



June 2014

POSO CREEK

Integrated Regional Water Management Plan | **2014 Update**



Semitropic Water Storage District
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2014 Poso Creek Integrated Regional Water Management (IRWM) Plan Update

submitted and adopted by the

Poso Creek Regional Water Management Group (RWMG)
Led by the Semitropic Water Storage District
Wasco, CA

on behalf of the

Poso Creek IRWM Group
Kern and Tulare Counties, CA

submitted to the

California Department of Water Resources (DWR)
Sacramento, CA

in accordance with the

Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84)

- June 2014 -

For more information regarding the planning and implementation efforts of the Poso Creek Integrated Regional Water Management (IRWM) Group, as well as archived versions of past planning documents, please visit the IRWM Group website located at:

www.semitropic.com/PosoCreekIRWM.html

The website is managed and maintained by the Semitropic Water Storage District, the IRWM Group Lead Agency.

POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT (IRWM) GROUP
2014 IRWM PLAN UDPATE SYNOPSIS

The purpose of the original 2007 Poso Creek IRWM Plan, the first IRWM Plan completed and adopted by the Poso Creek IRWM Group, was to provide a framework for (1) coordinating groundwater and surface water management activities through *regional* objectives, and (2) implementing the measures necessary to meet those objectives. These statements reflected the aims of the IRWM Group to improve water resources management that benefits inhabitants throughout the Poso Creek Region (Region) as well as water purveyors in other parts of California while satisfying regional priorities. At the time, the priorities principally considered the Department of Water Resources' (DWR) IRWM Proposition 50 Program Guidelines and the Resource Management Strategies (RMSs) presented in the California Water Plan Update 2005.

While these purposes and goals remain, the 2014 IRWM Plan Update (Plan) reflects the IRWM Group's expanded planning efforts to address requirements in the DWR's Proposition 84 IRWM Guidelines that focus on additional RMSs (California Water Plan Update 2013) and the IRWM Plan Standards as follows:

1. Coordination of comprehensive resource management activities for surface water, groundwater, environmental, and municipal into a cohesive set of "Regional Goals" (Goals) and "Measurable Objectives" (Objectives).
2. Evaluation and adaptation of the RWMG's Measurable Objectives, including Mission/Vision, Regional Goals and their compliance with State planning requirements for considering Program Preferences, Statewide Priorities, and RMSs.
3. Assessment of structural (project) and non-structural (program) enhancements that conform to the Measurable Objectives, leading to eventual implementation by the IRWM Group.

While this Plan was developed to compliment and expand upon the original 2007 Plan, the overriding conclusions remain the same. That is, surface water supplies available through delivery to the Region have been largely unreliable, on an annual basis, and will likely remain unreliable (reduced) in the future relative to historical conditions. Given water users within the districts that are involved in the IRWM Groups' efforts are reliant on surface water sources delivered from outside the Region, it will likely lead to a corresponding decline in groundwater levels as groundwater is used to make up the reduction in surface water supplies if proactive actions are not taken. The economic, environmental, and social burdens of this scenario will be felt by *all users* that rely in whole or in part on pumped groundwater, including a significant portion of agricultural, environmental, and municipal (communities) users in the Region.

As a generalization, this Plan puts into context the planning and implementation efforts to address these concerns by the IRWM Group through the direction of the Regional Water Management Group (RWMG). The RWMG is comprised of the districts and agencies that consider and provide funding of the planning and implementation efforts. In addition to the RWMG, the IRWM Group includes other regional Stakeholders, members that are directly involved with or potentially affected by the planning and management efforts of the RWMG, Interested Parties, and public or private entities that have interest in the Poso Creek regional planning process but may or may not be directly involved. This Plan contains materials discussed in context to regional water management needs and concerns for the IRWM Group regarding the follow subjects:

- *RWMG and IRWM Group Governance*: Discusses the IRWM Group's governance structure based on the agreements and management of the RWMG. Includes the decision making processes and outreach/involvement efforts used to facilitate participation in the IRWM Group by the RWMG, Stakeholders, and Interested Parties (public).
- *Regional Description*: Discusses the Poso Creek Region, including the water supply and demand situation, social and cultural makeup, and regional management objectives and conflicts which have led to the opportunity for regional water management activities.
- *Regional Goals and Measurable Objectives*: Discusses the IRWM Group's Goals and Objectives, including quantitative and qualitative metrics for monitoring and achieving said Goals and Objectives. Development of the Goals and Objectives consider Statewide Priorities and Resources Management Strategies, as well as the primary resource concerns of regional water users (e.g., agricultural, environmental, municipal, etc.)
- *Projects and Programs Review Process*: Discusses the procedure by which any district, agency, organization, or individual can submit projects and programs to the IRWM Group for consideration. Includes the RWMG and IRWM Group review process, and the means by which the Group communicates the list of projects and programs which have been selected for inclusion in the IRWM Group's planning and implementation efforts.
- *Impacts and Benefits*: Discusses the potential impacts and benefits of Plan implementation in the Region, to neighboring regions, with community (DAC), environmental, and economic concerns.
- *Plan Performance, Monitoring, and Data Management*: Discusses the performance measures and monitoring methods to ensure that the Plan Objectives are met.

Includes details on the data needs of the IRWM Group and how the collected data is shared publically and with local, State, and Federal agencies.

- *Funding Opportunities*: Discusses the plans for implementation and financing of projects and programs, including the potential funding mechanisms (e.g., grant funding support). The certainty and longevity of these funding sources is also discussed, as well as how to operate and maintain projects and programs once funding is no longer available.
- *Technical Analysis*: Discusses the technical analyses used in development of the Plan, with particular emphasis on the data and baseline conclusions from the original 2007 IRWM Plan.
- *Relation to Water Resources and Land-Use Planning*: Discusses the relation of the Plan to other planning documents and programs in the Region, and how the IRWM Group coordinates with these planning efforts.
- *Stakeholder and Public Involvement*: Further discusses the means by which the IRWM Group facilitates participation in the regional planning and implementation activities, by the RWMG, Stakeholders, and Interested Parties. Emphases are placed on public participation and the participation of regional communities (DACs).
- *Coordination and Integration Standards*: Discusses the process by which the IRWM Group coordinates projects and programs with local agencies (Stakeholders and Interested Parties). Addresses neighboring IRWM Groups and cooperation efforts between inter-regional groups.
- *Climate Change Assessment*: Discusses an evaluation of the Region's vulnerabilities to the potential impacts of climate change and how these vulnerabilities are addressed by the IRWM Group when considering projects and programs (e.g., GHG emissions, environmental impacts, etc.)

Both structural projects and non-structural program enhancements are addressed in this Plan, while conforming to the stated Goals and Objectives. These provide the means for coordinating the assets, needs, and operations regarding water supplies and demands in the Region, with the end result being mitigated water concerns for the RWMG, Stakeholders, and Interested Parties.

The following pages (tables) acknowledge the participation of the individual districts, agencies, organizations, and individuals who make up the RWMG, Stakeholders, and Interested Parties of the Poso Creek IRWM Group. Each of the Boards of Directors of the districts that make up the RWMG have adopted the Plan and its contents, representing their continued participation in further developing, funding, and ultimately managing the IRWM Group. Note that the RWMG had also adopted the original 2007 IRWM Plan in July 2007. To that extent, the Plan should be considered a *living document* which may change in response to new information, changed conditions, or other factors.

IRWM Participating Districts & Agencies

Poso Creek RWMG Participants

District, Agency of Entity	Location	Special District Type[1]	Voting Rights	Funding Commit.
Semitropic (SWSD)[2]	Wasco, CA	Water Storage District	X	X
North Kern (NKWSD)	Bakersfield, CA	Water Storage District	X	X
Cawelo (CWD)	Bakersfield, CA	Water District	X	X
Shafter-Wasco (SWID)	Wasco, CA	Irrigation District	X	X
Kern-Tulare (KTWD)	Bakersfield, CA	Water District	X	X
Delano-Earlimart (DEID)	Delano, CA	Irrigation District	X	
North West Kern (NWKRCD)	Bakersfield, CA	Resource Conservation District	X	
Disadvantaged Community (DAC) Representative			X	

[1] Statutory authority for water supply and/or water management granted under the California Water Code.
[2] IRWM Leading Agency.

Poso Creek IRWM Stakeholder Members

District, Agency of Entity	Location	CWC Category[1]
Southern San Joaquin Municipal Utility District (SSJ MUD)	Delano, CA	WP, GD
Rosedale-Rio Bravo Water Storage District	Bakersfield, CA	WP, GD
Buena Vista Water Storage District	Buttonwillow, CA	WP, GD
Lost Hills Utility District (LHUD)	Lost Hills, CA	GD
Lost Hills Water District (LHWD)	Lost Hills, CA	GD, WP
California Department of Water Resources (DWR)	Sacramento, CA	SF
U.S. Bureau of Reclamation (USBR)	Fresno, CA	SF
Kern County Water Agency (KCWA)	Bakersfield, CA	WP, SF
Kern National Wildlife Refuge	Wasco, CA	GD, ES

[1] Stakeholder and local agency categories as defined by the California Water Code §10541(g), see Plan Section 11.1.

Poso Creek IRWM Stakeholder Members (Continued)

District, Agency of Entity	Location	CWC Category[1]
Semitropic Wildlife Improvement District	Wasco, CA	GD, ES
Friant Water Users Authority	Lindsay, CA	ES, CO
Bishop Acres Mutual Water Company	Bakersfield, CA	WP
Tulare Basin Wildlife Partners	Three Rivers, CA	ES
Cities and Unincorporated Communities [2]		
City of Delano	Delano, CA	GD, CO, DC
City of McFarland	McFarland, CA	GD, CO, DC
City of Shafter	Shafter, CA	GD, CO, DC
Community of Buttonwillow	Buttonwillow, CA	CO, DC
Community of Earlimart	Earlimart, CA	CO, DC
Community of Lost Hills	Lost Hills, CA	CO, DC
Community of Richgrove	Richgrove, CA	CO, DC
Community of Madonna (Unincorporated)	Madonna, CA	CO, DC
Community of Pond (Unincorporated)	Pond, CA	CO, DC
Community of North Shafter (Unincorporated)	Shafter, CA	CO, DC
Community of South Shafter (Unincorporated), including Smith's Corner, Thomas Lane, Cherokee Strip, Burbank, Mexican Colony, and Southwest Shafter	Shafter, CA	CO, DC
Pond Union School District	Wasco, CA	SS
Semitropic School District	Wasco, CA	SS
Maple Elementary School	Shafter, CA	SS
Shafter Farm Labor Camp	Shafter, CA	OT
Rodriguez Farm Labor Camp	Richgrove, CA	OT
Community of Allensworth (Unincorporated)	Allensworth, CA	CO, DC

[1] Stakeholder and local agency categories as defined by the California Water Code §10541(g), see Plan Section 11.1.
[2] All incorporated cities and communities are considered Disadvantaged Communities (DACs), represented by both the DAC Representative (see RWMG Participants table) and a DAC Workgroup; see Plan Section 3.9.

Poso Creek IRWM Stakeholder Members (Continued)

District, Agency of Entity	Location	CWC Category[1]
Cities and Unincorporated Communities [2]		
Community of Alpaugh (Unincorporated)[3]	Alpaugh, CA	CO, DC
Community of Ducor (Unincorporated) [3]	Ducor, CA	CO, DC
Community of Blackwells Corner (Unincorporated) [3]	Blackwells Corner, CA	CO, DC
Individuals		
Kathy Wood McLaughlin, Tulare Basin Watershed Coordinator	Fresno, CA	ES
Carole Combs, Tulare Basin Wildlife Partners	Three Rivers, CA	ES

[1] Stakeholder and local agency categories as defined by the California Water Code §10541(g), see Plan Section 11.1.
[2] All incorporated cities and communities are considered Disadvantaged Communities (DACs), represented by both the DAC Representative (see RWMG Participants table) and a DAC Workgroup; see Plan Section 3.9.
[3] Located outside of Poso Creek IRWM Region.

Poso Creek IRWM Interested Parties

District, Agency of Entity	Location	CWC Category[1]
U.S. Department of Agriculture: Natural Resource Conservation Service (USDA – NRCS)	Bakersfield, CA	SF, ES
Fresno State University: California Water Institute	Fresno, CA	SF
Kern River Watershed Coalition Authority	Fresno, CA	ES, CO
Kern County Board of Supervisors	Bakersfield, CA	GD
County of Kern Engineering Services	Bakersfield, CA	GD
California Department of Fish and Wildlife	Sacramento, CA	SF, ES
Paramount Farms	Lost Hills, CA	IO
Community Water Center	Visalia, CA	CO
Individuals		
Mathew Hurley, Angiola Water District	Corcoran, CA	WP, GD
Denise Akins, County of Tulare	Visalia, CA	GD
Misc. 'Public Interest' including Landowners, Environmental Advocacy Groups, Private/ Public Organizations, etc.		CO, OT

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List of Acronyms

ACS	American Community Survey
AWMP	Agricultural Water Management Plan
BDCP	Bay-Delta Conservation Plan
BMO	Basin Management Objective
CASGEM	California Statewide Groundwater Elevation Monitoring *(DWR)*
CASWSC	California Water Science Center *(USGS)*
CDPH	California Department of Health
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System *(DWR)*
COG	Council of Governments
CVC	Cross Valley Canal
CVP	Central Valley Project *(Federal – USBR)*
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWC	California Water Code
DAC	Economically-Disadvantaged Community
DAMS	Department of Agriculture and Measurement Standards *(Kern County)*
DMS	Data Management System
DWR	California Department of Water Resources
ESR	Endangered Species Recovery *(Program)*
FMMP	California Farmland Mapping and Monitoring Program
FWA	Friant Water Authority
GHG	Greenhouse Gases *(Emissions)*
GIS	Geographic Information System
GWMP	Groundwater Management Plan
HCP	Habitat Conservation Plan
ID	Irrigation District
ILRP	Irrigated Lands Regulatory Program
IRWM	Integrated Regional Water Management *(Plan or Group)*
IRWMG	Integrated regional Water Management Group
IRWMP	Integrated Regional Water Management Plan
JPA	Joint Powers Authority
KCAD	Kern County Agricultural Department
KCWA	Kern County Water Agency
KGWMC	Kern Groundwater Management Committee
KCWRC	Kern County Water Resources Committee
KGWMC	Kern Groundwater Management Committee
KNWR	Kern National Wildlife Refuge
KRWCA	Kern River Watershed Coalition Authority
LAFCO	Local Agency Formation Commission

List of Acronyms (Continued)

M&I	Municipal and Industrial *(Water Uses)*
MHI	Median Household Income
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NWKRCD	North West Kern Resource Conservation District
NRCS	Natural Resource Conservation Service *(USDA)*
NWS	National Weather Service
PDCF	Project Definition and Characterization Form *(Submission Form)*
PIP	Public Involvement Plan *(Appendix G)*
QA/QC	Quality Assurance and Quality Control Measures
RMA	Regional Management Agency *(changed to RWMG)*
RMG	Regional Management Group *(changed to RWMG)*
RMS	Resource Management Strategy
RWMG	Regional Water Management Group
SDAC	Severely Disadvantaged Community *(DAC)*
SHE	Self-Help Enterprises, LLC.
SWP	State Water Project *(State – DWR)*
SWRCB	California State Water Resources Control Board
TBWP	Tulare Basin Wildlife Partners
USACE	US Army Corps of Engineers
USBR	US Bureau of Reclamation
USCID	US Committee on Irrigation and Drainage
USDA	US Department of Agriculture
USGS	US Geological Survey
UWMP	Urban Water Management Plan
WCP	Water Conservation Plan
WD	Water District
WMP	Water Management Plan
WSD	Water Storage District

1.0 Introduction

The Poso Creek Regional Water Management Group (RWMG) formed in 2005 as a group financed by individual water management districts (RWMG Participants) in the northern Tulare Lake region of Kern County. The RWMG formed the Poso Creek Region (Region) based on the individual districts having an interest in developing a collaborative approach to regional water management.

Following a defined Vision and Mission (Section 4.1), the RWMG ultimately developed and adopted an Integrated Regional Water Management Plan (IRWM Plan or IRWMP) in 2007 that articulated Planning Objectives and identified a list of structural (project) and non-structural (program) enhancements for the Region to improve water management between the RWMG Participants. The 2007 IRWMP followed the applicable State standards for IRWM planning, including IRWMP Proposition 50 Program Guidelines and the California Water Plan Update 2005. At that time, the RWMG had effectively formed an Integrated Regional Water Management Group (IRWMG or IRWM Group) that, in addition to the RWMG, included other Stakeholders, which includes members that are directly involved with or potentially affected by the planning and management efforts of the RWMG, and Interested Parties, which includes any public or private entities that have interest in the Poso Creek regional planning process but may or may not be directly involved. A diagram of the IRWM Group structure is shown in Figure 1.1, and further explained in Section 2.2.

