form. The Management Group indicated the wet year to dry year regulation of water supplies is a key component of district operations that needs to be discussed in the plan. In this regard, it was suggested that each agency consider how their actual operations would be different in a given year type (ideally, a "recent" year for which data are readily available) with construction of one or more of the potential conveyance improvements.

Agenda item 8, Action Items:

>Paul Oshel – Cost Allocation Memo

>Ron Eid and Sam Schaefer, B-E/GEI – Distribute electronic files of Project Summary Tables for review and input by the Management Group members.

The next regularly scheduled meeting will be on October 3rd, at 12 pm.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 12 pm to 3 pm, October 3, 2006

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on October 3rd, 2006 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives for seven of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Dale Brogan, Steve Dalke, and Brian Hockett. Also participating were Craig Wallace of Semitropic, Ron Eid and Sam Schaefer representing Bookman-Edmonston, Rick Iger and Curtis Creel from the Kern County Water Agency (KCWA), John Jones of D.W.R., Inc., and Ben Igawa from DWR, Fresno Office.

Paul Oshel called the meeting to order and allowed for introductions for the benefit of new stakeholders who were present. Ben Igawa provided a brief history of his involvement in water resources planning activities in the Region. The agenda is attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the September 5th, 2006 regular meeting of the Management Group were accepted as presented.

Agenda item 2, District Needs, Issues, Assets, etc.

2a) The Management Group discussed examples of each District's "wet" year operations and indicated areas where possible improvements to their infrastructure, combined with changes in operations, would allow for increased reliability of their supplies.

> Steve Dalke started the discussion by describing how Kern-Tulare and Rag Gulch water districts meet demands with their supplies during a wet year, the places where water supplies were delivered this past year, and the fact this past year was so wet that the districts ran out of places to put available water. Since additional spreading was possible this past year, the districts are looking at developing two recharge areas, with a total area of about 200 acres; 120 acres in Kern-Tulare and 80 acres in Rag Gulch.
>
> Rick Iger followed with a discussion of KCWA's recent 22-months of continuous recharge operations and the unusual condition of a 100 percent allocation of Table A for the SWP. Rick indicated that the CVC and the CA Aqueduct will be operating at maximum capacity in the future and identified Check 21 as a point constricting conveyance of water in the SWP system.
>
> Dana Munn discussed North Kern's ability to receive water for recharge at a delivery rate of up to 250 cfs to their west side facilities and up to 150 cfs to their east side facilities. Dana continued with a discussion of facilities and operations that are being considered by the District to allow more capacity and flexibility to deliver water supplies to recharge areas.

D R A F T

Dale Brogan discussed DEID's ability to deliver surplus water early in the year and deferring the delivery of its fully regulated supplies until later in the year. In this regard, DEID can schedule its firm (Class 1) water through the end of February of the subsequent calendar year. Dale discussed transferring water up to the available capacity in the Friant-Kern Canal and that water could be moved throughout the year, with the exception of July and August, when all of the canal capacity is typically being utilized.

Jerry Ezell discussed SWID's banking/exchange arrangements with North Kern and Semitropic. About 20 percent of SWID's area is not eligible to receive Federal water; thus, they try to obtain other non-federal sources of water for these lands.

Paul Oshel discussed Semitropic's goal to keep groundwater wells off during "wet" years by delivering non-contract water to growers. Semitropic starts the year in a 'put' mode, which means delivering surface water in lieu of pumping groundwater whenever and wherever it can within its area. Paul discussed several projects that are in preliminary to final design that will add to Semitropic's capacity to deliver surface water in lieu of pumping groundwater.

Semitropic is also planning to add direct recharge capacity for off-season recharge. Paul mentioned that results of an infiltration test on a 14-acre test pond indicate an absorptive rate of 0.23 feet/day and an annual rate of 40,000 acre-feet/year (assuming the development of several hundred acres of ponds). Semitropic's capacity for importing water is currently about 315,000 acre-feet/year and its goal is to be able to import up to 450,000 acre-feet/year. Semitropic presently has the capacity to recover 90,000 acre-feet/year; with the addition of the SWRU, pump-back capacity will increase to 290,000 acre-feet/year.

Agenda item 2b: Agenda item 2b "Opportunities to regulate supply within individual districts and the Management Group area with and without the Poso Creek IRWMP" was started during the discussion of agenda item 2a. The districts facilitated further discussion on opportunities and limitations to regulate supplies that occurred during the 2006 wet-year operations.

Agenda item 2c: An Update on Friant SJR Settlement was provided by Dale Brogan and Jerry Ezell who presented a slide show (and provided a handout) of the main topics of restoration, water management, and third-party issues. Dale provided discussion on the affects of the settlement on water supplies for Friant contractors. Dale also discussed opportunities for Friant contractors, such as DEID to regulate their Class 1 and Class 2 contract supplies. Dale mentioned studies will be conducted on operations involving recirculation of Friant water through adding a pumping plant at Patterson to deliver water into the Delta-Mendota Canal. It is anticipated that all years, except "dry" years, may include recirculation.

Agenda item 3, Discussion of IRWMP Project(s):

3a) The Management Group discussed the need in the near term to engage in project formulation and selection criteria. To help with this process, it was suggested that B-E spend time in one-on-one meetings with each district or small groups of districts to help with the process to formulate projects. Although a schedule was not determined at the monthly meeting, it was suggested B-E would lead this effort. In this regard, Dale Brogan noted three projects that have the potential to expand DEID's ability to capture available water supplies and are under consideration: (1) development of up to 480 acres of in-district spreading, with an estimated project cost of about $20 million (this is being studied under the Friant-MWD partnership); (2) delivery of surface water (when available) to the neighboring Pixley Irrigation District in lieu of using pumped groundwater (study underway); and (3) direct recharge in the White River. Paul Oshel also suggested adding to the list of potential projects a future connection between Semitropic's system and SSJMUD's system. In this regard, Semitropic has oversized a pipeline in one of its new distribution systems to accommodate such a connection.

Agenda item 4, Draft IRWMP: Following the project formulation discussion, there was discussion about the procedure and need for plan formulation for the draft IRWMP.

4a) and 4b). B-E asked for any additional feedback on the draft summary tables showing the linking between the IRWMP planning Objectives and Strategies, a list of considered infrastructure, and a location map. It was suggested that additional facility/concepts needed to be added to the infrastructure list. B-E agreed to help coordinate the Management Group member's efforts to complete the facility/concept descriptions and update the facility/concepts list.

4c). The Management Group discussed the status of the district water budgets in the context of the Kern County Mediation Process. The districts within Kern County reported they have completed their water balance.

Agenda item 5, Regional Management Group:

5a) The Management Group discussed the schedule to complete a draft IRWMP by the end of this year. B-E reported to the Management Group that six chapters of the IRWMP are now in draft form. The expected timing for the second cycle of implementation grants is the second half of 2007 and it will require that the Poso Creek IRWM Plan be adopted by that time. This Management Group discussed the level of detail needed for facility/concepts in the draft IRWMP versus a project description in an implementation grant.

5b) Paul Oshel reminded the Management Group that he still owed them a Cost Allocation Memo.

Agenda item 6, Groundwater Management Plans: For those districts that have not completed an update of their Groundwater Management Plans, they were reminded that the updates will need to be completed prior to an implementation grant proposal in 2007. Jerry Ezell noted that he has contracted with Dennis Keller to update SWID's groundwater management plan.

Agenda item 7, Action Items:

>Paul Oshel – Cost Allocation Memo
>B-E – Facilitate review and update of facility/concept list by the Management Group members.
> B-E – Facilitate project formulation, screening, and scoring process and meet with the Districts.

The next regularly scheduled meeting will be on November 7th, at 12 pm. The December meeting will likely be moved from the first Tuesday to the second Tuesday (12 Dec) to avoid conflicting with the ACWA conference.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 12 pm to 3 pm, November 7, 2006

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on November 7th, 2006 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives for six of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Dale Brogan, and Steve Dalke. Also participating were Ron Eid and Sam Schaefer representing Bookman-Edmonston, John Jones of D.W.R., Inc., and Al Steele from DWR, Fresno Office.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the October 3rd, 2006 regular meeting of the Management Group were accepted as presented.

Agenda item 2, IRWMP Project(s) Formulation

2a) The Management Group discussed progress made on Project descriptions. Since the October monthly meeting, input on Project descriptions was received from Dana Munn, Steve Dalke, and Paul Oshel. Dale Brogan indicated that their in-district recharge and recovery study should be available in about two weeks and would have all of the necessary information. Dale also requested that a proposed program between DEID and Pixley ID be added to the list and that two previously proposed projects (numbers 16 and 17) be removed, with the new 16 being a banking program with North Kern. The program with Pixley would also be an out-of-district banking project. Comments were also received on the importance of adding descriptive information about the IRWMP region to the location map, i.e., information that communicates the size and scope of the area and the assets.

Following the October meeting, several concepts were added to the potential project lists. One of the added concepts, a Joint Powers Authority, was discussed by the group as a means to streamline regional operational decisions that may be needed for integrating the operation of the proposed regional conveyance projects. The potential need for a Programmatic EIR was also discussed. Whatever the vehicle, it was agreed that it would be important for the Group to be positioned to move "quickly" and take advantage of water supply opportunities when they occur. It was also noted that the San Joaquin River Settlement includes significant environmental benefits and that some of the proposed projects will mitigate for the loss of water supplies that created those benefits; accordingly, it will be important to tell this story in the plan. Finally, it was agreed that B-E will update the Project list and location map based on the comments received and send the revisions out to the Management Group.

2b) Schedule District meetings with B-E for Project formulation. It was discussed and agreed by the Management Group members to provide their project descriptions by December 11th, the next Monthly Meeting. Due to several scheduling challenges, including the December ACWA conference, the approach of providing B-E with updated project descriptions was preferred over individual District meetings.

Agenda item 3, Project Evaluation:

3a) The Management Group discussed the need in the near term to engage in project formulation and selection criteria. A draft Project screening process was sent to the Management Group and comments were obtained at this meeting; B-E will revise the draft Project screening process diagram prior to the next monthly meeting.

3b) Discuss Management Group's screening criteria. The Management Group discussed the need to formulate and screen Projects. The Management Group asked Al Steele to describe the expected DWR grant review process. Al mentioned that the implementation grant proposal will likely be reviewed by a number of reviewers and stressed the importance of organizing the application to facilitate the review.

3c) Water Balance Information – Ron Eid presented slides describing the depth to groundwater over the past 25 years for the districts within the region. Also presented and discussed were water supply volumes for historical and projected conditions. Data were based on a number of sources.

Agenda item 4, Regional Management Group:

4a) IRWMP Schedule - The Management Group discussed the projected schedule to complete a draft IRWMP by the end of this year. It was agreed to allow the schedule to shift one month in preparing the draft IRWMP. The expected timing for the second cycle of implementation grants is the second half of 2007 and it will require that the Poso Creek IRWM Plan be adopted by that time. The Management Group discussed the anticipated level of detail needed for facility/concepts in the draft IRWMP versus a project description in an implementation grant. A goal was set for completing Project descriptions to be used for pre-screening by December 11th, 2006.

4b) 2nd Progress Report and Reimbursement Request to DWR. Paul Oshel reported that the first DWR reimbursement was received by Semitropic WSD. Sam Schaefer reported that the 2nd Progress Report was ready to send in once the budget numbers were compiled for the all of the In-Kind services plus the consultant expenses for the period ending September 30th, 2006. It was expected that this task would be completed prior to the December monthly meeting. The districts were reminded to keep tracking their In-Kind expenses as they will be compiled again following the end of the next period (December 31st, 2006).

4c) Paul Oshel noted that he still had to prepare a cost allocation memo for consideration by the Group.

Agenda item 5, Action Items:

>Paul Oshel – Cost Allocation Memo
>Management Group– Provide updates to facility/concept list for use in Project formulation.
> B-E – Revise Project pre-screening process.

The next scheduled meeting will be on December 11th, at 9 am. The December meeting was moved from the first Tuesday to avoid conflicting with the ACWA conference.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 9 am to 12 pm, December 11, 2006

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on December 11th, 2006 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives for six of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Dale Brogan, Steve Dalke and Scott Hamilton. Also participating were Ron Eid and Sam Schaefer representing Bookman-Edmonston, John Jones of D.W.R., Inc., Al Steele and Ben Igawa from DWR, Fresno Office, Rick Iger of KCWA, Dan Bartu of BVWSD, and Craig Cross and Tracie Billington of DWR, Sacramento Office by conference call.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the October 3rd, 2006 regular meeting of the Management Group were accepted as presented.

Added to the meeting agenda was an overview of Prop 50 draft funding for implantation grants. This was provided by Tracy Billington who called in from DWR Sacramento Office. Seven Implementation Grant proposals were recommended for funding at 25 million each. Prop 84, which contains funding for the Tulare and Kern County area, and Prop 1E were also discussed. DWR will expect to have Guidelines for Implementation of the Grant Proposals finalized by summer of 2007.

Agenda item 2, Discuss Management Group's Progress on Project descriptions

2a) A notebook containing project descriptions was handed out to each Management Group member. The Management Group discussed progress made on Project descriptions. Some modifications were noted to the names of the projects and two project descriptions were added to the list. Due to the short amount of work time between December and January meetings, the Management Group expected to continue editing the project descriptions in January, 2007. Also discussed were methods for sharing the electronic versions of the project descriptions files.