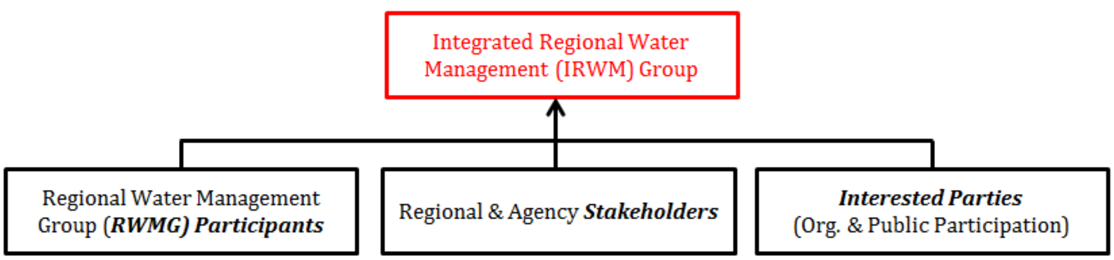
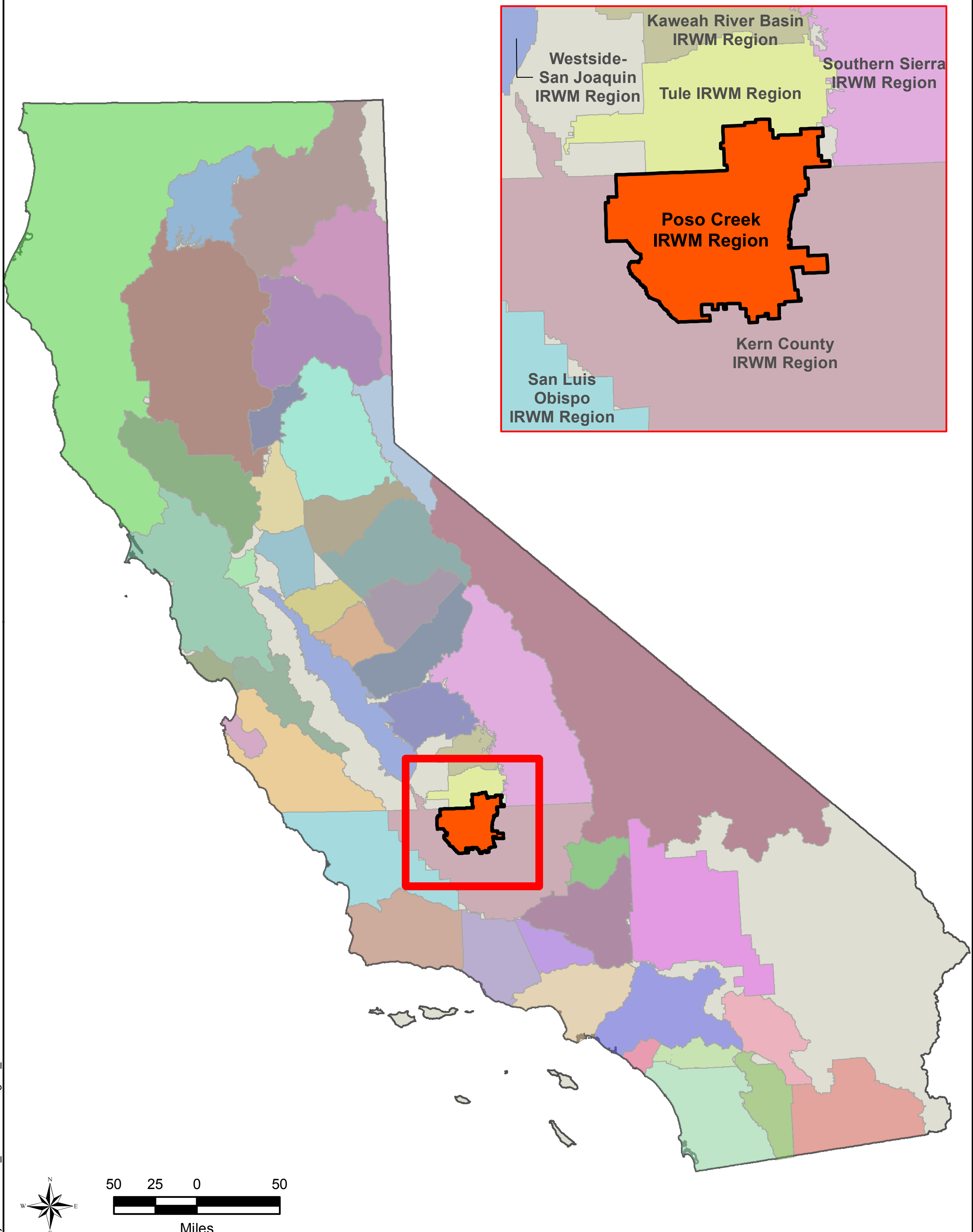


Figure 1.1 Poso Creek IRWM Group Structure

A listing of all active members of the IRWM Group, as of May 2014, is identified in the 'IRWM Participating Districts & Agencies' tables at the beginning of the Plan. Two views of the Region showing entities within and near the Poso Creek IRWMP Boundary are presented in Figure 1.2 and Figure 1.3.

Although individual members in each category of the IRWM Group have changed some since adoption of the 2007 IRWMP, a strong collaborative effort remains between those involved in the planning process to enhance regional water management through projects and programs that conform to current IRWMP Program Guidelines and are eligible for State and Federal grant funding. As such, the RWMG has developed and adopted a 2014 IRWM Plan Update (Plan or



SOURCE: DWR Bulletin 118, v.3, 2003.

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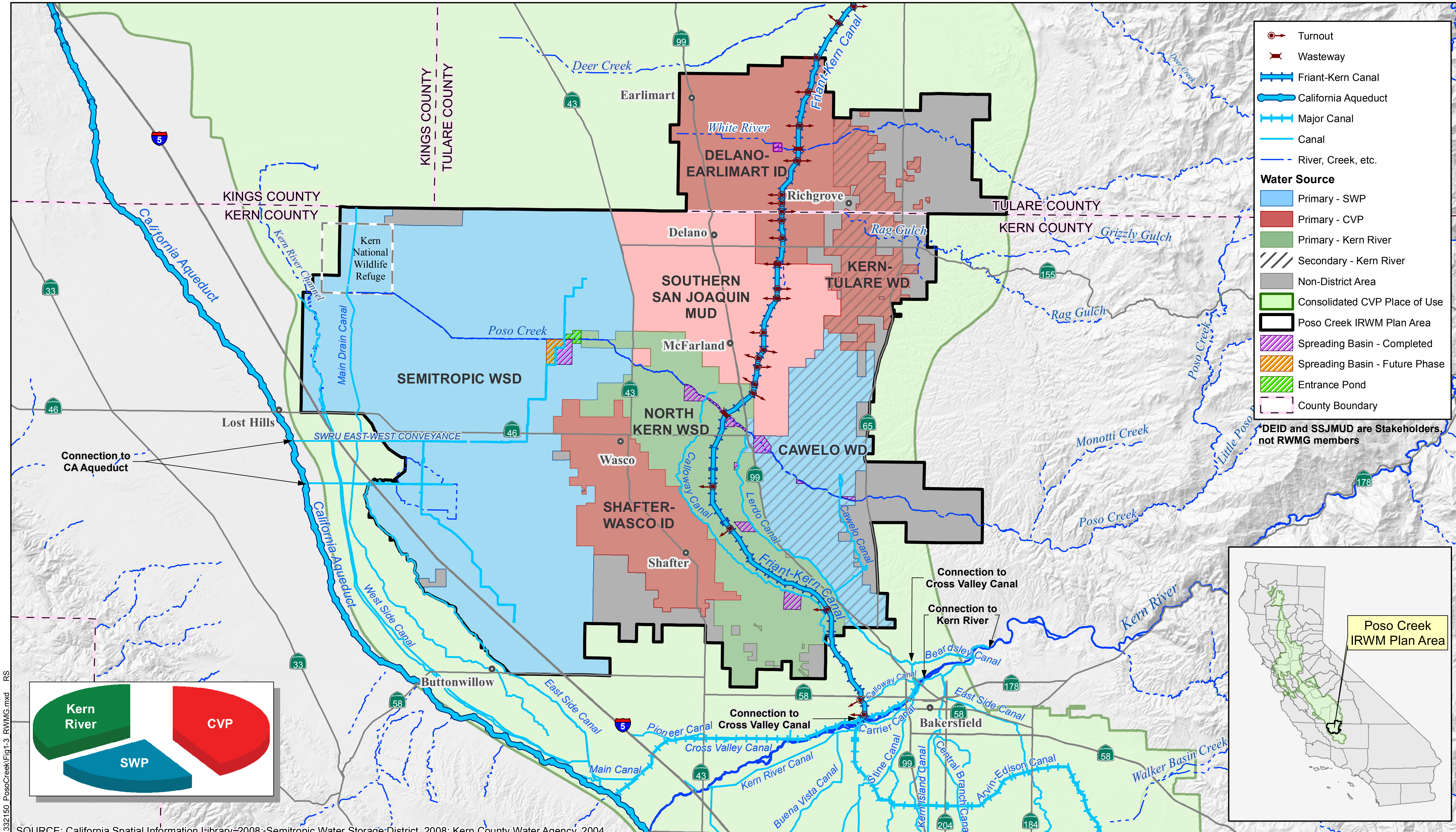
2014 Integrated Regional Water Management Plan (IRWMP) Update Kern and Tulare Counties, California	GEI Consultants	POSO CREEK IRWMP REGION
Poso Creek IRWM Group		JUNE 2014 FIGURE 1.2



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Miles

Poso Creek IRWM Plan, 2014 Update

Southern San Joaquin Valley, California

Poso Creek IRWM Plan Area (Region)

GEI Consultants
Bookman-Edmonston Division

REGIONAL WATER MANAGEMENT GROUP

JUNE 2014

FIGURE 1.3

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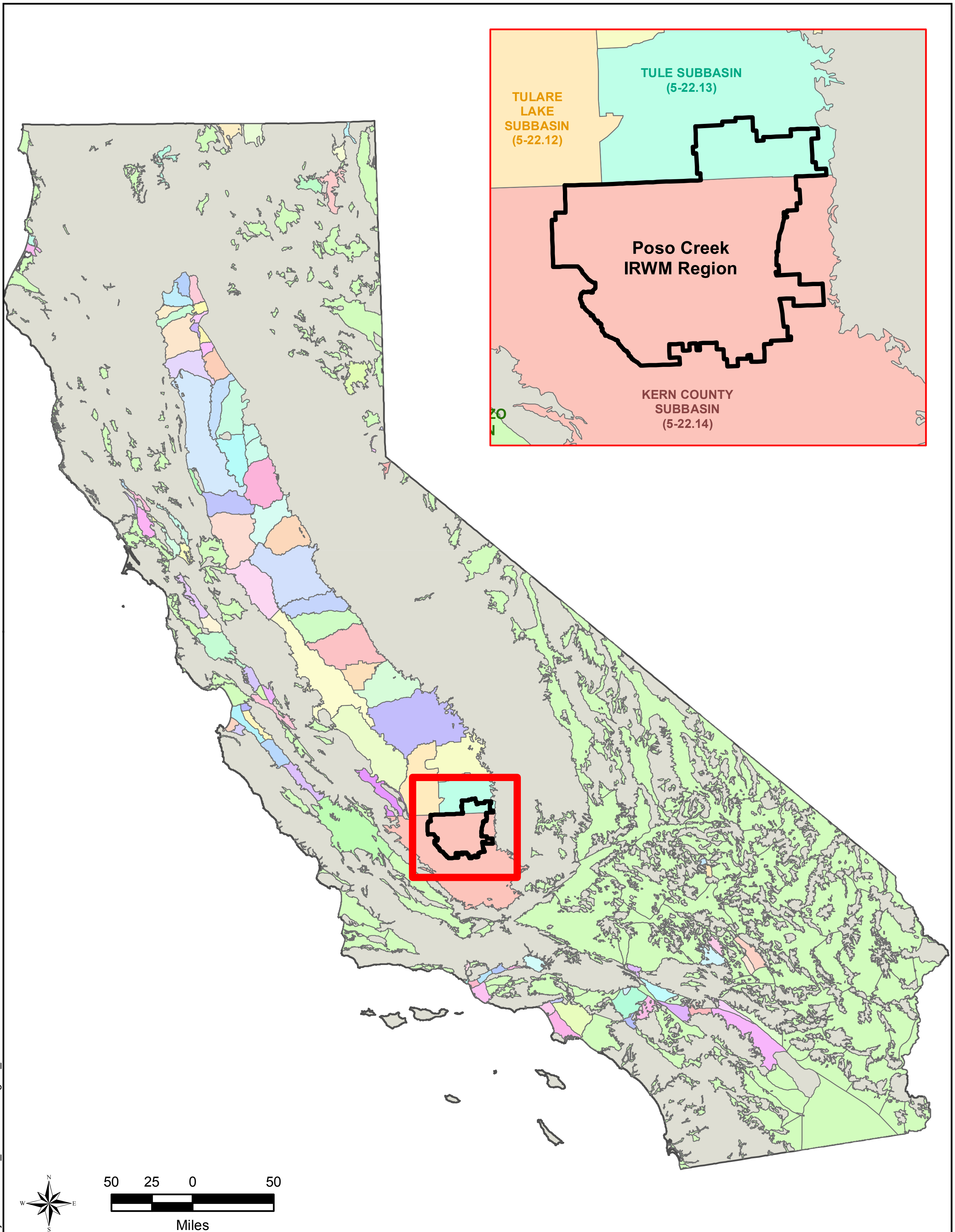
Plan Update) to clarify management and planning efforts that have evolved since 2007 and to conform with new State standards for IRWMPs applicable to IRWMP Proposition 84 Program Guidelines. The following sections provide an overview of the IRWM Group and their objectives with the development and adoption of a 2014 Update of the Poso Creek IRWMP.

1.1 Regional Overview

The Region is located at the southern end of the San Joaquin Valley, a physiographic trough surrounded by a horseshoe-shaped ring of mountains with the Sierra Nevada Mountains to the east and a series of coastal mountains to the west. In this semi-arid Region, "summers" (April through October) are typically hot and dry with no significant precipitation (i.e., total precipitation generally around 0.5 – 1.5 inches), while winters (November through March) are typically cooler and are characterized by frequent fog with some minor precipitation (i.e., total precipitation generally around 5 – 7 inches). The topography consists primarily of flat land (around 90 percent of the Region), with a mild westerly slope.

Irrigated agriculture is the dominant land use in the Region. Prior to formation of the agricultural water management districts, such as, the districts who are RWMG Participants, water for irrigation was obtained almost exclusively from groundwater sources, resulting in a rapid decline in static groundwater levels. It is noted that the groundwater basin common to the Region is the San Joaquin Valley Groundwater Basin (DWR No. 5-22), with most of the Region falling within the "Kern County Subbasin" (DWR No. 5-22.14). The delineation of basin boundaries was presented in DWR Bulletin 118, and these boundaries are shown with respect to the Region in Figure 1.4. To mitigate the impacts of declining groundwater levels, these districts were formed to provide public entities for entering into contracts for the use of supplemental surface water supplies delivered from State, Federal, and/or local watershed sources. Principal sources of surface water supplies to the Region include the Kern River (local); Poso Creek (local); State Water Project (SWP) with deliveries via the California Aqueduct; and the Central Valley Project (CVP) with deliveries via the Friant-Kern Canal and the California Aqueduct. In this regard, refer to Figure 1.1 for the locations of the main conveyance facilities, and to Section 3.3 for additional discussion.

Numerous public agencies, formed under the laws of the State of California (State), were established to develop, regulate, and distribute local water supplies and supplies imported from other areas of the State via the SWP and CVP. For decades, water districts and agencies around the State, including the RWMG Participants, have given much attention, effort, and funding to the effective planning and management of the available water resources.



SOURCE: DWR Bulletin 118, v.3, 2003.

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2014 Integrated Regional Water Management Plan (IRWMP) Update Kern and Tulare Counties, California	GEI Consultants	REGIONAL BOUNDARY IN RELATION TO GROUNDWATER BASIN BOUNDARIES
Poso Creek IRWM Group		JUNE 2014 FIGURE 1.4

The agricultural-based economy of the Region, which has a large economic influence in Kern County (Section 3.1), depends on adequate water supplies from a combination of local and imported surface water supplies and the underlying groundwater resources. However, shortages in available surface water supplies have been more frequent and larger than originally envisioned, largely due to regulatory restrictions on State and Federal deliveries of imported water supplies. Accordingly, water users in the Region are relying more heavily on groundwater pumping to meet water demands which, over time, may lead to groundwater level declines comparable to those which preceded the importation of supplemental surface water supplies. With climate change and increased competition for California's water resources from urban and environmental uses threatening to decrease available supplies even further, the individual districts identified and understand the need for regional, multi-district and agency water management to address both current and impending water resource issues.

To date, the regional approach taken by the IRWM Group has led to the successful completion of nearly $82 million in planning and project/program implementation activities to enhance water resources management and thereby mitigate the actual and anticipated reductions to surface water supplies delivered to the Region (see IRWM Projects and Programs lists in Appendix A). According to the 2007 IRWM Plan, the *reduction* in surface water supplies diverted into the Region could average on the order of 100,000 AF/year or more (as compared to historical levels of diversion and use). Continuous and adaptive regional planning and implementation efforts have helped to increase water use effectiveness in the Region through greater absorption and groundwater recharge and have helped to alleviate some of the water resources issues that are otherwise unresolvable and unmanageable under an individualized district planning focus.

1.2 Purpose and Scope

The purpose of the original 2007 IRWMP was 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. While these purposes remain, the 2014 Plan Update reflects the IRWM Group's expanded planning efforts to address requirements in the DWR's Proposition 84 IRWM Guidelines that focus on additional resource management strategies and the IRWM Plan Standards as follows:

1. Coordination of comprehensive resource management activities for surface water, groundwater, environmental, and municipal into a cohesive set of Regional Goals and Measurable Objectives (reference Sections 4.4 and 4.5, respectively).
2. Evaluation and adaptation of the RWMG's Measurable Objectives, including Mission/Vision, Regional Goals and their compliance with State planning requirements

for considering Program Preferences, Statewide Priorities, and Resource Management Strategies.