2b) An updated proposed projects list and location map was also handed out with the project descriptions notebook. The Management Group discussed contacting other entities who may benefit by having a project included or by being associated with the Poso Creek IRWMP. The Management Group mentioned the City of Shafter and suggested finding out the status of their proposed well replacement project and if they desire the project to be included in the Poso Creek IRWMP. The Management Group recommended another communication effort to reach out to other entities that may benefit by being included in the IRWMP.

Agenda item 3, Project Formulaton and Evaluation:

3a) A revised draft of the Project screening process diagram was handed out and discussed.

3b) The Management Group discussed the need to formulate, prioritize, and screen Projects. Discussion by the group led to questions about funding for projects that may start prior to receiving grant funding. When does the cost share begin and what is eligible? The Management Group suggested focusing on the screening criteria for the February monthly meeting.

3c) A draft brochure describing the IRWMP Region's assets, challenges and solutions was presented to the Management Group.

Agenda item 4, Regional Management Group:

4a) IRWMP Schedule - The Management Group discussed the need to add to some of the project descriptions to be used for pre-screening in early 2007; it was noted that several of the project descriptions are more complete than others.

4b) Sam Schaefer reported that the 2nd Progress Report would be sent in once the budget numbers were compiled for the all of the In-Kind services plus the consultant expenses for the period ending September 30th, 2006. It was expected that this task would be completed prior to the January monthly meeting.

4c) Paul Oshel noted that he still had to prepare a cost allocation memo for consideration by the Group.

Agenda item 5, Action Items:

>Paul Oshel – Cost Allocation Memo
>Management Group– Provide Input on Project Descriptions

The next scheduled meeting will be on January 8th, at 9 am. The January meeting was moved from the first Tuesday to avoid conflicting with the New Years holiday.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 9 am to 12 pm, January 8, 2007

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on January 8th, 2007 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives for seven of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Dale Brogan, Steve Dalke and Scott Hamilton. Also participating were Sam Schaefer representing Bookman-Edmonston, John Jones of D.W.R., Inc., and Al Steele and Ben Igawa from DWR, Fresno Office.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the December 11th, 2006 regular meeting of the Management Group were accepted as draft contingent on further comments.

Agenda item 2, Discuss Brochure: A draft brochure was handed out to the Management Group, discussed, and comments noted.

Agenda time 3, Overview of Prop 50 Planning and Implementation Grants Awards: As a follow up to questions from the previous monthly meeting, material on the Implementation Grant scoring (140 Total Points for Plan, Proposal, and Statewide Priorities) was handed out and discussed. It was noted the DWR will be conducting workshops to gain feedback for the next round of Implementation Grants and that guidelines are anticipated to be released in summer to fall of 2007.

Agenda Item 4, Plan Formulation: The status of the project descriptions, planning objectives, strategies, and proposed actions (as shown in brochure) were discussed by the Management Group. How plan formulation and selection of projects may affect the Implementation Grant scoring was discussed and will be considered by the Management Group as they move into Plan Formulation.

Agenda item 5, Project Formulation and Evaluation: The Management Group discussed how to screen and prioritize the proposed structural and non-structural actions, the need to have measurable objectives, and a process for project formulation. It was agreed to focus the next monthly meeting on project formulation for the IRWMP and consider evaluation criteria at a later date.

Agenda item 6. Regional Management Group

It was noted that the 2nd Progress Report and Reimbursement Request to DWR was sent in to DWR.

The next meeting will be at the regularly scheduled time of 12 noon on the first Tuesday of the month, February 6th, 2007.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 9 am to 12 pm, February 6, 2007

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on February 6, 2007 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives for seven of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Dale Brogan, Steve Dalke, and David Ansolabehere. Also participating were Craig Wallace of Semitropic, Ron Eid, Sam Schaefer, and John Zoraster representing Bookman-Edmonston, John Jones of D.W.R., Inc., Rick Iger of KCWA, and Ben Igawa from DWR, Fresno Office.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the January 8, 2007 regular meeting of the Management Group were accepted.

Agenda item 2, Brochure: An updated draft brochure was handed out to the Management Group, discussed, and comments noted. The Management Group decided to present the draft brochure to their respective Board of Directors meeting in February. Copies will be printed as needed to allow for minor updates based on feedback from the Management Group member districts.

Agenda Item 3, Plan Formulation:

a) **Project Descriptions**: Updates to project descriptions were handed out to each Management Group member; it was noted that most of the structural project descriptions were adequate to support project evaluation and support a water supply benefit analysis; the non-structural concepts will require more effort after they are considered as part of plan formulation.

b) **Proposed Projects and Plan Formulation:** The Management Group focused on how to evaluate and prioritize the proposed structural and non-structural actions. The Management Group discussed the need to evaluate wet-year and dry-year strategies, costs and preference associated with delivering surface supplies to in-lieu versus direct recharge, evaluating conveyance system options that use gravity versus routes requiring pumping, the need to conduct a monthly analysis of delivery of surface supplies to absorptive capacity to demonstrate existing conveyance constraints, and discussed how the proposed projects can have multiple benefits. The members of the Management Group who need to update their GW Management Plans were reminded that the plans need to be adopted prior to an Implementation Grant application.

c) **Draft Poso Creek IRWMP Chapters:** The Management Group discussed the review process for the draft IRWMP and suggested sending out chapters for review as they are completed to help make the task manageable.

Agenda time 4, Regional Management Group

a) **DWR Workshop:** Paul Oshel, Rick Iger, and Sam Schaefer attended the DWR workshop held on January 31, 007 in Alhambra, CA concerning the DWR's proposal to administer remaining Prop 50 funds and to gain feedback for the next round of Implementation Grants. Paul Oshel presented a draft of a comment letter on DWR's proposal and indicated that comments must be submitted that was due by February 8, 2007. The Management Group members agreed to review the letter and for it to be sent to the DWR representative.

b) **Third Progress Report and DWR Reimbursement Request to DWR**: GEI/B-E will draft the third progress report during February. In this regard, the Management Group will need to respond to a request for their In-Kind expenses for October – December, 2006. Semitropic will prepare the third DWR reimbursement request and submit to DWR.

c) **Cost Allocation Memo**: Paul Oshel briefly discussed the task.

Agenda item 5. Action Items

1) Send comment letter to DWR
2) Send updated Brochure to Management Group members
3) Host DWR Funding Area meeting at Semitropic
4) Contact City of Shafter concerning inclusion of their project in the Poso Creek IRWMP
5) Contact SSJMUD to ask again if they are interested in participating in the Poso Creek IRWMP
6) GEI/B-E to obtain annual report from NWKRCD
7) Send draft chapters 1-4 out to Management Group for review
8) Update tables for use in Plan formulation - objectives/strategies/projects tables
9) Commence work on development of a "tool" to evaluate water supply accomplishments.

The next meeting will be at the regularly scheduled time of 12 noon on the first Tuesday of the month, March 6, 2007.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 12 pm to 3 pm, March 6, 2007

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on March 6, 2007 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Dale Brogan, Steve Dalke, David Ansolabehere, and Brian Hockett. Also participating were Craig Wallace and Will Boschman of Semitropic, Jeff Fabbri, a board member of Semitropic, Ron Eid and Sam Schaefer representing Bookman-Edmonston, John Jones of D.W.R., Inc., Rick Iger of KCWA, and Ben Igawa from DWR, Fresno Office.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 0, Guests: Senator Dean Florez, Shafter and Senator Darrell Steinberg, Sacramento Area, participated in the first part of the monthly meeting. Paul Oshel provided them with an overview of the Poso Creek IRWMP. Senators Florez and Steinberg asked questions regarding the benefits of funding groundwater storage and conveyance for this area within the southern portion of the San Joaquin Valley. Also discussed was how the proposed projects of the Poso Creek IRWMP may help meet the needs of regional issues of statewide importance, such as the San Joaquin River settlement.

Agenda item 1, Minutes: The draft Minutes for the February 6, 2007 regular meeting of the Management Group were accepted.

Agenda item 2, Brochure: A final-draft brochure was handed out to the Management Group, discussed, and comments noted. The Management Group decided to use the brochure as presented and to make copies as needed.

Agenda time 3, Regional Management Group

a) **DWR:** It was noted that the DWR and SWRCB will make a decision on funding Prop 50, Step 2 proposals on March 20. Information will be updated at the April monthly meeting.

b) **Third Progress Report and DWR Reimbursement Request to DWR**: GEI/B-E and Semitropic will complete the report and submit the reimbursement request to DWR.

Agenda Item 4, Plan Formulation:

a) **Water Supply Evaluation:** Ron Eid presented progress on the evaluation of water supplies to the Poso Creek IRWMP Region. Also discussed was the assessment of each district's ability to match available surface supplies to their agricultural demands. Some districts have the ability to match their available surface supplies to their peak irrigation demand, others are limited by their in-

district conveyance, and some are limited due to regional conveyance constraints. The Management Group discussed ways to integrate their systems to overcome some of these limitations for the purpose of conserving groundwater resources.

b) **Prioritizing Projects**: The districts were reminded that the non-structural project description still needed some work; whereas, most of the structural descriptions were adequate for use in plan formulation.

c) **Draft Poso Creek IRWMP Chapters:** The Management Group discussed the review process for the draft IRWMP. Additional chapters were to be sent out in March.

Agenda item 5. Action Items

1) Continue evaluation of water supply accomplishments.
2) Send out completed draft chapters for review.
3) Formulate draft plan

The next meeting will be at the regularly scheduled time of 12 noon on the first Tuesday of the month, April 3, 2007.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 12 pm to 3 pm, April 3, 2007

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on April 3, 2007 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives of five of the eight Regional Management Group members were present, which included Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), and Steve Dalke; also participating were Craig Wallace of Semitropic, Ron Eid and Sam Schaefer representing Bookman-Edmonston, John Jones of D.W.R., Inc., and Ben Igawa and Al Steele from DWR, Fresno Office.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the March 6, 2007 regular meeting of the Management Group were accepted.

Agenda item 2, Brochure: The Management Group decided to send out the final-draft brochure to the regional stakeholders, state and federal agencies, and legislative contacts. In this regard, Ben Igawa took several copies to distribute.

Agenda Item 3, Plan Formulation:

a) **Present updated tables of IRWMP goals, objectives, strategies, regional priorities, and projects (structural and non-structural):** GEI/B-E handed out updated tables that are part of Ch 6 of the IRWMP and received initial comments from those present. The Ch 6 text accompanying the tables was to be sent out to the group the following week.

b) **Planning process – project screening diagram:** GEI/B-E presented an updated project screening diagram to be used as a method of project screening in plan formulation.

c) **Discuss progress on evaluation of water supply accomplishments:** Ron Eid presented an update on the evaluation of water supplies to the Poso Creek IRWMP Region that was initially presented the previous monthly meeting. This led to discussion on the assessment of each district's ability to match available surface supplies to their agricultural demands. Some districts have the ability to match their available surface supplies to their peak irrigation demand, others are limited by their in-district conveyance, and some are limited due to regional conveyance constraints. An e-mail request will be made to the Management Group in order to fill in the missing information in support of this analysis. GEI/B-E also requested that working sessions with a couple of district representatives would be helpful to provide a reality check on some of the assumptions that are required in the evaluation of water supply accomplishments.

Agenda time 4, Regional Management Group

D R A F T

a) **DWR Funding of Prop 50 – update on DWR decision:** The DWR and SWRCB decision to fund additional Prop 50, Step 2 proposals on March 20 was presented by Ben Igawa and discussed by the Management Group. A question concerning the North/South split was raised and answered through the DWR point of contact following the meeting. In particular, it is understood that the remaining Prop 50 funds available to the North are $11.5 million.

b) **Third Progress Report and DWR Reimbursement Request to DWR**: GEI/B-E and Semitropic completed the report and submitted the reimbursement request to DWR.

c) **Schedule and IRWMP Chapters review** – GEI/B-E requested comments on Ch 1 and 2. During this month, a Draft Plan notebook will be sent out to each Management Group member and chapters for review will be sent as completed.

Agenda item 5. Action Items

1) Continue evaluation of water supply accomplishments.
2) Send out Draft Plan notebooks and completed draft chapters for review.
3) Finish updating project descriptions for use in formulating the IRWMP.

The next meeting will be at the regularly scheduled time of 12 noon on the first Tuesday of the month, May 1, 2007.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 12 pm to 3 pm, May 1, 2007

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on May 1, 2007 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives of all eight Regional Management Group members were present, which included David Ansolabehere, Dale Brogan, Dana Munn, Jerry Ezell, Paul Oshel (designee for Will Boschman), Brian Hockett, and Steve Dalke; also participating were Craig Wallace of Semitropic, Ron Eid and Sam Schaefer representing Bookman-Edmonston, John Jones of D.W.R., Inc., and Ben Igawa from DWR, Fresno Office.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the April 3, 2007 regular meeting of the Management Group were accepted.

Agenda item 2, Plan Formulation: Sam Schaefer received comments on draft chapters 1, 2 and 6 and on the project descriptions. Draft chapters 1-4, and 9, a preliminary draft of chapters 7 and 8, and updated project descriptions were handed out for the RMG members. Dale requested a list to guide review of the documents; Sam was to follow up with sending out a list of most important sections to the RMG in order to help guide their review.

Ron Eid presented an update on the water supply accomplishments. The RMG discussed the assumptions in the analysis and how they represented their district operations. Ron was to follow-up with operational questions regarding the Friant-Kern Canal with Dale, Steve, and Jerry.