3. Assessment of structural (project) and non-structural (program) enhancements that conform to the Measurable Objectives, leading to eventual implementation by the IRWM Group.

Anticipating the need for funding assistance in order to implement the identified enhancements, this Plan Update is prepared in satisfaction of eligibility requirements for grant funding administered by the State under Proposition 84. Whereas the 2007 IRWMP adhered to the groundwater monitoring and assessment emphases of the then applicable Proposition 50 Guidelines, the 2014 Plan Update illustrates that the RWMG has since expanded their reach from specifically surface and groundwater water resources planning and management to more generalized resource management planning within the Region. The 2014 Plan Update includes a broader focus on water supply and demand, environmental and climate change impact assessment, and social and economic impacts of implemented projects and programs.

1.3 Plan Update and Organization

The IRWM Plan was updated by the IRWM Group for the following reasons:

1. Consideration of changes to the water related needs of RWMG Participants, Stakeholders, and Interested Parties;
2. Consideration of State goals and priorities from the 20x2020 Water Conservation Plan of 2010 that relate to water use efficiency;
3. Consideration of California Water Plan Update 2013 (Public Review Draft), and
4. Consideration of the 2012 DWR IRWMP Proposition 84 and 1E Guidelines.

These are similar to the reasons given in Section 4.3 for updating the goals and objectives from the 2007 IRWMP. The vision for the 2014 Plan Update, along with preparation of the Plan Update, was the result of the IRWM Group working in concert with its consultant, GEI Consultants, Inc. During preparation of the Plan Update, the Plan Standards and relevant topics were routinely discussed during periodic (public) meetings of the RWMG. Each section of the Plan Update was made available for review by the RWMG prior to release of the public review draft. It is noted that funding for the Plan Update was provided entirely by the RWMG Participants.

The Plan Update is organized such that the sixteen IRWM Plan Standards, set forth in the IRWMP Proposition 84 Guidelines, are fully addressed in a document that provides a clear description of regional conditions, resource management, and planning activities. The Update covers the standard 20-year planning horizon for IRWMPs and extends regional assessments for surface water and groundwater supplies and potential climate change impacts into the future. Each of the sections which follows addresses one or more of the Plan Standards, and the beginning of each section includes a table which clearly indicates the Plan Standards and Plan Standard Requirements which are addressed in that particular section, including identification of the subsection(s) where each requirement is addressed.

2.0 Governance

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Governance' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Name of RWMG responsible for implementation of IRWMP.	2.0, 2.1, 2.2
Description of IRWM governance structure.	2.2
Governance addresses public outreach and involvement process.	2.2, 2.3
Governance addresses effective decision making.	2.4
Balanced access and opportunity for participation in IRWM process.	2.2, 2.3
Effective communication internal and external to IRWM region.	2.2, 2.7
Long-term implementation of IRWM Plan.	2.6
Coordination with neighboring IRWM efforts and State/Federal agencies.	2.7
Collaborative process used to establish plan objectives.	2.5
Interim changes and formal changes to the IRWM Plan will be performed.	2.6
Updating or amending the IRWM Plan.	2.6
Publish NOI to prepare/update the plan; adopt the plan in public meeting.	2.3, 2.6

The RWMG is organized under a Memorandum of Understanding (MOU) which was executed by the RWMG (water management districts and agencies as discussed in Section 1.0 and further described in Appendix B). In addition to the MOU structure, governance relies on the effectiveness of the individual leaders within each of the participating groups, which includes the RWMG Participants, Stakeholders, and Interested Parties, their roles and responsibilities, communication between these groups, and contributions through established relationships between all participants. The following section describes the RWMG governance structure, including communication protocols and decision-making policies. The latest version of the MOU with attached amendments, which contains a more detailed governance description, is found in Appendix C.

2.1 Statutory and Regulatory Authority

Each of the districts in the RWMG has statutory authority over water supply or water management within their designated 'service areas' consistent with their enabling legislation. These responsibilities may include distribution and management of water supplies, water quality management, flood control, etc. As such, the districts may exercise certain powers regarding the management of water supplies for beneficial uses and may take legal action needed to protect or prevent interference with water, the quality thereof, or water rights within the district boundaries (CWC §60220 through §60231). Note that water supplies are defined as water which is delivered to district water management facilities for the purposes of agricultural, environmental, municipal and industrial uses, as well as groundwater recharge and water transfer and exchange. Agricultural water supply, primarily for crop irrigation, includes the volume of water delivered to a district's service area from both surface water and groundwater sources. It is worth noting that, following extensive public education and landowner election, each district or agency was formed by and for the benefit of all landowners within the organized (service) area. These districts continue to be governed by 'Boards of Directors' comprised exclusively of landowners, maintaining the direct relationship between formal water management and district users. District-specific authorities and rules/regulations for the distribution and protection of water supplies can be found in operational guideline documents adopted by a district's Board of Directors and available from the public agencies, commonly titled "Rules and Regulations for Distribution and Use of Water" or similar. Recall that brief descriptions of each of the RWMG districts are given in Appendix B.

As previously mentioned the RWMG was formed under and is governed by an MOU between the water management districts and agencies listed in the 'IRWM Participating Districts & Agencies' tables at the beginning of the Plan. The RWMG includes 'Water Storage Districts', 'Water Districts', 'Irrigation Districts', and one 'Resource Conservation District' as defined by the CWC. The MOU, executed on May 12, 2010, formalized the governance of the RWMG. An Amendment to the MOU (First Amendment, 2014) was signed as part of the Plan Update (copy included with MOU in Appendix C[1]) in order to reflect the updated IRWMP's Regional Goals and Measurable Objectives. The Poso Creek RWMG meets the definition per the CWC §10539 since it includes: (1) more than three local agencies; (2) at least two local agencies that have statutory authority over water supplies or water management; and (3) members that participate by means of a written agreement (in this case, an MOU) that was approved by the governing bodies of the local agencies.

The purpose of the agreement was "to provide for the governance of the RWMG for the study, promotion and development of water management-related projects and programs and to encourage and facilitate design, financing, acquisition, construction and/or operation of same by some or all of the participating groups" (RWMG Participants, Stakeholders, and Interested Parties). The MOU identifies these purposes as powers of the RWMG. The RWMG is not authorized to supersede any district-specific authorities for water management or to finance, acquire, construct or operate projects on behalf of any, or all, of the participating groups.

2.2 Governance Structure

As of 2014, the RWMG consists of seven voting members, comprised of members from each of the five agricultural water districts and North West Kern Resource Conservation District

[1]The MOU contained agreement between current RWMG Participants, as well as, the Rag Gulch Water District. Note that Rag Gulch WD has since merged with the Kern-Tulare WD into one district, effective early-2009. This change is identified in the First Amendment.

(NWKRCD) shown in the tables at the beginning of the Plan, under 'RWMG Participants", and a representative for *economically-disadvantaged communities* (DACs) as part of the RWMG's DAC Work Group (Poso Creek Region Disadvantaged Communities Group). Each of the RWMG Participants, as well as the DAC Work Group, has participated throughout the development of the Plan through periodic meetings; each has formally adopted the Plan; and each member continues to participate during the ongoing implementation phase. The NWKRCD and DAC Representative participate in the RWMG at no cost.

The organized areas of each district are shown in Table 3.1, as part of Section 3.2. The RWMG's primary roles and responsibilities include:

- Execute and maintain the governance structure including the MOU;
- Maintain, update, and adopt an IRWM Plan;
- Designate a 'Chairperson' as representative with clear authority to represent the RWMG;
- Facilitate public meetings/workshops for regional planning efforts;
- Submit regional structural (projects) and non-structural (programs) enhancements to accomplish the Regional Goals and Measurable Objectives set forth in the IRWM Plan and facilitate application for grant funding to accomplish the enhancements; and
- Compile and, as necessary, submit data regarding planning and implementation efforts.

Carrying out these responsibilities falls on the RWMG Participants, as they are the formal governing body in charge of the IRWM Group that votes on and executes RWMG agenda items while representing the interests of the RWMG Participants, Stakeholders, and Interested Parties, including the DAC Workgroup. The members of the RWMG Participants are selected by each of the districts. There are no term limits for members of the RWMG, and the districts and agencies are responsible for the rules and practices governing their member selection. A 'chairperson' is selected by the RWMG Participants, via simple majority vote, as their representative to the IRWM Stakeholders and Interested Parties, as well as, the public and regional landowners.

The Semitropic WSD has served as the 'Lead Agency' insofar as noticing and hosting meetings; acting as Treasurer; and contracting with consultants for required services. Other classifications of IRWMP involvement include Stakeholders, or members that are directly involved with or potentially affected by the planning and management efforts of the RWMG; and Interested Parties, which are any private or public entities that have interest in the Region's regional planning process but may or may not be directly involved.

Note that all Interested Parties participate in the IRWM Group free of cost. The classifications cover those entities which have opted not to become a member or are legally precluded from becoming a member, but have provided a formal expression of interest in regional planning activities to the RWMG. Although the input from IRWMP Stakeholders and Interested Parties, besides the DAC Workgroup, are not weighted as 'voting members', these entities are still able to actively participate and invest resources in the planning process, and are encouraged to do so. As such, these entities have provided a wide range of interests and information that add a great deal of diverse opinions and participation to the development and implementation of the IRWM Plan. An organization chart for the IRWM Group is shown below as Figure 2.1.

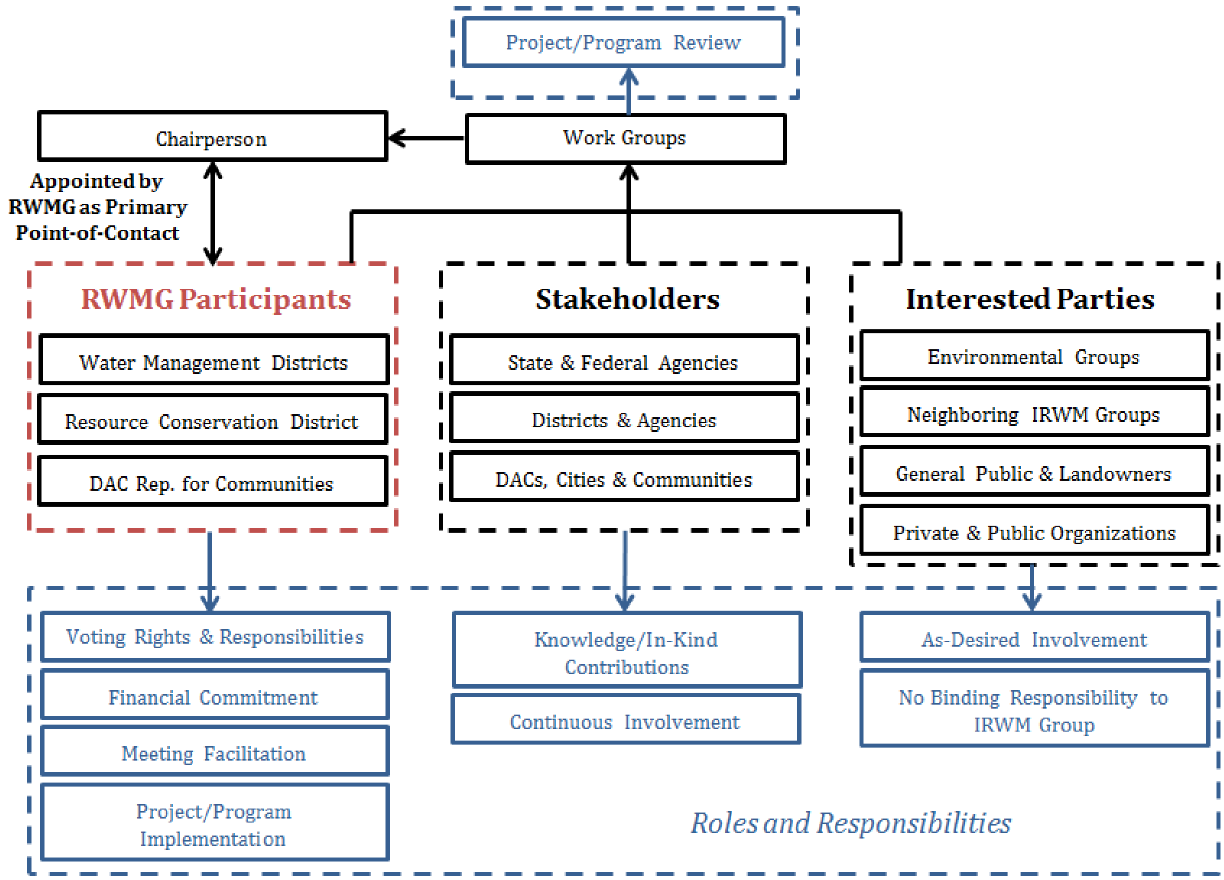


Figure 2.1 Poso Creek IRWM Group Organization Chart

As shown in Figure 2.1, the RWMG may form various Work Groups to address specific projects, policy/program review, implementation, planning efforts, or specific regional tasks. Work Groups generally focus on a limited number of tasks where a broader member base may be advantageous to provide expertise or knowledge in a particular subject matter, such as a DAC-based project. There is a simple structure in place for the appointment of workgroups, meaning they are simply established by the RWMG on an as-needed basis. Members do not have to be associated with the RWMG Participants. Further description regarding regional Work Groups is covered in the following section.

2.3 Work Groups

The RWMG has overseen the formation of numerous work groups over time to assist the IRWM Group with matters involving governance; DAC planning efforts; IRWM Plan updating and maintenance of compliance; project and program development; technical issues, project and program implementation; budgetary issues; regional groundwater monitoring efforts; and other ad-hoc administrative efforts. As previously stated, the RWMG may assign an action item to a defined Work Group on an as-needed basis. Following is a brief list of some of the key Work Groups that have been involved in the IRWMP planning and implementation efforts (a more extensive list can be found in the other planning documents written by the RWMG since the original 2007 IRWM Plan, as listed in Table 10.1).

- *Budget Development*: Appointed Work Group that develops and manages the monetary resource budget for the Poso Creek RWMG.
- *Groundwater Banking, Transfer, and Exchange Efforts*: Appointed Work Group to coordinate with RWMG Participants who are active in groundwater recharge and banking efforts, as described in Section 3.4, and to address their concerns regarding project and program review.
- *Wildlife Enhancement*: Appointed Work Group to coordinate with environmentally-concerned Interested Parties and to address their concerns regarding project and program review.
- *IRWM Boundary Coordination with Neighboring IRWM Groups*: Appointed Work Group to discuss and resolve boundary concerns with neighboring IRWMs, as described in Section 3.11.
- *Development of Governance MOU*: Work Group that initiated, developed, and revised the MOU that governs the Poso Creek RWMG (Section 2.2).
- *DAC Work Group*: Appointed and long-standing Work Group to coordinate with and address the concerns of DACs within the Region, and to coordinate with the DAC Representative and other private and public DAC representation. DAC involvement in the IRWM Group is further described in Section 11.3.
- *Various Project and Program Work Groups*: Appointed and as-needed Work Groups to assess project and program feasibility and the potential impacts and benefits of implementation.

The general public and regional landowners are encouraged to participate in the Work Groups based on their interests or stake in RWMG decisions. Some decisions may have direct effects to landowner water supplies or land use. As previously stated, all public involvement is classified as 'Interested Party' participation in the IRWM planning and implementation processes. Interested Parties need not be part of an entity or organization in order to participate, they can be any individual, whether a regional landowner or not, that attends an IRWM Group meeting, and they participate in the IRWM Group free of cost. None of the Interested Parties hold voting privileges directly; however, they are encouraged to present concerns or suggest projects/programs to the RWMG at the noticed meetings of the RWMG.

If direct involvement in the IRWM Group is not possible or desired, the public is encouraged to contact the RWMG via e-mail, call, or through a letter. Contact for each of the RWMG Participants is listed in Appendix B. The RWMG desires to remain transparent with the public regarding decisions made, projects/programs considered, and development and adoption of IRWM Plan. The RWMG distributes formal communications, such as, Notice of Intent and RWMG Meeting Notices as required by California Government Code §6066, or when otherwise deemed appropriate by the RWMG.

2.4 Decision-Making Process

The RWMG's modest size, coupled with its relatively simple governance structure (as illustrated in Figure 2.1), allows the group to easily assign an action item and reach a consensus decision in a quick and effective manner. Fundamentally, the process involves the discussion and review of the water management needs of RWMG Participants, Stakeholders, and Interested Parties regarding the Region at periodic, but formal, IRWM Group meetings.

IRWM Group meetings are usually held on the first Tuesday of each month at the office of the Lead Agency. If there are no action items up for consideration by the IRWM Group, then a monthly public noticed meeting may not be arranged. Conversely, if a higher-priority action item requires consideration, then a special meeting may be called with all RWMG Participants, Stakeholders, and Interested Parties adequately notified. At these meetings, an individual entity can present their project and program submissions to the IRWM Group under any classification, and will be given a fair opportunity to participate in the planning process. If an action is needed that requires a decision by the RWMG at a special (implementation) meeting, it can happen quickly by introduction to the group by the Chairperson and a simple majority vote by the RWMG. If the action requires more time for discussion, and immediate action is not necessary, the vote can be tabled until a future meeting.

Action items are identified at each meeting and work groups are formed to accomplish assigned tasks, as needed. Examples of decisions by the RWMG that have been made efficiently and relatively quickly at the meetings include:

- Accepting recommended modifications to the Region boundary to conform with neighboring IRWM groups;
- Identifying and selecting projects to submit for Federal and State grant applications;
- Accepting revised or updated DAC projects into the Poso Creek IRWM Plan from external assistance, particularly from Self-Help Enterprises (SHE);

- Integrating wildlife enhancement components into the Poso Creek IRWM Plan based on recommendations from Tulare Basin Wildlife Partners and others, such as, the Kern National Wildlife Refuge;
- Approving cost-share agreements for financing RWMG activities related to implementing the Plan, making revisions to the Plan, and meeting DWR IRWM Planning Requirements, and
- Approving and revising the MOU for Governance.

Note that the RWMG does not differentiate between major versus minor decisions based on expenses incurred or long-term impacts to associated Participants since the RWMG is not authorized to supersede individual district or agency management and planning efforts. As such, a simple majority vote is required to implement the activities or policies approved by the RWMG.

2.5 Plan Development

As previously discussed in Sections 1.2 and 1.3, the IRWM Plan was developed by the IRWM Group, including the RWMG Participants, Stakeholders, and Interested Parties. The purpose of the regional, multi-district and agency, water management planning approach was to resolve and improve current or impending water resource issues by enhancing management practices.

The updated 2014 IRWM Plan was conceptualized and drafted by the IRWM Group and an external consulting firm (GEI Consultants, Inc., Bakersfield, CA). It is organized such that the sixteen IRWM Plan Standards, per the IRWMP Proposition 84 Guidelines, are fully addressed in a document that provides a clear description of regional conditions, resource management, and planning activities. The Regional Goals and Measurable Objectives established in the Plan (Sections 4.4 and 4.5) were also developed and reviewed by the IRWM Group, in a concerted effort to illustrate that the RWMG has evolved into a broader resource management planning focus in comparison to the original 2007 IRWMP, with 2007 Planning Objectives.

As previously stated, the RWMG has maintained periodic meetings in a format that allows for adaptive management practices for updating the Plan in response to changing conditions to the Region both physically and in resource management. Section 5.1 covers the submittal and identification of projects and programs, with a similar process for identifying changes which may be made to the Plan when new topics and activities need to be addressed. In some cases, a working group comprised of any RWMG Participant, Stakeholder, or Interested Party may be assigned to a particular action item to aid in the review and planning process, at the discretion of the RWMG. This process has provided flexibility during review and planning efforts for considering new topics and activities (updates) that need to be captured in the Plan.

The IRWM Group has established the goal of updating their IRWM Plan every 5 to 7 years, through associated Plan amendments or a complete re-write of the Plan, or as needed to satisfy new IRWMP standards established by the DWR. The RWMG may seek grant funds for updating the IRWMP, as they are made available. The IRWM Group also plans to document on-going planning and implementation efforts through annual reports that include a 'Report Card' providing a list of regional accomplishments (see Appendix A1 for the Report Card). Refer to Section 7.2 for details on Plan performance monitoring and the proposed annual reporting procedure.

2.6 Plan Adoption and Implementation

The IRWM Plan and Plan Update were prepared and adopted following the public noticing procedure in accordance with California Government Code §6066. Appendix D contains copies of the public notices filed by the RWMG in (specified) local newspapers; specifically, the notice of intent to prepare and update an IRWMP and the notice of intent to adopt the updated Plan. Following public notice, the Plan is made available for public review and RWMG Participant, Stakeholder, and Interested Party consideration. Once applicable revisions, corrections, or suggested additions to the Plan are addressed, the Plan is formally adopted by each of the RWMG Participants. Appendix E contains a copy of the Resolution of Adoption forms filed by RWMG Participants. Note that any project or program proponents named in IRWM-specific grant applications that are not a RWMG Participant need to separately adopt the IRWM Plan prior to submittal of a funding application.

Recall that the IRWM Group was formed due to a regional concern regarding groundwater and surface water supply reliability, and the desire to address these concerns using a regional approach versus an individual approach through districts and agencies working together to insure long-term suitability of water supplies in the context of a common groundwater basin. It is anticipated that this concern will continue to motivate the districts and agencies for many years into the future.

The governance structure of the RWMG also helps to ensure long-term implementation of the group and, in particular, implementation of the latest IRWM Plan. Recall that all RWMG Participants have signed the MOU outlining the governance structure of the RWMG (Section 2.1). Participants can request removal from the MOU for various reasons, and thus the RWMG, however, the RWMG Participants signing of the document expresses the long-term interest and commitment to regional water management. By allowing the RWMG Participants, Stakeholders, and Interested Parties some flexibility to work together in the regional planning and implementation processes, the IRWM Group has set up a governance structure (Figure 2.1) that ensures active participation and a sustainable organization.

To meet the financial obligations of the RWMG, and thus protect the long-term outlook of the group, the RWMG develops an annual budget for the year, which includes IRWM planning efforts and implementation described in the IRWM Plan. The annual budget is developed and approved at the beginning of each year, typically in January. Each RWMG member contributes their share of the projected annual budget in accordance with the cost-sharing provisions of the MOU; 50% of budget is split equally between the RWMG Participants, while the other 50% is split between the Participants based on the amount of acreage within each Participant's jurisdiction. The RWMG Participants are billed up to their shared limit, based on planning and implementation expenses, on an as-required basis.

2.7 Coordination with Neighboring IRWM Efforts, State and Federal Agencies

Interregional Coordination occurs through interaction of the RWMG Participants with other representatives of adjacent IRWM Regions to understand the specific water resources needs and priorities of the "overall region" within the Southern San Joaquin Valley, and Central Valley as a whole, explore common management and planning strategies, and consider regional projects and programs. In addition, State, Federal, and local agencies interact with the RWMG to foster and build relationships within the State, while maintaining a Stakeholder interest in the activities and policies of the IRWM Group. Note that while these agencies may have Stakeholder interest, their participation in the IRWM Group is different than other Stakeholders or Interested Parties since they administer grant support to accomplish the Regional Goals and Measurable Objectives of the IRWM Plan and maintain requirements to guide the regional planning process. Specific coordinating efforts between the Poso Creek IRWM Group and these agencies or neighboring IRWM efforts include:

- Regularly scheduled (monthly) meetings occur with neighboring established and developing IRWM groups within the Tulare Lake Hydrologic Region and Southern San Joaquin Valley. Participants in the meetings include representatives of the Kaweah Delta Water Conservation District, the Deer Creek and Tule River Authority, Kings River Conservation District, the Upper Kings IRWM, the Southern Sierra IRWM, the Kern County Water Agency, the Kern IRWM, and the Westside Drainage IRWM.
- Working with the Watershed Coordinators funded through the Tulare Basin Watershed Initiative within the Tulare Lake Hydrologic Region.
- Supporting the efforts of the 'Partnership for the San Joaquin Valley' (SJV Partnership) to develop an Action Plan that is a framework for planning for an eight-county area of the Central Valley.
- Formalizing letters of agreements with neighboring IRWMs, such as, formalized boundary agreement with Tule IRWM and Kern IRWM and participating as a Stakeholder in other IRWM planning efforts, such as, the Kern IRWM.

- Attendance at conferences including the USBR Mid-Pacific Conference, the California Association of Water Agencies, the California Irrigation Institute, and coordination meetings, such as, "Round Table of Regions" to understand regional projects and programs, discuss implementation of overall regional enhancements, and coordinate with other IRWM efforts.
- Participating in meetings with environmental entities, such as, the semi-annual Tulare Lake Basin Working Group meeting and working to develop and implement wildlife projects and programs in the Region.
- Presenting Plan project and program implementation case-studies at technical conferences, such as, the US Committee on Irrigation and Drainage (USCID) to share experiences of Poso Creek Regional planning efforts with other entities.

Note that maintaining governance structure, periodic updating to the IRWM Plan and active local participation for the implementation of the Plan by the Poso Creek IRWM Group provides other similar IRWM groups with a functional entity to communicate with for implementing water management strategies within the overall region. The RWMG will continue to engage regional water planning agencies and public entities through the IRWMP efforts.

3.0 Regional Description

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Region Description' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Explain how plan will help reduce dependence on the Delta supply regionally.	3.2
Describe watersheds and water systems.	3.5, 3.7, 3.8
Describe internal boundaries.	3.0, 3.5
Describe water supplies and demands for minimum 20-year planning horizon.	3.1, 3.2, 3.3, 3.4
Describe water quality conditions.	3.6
Describe social and cultural makeup.	3.0, 3.9, 3.10
Describe major water related objectives and conflicts.	3.0
Explain determination of IRWM regional boundary and why region is appropriate for IRWM planning.	3.11
Describe neighboring and/or overlapping IRWM efforts.	3.11
Explain how opportunities are maximized for integration of water management activities.	3.11

As mentioned in Section 1.1, much of the land use in the Region consists of irrigated agriculture. The rich soils, climate, and irrigation water supplies have made it possible to grow a variety of crops, including almonds, grapes, citrus, pistachios, and vegetables. Agricultural production has been a significant part of the Region's resource management for decades, with actively practiced, conjunctive management of surface water and groundwater supplies for irrigation. According to the Kern County Department of Agriculture and Measurement Standards' 2012 Annual Crop Report (2013 Kern County DAMS), Kern County is the nation's number two crop-producing county. In fact, Kern County would rank among the Top-20 states for crop values if it were its own state, according to the Kern County Agricultural Department (KCAD). Also noted in the 2012 Report, the gross value of all agricultural products in the county exceeded $6.2 billion, which represents an increase of around 11.5% from the prior year (2011). Beyond crop sales, the economic benefits of a healthy agricultural industry include regional employment (approximately one agricultural job for every 38 cropped acres), a greater variety and availability of foods, and a stronger working class and regional economy (2012 figures equate to $11.7 billion of total value from agricultural production towards the entire economy of Kern County).

To maintain agricultural production in the Region at current levels, a long-term solution to water supply reliability must be developed and implemented. The Region's economy relies on supplemental water supplies from outside of the Region. Part of the solution to gain supply reliability, as outlined in this Plan, is found in local measures that require the cooperation and actions of the RWMG Participants, Stakeholders, and Interested Parties. These measures include both structural and non-structural projects/programs that are planned in cooperation with other entities in the State facing similar long-term water reliability issues. The consequences of failing to increase water supply reliability within the Region include, but are not limited to, increased costs of agricultural production; decreased cropped and irrigated acreage; decreased workforce; and significant economic losses, both locally and statewide.

While most of the water use is for agricultural purposes, there are some industrial (some of which related to agriculture), commercial, and domestic users and communities in the Region that use water and typically rely on groundwater as the sole source of supply. The economic fiber of the Region depends on the effective, efficient, and conjunctive use of surface water supplies and groundwater from the common groundwater basin. The following sections include descriptions of water supplies and demands; watersheds and water systems; as well as the potential social, cultural, and economic impacts of regional resource planning and management.

3.1 Regional Water Supplies

The Region relies on the conjunctive use of groundwater and surface water, where the latter includes local and imported supplies. The sources of surface water supplies were described and quantified in Chapter 4 of the 2007 IRWM Plan, which has been included herein for ease of reference as Appendix F1. Quantification included both the historical "baseline" (1981-2005) and the projected availability of surface water supplies going forward. The following table presents the average annual baseline amounts and the average annual projected availability from the 2007 IRWM Plan, as well as the 20-year average projections prepared for this Plan Update.

Table 3.1 Historical Baseline and Projected Availability of Surface Water Supplies

Source of Supply	Baseline (AF)	Projected Availability (AF)	
		2007 IRWM Plan[1]	2014 IRWM Plan Update
Local	252,000	234,000	198,000
State (SWP)	213,000	149,000	123,000
Federal (CVP)	310,000	320,000	320,000
Total	775,000	703,000	641,000

[1] 2007 IRWM Plan projected availability of surface water supplies are covered in Appendix F.

It is noted that the historical baseline reflects the amount of water actually diverted into the Region; whereas, the two projections reflect the availability at the source of supply. Owing to mismatches between availability and demand, it is not practicable to utilize all of the available supply.

When water supply studies were being conducted in support of the 2007 IRWM Plan, there were few if any quantitative estimates of the potential impact of climate change on the availability of surface water supplies. Accordingly, the 2007 IRWM Plan did not reflect climate change. For the purpose of making an apples-to-apples comparison with the projections in the 2007 IRWM Plan, this Plan amounts in Table 3.2 also reflect a future scenario without climate change. As shown in Table 3.1, the total of all surface water supplies projected to be available to the Region averaged 703,000 acre-feet annually in the 2007 IRWM Plan. This compares to a projected average of 641,000 acre-feet for the next 20 years, which implies a reduction of almost 9 percent in the projected availability of surface water supplies to the Region. This reduction is attributable to reductions in the projected reliability of SWP supplies and the projected availability of Kern River water supplies.

It is recalled that the 2007 IRWM Plan relied on the 2005 SWP Delivery Reliability Report for the purpose of projecting the availability of this source of supply. Beginning with the 2007 SWP Delivery Reliability Report, DWR reflected climate change in the water supply scenarios which were evaluated. Based on data contained in the (Draft) 2013 SWP Delivery Reliability Report, the following table presents a 20-year projection for two scenarios; one without climate change, and one with climate change.

Table 3.2 Projected Availability of SWP Water with and without Climate Change

SWP Delivery Year	Conditions without anticipated Climate Change[1]		Conditions with anticipated Climate Change[1]	
	Table A %	Article 21 (1,000 AF)	Table A %	Article 21 (1,000 AF)
2013	62%	58	62%	58
2018	62%	58	61%	59
2023	62%	59	60%	60
2028	62%	60	59%	61
2033	62%	60	58%	62
20-Yr Avg.	62%	59	60%	60

* Source: SWP Delivery Reliability Report (2013 Draft).
[1] Anticipated climate change impacts are further explained in Section 13.0.

As shown above, the 20-year average "Table A" allocation is projected to decrease from 62 to 60 percent when climate change is considered. This implies a reduction of about 3.2 percent relative to the without-climate change scenario. In the absence of similar estimates for the other sources of supply, it is considered reasonable to apply this same reduction. Accordingly, it is estimated that climate change could further reduce the projected availability of all surface water supplies by about 20,000 acre-feet annually on average (3.2% x 641,000 acre-feet), which would result in a total projected amount of about 621,000 acre-feet annually on average. This is an average annual reduction of 82,000 acre-feet compared to the projected availability in the 2007 IRWM Plan (703,000 acre-feet minus 621,000 acre-feet). Relative to the 2007 IRWM Plan projection, this is a reduction of almost 12 percent, about one-quarter of which is attributable to consideration of climate change, with the remainder attributable to other factors. Finally, the projection for the next 20 years is almost 20 percent less than the historical baseline.

3.2 Dependence on Supplemental Surface Water Supplies

As mentioned in Section 3.1 and the 2007 IRWM Plan (see Appendix F), the Region's principal supplemental surface water supplies include Kern River, CVP, and SWP water. These supplies are used in conjunction with groundwater to meet irrigation water requirements and to recharge the underlying groundwater. As previously mentioned, the districts were formed to provide public entities for entering into contracts for the delivery of supplemental surface water supplies. Consistent with their enabling legislation, these districts have been responsible for the delivery of supplemental water in their service areas. It is noteworthy that these surface water supplies are the principal sources of water recharge in the Region and that all users beyond the RWMG, including the local communities, cities, and industrial entities, rely in whole or in part on the Region's groundwater. Since the 2007 IRWM Plan, the reliability of surface water supplies available to the Region has decreased. As a generalization, reliability is a measure of coincidence of supply and demand; the better the match, the more reliable or "firm" is the supply. The following are descriptions of the primary surface water supplies deliveries and used by the districts in the Region. They are further explained, in terms of watershed sources and delivery systems, in Section 3.5.

State Water Project (SWP)

Kern County Water Agency (KCWA) holds the master contract with the State of California for the delivery of SWP water into Kern County. Accordingly, the SWP contractors in the Region (namely, Cawelo WD and Semitropic WSD) annually receive SWP water under contracts with KCWA. While each contract is for a specific amount of water, the amount available for delivery in any given year varies with hydrology and operational constraints on the SWP. Shortages in SWP supplies are occurring more frequently and are larger than originally envisioned, mainly due to regulatory restrictions on the pumping of water from the Delta. These restrictions have generally resulted from Court Orders and regulatory decisions related to endangered species, water quality, and environmental needs. Accordingly, SWP operations have been altered, which has resulted in reduced deliveries to contractors as well as some changes in the timing of deliveries.

It is also understood that the Delta must not only provide for external water users, but the internal water users and habitat needs within the Delta. Under this Plan, the districts within the Region will work cooperatively to reduce dependence on "firm" deliveries that originate from the Delta. To a large extent, this means leveraging the direct and in-lieu recharge assets and conveyance facilities of the Region to regulate water supplies from times of surplus or available pumping south of the Delta to times of need. This, in turn, translates to having the necessary conveyance infrastructure and management arrangements to wheel the available supplies to available absorptive capability and to recover and deliver previously-banked water during times of need.

Central Valley Project (CVP)

The CVP contractors in the Region receive an allocation of available water supplies each year in proportion to the amounts set forth in their respective contracts with the federal government (USBR). Typically, there are two contract amounts; one for Class 1 water and one for Class 2 water. Class 1 water represents a "firm" allocation of supplies; however, there are years where only fractions of Class 1 water are delivered to regional users and, in 2014, districts are experiencing a zero allocation. Class 2 water is highly variable and principally occurs in wetter years.