Steve Dalke led a discussion on project formulation, which began as draft concept paper circulated prior to the monthly meeting. The discussion focused on the technical evaluation provided in the analysis of the water supply accomplishments combined with the district operations within the Region. The results of this discussion was acknowledgement by all the RMG that a "bundle" of projects that included non-structural projects focused on the Institutional Agreements and CEQA/NEPA analysis for the Regional operations and structural projects no. 5, 11, 17, and 18 would provide a "first-phase" solution in meeting the Region's priority needs. The proposed mix of non-structural and structural projects contains a benefit to each member district, which is also important to the RMG.

As part of the project formulation, the RMG discussed interest by SSJMUD in regard to interconnections with Cawelo and North Kern. The RMG also discussed the water quality constraint on returning stored groundwater back into the F-K Canal.

Agenda Item 3, Regional Management Group:

a) Set completion schedule for Draft IRWMP, 30-day public review, and adoption of IRWMP by Boards [Adoption deadline is August 1, 2007]

b) GEI/B-E and Semitropic will complete the Fourth Progress report and submit the reimbursement request to DWR in May.

c) The opportunity to join the Joint Power Authority of the Southern San Joaquin Valley Water-Related Entities for the purpose of coordinating funding opportunities was discussed. Paul Oshel will attend the next coordinating and policy committee meeting to be held on May 18th

d) Regarding the Prop 50 grant application, the RMG suggested going forward with a project component of the "first-phase" bundle combined with institutional agreements for the Prop 50 grant application. Craig Cross reminded the RMG to review the draft PSP guidelines that were recently released for guidance on the Prop 50 grant application.

Agenda item 5. Action Items

1) Complete evaluation of water supply accomplishments.
2) Prepare draft chapters for RMG and Public review.
3) Complete project descriptions for use in formulating the IRWMP.
4) Formulate project bundles for the IRWMP
5) Prepare resolution of adoption for districts
6) Scope out level of effort needed for the FAAST application due August 1st.

The next meeting will be at the regularly scheduled time of 12 noon on the first Tuesday of the month, June 5, 2007.

Minutes of the Poso Creek IRWM Plan Management Group Meeting
Convened at 12 pm to 3 pm, June 5, 2007

The regularly scheduled and noticed public meeting of the Poso Creek Regional Management Group (Management Group) for the Poso Creek Integrated Regional Water Management Plan (IRWMP) was held on June 5, 2007 at the Semitropic Water Storage District (SWSD) offices in Wasco. Representatives of five Regional Management Group members were present, which included Dale Brogan, Dana Munn, Paul Oshel (designee for Will Boschman), and Steve Dalke; also participating were Craig Wallace of Semitropic, Dick Rhone and Sam Schaefer representing GEI/Bookman-Edmonston, and Al Steele from DWR.

Paul Oshel called the meeting to order and allowed for introductions. The agenda and attendance sheet are attached to these Minutes.

Agenda item 1, Minutes: The draft Minutes for the May 1, 2007 regular meeting of the Management Group were accepted.

Agenda item 2, Plan Formulation: Sam Schaefer provided an update on the Public Draft and scheduling the RMG review of draft chapters was discussed.

a. Public Draft schedule – the RMG requested to schedule a working meeting to allow time for a focused review of the IRWMP prior to the Public Review. June 21st was selected for the RMG review of the Plan

b. Steve's Concept Paper, Project Bundles, and Plan Implementation - A second version of the plan formulation concept paper was circulated prior to the monthly meeting. A summary of chapters 4, 5, and 7 of the Draft IRWMP was also handed out to the RMG. These chapters are an analysis of the water supply accomplishments based on the historical and projected district operations within the Region. The results of this discussion was acknowledgement by the RMG to maintain a broad "bundle" of projects for Plan Implementation and to include in the Plan non-structural projects focused on the Institutional Agreements and CEQA/NEPA analysis for the Regional operations and structural projects that provide a "first-phase" solution in meeting the Region's priority needs.

The intent of the RMG is to have an IRWMP adopted by August 1st that contains a broad proposed mix of non-structural and structural projects. Presently, the IRWMP identifies benefits that will be realized by implementation of the IRWMP in the Region. The RMG is in the process of evaluating which IRMWP components to suggest as part of the near-term funding opportunities. A meeting was set for July 9th to continue forming a first phase of projects for implementation.

Agenda Item 3, Regional Management Group:

a) The completion schedule for the IRWMP, 30-day public review, and adoption of IRWMP by Boards was discussed. The start of the public review period was adjusted to accommodate the RMG's request for a focused review of the IRWMP.

b) GEI/B-E handed out a copy of the Fourth Progress report that was submitted along with a reimbursement request to the DWR in May.

c) The opportunity to join the Joint Powers Authority of the Southern San Joaquin Valley Water-Related Entities for the purpose of coordinating funding opportunities was discussed. Sam Schaefer, who attended in place of Paul Oshel, reported on the coordinating and policy committee meeting held on May 18th. The RMG intends to submit a Proposition 50 proposal independent of the larger group.

d) Regarding the Prop 50 grant application, the RMG discussed and suggested going forward with a "first-phase" of projects that will include institutional agreements and structural projects.

Agenda item 5. Action Items

1) RMG to review the draft IRWMP.
2) GEI/B-E to prepare notice and release draft IRWMP for public review.
3) RMG will meet and select projects to be included in near-term funding proposals.
4) GEI/B-E to initiate and complete FAAST application for Step 1 proposal for Proposition 50 Round 2.
5) RMG to hold a public hearing.
6) Prepare resolution of adoption for districts

The next meeting will be the Public Hearing scheduled for 2 pm, July 9th, 2007.

Resolution to Add Delano-Earlimart Water District to the Poso Creek Regional Management Group

Paul

RESOLUTION BEFORE THE BOARD OF DIRECTORS
OF THE
SEMITROPIC WATER STORAGE DISTRICT

IN THE MATTER OF: Resolution No. ST 06-02

ADD DELANO EARLIMART WATER DISTRICT TO THE POSO CREEK REGIONAL WATER MANAGEMENT GROUP TO PREPARE AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN FOR THE POSO CREEK AREA

WHEREAS, the Semitropic Water Storage District made application to the California Department of Water Resources and State Water Resources Control Board and obtained a grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 et seq.) to prepare an Integrated Regional Water Management Plan (IRWMP); and

WHEREAS, the Poso Creek Regional Water Management Group has been formed to prepare the said IRWMP for the area; and

WHEREAS, the Delano Earlimart Water District desires to participate in the planning process with other Poso Creek Regional Water Management Group members to prepare the IRWMP which will include the District service area; and

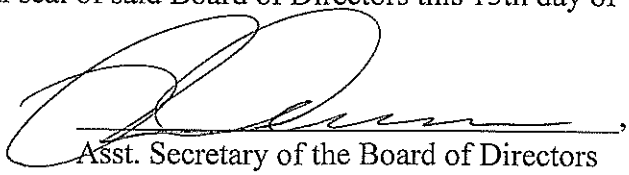
NOW THEREFORE, IT IS HEREBY RESOLVED by the Board of Directors of SEMITROPIC WATER STORAGE DISTRICT that Semitropic Water Storage District supports and authorizes the preparation of the IRWMP.

ALL THE FOREGOING, being on motion of Director Waterhouse, seconded by Director Portwood, was hereby authorized by the following vote, to wit:

AYES:	Directors Crettol, Fabbri, Page, Portwood, Tracy, Waterhouse and Wegis
NOES:	None
ABSTAIN:	None
ABSENT:	None

I HEREBY CERTIFY that the foregoing is a true copy of the resolution of the Board of Directors of SEMITROPIC WATER STORAGE DISTRICT as duly passed and adopted by said Board of Directors at an adjourned meeting held this 15th day of February, 2006.

WITNESS my hand and official seal of said Board of Directors this 15th day of February, 2006.



Asst. Secretary of the Board of Directors

(SEAL)

Proof of Publication - Public Notice

PROOF OF PUBLICATION

The BAKERSFIELD CALIFORNIAN
P.O. BOX 440
BAKERSFIELD, CA 93302

SEMITROPIC WATER DISTRICT
PO BOX Z
WASCO, CA 93280

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PO BOX Z
WASCO,CA 93280

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STATE OF CALIFORNIA
COUNTY OF KERN

I AM A CITIZEN OF THE UNITED STATES AND A RESIDENT OF THE COUNTY AFORESAID: I AM OVER THE AGE OF EIGHTEEN YEARS, AND NOT A PARTY TO OR INTERESTED IN THE ABOVE ENTITLED MATTER. I AM THE ASSISTANT PRINCIPAL CLERK OF THE PRINTER OF THE BAKERSFIELD CALIFORNIAN, A NEWSPAPER OF GENERAL CIRCULATION, PRINTED AND PUBLISHED DAILY IN THE CITY OF BAKERSFIELD COUNTY OF KERN,

AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATION BY THE SUPERIOR COURT OF THE COUNTY OF KERN, STATE OF CALIFORNIA, UNDER DATE OF FEBRUARY 5, 1952, CASE NUMBER 57610; THAT THE NOTICE, OF WHICH THE ANNEXED IS A PRINTED COPY, HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER
AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO WIT: 3/11/06
3/18/06

ALL IN YEAR 2006

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT.

Ashley Wynne

DATED AT BAKERSFIELD CALIFORNIA

3-20-06

Solicitor I.D.: 0

First Text
PUBLICNOTICENOTICEISHEREBYGIVENthattheSe

Ad Number 58268

PUBLIC NOTICE

NOTICE IS HEREBY GIVEN that the Semitropic Water Storage District (District) in cooperation with other water interests in the Poso Creek Regional area has formed a Regional Management Group (RMG) to develop an Integrated Regional Water Management Plan (IRWM Plan) for that portion of the Kern River Watershed north of the Kern River located within northern Kern and southern Tulare counties. The participating agencies intend to work cooperatively to draft the IRWNM Plan. The RMG is holding a public meeting beginning at 2:00 pm on Tuesday March 21st, 2006 to brief the public about the planning process, receive comments, and decide whether to prepare an integrated regional water management plan for the region. The Hearing will be held at the District Office located at 1101 Central Avenue, Wasco, CA 93280. Interested parties are encouraged to attend this hearing.

The manner in which interested parties can participate in the planning process may include (1) attending public hearings conducted by the District and other RMG members; (2) attending monthly public meetings scheduled throughout the planning process by the RMG (meetings are tentatively scheduled for the first Tuesday of each month at 2 PM at the Semitropic Water Storage District office located at 1101 Central Avenue, Wasco, CA; (3) requesting a draft of the Plan when it becomes available and providing written comments to the District and RMG at the address below; (4) providing written comments throughout the planning process to the District and; (5) attending future public hearings, which will be announced in the newspaper, and are intended to receive further comments on the draft of the Plan.

Written comments and communications with the District and/or the RMG should be addressed to Mr. Paul Oshel, District Engineer, at 1101 Central Avenue, Wasco, CA 93280.

March 11, 18, 2006 (58268)

Letter – Invitation for Stakeholder Participation

Poso Creek Integrated Regional Water Management Plan

Management Group

August 15, 2006

Martin N. Milobar, Engineer Manager
Buena Vista Water Storage District
P.O. Box 756
Buttonwillow, CA 93206

Subject: Poso Creek Integrated Regional Water Management Plan
Invitation for Stakeholder Participation

Dear Mr. Milobar:

Seven agricultural water districts overlying the groundwater basin in the northerly portion of Kern County together with a resource conservation district have formed the Poso Creek Regional Management Group (Regional Management Group) and are developing an Integrated Regional Water Management Plan (IRWMP). These water agencies, along with the resource conservation district that encompasses almost the entire study area, make up an eight-agency partnership formed for the purpose of developing the IRWMP. The Regional Management Group will document the water management needs of the area and will develop regional water management strategies to address these needs and the framework for implementing them. Planning objectives identified include; 1) water supply reliability, 2) maintain economical groundwater pumping costs, 3) protect quality of groundwater, 4) maintain water supply costs at a level commensurate with the agricultural economy of the area, 5) enhance monitoring activities to meet groundwater level and water quality goals, 6) environmental restoration, and 7) improve flood control.

The Regional Management Group is composed of member agencies located in a portion of the Tulare Lake Basin Hydrologic area. This Regional Management Group shares a common goal of managing substantial portions of the surface water and groundwater resources of the region located north of the Kern River and the Kern River fan. These managed resources include water supplies from the State Water Project via the California Aqueduct, Central Valley Project via the Friant-Kern Canal, Kern River, Poso Creek, and from the groundwater basin.

The agencies listed below make up the Regional Management Group that is formulating and ultimately adopting the IRWMP.

- Semitropic Water Storage District – Lead Agency
- Cawelo Water District
- Delano-Earlimart Irrigation District
- Kern-Tulare Water District
- North Kern Water Storage District
- North West Kern Resource Conservation District (NWKRCD)
- Rag Gulch Water District
- Shafter-Wasco Irrigation District

Semitropic is acting as the Lead Agency in the development of the IRWMP and is responsible for all administrative responsibilities associated with the planning process. As the lead agency, Semitropic will organize the Regional Management Group meetings, facilitate data exchanges among members, and provide administrative reports required for the IRWMP.

A map showing the overall planning area of the Regional Management Group and the individual district boundaries is attached. The boundaries of the planning area encompass all of the area within the above-listed agencies as well as additional areas outside of the listed districts. However, to the extent that the NWKRCD boundaries include areas outside of the other agencies, these areas are not included.