Similar to the SWP, there are significant reliability concerns with the delivery of CVP water (reference the *Central Valley Project Water Plan 2013*). These concerns arise in part from plans to restore a portion of the San Joaquin River, which will reduce available supplies and impact the scheduling of available supplies. Similar to the Delta, the San Joaquin River provides a valued habitat for local flora and fauna that must be considered along with providing adequate water for contract water users. Under this Plan, the districts within the Region have the intent of working cooperatively to increase flexibility for delivery of water supplies that are competitive with uses in the San Joaquin River. In particular, this is being accomplished through projects and programs which increase the Region's ability to make the best use of water supplies when they are available and adding more efficient and effective conveyance infrastructure for delivering and storing available water supplies. The strategy is the same as that articulated for SWP water; namely, leverage the direct and in-lieu recharge assets and conveyance facilities of the Region to regulate water supplies from times of surplus to times of need. In summary, the goals and objectives are similar for all water contractors in the Region, regardless of whether the supplies originate from the SWP or CVP.

Kern River

Excepting for the most senior rights, the Kern River has always been subject to large year-to-year swings in yield depending on hydrology. For this reason, North Kern WSD constructed 1,500 acres of spreading ponds in the 1950s to help regulate its highly variable Kern River supplies. Kern River flows are regulated by Isabella Reservoir, which is located to the east of the Region in the southern Sierras. Conservation space available in Isabella Reservoir also helps to regulate Kern River supplies within a given year as well as from year to year.

The discharge of the Kern River depends on the accumulation of snowpack in the southern Sierras. Global warming (discussed in Section 13.1) has the potential to exacerbate the naturally high variability of this source of supply. In addition, dam safety concerns prompted USACE to impose storage restrictions on Isabella Reservoir in 2006 and these restrictions are not likely to be lifted until after 2020. In wetter years, these restrictions could result in the loss of Kern River water to the Region. In summary, while Kern River has never been a very reliable source of supply from year to year, this does not exempt it from these additional reliability concerns going forward.

3.3 Dependence on Groundwater Supplies

Most of the Region overlies a usable groundwater basin; in particular, the Kern County Subbasin of the Tulare Lake Basin, which is part of the Central Valley aquifer system. DWR Bulletin 118 (2003 Update) identifies the Kern County Subbasin as No. 5-22.14. The northeastern most portion of the Region overlies the Tule Subbasin, also part of the Tulare Lake Basin, and identified as No. 5-22.13 in DWR Bulletin 118. Both subbasins are shown in relation to the Region in Figure 1.4, and the sizes of the basins (as published by DWR) are indicated in Table 3.3. It is noted that these subbasins exist more for water accounting convenience than for any hydrogeologic considerations.

Table 3.3 Groundwater Basins

Basin Name	Size (Sq. Mi)	Est. Capacity (AF)	Safe Yield (AFY)
Kern County Groundwater Subbasin[1]	3,040	40,000,000	Unknown
Tule Groundwater Subbasin[2]	733	14,600,000	Unknown

[1] DWR San Joaquin District Kern County Groundwater Subbasin Information: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/5-22.14.pdf
[2] DWR San Joaquin District Tule Groundwater Subbasin Information: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/5-22.13.pdf

As previously mentioned, prior to formation of the agricultural water management districts, water for irrigation was obtained almost exclusively from groundwater sources, resulting in a rapid decline in static groundwater levels. The semi-arid climate in the Region, with little precipitation during a typical year (total precipitation generally around 5 – 9 inches), does little to offset water uses. Further, the Poso Creek and White River watersheds are the only local watersheds to naturally discharge into the Region, and this has been very infrequent and relatively small compared to total water uses in the Region. Accordingly, the Region is dependent on the conjunctive use of imported surface water supplies with the underlying groundwater reservoir.

To mitigate the impacts of groundwater use within the basin, districts were formed to provide the vehicle for entering into contracts for supplemental surface water supplies which were available from State, Federal, and/or local watershed sources. The use of supplemental surface water supplies in lieu of pumped groundwater has gone a long way to alleviate concerns regarding the stress placed on the groundwater basin; however, the Region has been experiencing shortages in the contract water supplies which have been caused by conveyance and/or pumping constraints in the Delta. These shortages have had the effect of increasing the stress on the groundwater basin. At present, all urban water demands in the Region are met exclusively with pumped groundwater; however, the total urban and environmental water uses have been estimated to be on the order of five percent of the total water use in the Region. Accordingly, urban water users feel the effects of the increased stress on the groundwater basin.

The groundwater level response to increased stress is captured by the extensive monitoring network, which includes both dedicated monitor wells and supply wells. "Continuously" recording water level sensors are installed in several monitoring wells in the Region. Long-term water-level data in selected wells are used to evaluate groundwater movement, storage conditions, and pumping lifts and costs. Those districts within the Region which registered as "monitoring entities" report groundwater level measurements from selected well locations to DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) program. Additional information on the collection of groundwater data and management by the RWMG Participants is presented in Section 7.6.

3.4 Regional Water Demands

Water demands in the Region have been and will continue to be dominated by irrigated agriculture. Remaining demands principally include M&I and environmental. Historical water uses and projected water demands were addressed in Chapter 5 of the 2007 IRWM Plan, which has been included herein for ease of reference as Appendix F2.

Irrigated Agriculture

The year-to-year fluctuations, as well as any trends, were evaluated in the 2007 IRWM Plan by compiling data regarding individual crop acreage and irrigated acreage from each of the water districts and irrigation districts in the Region. Collectively, these districts include on the order of 95 percent of the irrigated acreage within the Region. In other words, there is relatively little irrigated acreage that is not within an organized district as shown in Table 3.4. Over the historical "baseline" (1981-2005), the total irrigated acreage generally fluctuated between 340,000 and 375,000 acres, with an average of about 350,000 acres and no apparent long-term trend. Data from these same districts were compiled for 2013 and yielded a total of about 360,000 irrigated acres (see below).

Table 3.4 Irrigated Area in Poso Creek Region in 2013

District	Total Area (acres)	Irrigated Area (acres)[1]	% of District Area
Cawelo WD	44,700	34,800	78%
Delano-Earlimart ID	56,500	48,000	85%
Kern-Tulare WD	22,200	17,000	77%
North Kern WSD	67,400	55,400	82%
Semitropic WSD	221,000	126,300	57%
Shafter-Wasco ID	37,500	30,300	81%
Southern San Joaquin MUD	58,000	48,200	83%
Total	507,300	360,000	71%

While this total is a little higher than the average for the 25-year historical baseline, it is more importantly well within the year-to-year fluctuations which were seen in the historical baseline. Accordingly, based solely on irrigated acreage, there is nothing to suggest that the projected water demand for irrigated agriculture over the next 20 years will differ materially from the historical baseline. Water demands for irrigated agriculture are also a function of crop types or crop pattern. In this regard, noticeable trends exist in the time-series data. In particular, field crops have been decreasing over time in favor of nuts, primarily almonds and pistachios. This trend was observed over the historical baseline and the 2013 data indicates a continuation of this trend. This is illustrated in Table 3.5, which presents the crop pattern for 2005 (the last year of the historical baseline) and 2013.

Table 3.5 Crop Pattern for Poso Creek Region

Crop Category[2]	2005[1]	2013[1]	Change
Citrus and Subtropical*	9%	7%	- 2%
Deciduous Fruits and Nuts*	37%	51%	+ 14%
Field Crops	13%	5%	- 8%
Grain and Hay Crops	14%	14%	---
Truck, Nursery, and Berry Crops	5%	3%	- 2%
Vineyards*	22%	21%	- 1%
Total	100%	100%	
Permanent Crops	68%	78%	+ 10%

* Permanent crops.
[1] Based on crop surveys conducted by each district in the Region.
[2] Percentages are based on the total for the crop categories shown in the table.

Cotton is the field crop which has experienced the greatest decline in acreage, while almonds have experienced the greatest increase. Relatively, almonds have a higher water demand than cotton. Accordingly, even though total irrigated acreage in the Region does not indicate any material change in the water demand for irrigated agriculture, changes in the crop pattern suggest an increase in demand over time. Further, this trend toward permanent crops represents a "hardening" of the total crop water requirement, which simply means that the demand must be met year in and year out, as compared to an annual crop where there is some choice to plant or not to plant in any given year depending on hydrologic conditions or other considerations.

According to recent Water Supply Reports published by the Kern County Water Agency, the unit consumptive use of cotton is 2.71 AF/ac, while the unit consumptive use of almonds is about 3.28 AF/ac. To reflect the fact that not all almond acreage is at maturity at any given time, for illustrative purposes, it is assumed that the average consumptive use for all almond acreage is 95% of the use at maturity, or 3.12 AF/ac. Using this discounted unit value, converting one acre of cotton to one acre of almonds would result in an increase in the consumptive use of water for that one acre by about 15%. In terms of the total demand for the Region, this implies that a regional shift from 30% cotton and 40% almonds to 20% cotton and 50% almonds would result in an increase in the total consumptive use for the Region of 1.5%.

Table 3.4 indicates that "Deciduous Fruits and Nuts" went from 37% in 2005 to 51% in 2013. For illustrative purposes, it is considered reasonable to estimate the impact of this change by assuming that this involved the one-for-one conversion of cotton to almonds. This would imply an increase of a little more than 2% in the total consumptive use for the Region. While not insignificant, this is a relatively small change compared to the decreases that have been evidenced in the surface water supplies available to the Region. Going forward, given the relatively significant percentage of the Region's irrigated acreage that is already developed to permanent crops (about 78% in 2013; reference Table 3.5), it is projected that any increase in the total consumptive use for the Region as a result of a shift in crop pattern is likely to be relatively small over the next 20 years. In this regard, not only is the acreage which remains in annual crops limited, but the current drought conditions and the uncertainty that surrounds the Region's surface water supplies is likely to adversely impact the trend that has been evidenced historically.

Finally, climate change has the potential to affect the use of water by agriculture through increased consumptive use and/or climate-induced changes in crop pattern. Section 13 includes more discussion in this regard.

Municipal and Industrial

Collectively, the cities of Delano, McFarland, Shafter, and Wasco include the majority of the Region's population. Three of these four cities have prepared 2010 UWMPs; Delano, Shafter, and Wasco. Each of these plans includes a projection of gross water use at five-year time steps for the next 20 years (2015-2035). "Gross" simply means the total volume of water which is introduced into the water purveyor's distribution system, keeping in mind that a portion of this amount makes its way to a wastewater treatment plant and is available for reuse, and some amount becomes deep percolation from landscape irrigation. Based on population data for 2010, the combined service area population for these three cities is about 70% of the Region's total population. Accordingly, the projections for the three cities were combined for a given projection year and divided by 70% to provide a projection for the Region, all of which are summarized in Table 3.6.

Table 3.6 Actual (2010) and Projected Gross Use of Water for M&I Purposes

Year	Shafter (AF)[1]	Delano (AF)[2]	Wasco (AF)[3]	Total (AF)	Poso Creek Region (AF)[4]
2010	4,738	9,272	4,681	18,691	27,000
2015	5,036	10,666	6,661	22,363	32,000
2020	5,063	11,786	8,925	25,774	37,000
2025	5,170	13,023	11,469	29,662	43,000
2030	5,708	14,391	14,293	34,392	49,000
2035	6,302	15,902	17,397	39,601	57,000

[1] Data taken from Tables 12 through 14 of 2010 Shafter UWMP, see Section 10.1.
[2] Data taken from Table 3-13 of 2010 Delano UWMP, see Section 10.1.
[3] Data taken from Table 4-4 of 2010 Wasco UWMP, see Section 10.1.
[4] Projection for the Poso Creek Region, as described in the text.

The regional projections imply a 20-year average gross use of about 44,000 acre-feet. However, based on population estimates since 2010, it is anticipated that the 2015 UWMPs will reflect lower projected water use as compared to the 2010 UWMPs. Based on the projections which are currently available, the net use of water for M&I purposes over the next 20 years is expected to average on the order of one-half of the gross use, or about 22,000 acre-feet annually. It is noteworthy that any additional urban development would likely remove a comparable amount of irrigated agriculture, which would simply trade one demand for another, with little measurable change in total demand over the 20-year planning horizon.

Finally, it is noted that the 2007 IRWM Plan included an estimate of the gross regional use of water for M&I purposes of 40,000 acre-feet annually under 2006 conditions. This stands in contrast to the 2010 estimate of 27,000 acre-feet (reference Table 3.5). The difference is explained by an error in the source data which was used for the 2007 IRWM Plan. Use of the 2010 UWMPs for this Plan, as noted in Section 10.1, highlighted this error.

Environmental

As discussed in the 2007 IRWM Plan (reference Appendix F2), there are two dedicated environmental and recreational uses of water in the Region; the Kern National Wildlife Refuge, and a number of "duck clubs". There is nothing to suggest that these uses will change or that any new uses will be developed. Accordingly, no changes are projected over the 20-year planning horizon.

Over the next 20 years, agricultural water use is not expected to change significantly from current levels. If there is an increase, it is expected to be relatively small and would be the result of a shift to crops that use more water and/or climate change. M&I water use is expected to increase, and the projections in Table 3.6 indicates that the increase could be on the order of 75% to 80% of 2015 levels; however, it is anticipated that this will be reduced when the 2015 UWMPs are available. Further, any increase in urban development will likely be at the expense of existing agricultural development. Accordingly, any increase in urban demand would be substantially if not entirely offset by a decrease in agricultural demand. Finally, no changes are expected in the environmental and recreational water uses in the Region over the next 20 years.

3.5 Watersheds and Water Systems

There are two watersheds that naturally discharge to the Region; Poso Creek (the Region's namesake) and White River. While these streams discharge to the Region, their watersheds are largely located outside of the Region. In particular, the Poso Creek watershed is located within the Kern IRWM Region, and the White River watershed is located within the Southern Sierra IRWM Region. While these watersheds are outside of any direct management by the Poso Creek RWMG, they are in the category of matters which require coordination with adjoining IRWM regions. Both are ephemeral streams that make relatively small contributions to the Region's water supplies. The Region's principal sources of surface water supplies are all diverted into the Region; namely, Kern River, CVP, and SWP water supplies. The watersheds for these sources of supply are located well outside the Region, and range from the northern Sierras to the southern Sierras. Accordingly, there is considerable infrastructure involved in providing for the diversion and delivery of these sources of supply into the Region, as shown in Figure 1.2.

Prior to formation of the agricultural water management districts within the Region, water for irrigation was obtained almost exclusively from groundwater sources, resulting in a rapid decline in static groundwater levels. To mitigate this decline "special districts" were formed under the provisions of Division 13 of the Water Code for the purpose of obtaining a "supplemental or partial water supply" for irrigation. District boundaries, or the extent of individual service areas and governing areas described in Section 2.1, reflect the group(s) of landowners or agricultural water users that came together at the time that each district was formed for the purpose of addressing water supply issues in their area. Each of these districts entered into contracts for surface water supplies which were developed external to the Region in order to supplement the pumping of groundwater within the Region for irrigation. Brief descriptions of these districts are provided in Appendix C. Since their formation, the districts in the Region have become uniquely positioned with assets, both natural and man-made, that collectively enable *regional* solutions to the individual district challenges of balancing surface water and groundwater supplies through an integrated water planning approach.

State Water Project (SWP)

The SWP provides the most distant source of supplemental water delivered into the Region. This supply originates in the northern Sierras and is ultimately pumped from the Sacramento-San Joaquin River Delta and conveyed south in the California Aqueduct along the west side of the San Joaquin Valley. Similar to the Friant-Kern Canal, the Aqueduct is lined with concrete. Two of the districts in the Region are long-term SWP contractors; Cawelo WD and Semitropic WSD. Semitropic WSD diverts water from the Aqueduct into the Region through three turnouts, which collectively provide significant diversion capacity and individually provide a certain degree of flexibility and redundancy to water diversion and delivery operations. DWR operates and maintains all of the SWP facilities, including the turnouts from the Aqueduct. Direct delivery of SWP water to Cawelo WD requires that water be diverted from the Aqueduct into the Cross Valley Canal (CVC) near Tupman. Through a series of pumping plants, water is lifted east in the CVC to Bakersfield, where one final pumping plant is necessary to lift the water into the Beardsley Canal for conveyance to Cawelo WD. The CVC is operated and maintained by the Kern County Water Agency.

Central Valley Project (CVP)

The Friant Division of the CVP provides most of the CVP water delivered into the Region. Three of the districts within the Region are long-term CVP-Friant contractors; Delano-

Earlimart ID, Shafter-Wasco ID, and Southern San Joaquin MUD. The San Joaquin River watershed is the source of supply for the Friant Division and these long-term contractors. The US Bureau of Reclamation (USBR) regulates this source of supply in Millerton Reservoir which is formed by Friant Dam on the San Joaquin River. Similar to the Kern River, though located further north, the San Joaquin River has its origins high in the Sierras. The Friant-Kern Canal is a major concrete-lined facility which conveys San Joaquin River water south from Millerton Reservoir to its terminus at the Kern River near the City of Bakersfield. As the canal makes its way along the east side of the San Joaquin Valley, it slices through the east half of the Region. Accordingly, diversions of CVP-Friant water into the Region are made at several turnouts which are located along the Friant-Kern Canal. In addition to the turnouts which serve the long-term contractors, North Kern WSD and Cawelo WD have constructed two turnouts to provide for the diversion of wet-year supplies on an as-available basis in order to augment groundwater recharge within the Region. The canal is operated and maintained by the Friant Water Authority, which is a joint-powers agency comprised of all of the long-term Friant contractors, including the three located within the Region.