The Management Group has identified your organization as a potential stakeholder in the IRWMP development process. Your interest in the Poso Creek regional water resources and views on how they should be managed are important to the Regional Management Group. We welcome your input, reviews, and comments on the IRWMP as it is developed. Therefore, we are inviting your participation as a stakeholder in the Poso Creek IRWMP process. Regional Management Group public meetings are tentatively held at 12 pm on the first Tuesday of each month at Semitropic's offices. Alternative attendance can also be accomplished by conference phone.

Please call Mr. Paul Oshel, District Engineer, at (661) 758-5113 for copies of past or future meeting minutes, requests to receive agenda packages, or answer questions.

Sincerely,

Paul M Oshel

By Paul M. Oshel, District Engineer, Semitropic Water Storage District
on behalf of the following eight entities

Wilmar L. Boschman
General Manager
Semitropic Water Storage District

David R. Ansolabehere
General Manager
Cawelo Water District

Dale R. Brogan
General Manager
Delano-Earlimart Irrigation District

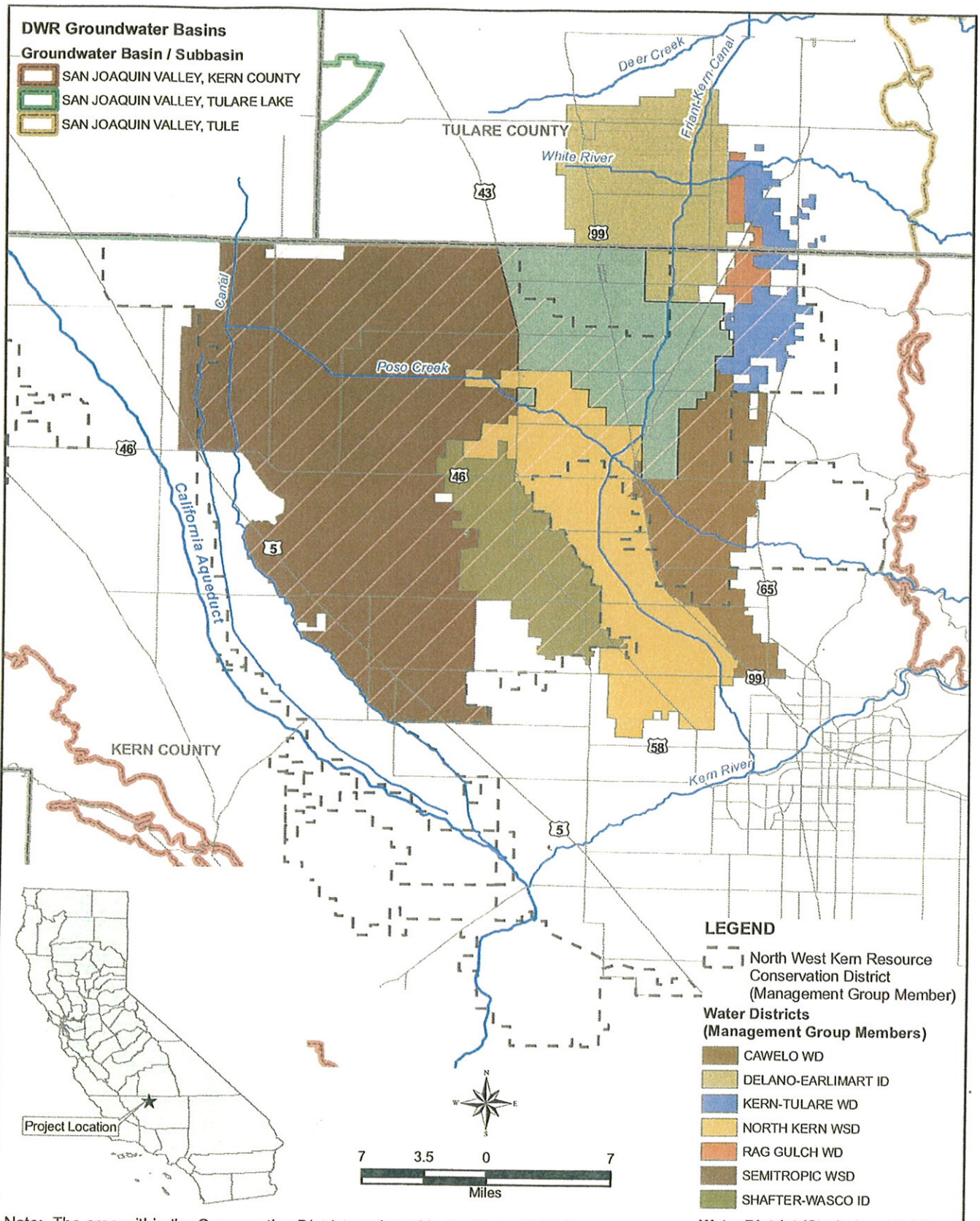
Steven C. Dalke
General Manager
Kern-Tulare Water District

Dana S. Munn
General Manager
North Kern Water Storage District

Brian Hockett
District Manager
North West Kern Resource Conservation District (NWKRCD)

Steven C. Dalke
General Manager
Rag Gulch Water District

Jerry L. Ezell
General Manager
Shafter-Wasco Irrigation District



Note: The area within the Conservation District, and outside the Water District areas, is not included in the IRWMP study area.

Semitropic Water Storage District Poso Creek IRWMP	Bookman-Edmonston A Division of GEI Consultants	STUDY AREA AND MANAGEMENT GROUP BOUNDARIES
Kern County, California SOURCE: CA Spatial Library		APRIL 2006 FIGURE 1

05-10-06 S:/GIS/Projects/033740/Basemap/060405.mxd

Mailing List

Name	Title	Company	Address
Martin N. Milobar	Engineer Manager	Buena Vista WSD	525 North Main Street PO Box 756 Buttonwillow, CA 93206
Phillip D. Nixon	Manager	Lost Hills WD	3008 Sillect Ave., Suite 205 Bakersfield, CA 93308-6340
Hal Crossley	Gen. Manager	Rosedale-Rio Bravo WSD	849 Allen Road PO Box 867 Bakersfield, CA 93302-0867
William R. Carlisle	Gen. Manager	So. San Joaquin MUD	PO Box 279 Delano, CA 93216
James M. Beck	Gen. Manager	KCWA	PO Box 58 Bakersfield, CA 93302-0058
Ronald D. Jacobsma	Gen. Manager	Friant Water Users Auth.	332 Norwalk Delano, CA 93215
Michael J. Rubio	Supervisor	Kern County Board of Supervisors	1115 Truxtun Avenue Room 505 Bakersfield, CA 93301
Abdel L. Salem	City Manager	City of Delano	PO Box 939 Delano, CA 93215
Anthony B. Lopez	City Administrator	City of McFarland	401 W. Kern Avenue McFarland, CA 93250
John D. Guinn	City Manager	City of Shafter	336 Pacific Avenue Shafter, CA 93263
Larry F. Pennell	City Manager	City of Wasco	PO Box 190 Wasco, CA 93280
Thomas F. Schroeter	District Counsel	Lost Hills Utility District	PO Box 246 Lost Hills, CA 93249
Al Steele	Geologist	California Department of Water Resources	3374 East Shields Avenue Fresno, CA 93726
John Carlson	Executive Director	California Fish & Game	1416 Ninth Street Sacramento, CA 95814
William H. Luce	Area Manager	USBR	South Central Ca. Area Office 1243 N. Street Fresno, CA 93727
David Hardt	Refuge Manager	Kern National Wildlife Refuge	PO Box 670 Delano, CA 93216-0670

Mailing List

Shelby Hagenauer	Legislative Aide	Congressman Bill Thomas	Washington DC Office 2208 Rayburn Washington, D.C. 20515
John Drake	Legislative Aide	Congressman Jim Costa	Washington DC Office 1004 Longworth HOB Washington, DC 20515
Al Wagner	Chief of Staff	Senator Dean Florez	1800 30th Street Suite 350 Bakersfield, CA 93301
Jonathan Dickenson	Legislative Aide	Senator Roy Ashburn	State Capitol Room 5094 Sacramento, CA 95814
Tom Higgenson	Legislative Director	Assembly member Nicole Parra	State Capitol PO Box 942849 Sacramento, CA 94249-0030
Julie Sauls	Legislative Aide	Assemblyman Kevin McCarthy	State Capitol Room 3098 Sacramento, CA 94249-0032
Address all Letters to Assemblyman Bill Maze		Assemblyman Bill Maze	Capitol Office State Capitol Room 4015 Sacramento, CA 94249-0034

Project Brochure

POSO CREEK

Integrated Regional Water Management Plan

March 2007

Poso Creek IRWMP Regional Management Group

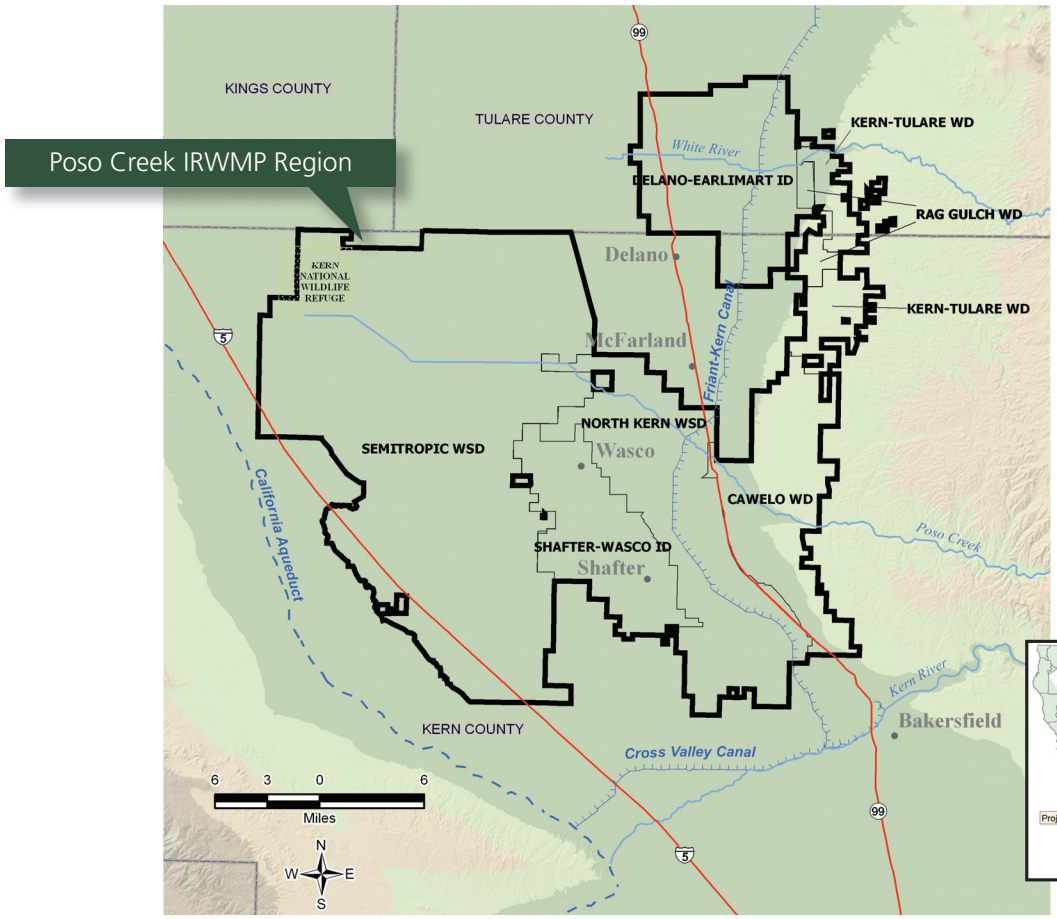
The Poso Creek Regional Management Group (Regional Management Group) comprises seven agricultural districts and one resource conservation district listed below.

The Regional Management Group will formulate and ultimately adopt the Poso Creek Integrated Regional Water Management Plan (Poso Creek IRWMP).

- Semitropic Water Storage District – Lead Agency
- Cawelo Water District
- Delano-Earlimart Irrigation District
- Kern-Tulare Water District
- North Kern Water Storage District
- Rag Gulch Water District
- Shafter-Wasco Irrigation District
- North West Kern Resource Conservation District

These districts overlie the groundwater basin in the Tulare Lake Basin Hydrologic area located in the northerly portion of Kern County. The Poso Creek IRWMP Region (Region) is a fertile agricultural area with a current annual gross value of agricultural commodities estimated at $2 billion. The rich soils, climate, and irrigation water make it possible to grow predominately high-value, permanent crops. The largest value commodities – almonds, grapes, citrus, pistachios, and vegetables – are sold worldwide.

The Poso Creek IRWMP emphasizes resolving the Region's short-term and long-term water supply challenges through an integrated water resource planning approach. The Poso Creek IRWMP will include development of regional water management strategies to address the Region's needs and the framework for prioritizing and implementing them. The focus of the Regional Management Group is to improve water supplies throughout the Region.



Note: The boundary of the IRWMP Region encompasses all of the area within seven districts; however, to the extent that the NWKRCD boundary includes area outside of the seven districts, the NWKRCD boundary lines are not included.

Poso Creek IRWMP Region's Assets

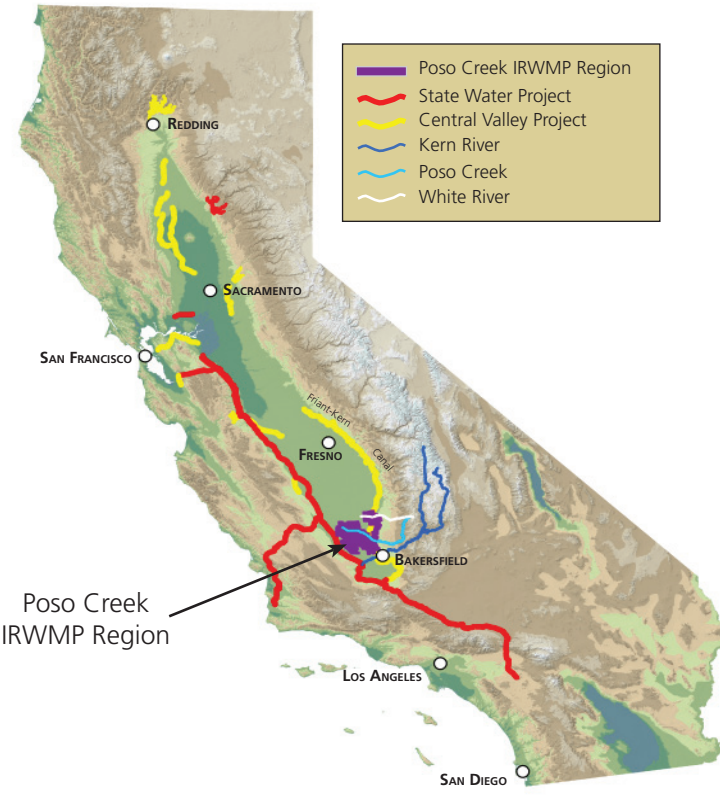
The Regional Management Group and stakeholders (listed on the last page of this brochure) share a common interest in managing the surface water and groundwater resources of the Region. They have operated segments of the groundwater basin conjunctively with available surface supplies for decades. The managed resources include water supplies from:

- State Water Project via the California Aqueduct
- Central Valley Project via the California Aqueduct
- Central Valley Project via the Friant-Kern Canal
- Kern River
- Poso Creek
- Common groundwater basin

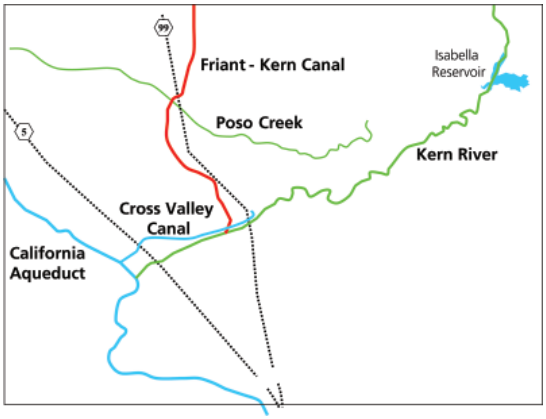
The Region is located at the crossroads of the California Aqueduct, Friant-Kern Canal, and the Kern River. Thus, the potential for increased conjunctive use of surface water and groundwater supplies is a valuable asset to the Region.

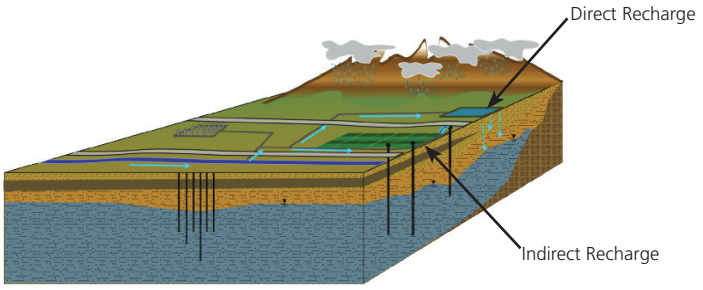
Since California typically experiences either wet or dry years, the groundwater basin acts as a large regulating reservoir. The existing conjunctive use operation can be expanded by adding interconnections and promoting water supply exchanges between districts that allow for more flexibility in the Region's water supply. The Region's assets of federal, state, and local water supplies, dewatered groundwater storage, and significant irrigation demand make it an ideal location to regulate surface supplies conjunctively to the benefit of the agricultural based economy of the Region and to California.

Water Supply, Conveyance, and Groundwater Storage



The proximity of the Poso Creek IRWMP Region to the California Aqueduct, Fiant-Kern Canal, Kern River, Poso Creek and groundwater banking facilities, combined with large conveyance and absorptive capacity, provides an ideal setting for expanded conjunctive use operations.





The Region has large conjunctive use operations and significant groundwater storage capacity.

Challenges to the Region

The accumulated effect of surface water supplies is reflected in the Region's groundwater levels. As shown in the figure below, surface water supplies to the Region have generally stabilized groundwater levels since 1970.[1] This relatively balanced condition will continue if deliveries of surface water supplies remain the same as recent historical amounts. However, the Region's deliveries of surface water supplies are projected to decrease due to increased urbanization and environmental restoration throughout the state.

Also shown in the figure are the effects of a 10 percent reduction in deliveries of surface water supplies on regional groundwater levels. As pressure on surface supplies increases, it is apparent that the Region must make additional use of its groundwater basin to regulate and capture the available wet-year supplies. This increased conjunctive use operation will help maintain water reliability within the Region.

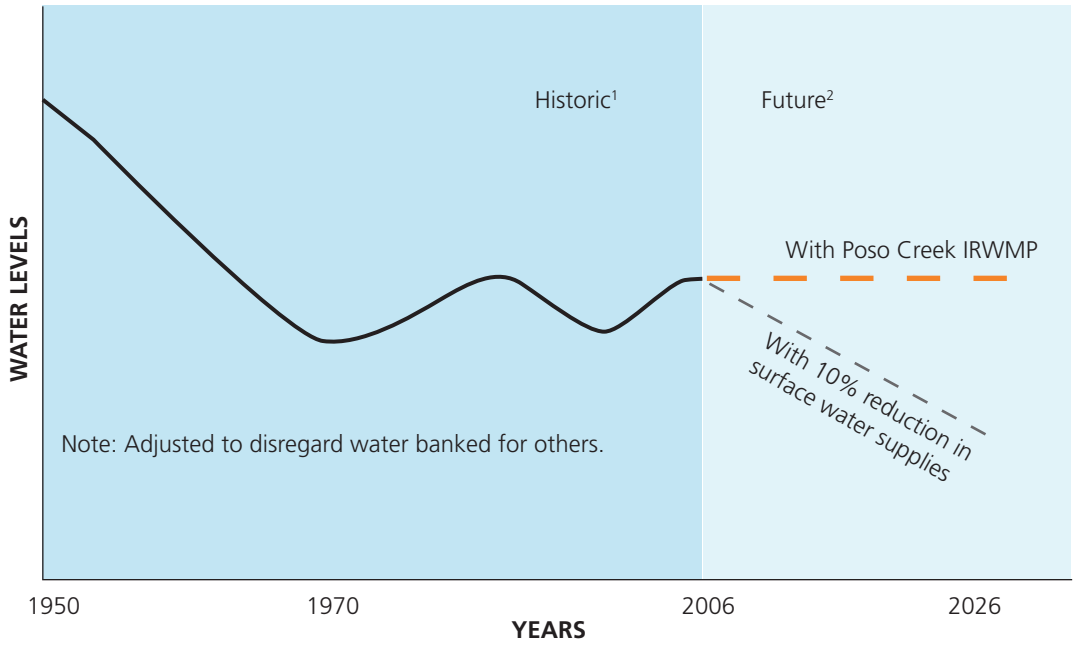
Since the Region produces crops for both local and world markets, to maintain its competitive role in the market place, the water supply must remain economical. Increased conjunctive use operations will help to maintain or enhance groundwater levels that support economically viable groundwater pumping lifts.

Groundwater water quality in the Region is currently very good. Water banking and exchange activities will require water quality management and treatment to maintain that water quality.

The Largest Water Supply Challenges Facing the Region

- Water Reliability
- Water Cost
- Water Quality

Regional Groundwater Levels

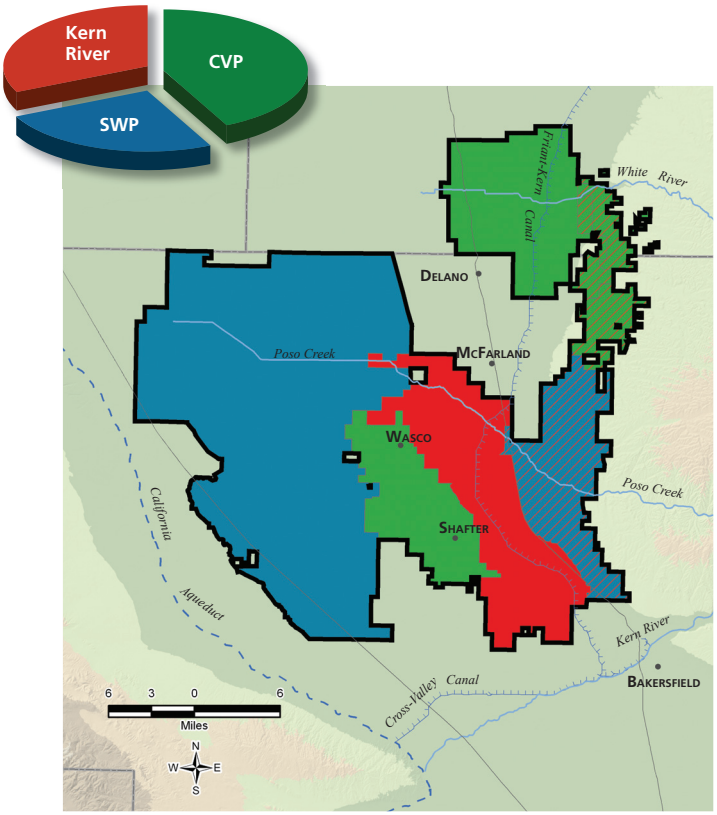


[1] The historical data has been adjusted to disregard banked water for outside banking interests.

[2] 20-year projection assuming that there is a ten percent decline in surface water supplies delivered to the Region.

Regional Cooperation Will Provide A Solution

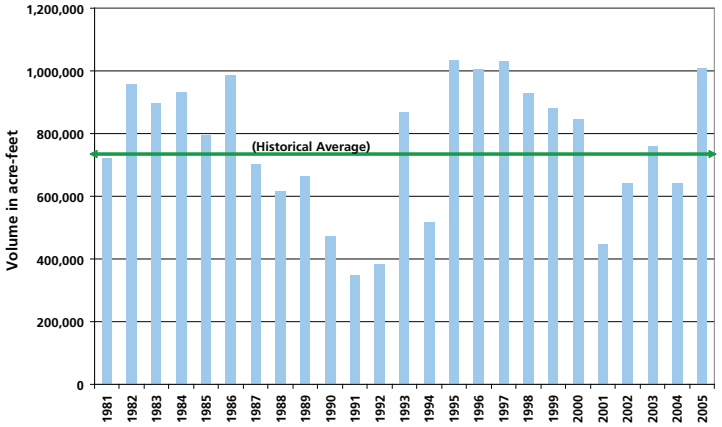
Sources of the Region's individual districts' surface water supplies are shown on the map below. With the expected loss of historical surface water supply reliability, the Region must absorb wet-year water supplies in order to maintain a reliable and economical water supply. Wet-year water is available on short notice and not always at times when the water can be delivered for an irrigation demand. Therefore, it is important that the Region increase its ability to absorb surface water when available.



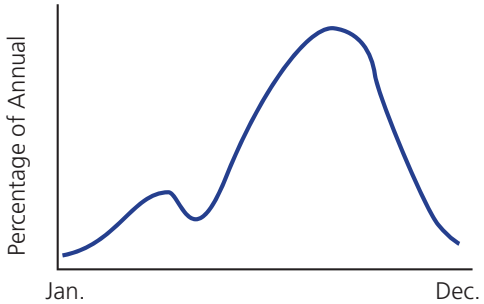
Because water is available to the Region from a number of sources which have differing hydrologic timing, integration of these various water supplies, combined with conjunctive use of the groundwater basin, provides the Region with an opportunity to improve its water supplies.

Regional cooperation will provide solutions for individual district needs by increasing operational flexibility. This can be accomplished by enhancing the existing conveyance systems within districts and establishing interconnections between districts. These conveyance enhancements will foster additional water delivery capability within the Region.

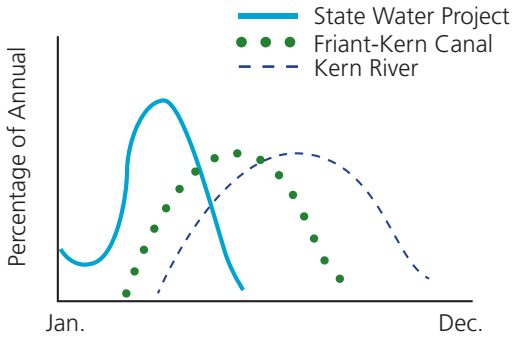
Historical Surface Water Supplies delivered to Poso Creek IRWMP Region during 1981-2005



Typical Irrigation Water Demand



Differing Hydrologic Timing of Surface Water Supplies



Planning Objectives, Strategies and Proposed Actions

As part of the IRWMP, the Regional Management Group and stakeholders are considering implementing structural and non-structural actions that support the Region's Planning Objectives, the State of California's state-wide priorities, and the California Water Plan Update 2005 Resource Management Strategies.