Kern River

Fed by snowmelt runoff from the southern Sierras, extending as far north as Mount Whitney, the Kern River is the most southerly of the significant Sierra watersheds. The Kern River discharges to the San Joaquin Valley near the City of Bakersfield. Until the mid-1950s, the flow of the Kern River was unregulated or unimpaired. With construction of Isabella Dam and Reservoir in the mid-1950s by the US Army Corps of Engineers (USACE), most of the flow of Kern River has been regulated. At spillway crest, the reservoir has a capacity of about 568,000 acre-feet. Though constructed with the primary purpose of flood control, other benefits include conservation and recreation. Operations at Isabella Dam are managed by USACE.

North Kern WSD secured its rights to divert Kern River water into the Region in the early 1950s. In the mid-1970s, North Kern entered into a long-term contract for the diversion and use of additional Kern River water. At that same time, Cawelo WD and Kern-Tulare WD also entered into similar long-term contracts. The direct diversion of Kern River water into the Region takes place at two primary points of diversion which coincide with the headworks of the Beardsley Canal and the Calloway Canal, respectively. Diversions are by gravity and North Kern is responsible for the operation of these two main conveyance canals. During "normal" operations, the Beardsley Canal is used before the Calloway is used owing to the fact that diversions are at a higher elevation than the Calloway and thereby have more utility with regard to gravity distribution. Further, the Beardsley Canal is concrete-lined, whereas the Calloway is unlined, thereby maximizing the delivery of the diverted water into the Region. Once in the Region, the Beardsley Canal changes name (to the Lerdo Canal) and is unlined. Accordingly, the Calloway Canal is typically relegated to use only during wetter years when the capacity of the Beardsley Canal is exceeded.

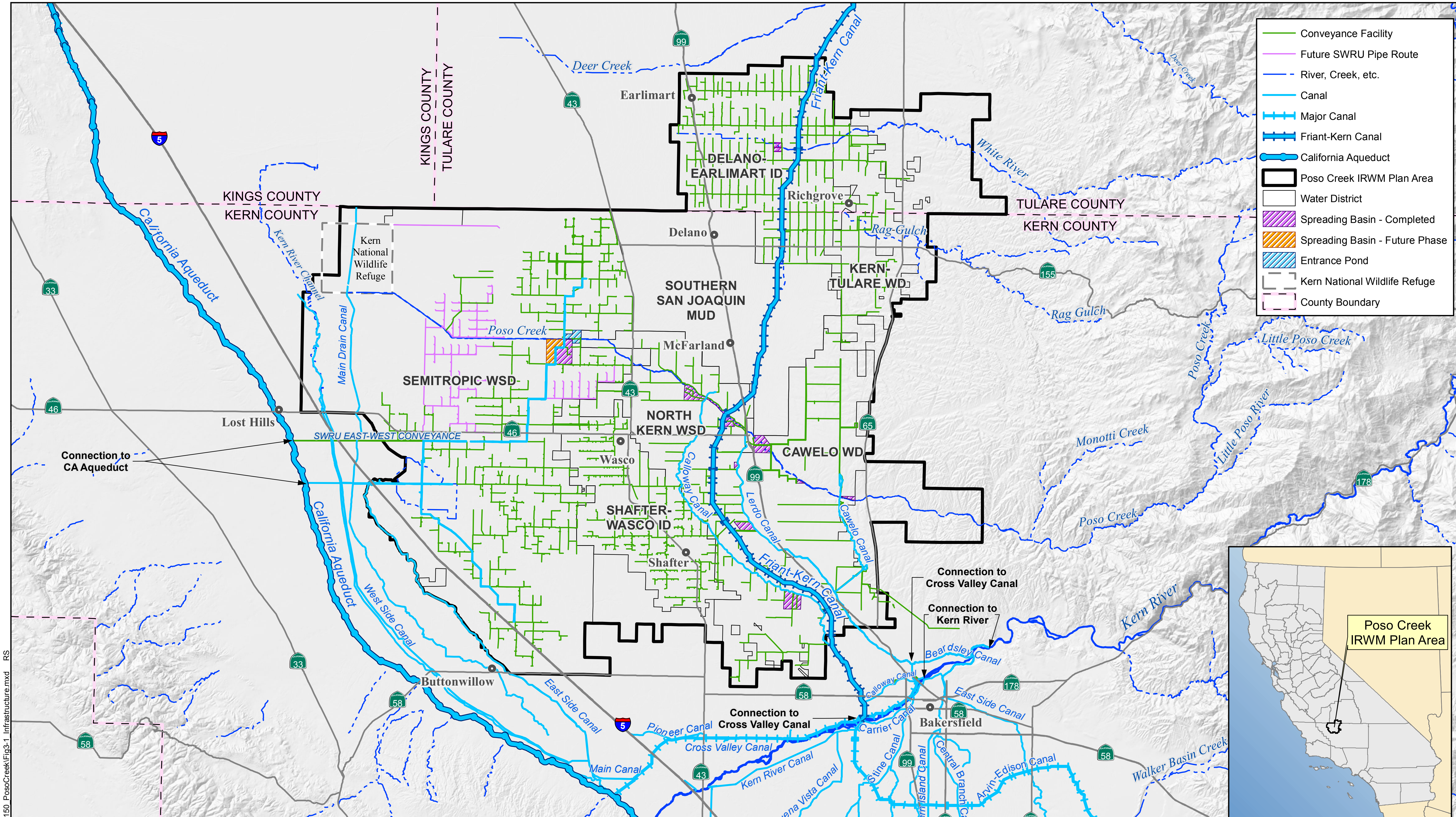
Water Conveyance Infrastructure (Irrigation Distribution Systems)

From the previously-described points of diversion from the Kern River, the Friant-Kern Canal, and the California Aqueduct, each district with a supplemental surface water supply has constructed additional main conveyance facilities and/or distribution laterals to deliver the water to individual growers within the district. While the main conveyance facilities typically rely on canals owing to the required capacity, a combination of canals and pipelines are used for laterals which divert water from the main conveyance facilities. The irrigation distribution system for a given district includes all those facilities necessary to divert water at the source of supply and make deliveries to each of the farm turnouts within a given service area. Each farm turnout "typically" serves about 160 acres and all deliveries are measured. While all of these facilities are operated and maintained by each of the special districts in the Region, the on-farm distribution of water is the responsibility of each individual grower. In addition to canals and/or pipelines, other irrigation distribution system features include pumping stations and small regulating reservoirs. These systems are more particularly described in each district's Agricultural Water Management Plan, Water Conservation Plan, and/or Groundwater Management Plan. A general layout of the distribution networks and water conveyance infrastructure is shown in Figure 3.1.

Conveyance Interconnections

Irrigation distribution systems have been designed and constructed to deliver water to a specific service area. Over time, in order to increase operations flexibility and redundancy; to facilitate water exchanges; to respond to changed or changing conditions; and generally improve water management, a number of inter-district connections have been constructed. These are connections between the irrigation distribution systems of two individual districts which allow water to be moved from one system to the other, often in either direction. In addition, connections have been constructed between the main conveyance facilities of the regionally significant sources of supply. All of these are referred to hereinafter as "interconnections".

Connecting the Region's principal sources of supply began in the 1970s, with construction of the CVC. The CVC provides a connection between the Aqueduct on the west side of the Valley and the Beardsley Canal on the east side of the Valley. It also set the stage for the subsequent construction of an interconnection between the CVC and the Friant-Kern Canal and an interconnection between the CVC and the Calloway Canal. It is noteworthy that the latter interconnection was identified in the 2007 IRWM Plan as a proposed project and its construction is expected to be complete by the end of 2014. The CVC, in combination with these two interconnections, provides the plumbing necessary to move water between all three of the Region's sources of supplemental surface water supplies; Kern River, CVP-Friant, and SWP. Though typically smaller in scale, several interconnections between the irrigation distribution systems of two adjacent districts have been constructed which also allow water from the different sources of supply to be moved around within the Region to some extent to be moved from one



SOURCE: California Spatial Information Library, 2008; Semitropic Water Storage District, 2008; Kern County Water Agency, 2004.

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2014 Integrated Regional Water Management Plan (IRWMP) Update

Kern and Tulare Counties, California

Poso Creek IRWM Group

GEI Consultants
Bookman-Edmonston Division

WATER DISTRIBUTION NETWORK AND CONVEYANCE INFRASTRUCTURE

JUNE 2014

FIGURE 3.1

15-May-2014 Z:\Projects\1332150_PosoCreek\Fig3-1_Infrastructure.mxd RS system to the other. Once again, some of these interconnections were identified in the 2007 IRWM Plan as proposed projects and have since been constructed.

Minor Streams

As previously noted, Poso Creek and White River constitute a relatively small and infrequent source of water supplies to the Region, much of it as recharge from channel seepage. Dry much of the time, the stream channels provide east-west movement corridors for wildlife, as well as some riparian habitat. In addition, the channels have been used to convey and/or recharge water released from the Friant-Kern Canal from time to time, primarily during very wet periods. The channels are maintained to some extent to provide carrying capacity for flood control purposes. In the past, USACE has conducted studies regarding the feasibility of constructing a dam and reservoir on Poso Creek; however, this proposal has yet to prove feasible.

Groundwater Recharge

The Region overlies a large hydraulically-connected groundwater basin which has been used conjunctively with available surface water supplies for decades. Conjunctive management is intended to preserve the underlying basin and to mitigate groundwater level declines. Groundwater recharge within the Region occurs intentionally through the use of constructed spreading ponds and stream channels (Poso Creek and White River). It also occurs incidentally, through the use of unlined canals and as deep percolation of applied irrigation water. These are both forms of direct recharge. In addition, indirect recharge refers to the delivery of surface water supplies in lieu of pumped groundwater to satisfy irrigation water requirements. To the extent that the available surface water supplies are regulated, this is the preferred approach; however, to the extent that the surface water supplies are available in excess of then current irrigation demands and the water cannot otherwise be regulated, then direct recharge through spreading ponds is necessary in order to capture the water.

With several thousand acres of constructed spreading ponds, the Region has significant capability to recharge otherwise unregulated water supplies that are available from time to time and are in excess of the irrigation demand at the time that the supplies are available. About one-half of this acreage was developed more than 50 years ago to regulate highly variable Kern River supplies; however, the remaining half has been developed in more recent times in an effort to cope with the reduced reliability of available surface water supplies. While the spreading ponds are maintained by the districts within which they are located, they are very much a regional asset, with benefits accruing to the common groundwater basin which underlies the Region. In combination with significant dewatered storage capacity and conveyance connections to three independent sources of surface water supplies, these spreading assets are a very significant feature of the Region's conjunctive management of available water supplies. In this regard, a 400-cfs pumping plant and discharge pipeline were constructed since formulation of the IRWM

Plan in order to link some of the existing spreading ponds with other sources of supply and to generally increase the rate at which water can be diverted and delivered to spreading, thereby maximizing the utility of the existing ponds and the use of available surface water supplies. Lands which have been developed to spreading are typically comprised of several ponds or cells which are created and separated by contour dikes, as illustrated in Figure 3.2.

Figure 3.2 Constructed Spreading Ponds for Groundwater Recharge (SemitropicWSD).

Groundwater Recovery

In general, groundwater use in the Region relies in the use of deep wells that are owned and operated by growers to meet on-farm water requirements; however, some of the districts have developed district-owned and –operated deep wells. In particular, North Kern WSD, Cawelo WD, and Semitropic WSD have each developed deep well pumping capability. These are the same districts where most of the constructed spreading ponds are located. While privately-owned on-farm wells have limited geographic utility, district-owned wells typically discharge into the district's distribution system, where the utility is increased significantly. In addition, in the case where a given well exhibits elevated TDS (for example), this provides a means of blending that water in the district's distribution system (under the right conditions), thereby rendering the well useable and meeting irrigation water requirements. Figure 3.3 shows a typical district-owned deep well discharging into a district canal.

Figure 3.3 Typical Groundwater Well Discharging to a Main Conveyance Canal.

It is worth noting that Semitropic WSD, Cawelo WD, and North Kern WSD operate long-term "Water Banking Programs" that allows neighboring districts and/or "banking partners", including districts outside of the Region, to store surplus water in a district and to recover their water when needed. These districts receive surface water from the banking partners in years of ample supplies and deliver it to their landowners for irrigation use in lieu of groundwater pumping. Groundwater which otherwise would have been pumped remains in storage, credited to the account of the banking partner. In times of water supply deficiencies, the water may be recovered and returned to the banking partner either through physical deliveries (water returned to the California Aqueduct) or by an exchange by delivery of surface water supplies to the banking partner while pumping groundwater from district and landowner wells.

Other prominent groundwater banking facilities in Kern County include the Kern Water Bank and the Pioneer Project, which are out-of-Region facilities managed by the Kern Water Bank Authority and KCWA, respectively. Located directly south of the Region on the Kern River fan, and still within the Kern County Subbasin, both are direct recharge-based water banking projects. To the extent that water is available to the Region which cannot be absorbed within the Region, these water banking projects provide an additional for otherwise surplus surface water supplies available during very wet periods. Further explanations of these Groundwater Banking Projects, as well as regional groundwater recharge efforts and groundwater recovery (well pumping), are provided in the Groundwater Management Plans, AWMPs, and WCPs of the individual districts within the Region (reference Section 10.1).

Other Water Supplies

While urban wastewater remains fairly limited in the Region, water which is brought to the surface in the process of producing oil has become a measurable source of water. Further, unlike wastewater, this represents new water. Within the Region, most of this water is generated in the so-called Kern River Field. Owing to its proximity to the Kern River Field, most of this water is delivered through a pipeline to Cawelo WD. In recent years, deliveries have ranged from about 25,000 to 30,000 acre-feet annually.

3.6 Water Quality Conditions

The Region's principal sources of supplemental surface water include State, Federal, and local supplies, all of which are used conjunctively with the underlying groundwater. In addition to water quality monitoring conducted by the project operators, such as the SWP and the CVP, each district in the Region does some sampling and testing of its surface water supplies as well as produced groundwater. Since the districts in the Region provide water for irrigated agricultural uses, testing is typically limited to constituents that have relevance to the water's suitability for crop irrigation (reference Section 7.6), and this applies to both surface water sources and groundwater. On the other hand, the cities and communities in the Region rely exclusively on pumped groundwater and their sampling and testing is focused on suitability for potable uses.

Surface Water Quality

Since the use of supplemental surface water within the Region is solely for irrigation use, this discussion is focused on that use. Generally speaking, the quality of Kern River, SWP, and Friant-CVP water is considered good to excellent in terms of suitability for irrigation and agricultural use. The quality of SWP water supplies is regularly monitored by DWR at several locations along the Aqueduct, many of which are located 'upstream' of the delivery points into the Region (reference Figure 3.1). The USBR also conducts water quality monitoring along the Friant-Kern Canal, which also includes locations upstream of delivery points into the Region. Friant-CVP water and Kern River water exhibit the lowest concentrations of total dissolved solids (TDS), generally on the order of 50 mg/L and 100 mg/L, respectively. The TDS concentration in SWP water is higher, typically ranging from 250 mg/L to 350 mg/L.

In addition to the principal sources of supplemental surface water, Poso Creek and oilfield-produced water also make contributions to the Region's water supplies. Poso Creek exhibits TDS concentrations that are typically higher than the Kern River, but less than SWP water. The oilfield-produced water is monitored for certain constituents with regard to its suitability for crop irrigation, principally the concentrations of boron and TDS in the context of salt-sensitive crops. Oilfield-produced water is typically blended with other water sources in order to reduce the concentration of salts to an acceptable level for the crops to which it is applied. For example, the TDS concentration of oilfield-produced water ranges up to 700 mg/L; however, after blending, the quality is typically no more than 450 mg/L, which is satisfactory for most agricultural uses. Additional information regarding the use of this unique source of supply, and conformance with the CVRWQCB's waste discharge requirements, are covered in district-specific Agricultural Water Management Plans (reference Section 10.1).

Irrigation concentrates the salts that are in the irrigation water, and the importation of supplemental surface water supplies brings more salts into the Region. Accordingly, without any natural outflow, the salt load continues to increase within the San Joaquin Valley, which includes the Poso Creek Region. These observations were acknowledged when the RWQCB's Basin Plan was prepared for the Tulare Lake Basin. While there are no anticipated changes in surface water quality going forward, a long-term increase in the concentration of salts in groundwater can be expected.

Groundwater Quality

The main production zones are generally of good water quality and suitable for irrigation (often ranging from 250 to 350 mg/L); however, there are areas of poorer quality groundwater found within the Region which are either not used for irrigation or are blended with other supplies in order to achieve acceptable levels of TDS. In these areas, concentrations of TDS and chlorides have exceeded the limits normally desired for irrigation of salt-sensitive crops, 450 mg/L and 140 mg/L, respectively. Shallow groundwater is present in those areas where the underlying sediments result in the occurrence of shallow groundwater, and it is typically marked by high salinity. Depending on location, this can be the result of natural conditions and/or irrigation practices.

Criteria set by DWR define three classes of groundwater according to TDS: Class 1 (TDS < 700 mg/L), Class 2 (700 mg/L < TDS < 2000 mg/L), and Class 3 (TDS > 2000 mg/L), where Class 1 is the best quality. Most of the historical water quality sampling in the Region has been done for agricultural purposes by the individual districts. Based on this sampling, groundwater underlying the Region generally meets the Class 1 criteria as noted above; however, there are exceptions. In general, groundwater in the western parts of the Region is of relatively poorer quality and has higher TDS content relative to the eastern part of the Region. The prevention of groundwater migration from the poor quality areas to the higher quality areas is an obvious management goal of the RWMG. Groundwater moves in response to a gradient; accordingly, it is critical to bring in supplemental water supplies into the Region to maintain groundwater levels or mitigate long-term groundwater level declines.

None of the districts in the Region provide any drainage facilities, nor do they control or monitor any on-farm subsurface drainage systems. Accordingly, the RWMG does not have measurements of water quality with regards to agricultural runoff and drainage to the extent that it exists within the Region. However, the RWMG Participants do participate in and help facilitate the Irrigated Lands Regulatory Program (ILRP) in cooperation with the KCWA and Kern River Watershed Coalition Authority, to monitor water quality at various locations around the Region where large quantities of agricultural runoff or drainage would cause quality concerns. The individual districts control the results of these monitoring efforts, and ensure that all water quality is suitable for irrigation if within the district's conveyance network.

Arsenic and nitrates are also constituents of concern in limited areas with regards to drinking water supplies. For the most part, the arsenic is believed to be naturally occurring, while irrigated agriculture has contributed to nitrate concentrations in groundwater. While these constituents have been manageable to date by the cities and communities, they may require more detailed, creative, and cooperative approaches in the future, especially with more stringent water quality standards. The IRWM Group has worked directly with the California Department of Public Health (CDPH), Self-Help Enterprises, Inc., and the communities in the Region, to focus efforts on improving drinking water conditions in the Region, specifically to meet the needs of the cities and communities within the Region, all of which are economically-disadvantaged communities.

Finally, for reasons discussed in the immediately preceding section (Surface Water Quality), a long-term increase in the concentration of salts in groundwater can be expected going forward, which is the principal concern for irrigated agriculture. With that said the long-term effect of implementation of the RWQCB's recent General Order regarding agricultural discharges to groundwater remains to be seen, particularly as it relates to nitrate concentrations in groundwater, which is a concern with regard to potable uses.

3.7 Ecological Processes and Environmental Resources within Region

The development of land in the Poso Creek Region for agricultural and municipal purposes tends to have long-term ecological impacts, particularly for local (native) flora and fauna. Accordingly, proper identification and protection of areas to reduce future environmental impacts, is a key objective of the IRWM Group (reference Section 4.5, Measurable Objective "I").

The North West Kern RCD (RCD), a member of the RWMG Participants, was established to provide 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. Since establishment, the role of the RCD has expanded to include assistance to the county and towns that lie within and adjacent to the district, which includes a total area of about 594,000 acres in Kern County. The RCD has assisted the districts and agencies in the Poso Creek Region with monitoring of environmental resources, including wildlife refuges and duck clubs, and the measurement of on-farm irrigation efficiency for water conservation through use of the on-farm mobile irrigation assessment laboratory.

The US Department of Agriculture: Natural Resource Conservation Service (NRCS) also works with the districts and landowners in the Region to provide technical support for the conservation of land and water, the preservation or restoration of habitable lands, and other programs to help conserve resources. Participation in NRCS programs is voluntary, with the NRCS providing financial assistance for many of these activities, and is usually targeted at the on-farm level. Moreover, the Endangered Species Recovery Program (ESR Program) established by the U.S. Fish and Wildlife Service presents an ecosystem approach to species recovery that applies to the Region, specifically the areas shown in Figure 3.4. The ESR Program primarily involves the management or enforcement of federally-threatened and -endangered species and includes any actions such as federal permitting, funding, or punishment for violation. With regard to these species, Kern County has more than two dozen threatened and endangered species, principally including, but not limited to, the San Joaquin Kit Fox, Tipton Kangaroo Rat, and the San Joaquin Wooly threads. Many of these species are expected to reside within the Region's boundaries.

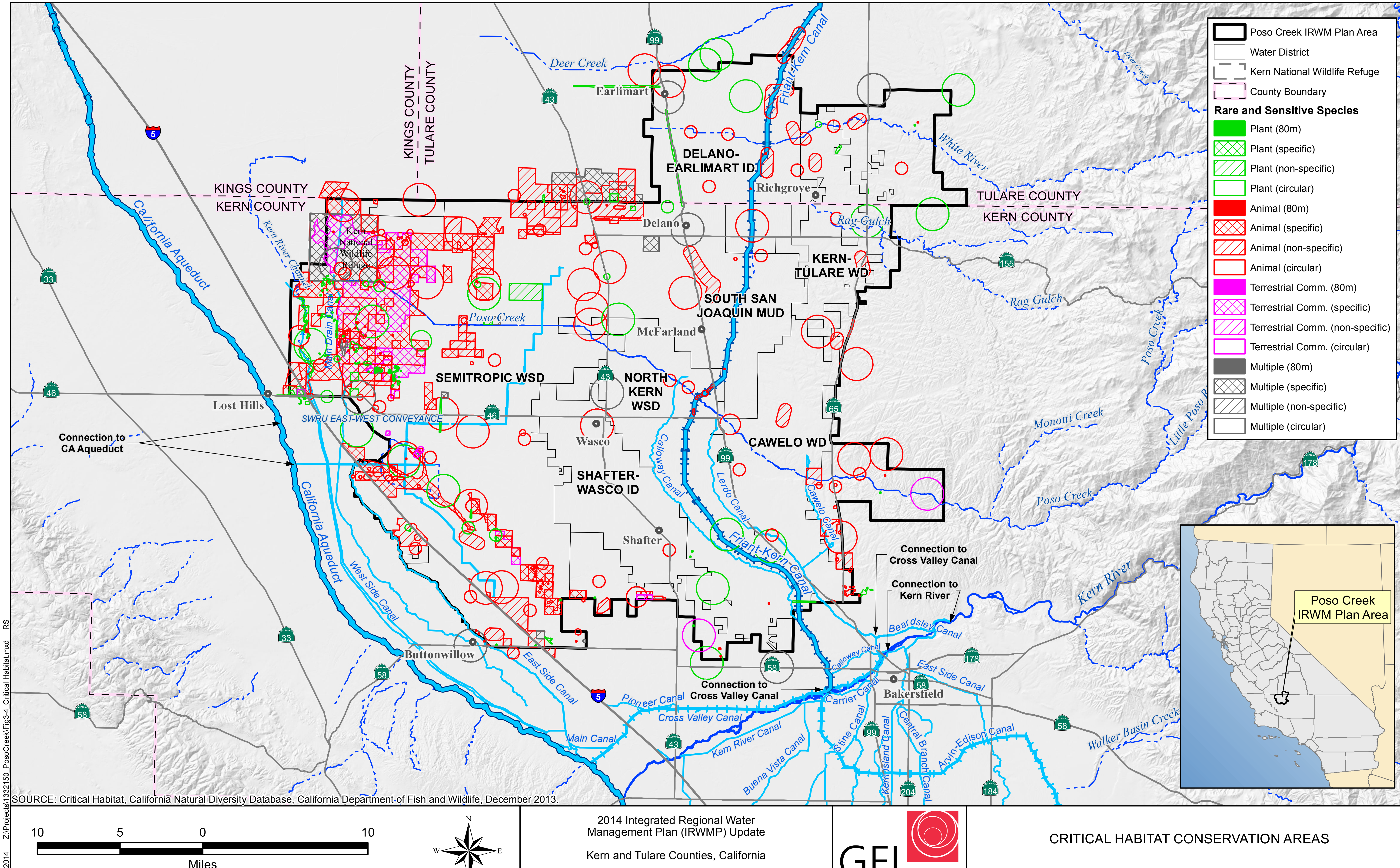
Bay-Delta Conservation Plan (BDCP)

Implementation of projects and programs that support the State's co-equal goals, as defined in the *Amended Memorandum of Agreement Regarding Collaboration on Planning, Design and Environmental Compliance for the Delta Habitat Conservation and Conveyance Program in Connection with the California Bay Delta Conservation Plan* (BDCP 2011), will be considered. The implementation of co-equal goals is a way of providing reliable water supply for California, while enhancing, protecting, and restoring the Delta ecosystem and habitat (SB1, Steinberg- Section 85054) for Smelt, and Chinook Salmon. Recall from Section 3.5 that some of the districts within the Region contract for water supplies that must be pumped from the Delta and delivered via the Aqueduct. By improving the effectiveness of water storage and conveyance in the Region, which has been discussed throughout this Plan, the Region's reliance on "firm" supplemental surface water supplies is reduced, thereby supporting the environmental goals for both the San Joaquin River and the Sacramento-San Joaquin River Delta.

Wildlife Refuges and Water Demands

The Kern National Wildlife Refuge (KNWR) is an approximately 1,249-acre refuge located in the northwestern portion of the Region which is managed by the US Fish and Wildlife Service (USFWS). It is a controlled habitat conservation area set aside as public lands to protect local wildlife and plants (shown in Figure 3.5). The RWMG maintains communication with the KNWR Staff and has considered possible water supply conveyance projects that may benefit the KNWR and the conservation goals of the USFWS and the California Department of Fish and Game.

Since the passage of the Central Valley Project Improvement Act (CVPIA) in 1992, 19 State, Federal, and privately-owned refuges annually provide critical managed wetland habitat



SOURCE: Critical Habitat, California Natural Diversity Database, California Department of Fish and Wildlife, December 2013.

2014 Integrated Regional Water Management Plan (IRWMP) Update

Kern and Tulare Counties, California

Poso Creek IRWM Group

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CRITICAL HABITAT CONSERVATION AREAS

JUNE 2014

FIGURE 3.4

15-May-2014 Z:\Projects\1332150_PosoCreek\Fig3-4_Critical Habitat.mxd RS for a host of water-dependent wildlife. The Refuge Water Supply Program is managed jointly by the U.S. Fish and Wildlife Service and Bureau of Reclamation, and consists of several program components which include: the acquisition of refuge water supplies; the construction of conveyance systems to deliver those water supplies; and the conveyance of the refuge water itself. The KNWR is one of the federal refuges that now receive a reliable source of water to help satisfy some of the yearly habitat requirements for species that use the refuge. Prior to the enactment of CVPIA legislation, most of these refuges relied upon surplus water storage, agricultural return flows, junior water rights and groundwater for their supply, all sources that were either unreliable or of marginal quality, or both. The CVPIA legislation mandated an allotment of secure, reliable water to these refuges, which range as far north as Glenn County and as far south as Kern County (in the Central Valley of California).

Figure 3.5 Kern National Wildlife Refuge
(US Fish & Wildlife Service credited for photograph).

With the benefits of water supplies provided by the CVPIA, refuge managers, including those at the KNWR, can now plan for at least one irrigation of their moist soil food plants, provide breeding ponds for waterfowl and colonial nesting birds such as white-faced ibis, great-blue herons and egrets. This allows for late summer habitats for the first birds migrating south spending the winter in the Central Valley. However, all of these beneficial habitat management practices are limited in scope each year because of the limited amount of water made available to these areas. Often, only one irrigation may be accomplished each year, while 2 or 3 are preferred, and the acres of brood habitat or later summer habitat is usually less than what is needed to support the numbers of wildlife utilizing the refuge.

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, such as the KNWR. As part of their efforts to support species recovery, the Metro Bakersfield Habitat Conservation Plan (HCP) and the Kern Valley Floor HCP have established endangered species recovery programs in the San Joaquin Valley to promote species recovery. See Figure 3.4 for a map of the critical habitat conservation areas as defined for the Region. The RWMG understands the need to safeguard the ecological processes and environmental resources within their boundaries.

3.8 Water-Related Recreation Land Use

Recreational water use in the Region is limited to the KNWR on the northwest side of the Region (shown in Figure 1.1) and a number of "duck clubs", which are located in the same portion of the Region. Specifically, water demands are attributable to grain irrigation and/or flooding ponds for waterfowl, including duck clubs.

Lakes for water recreation in Kern County that are outside of the Poso Creek Region include the Isabella Reservoir, also known as Lake Isabella (shown in Figure 3.6), and Lake Ming, both of which are located east of the City of Bakersfield and impound Kern River water. Others include Lake Woollomes, which adjoins the Friant-Kern Canal (east of Delano) and serves as a regulating reservoir for Friant-Kern Canal operations; and the Buena Vista Aquatic Recreation Area, also known as Lake Webb, which is near the California Aqueduct, southwest of Bakersfield (and outside of the Poso Creek Region). Recreational activities on these lakes primarily include camping, fishing and boating. The USACE is responsible for day-to-day reservoir operations at Lake Isabella, while the Kern County Parks and Recreation Department administers the recreational activities at each of these locations.

Figure 3.6 Isabella Reservoir Recreational Area

Although North Kern WSD exercises its rights to conservation space in Isabella Reservoir for the regulation of its Kern River supplies, no deliveries of water are made explicitly for recreational use. Accordingly, any recreational use of RWMG Participant water supplies is incidental to the storage of water in reservoirs, for the purpose of regulating the delivery of surface water supplies.

3.9 Urban and Industrial Lands and Disadvantaged Communities

According to the 2010 U.S. Census, Kern County's population was almost 840,000 which represented an increase of 26.9 percent over 2000 Census data. Available demographic data indicates that approximately 49.5 percent of people are white (non-Hispanic), 38.4 percent are Hispanic, 6 percent are African-American, 4.1 percent are Asian, and 2.6 percent are Native American. The median household income in the County was listed as $35,446, with 20.8 percent of homes below the poverty line (27.8 percent of children under 18 and 10.5 percent of adults age 65 and older live in conditions below the poverty level). Thirty-three percent of the households in Kern County received means-tested public assistance or non-cash governmental benefits.

The largest urban area in Kern County, and in the southern San Joaquin Valley, is the City of Bakersfield (located immediately southeast of the Region) with a 2010 population of about 347,000 (which is about 41 percent of the total for the County),. Based on recent estimates, approximately 120,000 people presently reside within the Region, which is about double the estimate for 1990. 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 in Figure 3.7. Several smaller population centers in outlying areas support processing facilities for agricultural and petroleum products. There are no Native American tribal communities located in the Region.

Many of the communities in the Region are considered "economically disadvantaged" based on a comparison of the statewide median household income ($60,883 for 2006-2010 based on ACS Census data) to the population-weighted average household income level for the Region (approximately $30,294, or about 50 percent of statewide value). This value falls well below the 80% of statewide median household income threshold (value $48,706) for designation as "economically disadvantaged", in accordance with CWC §79505.5(a). This implies that most unincorporated communities are classified as "disadvantaged communities" (DACs). The CWC also defines "severely disadvantaged communities" (SDACs) as those with median household income below 60 percent of the statewide value, which results in a threshold of approximately $36,530 which only applies to some of the poorest of areas in the Region.

Given that DACs are in the Poso Creek Region, identifying the water supply and water quality needs of these low-income areas is necessary for the IRWM Group. The RWMG has taken proactive steps for identifying and including DACs in development of the Plan. Following the identification of economically-disadvantaged areas, representatives were extended an invitation to participate in the IRWM Group. Several communities that met the criteria for DACs joined the Poso Creek IRWM Group and have participated since its formation. A list of DACs in the Region is given in Table 3.7, and a map of the locations of these DACs is shown in Figure 3.7. Recall from Section 2.2 that DACs are represented by a DAC Representative who is a voting member of the RWMG, as well as a DAC Work Group that focuses on the needs, impacts, and benefits to communities in the Region. For the DAC communities that remain unrepresented, or are located outside the Region boundary, the IRWM Group has worked with Self-Help Enterprises and the Community Water Center to identify and provide needs assessment of unincorporated disadvantaged communities. More on the involvement of these entities, as well as all DACs, in the planning and implementation efforts of the IRWM Group is described in Section 11.3.

The DACs in the Poso Creek Region have several significant obstacles to overcome in order to ensure reliable water supplies and adequate water quality for their residents. Some of these obstacles include the following:

- Lack of financial resources due to lower-income residents, many of whom are not able to adequately fund community projects and programs (i.e., lower tax income for these communities and limited involvement from residents). In addition, many of these communities struggle to provide basic services such as maintenance, permitting, and staff to address the needs and issues of their residents.
- Lack of technical and managerial ability of community leadership and personnel to plan and afford the necessary steps for assuring water quantity and quality. It also relates to being unable to hire skilled staff and provide competitive income levels, thereby perpetuating the lack of leadership capacity, specifically regarding water-related concerns.
- The water and wastewater infrastructure of many of the DACs in the Region are substandard or aging, relying on old or severely leaking wells and distribution systems leading to many water challenges. Recall that all cities and communities in the Region rely solely on groundwater (reference Section 3.4). Some of these wells are shallow, inadequately constructed, or improperly sealed, which leads to poor water pressure and/or poor water quality.
- Many of the DACs are geographically isolated, located long distances from larger cities or more economically prosperous areas.

The IRWM Group has worked with the DACs with the intent of providing solutions to regional water supply and quality issues; regardless of location (some of the DACs are located outside the Region boundary), status/condition (e.g., comparison of level of economic-disadvantage between DACs), or ability to participate in IRWM Group efforts. Through the DAC Representative (reference Section 2.2), the RWMG will continue its outreach to DACs and encourage participation in the IRWM Group (as stated in Section 11.4). The IRWM Group has supported project and program development and implantation for these DACs, with a good deal of success, which is illustrated in Appendix A1.

Regarding the use of groundwater supplies by these DACs, the RWMG has identified and implemented projects and programs that benefit the underlying groundwater basin (as stated in Section 3.4). In this regard, recall that the agricultural water management districts and DACs, as well as other cities and M&I users, share a groundwater basin that is hydraulically connected and utilized by all users in the Region. Accordingly, any decline in water levels will be felt by all users, including the regional DACs that rely on the groundwater for their supplies due to an associated increase in the use of power and energy resources (environmental burden), as well as infrastructure (well) upgrades which become necessary to pump groundwater from deeper in the aquifer. To that extent, projects and programs such as those which were implemented (Appendix A1) or those which are proposed as part of this Plan (Appendix A2) which work to mitigate declines in water levels will provide benefits to other groundwater users in the Region. Beyond projects and programs aimed specifically at improving water supply or water quality issues at the DAC-level (e.g., construction or rehabilitation of a groundwater well), the types of activities described in this Plan provide benefit to the DACs in the Region through the common groundwater reservoir.