The seven Planning Objectives identified for the Poso Creek IRWMP Region are:

1) Maintain and improve water supply reliability
2) Maintain groundwater levels at economically viable pumping lifts
3) Protect the quality of groundwater and enhance where practical
4) Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the area
5) Enhance monitoring activities to meet groundwater levels and water quality goals
6) Maintain and/or enhance environmental resources within and outside of the study area
7) Enhance flood control in the study area

Planning objectives 1 through 5 were selected by the Regional Management Group based on a consensus reached during a pre-application meeting held on April 20, 2005. Subsequently, during the kick-off meeting for the Poso Creek IRWMP held on January 5, 2006, the Regional Management Group added planning objective 6, and, based on stakeholder input during monthly meetings held in 2006, planning objective 7 was added.

The Regional Management Group, with input from the stakeholders, is considering all of the Water Management Strategies listed in Table A-1 of the DWR's IRWMP Grant Program Guidelines, as listed below. Most of these water management strategies are considered ongoing and practiced in this Region. Recognizing the agricultural and environmental characteristics of the Region, the Regional Management Group is evaluating which strategies are feasible for implementation.

Highest Priority Strategies Considered for Project Implementation

- Groundwater management
- Water supply reliability
- Conjunctive management of surface water and groundwater
- Water transfers and exchanges
- Water quality protection and improvement

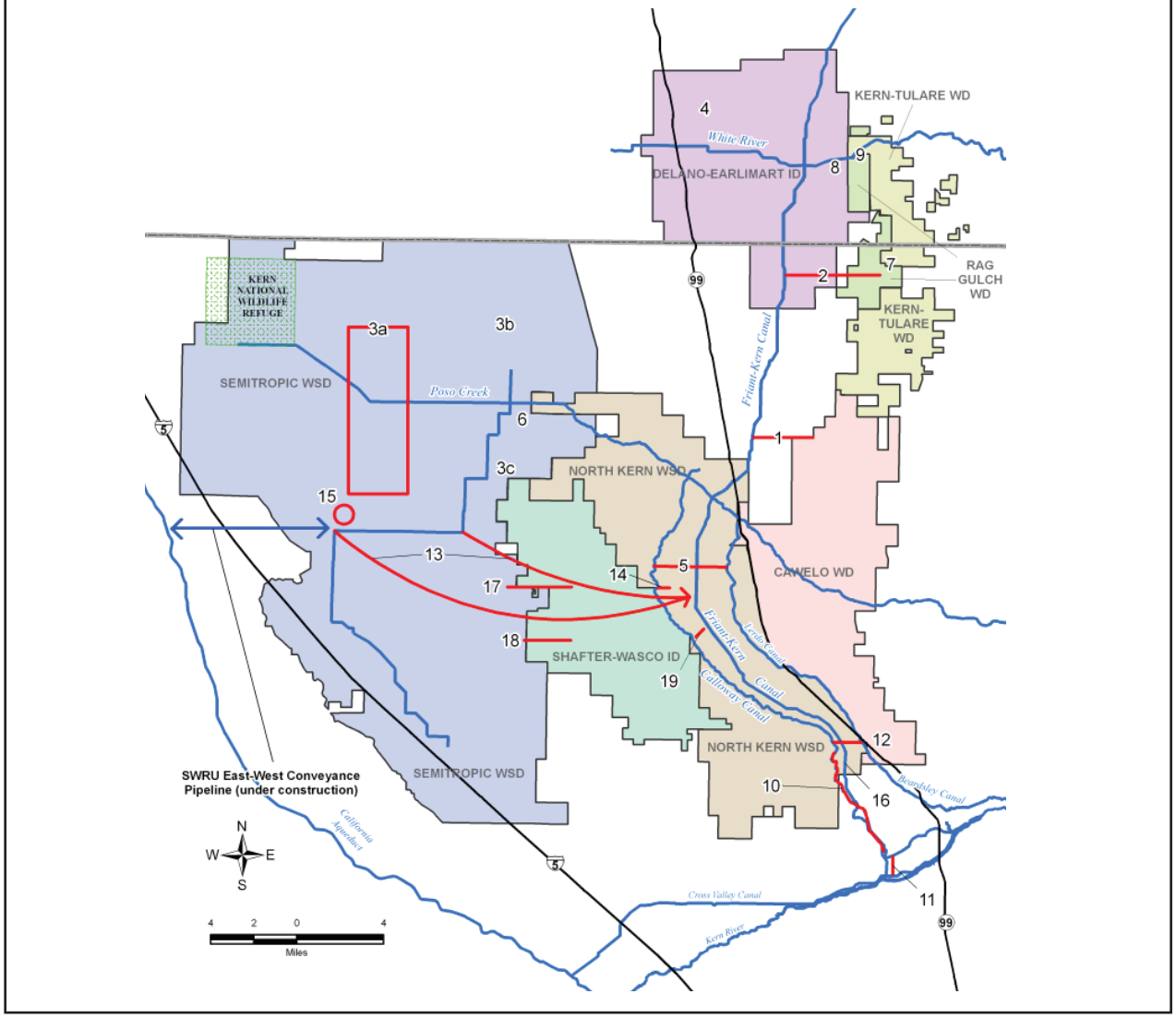
Strategies Considered for Project Integration[3]

- Ecosystem restoration
- Environmental and habitat protection and improvement
- Flood management
- Imported water
- Land use planning
- NPS pollution control
- Recreation and public access
- Storm water capture and management
- Surface storage
- Water conservation
- Water recycling
- Water and wastewater treatment
- Watershed planning
- Wetlands enhancement and creation

The Regional Management Group will formulate and prioritize projects to implement, consisting of the proposed structural and non-structural actions listed on the opposite page. Locations of the proposed structural actions are shown on the map.

[3] Due to the location of the Region, desalination is the only water management strategy not under consideration for the Region.

Proposed Structural and Non-Structural Actions



Structural Actions (Locations Shown on Map)

Expand In-Lieu Service Areas

1 Connect Friant-Kern Canal Turnout to Cawelo's North System
2 Ninth Avenue Pipeline
3a Stored Water Recovery Unit (SWRU) In-Lieu Service Areas
3b P-1030 Existing In-Lieu Service Area
3c P-565 New In-Lieu Service Area

Expand Direct Recharge

4 G-W Banking North of DEID with Pixley ID
5 G-W Banking Conveyance Improvements to North Kern Recharge and Recovery Facilities
6 Pond Poso Spreading Grounds
7 Rag Gulch G-W Banking Project
8 White River G-W Banking for DEID
9 White River G-W Banking for RGWD

Modify Conveyance Systems

10 Calloway Canal Improvements
11 Calloway Canal to Cross Valley Canal Interconnection
12 Calloway Canal to Lerdo Canal Interconnection
13 Multi-District Conveyance Facility
14 North Connection to Shafter-Wasco ID
15 Pilot Arsenic Treatment Plant
16 Reverse Flow in the Friant-Kern Canal
17 Shafter-Wasco/Semitropic Interconnection on Kimberlina Road
18 Shafter-Wasco/Semitropic Interconnection on Madera Avenue
19 South Connection to Shafter-Wasco ID

Non-Structural Actions (Locations not shown on map)

20 Energy Usage
21 Joint Powers Authority
22 Institutional Agreements and Governance for IRWMP Implementation
23 G-W Banking for Parties Outside of Poso Creek IRWMP Region
24 Optimize the Region's Pumping Lifts
25 Enhance Groundwater Monitoring and/or Modeling

Enhance Environmental Resources

26 Wildlife Improvements Projects in IRWMP Region
27 Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region

Enhance Flood Control

28 Enhance Flood Control in the IRWMP Region with a Pipeline Connecting Friant-Kern Canal to Future Flood Structure on Poso Creek

Regional Stakeholders:

- Buena Vista Water Storage District
- Lost Hills Water District
- Rosedale-Rio Bravo Water Storage District
- Southern San Joaquin Municipal Utility District
- Kern County Water Agency
- Friant Water Users Authority
- Kern County Board of Supervisors
- City of Delano
- City of McFarland
- City of Shafter
- City of Wasco
- Lost Hills Utility District
- Kern National Wildlife Refuge

State and Federal Agencies:

- California Department of Fish and Game
- California Department of Water Resources
- U.S. Bureau of Reclamation

Legislative Contacts:

- Congressman Kevin McCarthy
- Congressman Jim Costa
- Congressman Devin Nunes
- Senator Dean Florez
- Senator Roy Ashburn
- Assembly Member Nicole Parra
- Assembly Member Jean Fuller
- Assemblyman Bill Maze

Funding for the Poso Creek Integrated Regional Water Management Plan is provided by a grant from the California Department of Water Resources.

Your interest in the Region's water resources and views on how they should be managed are important to the Regional Management Group and stakeholders. We welcome your input, reviews, and comments on the Poso Creek IRWMP. Regional Management Group public meetings are typically held at 12 pm on the first Tuesday of each month at the Semitropic Water Storage District offices. You may also participate in the meetings by conference call.

Please contact Mr. Paul Oshel, District Engineer for Semitropic Water Storage District, at (661) 758-5113, for information or to answer questions on behalf of the following eight entities:

Wilmar L. Boschman
General Manager
Semitropic Water Storage District

David R. Ansolabehere
General Manager
Cawelo Water District

Dale R. Brogan
General Manager
Delano-Earlimart Irrigation District

Steven C. Dalke
General Manager
Kern-Tulare Water District

Dana S. Munn
Engineer-Manager
North Kern Water Storage District

Brian Hockett
District Manager
North West Kern Resource Conservation District (NWKRCD)

Steven C. Dalke
General Manager
Rag Gulch Water District

Jerry L. Ezell
General Manager
Shafter-Wasco Irrigation District

Proof of Publication – Draft Plan for Public Review

PROOF OF PUBLICATION

The BAKERSFIELD CALIFORNIAN
P.O. BOX 440
BAKERSFIELD, CA 93302

BOOKMAN-EDMONSTON
5100 CALIFORNIA AVE STE 227
BAKERSFIELD, CA 93309

Ad Number:	10414770	**PO #:**	
Edition:	TBC	**Run Times**	2
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STATE OF CALIFORNIA
COUNTY OF KERN

I AM A CITIZEN OF THE UNITED STATES AND A RESIDENT OF THE COUNTY AFORESAID: I AM OVER THE AGE OF EIGHTEEN YEARS, AND NOT A PARTY TO OR INTERESTED IN THE ABOVE ENTITLED MATTER. I AM THE ASSISTANT PRINCIPAL CLERK OF THE PRINTER OF THE BAKERSFIELD CALIFORNIAN, A NEWSPAPER OF GENERAL CIRCULATION, PRINTED AND PUBLISHED DAILY IN THE CITY OF BAKERSFIELD COUNTY OF KERN,

AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATION BY THE SUPERIOR COURT OF THE COUNTY OF KERN, STATE OF CALIFORNIA, UNDER DATE OF FEBRUARY 5, 1952, CASE NUMBER 57610; THAT THE NOTICE, OF WHICH THE ANNEXED IS A PRINTED COPY, HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER
AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO WIT: 7/2/07
6/25/07

ALL IN YEAR 2007

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT.

Cynthia Martinez

DATED AT BAKERSFIELD CALIFORNIA

7-2-07

Solicitor I.D.: 0

First Text
NoticeisherebygiventhattheSemitropicWate

Ad Number 10414770

Notice is hereby given that the Semitropic Water Storage District (District), in cooperation with other water interests in the Poso Creek Regional Management Group (RMG), have developed an Integrated Regional Water Management Plan (IRWMP) for the San Joaquin Valley portion of Kern County lying north of the Kern River fan and extending into Tulare County. A public draft of the IRWMP is available for review at the District's office located at 1101 Central Avenue, Wasco, California and at the Shafter Branch of the Public Library. The public review period is scheduled for June 25, 2007 - July 25, 2007. The RMG is holding a public hearing at 2:00 pm on July 9, 2007 to brief the public about the plan and receive comments. The hearing will be held at the District's office located at 1101 Central Avenue, Wasco, California 93280. Interested parties can participate in the public draft review process by providing written comments to the District and attending the public hearing. Written comments and communications with the District and/or the RMG should be addressed to Mr. Paul Oshel, District Engineer, at 1101 Central Avenue, Wasco, California 93280, or he can be reached by telephone at (661) 327-7144.

Se les anuncia al publico en general que el Distrito de Almacenamiento de Agua de Semitropic (Semitropic Water Storage District) - el Distrito, en cooperación con otros intereses en el agua en el Grupo de Administración Regional de Poso Creek , han desarrollado un Plan Regional Integrado de la Administración del Agua para el Valle de San Joaquin del Condado de Kern al norte del Río Kern y extendiendo hasta el Condado de Tulare. El anteproyecto publico del Plan Regional Integrado de la Administración del Agua esta disponible para la revisión en la oficina del Distrito localizado en el 1101 Central Ave, Wasco, California y en la Biblioteca Pública de Shafter. El período de revisión pública esta programado para Junio 25, 2005 hasta Julio 25, 2007. El Grupo de Administración Regional patrocinará una audiencia a las 2:00 p.m. en Julio 9, 2007 para informar al público del plan y recibir comentarios. La audiencia se llevará acabo en la oficina del Distrito localizada en el 1101 Central Ave, Wasco, California 93280. Todos aquellos interesados pueden participar en el proceso de revisión del anteproyecto público proporcionando comentarios escritos al Distrito y atendiendo la audiencia publica. Comentarios escritos y toda comunicación con el Distrito y el Grupo de Administración Regional deberá ser tratado con el Sr. Paul Oshel, el Ingeniero del Distrito, a 1101 Central Ave, Wasco, California 93280, o por teléfono al (661)-327-7144.

June 25, July 2, 2006 (10414770)

Stakeholder Participation in Review of Draft Plan

Poso Creek Integrated Regional Water Management Plan

Management Group

June 28, 2007

Name
Title
Stakeholder Entity
Address line 1
Address line 2

Subject: Public Draft of the Poso Creek Integrated Regional Water Management Plan
Stakeholder Participation in Review of Draft Plan

Dear _____:

By letter dated August 15, 2006, your organization was identified as a potential stakeholder in the development of the Poso Creek Integrated Regional Water Management Plan (Poso Creek IRWMP or Plan). In the letter, the eight member agencies, known as the Regional Management Group (RMG), announced their meeting schedule and expressed their interest in having your organization provide input on the Plan as it was being developed and prior to implementation. The RMG includes the following agencies, which are also identified on Figure ES-1 of the enclosed Executive Summary.

- Cawelo Water District
- Delano-Earlimart Irrigation District
- Kern-Tulare Water District
- North Kern Water Storage District
- North West Kern Resource Conservation District
- Rag Gulch Water District
- Semitropic Water Storage District – Lead Agency
- Shafter-Wasco Irrigation District

While you may already be aware, this is to formally notify you that the draft Plan is now available for public review at the office of each of the members of the RMG, at the Shafter Branch of the Public Library, and at the Beale Memorial Library in downtown Bakersfield. The draft Plan's Executive Summary is included as an attachment to this letter.

Your interest in water resources management in the Region, as well as views on how to go forward with Plan implementation, are important to the RMG. Accordingly, we are inviting your participation in the public review process and welcome your input, review, and comments on the draft Plan as it is being adopted and as it moves into implementation. The public review period is scheduled to be completed on July 25, 2007.

As part of the public review process, the RMG will be hosting a **public hearing at 2:00 pm on July 9, 2007** to brief the public about the plan and receive comments. The hearing will be held at the office of Semitropic Water Storage District (District), located at 1101 Central Avenue, Wasco, California 93280. Interested parties can participate in the public draft review process by providing written comments to the District and attending the public hearing. Written comments and communications with the District and/or the RMG should be addressed to Mr. Paul Oshel, District Engineer, at 1101 Central Avenue, Wasco, California 93280, or he can be reached by telephone at (661) 327-7144.

Why should you support the Poso Creek IRWMP?

While the Plan includes a number of findings, the overriding conclusion is that **surface water supplies available to the Region will be significantly reduced in the future** (relative to historical conditions) and that **there will be a corresponding decline in groundwater levels** as groundwater is used to make up the reduction in surface water supplies if actions are not taken. This decline will result in an **increase in the use of power and energy resources** to pump groundwater, creating both an environmental and economic burden. This economic burden will be felt by all uses that rely in whole or in part on pumped groundwater --- whether agricultural, municipal, or industrial. While the *common groundwater basin* is the reason that all overlying uses will feel the impact, it is also the reason that anything that is done to mitigate declines in water levels, such as projects identified in the Plan, will benefit all uses. As a generalization, the Plan contemplates projects, both structural and non-structural, that will allow the agencies within the Region to maximize the use of their contract water supplies and other supplies that may be available from time to time. In particular, these projects provide the means for coordinating the assets, needs, and operations of the agencies within the Region, with the end result being improved water supply reliability.

What can you do *now* to help support the Poso Creek IRWMP?

The RMG is interested in your support in the form of a letter as the Plan moves into implementation. The RMG intends to implement the Plan as funding permits, which could include local funds, Proposition 50 and Proposition 84 grant funds, and other funding opportunities as they become available. Please consider providing a letter of support by July 26th, 2007 to allow the RMG to include your letter in their application for grant funds under Proposition 50, which is due August 1, 2007. The letter can be addressed to Mr. Paul Oshel (see address above).

Please call Mr. Paul Oshel, District Engineer, at (661) 758-5113 for copies of past or future meeting minutes, requests to receive agenda packages, or to answer questions.

Sincerely,

By Wilmar L. Boschman, General Manager, Semitropic Water Storage District
on behalf of the following eight entities

Wilmar L. Boschman
General Manager
Semitropic Water Storage District

David R. Ansolabehere
General Manager
Cawelo Water District

Dale R. Brogan
General Manager
Delano-Earlimart Irrigation District

Steven C. Dalke
General Manager
Kern-Tulare Water District

Dana S. Munn
General Manager
North Kern Water Storage District

Brian Hockett
District Manager
North West Kern Resource Conservation District (NWKRCD)

Steven C. Dalke
General Manager
Rag Gulch Water District

Jerry L. Ezell
General Manager
Shafter-Wasco Irrigation District

Mailing List

Name	Title	Company	Address	Notes
Martin N. Milobar	Engineer-Manager	Buena Vista WSD	525 North Main Street PO Box 756 Buttonwillow, CA 93206	
Phillip D. Nixon	Manager	Lost Hills WD	3008 Sillect Ave., Suite 205 Bakersfield, CA 93308-6340	
Hal Crossley	Gen. Manager	Rosedale-Rio Bravo WSD	849 Allen Road PO Box 867 Bakersfield, CA 93302-0867	
William R. Carlisle	Gen. Manager	So. San Joaquin MUD	PO Box 279 Delano, CA 93215	
James M. Beck	Gen. Manager	KCWA	PO Box 58 Bakersfield, CA 93302-0058	
Ronald D. Jacobsma	Gen. Manager	Friant Water Users Auth.	332 Norwalk Delano, CA 93215	
Jon McQuiston	Supervisor, District 1	Kern County Board of Supervisors	1115 Truxtun Avenue 5th Floor Bakersfield, CA 93301	
Don Maben	Supervisor, District 2	Kern County Board of Supervisors	1115 Truxtun Avenue 5th Floor Bakersfield, CA 93301	
Mike Maggard	Supervisor, District 3	Kern County Board of Supervisors	1115 Truxtun Avenue 5th Floor Bakersfield, CA 93301	
Ray Watson	Supervisor, District 4	Kern County Board of Supervisors	1115 Truxtun Avenue 5th Floor Bakersfield, CA 93301	
Michael J. Rubio	Supervisor, District 5	Kern County Board of Supervisors	1115 Truxtun Avenue Room 505 Bakersfield, CA 93301	
Abdel L. Salem	City Manager	City of Delano	PO Box 939 Delano, CA 93215	City Hall P.O. Box 3010

Mailing List

				Delano, CA 93216
Anthony B. Lopez	City Administrator	City of McFarland	401 W. Kern Avenue McFarland, CA 93250	
John D. Guinn	City Manager	City of Shafter	336 Pacific Avenue Shafter, CA 93263	
Larry F. Pennell	City Manager	City of Wasco	PO Box 190 Wasco, CA 93280	
Thomas F. Schroeter	District Counsel	Lost Hills Utility District	PO Box 246 Lost Hills, CA 93249	
Al Steele	Engineering Geologist	California Department of Water Resources, San Joaquin District	3374 East Shields Avenue Fresno, CA 93726	
Paula Landis	District Chief	California Department of Water Resources, San Joaquin District	3374 East Shields Avenue Fresno, CA 93726	
John Carlson	Executive Director	California Department of Fish & Game	1416 Ninth Street Sacramento, CA 95814	
Micheal Jackson	Area Manager	USBR	South Central Ca. Area Office 1243 N. Street Fresno, CA 93721	
David Hardt	Refuge Manager	Kern National Wildlife Refuge	PO Box 670 Delano, CA 93216-0670	
Congressman Kevin McCarthy			Washington DC Office 1523 Longworth, House Office Building Washington, D.C. 20515-0522	Main District Office 4100 Empire Dr., Ste. 150 Bakersfield, CA 93309
John Drake	Legislative Aide	Congressman Jim Costa	Washington DC Office 1314 Longworth HOB Washington, DC 20515	Bakersfield District Office 2700 M Street, Ste., 227 Bakersfield, CA 93301
Al Wagner	Chief of Staff	Senator Dean Florez	State Capitol, Room 5061	1800 30th Street

Mailing List

			Sacramento, CA 95814	Suite 350 Bakersfield, CA 93301
Jonathan Dickenson	Legislative Aide	Senator Roy Ashburn	State Capitol Room 3063 Sacramento, CA 95814	Bakersfield Office 5001 California, Ave., Room 105 Bakersfield, CA 93309
Tom Higgenson	Legislative Director	Assembly Member Nicole Parra	State Capitol PO Box 942849 Sacramento, CA 94249-0030	Bakersfield Office 601 24th St., Ste. A Bakersfield, CA 93301
Assembly Member Jean Fuller		Assembly Member Jean Fuller	State Capitol, Room 3098 Sacramento, CA 95814	Bakersfield District Office 4900 California Ave., Ste. 100-B Bakersfield, CA 93309
Address all Letters to Assemblyman Bill Maze		Assemblyman Bill Maze	Capitol Office State Capitol Room 5160 Sacramento, CA 94249-0034	District Office 5959 S. Mooney Blvd. Visalia, CA 93277
Congressman Devin Nunes		Congressman Devin Nunes	Washington DC Office 1013 Longworth HOB Washington, DC 20515	Visalia Office 113 North Church Street, Ste. 208 Visalia, CA 93291

Appendix F

Resolutions of Plan Adoption

Cawelo Water District

CAWELO WATER DISTRICT

RESOLUTION NO. 591

RESOLUTION OF THE CAWELO WATER DISTRICT IN SUPPORT OF ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND SUBMITTING AN APPLICATION TO FILE AN IMPLEMENTATION GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER, COASTAL AND BEACH PROTECTION ACT OF 2002, WATER CODE SECTION 79560 *et seq.*, (Proposition 50)

WHEREAS, the Cawelo Water District (District) has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW, THEREFORE, BE IT RESOLVED, by the **CAWELO WATER DISTRICT** Board of Directors as follows:

1. That the Poso Creek Integrated Regional Water Management Plan is hereby adopted and that the District's General Manager, David Ansolabehere is authorized to sign a signatory page which will accompany the Plan and indicate adoption of the Plan by this District, upon termination of the formal public review period.

2. That said District Board of Directors supports the submission of an application by Semitropic Water Storage District, as lead agency for the Poso Creek Regional Management Group, to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan.

PASSED AND ADOPTED by the Board of Directors of Cawelo Water District this 12th day of July 2007, by the following roll call vote:

AYES: Scott Hamilton, Rick Widhalm, Keith Watkins, Kevin Andrew, Brian Blackwell

NOES: None

ABSENT: None

ABSTAINED: None

[SEAL]

Scott Hamilton, President
Board of Directors

ATTEST:

Richard Widhalm, Secretary
Cawelo Water District

Delano-Earlimart Irrigation District

RESOLUTION NO. 07-07
of the
DELANO-EARLIMART IRRIGATION DISTRICT

ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND SUBMISSION OF APPLICATIONS FOR IMPLEMENTATION FUNDING

WHEREAS, the Delano-Earlimart Irrigation District (District) has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Delano-Earlimart Irrigation District that the Poso Creek Integrated Regional Water Management Plan is hereby adopted and that the District's General Manager, Dale R. Brogan, is authorized to sign a signatory page which will accompany the Plan and indicate adoption of the Plan by this District, upon termination of the formal public review period.

BE IT FURTHER RESOLVED that said District Board of Directors supports the submission of an application by Semitropic Water Storage District, as lead agency for the Poso Creek Regional Management Group, to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan and to pursue any other funding opportunities that the Regional Management Group may deem advisable.

ADOPTED: July 12, 2007 upon motion of Director Canata, seconded by Director Caratan and passed by the following vote:

AYES: **5**
NOES: **0**
ABSTAIN: **0**
ABSENT: **0**

CERTIFICATE OF SECRETARY

I do hereby certify that I am the Secretary of the Delano-Earlimart Irrigation District, an irrigation district organized and existing under the laws of the State of California, and that the foregoing Resolution was duly adopted by the Board of Directors of said District at a meeting thereof duly and regularly held at the office of the said District at 14181 Avenue 24, Delano, California on the 12th day of July, 2007, at which meeting a quorum of said Board of Directors was at all times present and acting, and that said Resolution has not been rescinded or amended in whole or any part thereof, and remains in force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and the Seal of the Delano-Earlimart Irrigation District this 12th day of July 2007.

Dale R. Brogan, Secretary
Delano-Earlimart Irrigation District

Kern-Tulare and Rag Gulch Water Districts

KERN-TULARE WATER DISTRICT
Resolution No. 2007-7

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE KERN-TULARE WATER DISTRICT IN SUPPORT OF ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND SUBMITTING AN APPLICATION TO FILE AN IMPLEMENTATION GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER, COASTAL AND BEACH PROTECTION ACT OF 2002, WATER CODE SECTION 79560 *et seq.*, (PROPOSITION 50).

WHEREAS, the District has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW THEREFORE BE IT RESOLVED, by the Board of Directors of the Kern-Tulare Water District as follows:

1. That the Plan is hereby adopted and that the District's General Manager is authorized to sign a signatory page which will accompany the Plan and indicate adoption of the Plan by this District, upon termination of the formal public review period.

2. That the Board supports the submission of an application by Semitropic Water Storage District, as lead agency for the Poso Creek Regional Management Group, to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan.

ALL THE FOREGOING, being on motion of Director Pandol, seconded by Director Zaninovich, was authorized by the following vote:

AYES:	Holmes, Kelsey, Pandol, Stephens, and Zaninovich
NOES:	None
ABSENT:	None
ABSTAIN:	None

I HEREBY CERTIFY that the foregoing is a resolution of the Rag Gulch Water District as a duly passed and adopted by the Board of Directors on the 17th day of July, 2007.

Witness my hand and seal of the Board of Directors this 17th day of July, 2007.

Kent Stephens, ***President of the Board of Directors***

ATTEST:

John Zaninovich, ***Secretary of the Board of Directors***

RAG GULCH WATER DISTRICT
Resolution No. 2007-5

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE RAG GULCH WATER DISTRICT IN SUPPORT OF ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND SUBMITTING AN APPLICATION TO FILE AN IMPLEMENTATION GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER, COASTAL AND BEACH PROTECTION ACT OF 2002, WATER CODE SECTION 79560 *et seq.*, (PROPOSITION 50).

WHEREAS, the District has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW THEREFORE BE IT RESOLVED, by the Board of Directors of the Rag Gulch Water District as follows:

1. That the Plan is hereby adopted and that the District's General Manager is authorized to sign a signatory page which will accompany the Plan and indicate adoption of the Plan by this District, upon termination of the formal public review period.

2. That the Board supports the submission of an application by Semitropic Water Storage District, as lead agency for the Poso Creek Regional Management Group, to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan.

ALL THE FOREGOING, being on motion of Director Pandol, seconded by Director Zaninovich, was authorized by the following vote:

AYES:	Caratan, Holmes, Pandol, Stephens, and Zaninovich
NOES:	None
ABSENT:	None
ABSTAIN:	None

I HEREBY CERTIFY that the foregoing is a resolution of the Rag Gulch Water District as a duly passed and adopted by the Board of Directors on the 17th day of July, 2007.

Witness my hand and seal of the Board of Directors this 17th day of July, 2007.

Kent Stephens, ***President of the Board of Directors***

ATTEST:

John Zaninovich, ***Secretary of the Board of Directors***

North Kern Water Storage District

RESOLUTION OF THE NORTH KERN WATER STORAGE DISTRICT
IN SUPPORT OF ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT
PLAN AND SUBMITTING AN APPLICATION TO FILE AN IMPLEMENTATION
GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER,
COASTAL AND BEACH PROTECTION ACT OF 2002,
WATER CODE SECTION 79560 *et seq.*, (Proposition 50).

WHEREAS, the North Kern water Storage District (District) has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW, THEREFORE, BE IT RESOLVED, by the **North Kern Water Storage District** Board of Directors as follows:

1. That the Poso Creek Integrated Regional Water Management Plan is hereby adopted and that the District's Engineer-Manager, Mr. Dana S. Munn is authorized to sign a signatory page which will accompany the Plan and indicate adoption of the Plan by this District, upon termination of the formal public review period.

2. That said District Board of Directors supports the submission of an application by Semitropic Water Storage District, as lead agency for the Poso Creek Regional Management Group, to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan.

ENACTED: July 17, 2007

Kevin Andrew
President, Board of Directors
North Kern Water Storage District

ATTEST:

Dana S. Munn, Assistant Secretary

North West Kern Resource Conservation District

North West Kern Resource Conservation District
5000 California Ave. #100
Bakersfield, CA 93309
(661) 336-0967 ext 5
(661) 336-0857 fax

RESOLUTION OF THE BOARD OF DIRECTORS OF THE
NORTH WEST KERN RESOURCE CONSERVATION DISTRICT

RESOLUTION NO. 07-10

ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND SEEKING AN IMPLEMENTATION GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER, COASTAL AND BEACH PROTECTION ACT OF 2002, WATER CODE SECTION 79560 *et seq.*, (PROPOSITION 50), AND ANY OTHER FUNDING THAT THE REGIONAL MANAGEMENT GROUP DEEMS ADVISABLE TO PURSUE.

WHEREAS, the North West Kern Resource Conservation District (District) has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW, THEREFORE, BE IT RESOLVED, by the North West Kern Board of Directors as follows:

1. That the Poso Creek Integrated Regional Water Management Plan is hereby adopted and that the District's Manager, Brian W. Hockett is authorized to sign a signatory page which will accompany the Plan and indicate adoption of the Plan by this District, upon termination of the formal public review period.

2. That said District Board of Directors supports the submission of an application by Semitropic Water Storage District, as lead agency for the Poso Creek Regional Management Group, to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan.

PASSED AND ADOPTED this 18th day of July, 2007 at a regular meeting of the Board of Directors by the following vote:

AYES: IIII

NOES: _____

ABSENT: II

Craig D. Fulwyler, President

ATTEST:

Stephen Fanucchi, District Secretary

Semitropic Water Storage District

SEMITROPIC IMPROVEMENT DISTRICT OF
SEMITROPIC WATER STORAGE DISTRICT

IN THE MATTER OF: RESOLUTION NO. SID 07-4

IN SUPPORT OF ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND SUBMITTING AN APPLICATION TO FILE AN IMPLEMENTATION GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER, COASTAL AND BEACH PROTECTION ACT OF 2002, WATER CODE SECTION 79560 *et seq.*, (PROPOSITION 50)

WHEREAS, the Semitropic water Storage District (District) has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW, THEREFORE, BE IT RESOLVED by the Semitropic Water Storage District Board of Directors as follows:

1. That the Poso Creek Integrated Regional Water Management Plan is hereby adopted and that the District's Assistant Secretary, Wilmar L. Boschman is authorized to sign a signatory page which will accompany the Plan and

indicate adoption of the Plan by this District, upon termination of the formal public review period.

2. That said District Board of Directors supports and authorizes its Assistant Secretary, Wilmar L. Boschman to submit an application to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan.

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Semitropic Improvement District of Semitropic Water Storage District held on the 11th day of July, 2007, by the following vote, to wit:

AYES: Directors Crettol, Page, Portwood, Tracy, Waterhouse and Wegis

NOES: None

ABSENT: Director Fabbri

ABSTAIN: None

President

ATTEST:

Assistant Secretary

Shafter-Wasco Irrigation District

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SHAFTER-WASCO IRRIGATION DISTRICT

IN THE MATTER OF: ***Resolution No.* 07-08**

IN SUPPORT OF ADOPTING AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN AND SUBMITTING AN APPLICATION TO FILE AN IMPLEMENTATION GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER, COASTAL AND BEACH PROTECTION ACT OF 2002, WATER CODE SECTION 79560 *et seq.*, (PROPOSITION 50).

WHEREAS, the Shafter-Wasco Irrigation District has been meeting monthly with other neighboring districts since January 2006 to formulate an Integrated Regional Water Management Plan (Plan) for their collective area, where the group of districts is referred to as the Poso Creek Regional Management Group (Regional Management Group) and the area as the Poso Creek Regional Management Area; and

WHEREAS, the Regional Management Group includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Rag Gulch Water District, Semitropic Water Storage District, and Shafter-Wasco Irrigation District; and

WHEREAS, in August 2006, potential stakeholders were identified and invited to participate in the formulation of the Plan; and

WHEREAS, a Draft Plan has been prepared in accordance with IRWM Plan Standards as set forth in Appendix A to the November 2004 Integrated Regional Water Management Grant Program Guidelines published by the Department of Water Resources and the State Water Resources Control Board pursuant to California Water Code Section 79562.5(b); and

WHEREAS, by published notice, the Draft Plan was made available to the public for review and comment, and a public hearing was conducted to receive comments; and

WHEREAS, the Regional Management Group, with Semitropic Water Storage District as lead agency, desires to pursue funding opportunities for implementation of the Plan.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of the Shafter-Wasco Irrigation District as follows:

1. That the Poso Creek Integrated Regional Water Management Plan is hereby adopted and that the District's General Manager, Jerry Ezell is authorized to sign a signatory page which will accompany the Plan and indicate adoption of the Plan by the District, upon termination of the formal public review period.

2. That said District Board of Directors supports the submission of an application by Semitropic Water Storage District, as lead agency for the Poso Creek Regional Management Group, to the California Department of Water Resources and State Water Resources Control Board to obtain an implementation grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*) to assist with implementation of the Poso Creek Integrated Regional Water Management Plan.

ALL THE FOREGOING, being on motion of Director Ken Paul, and seconded by D. Mark Franz, Director was authorized by the following vote:

AYES:	D. Mark Franz, Ken Paul and Art Penner
NOES:	None
ABSENT:	Samuel D. Frantz
ABSTAIN:	None

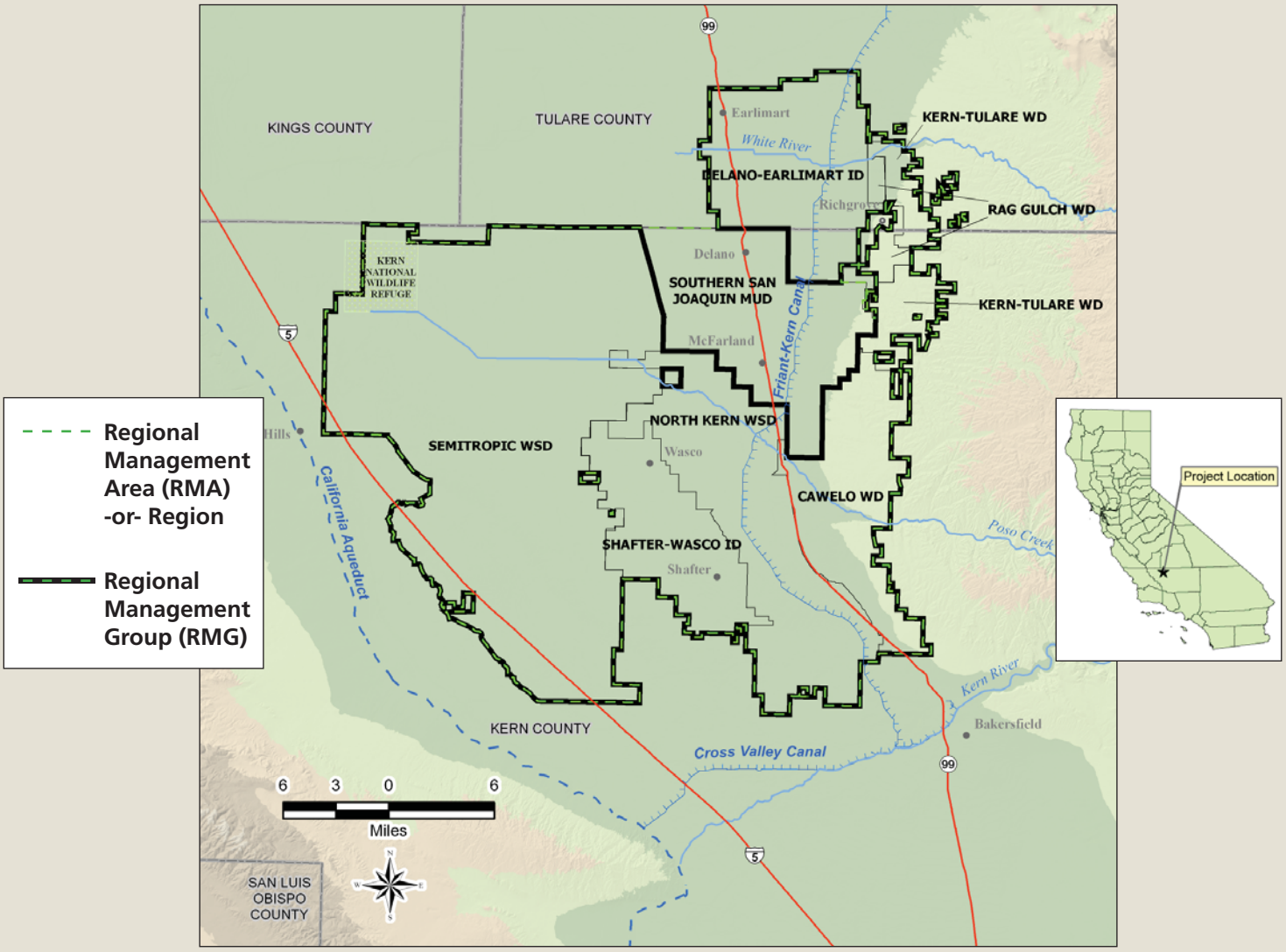
I HEREBY CERTIFY that the foregoing is a resolution of the Shafter-Wasco Irrigation District as a duly passed and adopted by said Board of Directors on the 10th day of July, 2007.

WITNESS my hand and seal of said Board of Directors this 10th day of July, 2007.

Arthur Penner, ***President of the Board of Directors***

ATTEST:

Jerry L. Ezell, ***Secretary of the Board of Directors***



Please contact Mr. Paul Oshel, District Engineer for Semitropic Water Storage District, at (661) 758-5113 for information or to answer questions on behalf of the following eight entities:

Wilmar L. Boschman
General Manager
Semitropic Water Storage District

David R. Ansolabehere
General Manager
Cawelo Water District

Dale R. Brogan
General Manager
Delano-Earlimart Irrigation District

Steven C. Dalke
General Manager
Kern-Tulare Water District

Dana S. Munn
Engineer-Manager
North Kern Water Storage District

Brian Hockett
District Manager
North West Kern Resource Conservation District

Steven C. Dalke
General Manager
Rag Gulch Water District

Jerry L. Ezell
General Manager
Shafter-Wasco Irrigation District

Grant funding for the Poso Creek Integrated Regional Water Management Plan was provided by the California Department of Water Resources.