This Plan Update contemplates that DAC-specific projects and programs will be included in the Annual Report, pursuant to the Regional Goals and Measurable Objectives outlined in Sections 4.4 and 4.5, respectively. It is noted that project and program submissions to the RWMG are expected to address potential impacts and benefits to regional DACs, which is a factor that is weighted during review of project/program submissions (reference Section 5.1). Beyond the list in the Annual Report, it is intended that the DAC Representative and Work Group will work with DAC leadership in the Region to maintain a current list of the DACs and their primary contact information. Representatives from Self-Help Enterprises and the Community Water Center are invited to participate in the IRWM Group meetings, and to call for the inclusion of specific projects or programs with a DAC focus, when it comes to grant and funding applications to accomplish the Goals and Objectives of this Plan.

Table 3.7 Characteristics of the Region's Disadvantaged Communities

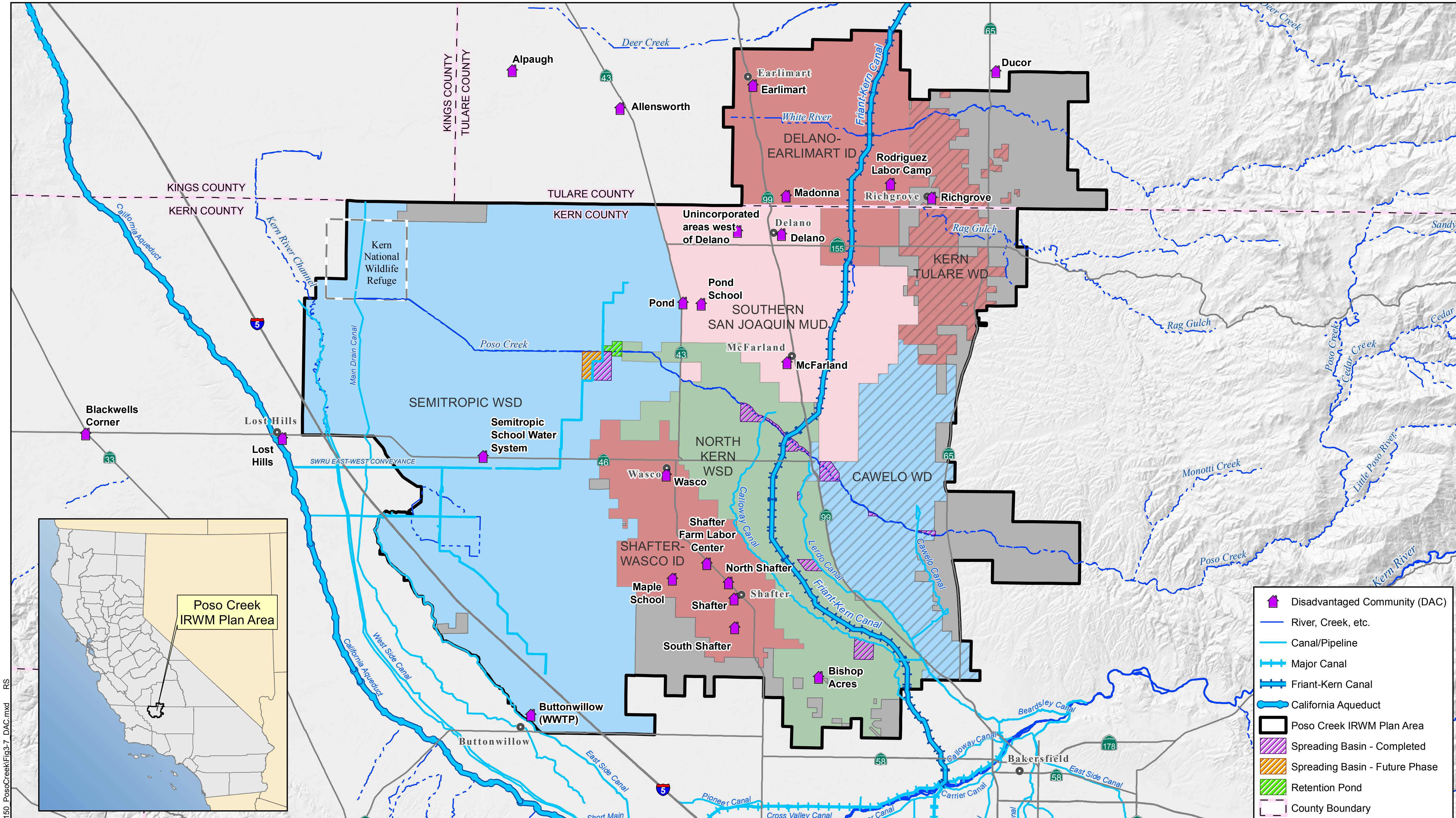
City/Community	County	Population[1]	Estimated Households	Median Household Income (MHI)[1]	% of State MHI[2]	Corresponding Entity
Allensworth[3]	Tulare	471	121	$23,594	39%	Allensworth Community Services District
Alpaugh[3]	Tulare	1,026	241	$20,724	34%	Alpaugh Joint Powers Authority
Bishop Acres	Kern	Not Avail.	26	$34,345	56%	Bishop Acres Mutual Water Company
Blackwells Corner	Kern	Not Avail.	Not Avail.	$29,338	48%	
Buttonwillow	Kern	1,508	411	$37,500	62%	Buttonwillow County Water District
Delano	Kern	53,041	11,002	$35,507	58%	City of Delano
Unincorporated Areas West of Delano	Kern	Not Avail.	Not Avail.	$30,946	51%	County of Kern, City of Delano
Ducor[3]	Tulare	612	126	$33,549	55%	Ducor Community Services District
Earlimart	Tulare	8,537	1,945	$25,885	43%	Earlimart Public Utility District
Lost Hills	Kern	2,412	440	$29,348	48%	Lost Hills Utility District
Madonna	Tulare	Not Avail.	28	$13,000	21%	City of Delano County of Tulare
Maple School District	Kern	Not Avail.	Not Avail.	$27,634	45%	City of Shafter
McFarland	Kern	12,707	2,706	$35,812	59%	City of McFarland
Pond	Kern	48	24	$30,946	51%	Pond Mutual Water Company

[1] Data obtained from the latest US Census Bureau statistics, generally 2010 Census Data (available via American Fact Finder online database).
[2] Percent of State MHI from 2010 ACS Census Data, threshold of $60,883 with 80 percent value of $48,706, as stated above (from Prop. 84 Guidelines)
[3] Located outside of Poso Creek IRWM Region.

Table 3.7 (Continued) Characteristics of the Region's Disadvantaged Communities

City/Community	County	Population[1]	Estimated Households	Median Household Income (MHI)[1]	% of State MHI[2]	Corresponding Entity
Pond School District	Kern	Not Avail.	Not Avail.	$30,946	51%	Pond School District
Richgrove	Tulare	2,882	593	$29,537	49%	Richgrove Community Services District
Rodriguez Labor Camp	Tulare	110	Not Avail.	Not Avail.	Not Avail.	Richgrove Community Services District
Semitropic School District	Kern	263	NA[1]	$29,338	48%	Semi-Tropic School District
Shafter	Kern	16,988	4,629	$40,731	67%	City of Shafter
Shafter Farm Labor Center	Kern	Not Avail.	Not Avail.	Not Avail.	Not Avail.	Housing Authority of County of Kern
Shafter North (North Park & North Shafter)	Kern	1,000	207	$27,634	45%	City of Shafter
Shafter South (Smith's Corner, Thomas Lane, Cherokee Strip, Burbank, Mexican Colony, Southwest Shafter)	Kern	1,300	348	$27,634	45%	County of Kern, City of Shafter
Wasco	Kern	25,545	5,413	$42,221	69%	City of Wasco

[1] Data obtained from the latest US Census Bureau statistics, generally 2010 Census Data (available via American Fact Finder online database).
[2] Percent of State MHI from 2010 ACS Census Data, threshold of $60,883 with 80 percent value of $48,706, as stated above (from Prop. 84 Guidelines).



SOURCE: California Spatial Information Library, 2008; Semitropic Water Storage District, 2008; Kern County Water Agency, 2006.

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2014 Integrated Regional Water Management Plan (IRWMP) Update

Kern and Tulare Counties, California

Poso Creek IRWM Group

GEI Consultants
Bookman-Edmonston Division

LOCATION OF DACS IN THE POSO CREEK REGION

JUNE 2014

FIGURE 3.7

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3.10 Social, Cultural, and Economic Trends of the Region

As discussed in Section 3.0, the economy of the Region is based on irrigated agriculture. Reasonable land costs and smaller-sized communities have perpetuated this Region as a predominantly agricultural area. In other words, there has been little disruption in farming practices due to urbanization or decreased economic viability. However, the largely “open” areas, combined with relatively lower land costs in comparison to other urbanized areas of California, make the Region a potential area for population growth over the next few decades. In particular, the proximity to the City of Bakersfield, which is located just south of the Region and is the, largest urban area in Kern County, increase the likelihood of increased pressured to convert adjacent farm land to urban uses. Urban growth will challenge some of the Region’s resources, including wastewater collection and treatment, environmental resources, industrial water needs, and principally the ability to supply adequate drinking water resources to an expanding population.

Economic and social development in the Region requires an adequate and stable water supply. Given that cities and communities in the Region rely on groundwater pumping to meet demands; it is important to maintain groundwater levels for all uses. Within the Region, the agricultural districts are responsible for importing supplemental surface water supplies which recharge the groundwater reservoir. The conjunctive-use practices of these districts have served to reduce the stress on the underlying aquifer, which benefits all those who rely on groundwater, including the cities and communities in the Region. In particular, the relatively higher groundwater levels helps assure that pumping lifts remain economically viable.

Despite the success of the agricultural-based economy, the Region still faces unemployment, lower wage levels for employees (on average), and areas of poverty as described in Section 3.9. Many of the communities and cities are working to mitigate these issues by creating jobs and expanding the economic base, particularly in their connection to the local agricultural-based economy that includes expansion and improvement of farmworker jobs. However, there are several social and cultural trends that make these efforts difficult. According to the 2010 census, between 20 and 25 percent of those residing in the San Joaquin Valley were foreign-born leading to prevalent cultural barriers in and around the Region. More than 40 percent of people speak a language in their home other than English. Despite these trends, the Region is home to many hard-working people, labor and business leaders, and entrepreneurs who are working to better the living conditions and economy of the Region. Regardless, the fact still remains that many of the communities in the Region are comprised of farmworkers or persons associated with agricultural-based employment. To that extent, it is essential that the Region’s agricultural economy remains viable, with economically competitive crops, modern growing and effective irrigation practices, and a reliable water supply.

3.11 Appropriateness of the Region for an IRWM Plan

Since the formation of the water management districts and agencies in the Region, water resources management has been based on the conjunctive use of supplemental surface water supplies with the common groundwater basin. Since the groundwater basin is a shared resource, the districts are all actively involved in the management of imported surface water supplies, and several districts operate groundwater banking projects, the formation of a regional water management group (RWMG) was logical. In this way, water supply and demand management was approached through cooperative and mutually beneficial planning efforts. The Region's assets, including State, Federal, and local water supplies (reference Sections 3.1 and 3.5), proximity to major conveyance facilities (Section 3.3), and significant groundwater storage and absorptive capacities (Sections 3.3 and 3.4), also made it an ideal location to enhance the existing conjunctive-use practices through regional cooperation and management. The RWMG Participants each faced common issues; principally, maintenance of a reliable water supply and balancing the use of surface water and groundwater. The individual districts and agencies that formed the RWMG also had a history of working together based on prior water management arrangements, including water transfers and exchanges, water banking agreements, shared water conveyance networks, and cooperative management efforts. The formation of the RWMG simply took this to a new level.

The Poso Creek Region lies within a specific portion of the Tulare Lake Basin Hydrologic area, known as the Poso Hydrologic Unit, as defined by the SWRCB (SWRCB 1975). As shown in Figure 1.1, it is located in the northerly portion of Kern County and southerly portion of Tulare County. Figure 3.8 shows the relationship of the RWMG to the Poso Hydrologic Unit. The Region boundary was influenced by several factors, including the following:

- Political and jurisdictional boundaries of those districts wanting to participate in the joint planning effort;
- Natural surface water systems and rights to those sources;
- Access and rights to multiple sources of surface water supplies and surface water conveyance systems within the planning area, and for conveying water to or from the planning area;
- Access to a common groundwater basin;
- Common watershed boundaries and sub-units;
- Land use, particularly irrigated agriculture, waterfowl habitat and preserves, and sensitive upland species habitat;
- Topography and geography as it relates to the ability to economically provide water for irrigation;
- Common floodplains and flooding issues; and
- Significant yet manageable size.

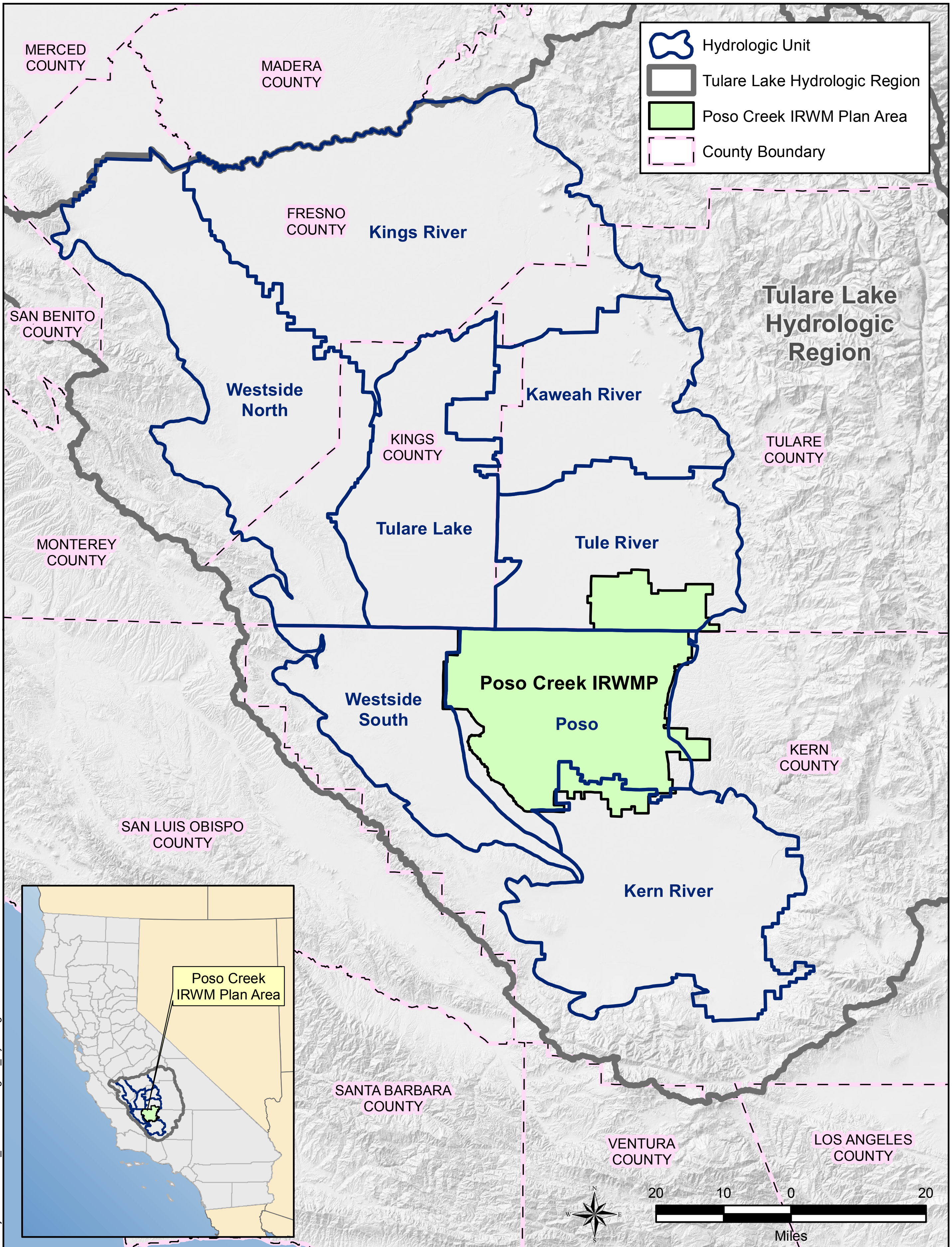
As described in more detail in Section 3.3, the RWMG not only shares a common groundwater basin, the districts have access to several local and regional water supplies and conveyance systems. For these reasons, the Poso Creek Region was chosen as an area that was poised to leverage its diverse portfolio of water supplies and infrastructure for the common purpose of improving water supply reliability within the Region.

Throughout the IRWM planning and implementation process, the boundary of the Poso Creek Region has evolved to encompass some adjacent but "unorganized" areas. These areas are similar in most respects excepting that they are not included within an organized district. As part of Plan implementation during the Region Acceptance Process, the Poso Creek Region Boundary was modified along the north and east to conform to neighboring IRWM Groups and was additionally modified to the east to include an area along Poso Creek channel where a flood control reservoir has been considered in past studies.

Owing to the common groundwater, management practices, and concerns, it is logical that, through working together, water management programs can be accomplished which help to meet the overarching goal of improving the reliability of the Region's water supplies that could not otherwise be accomplished. Several water banking and exchange agreements have been accomplished as a result of the dialogue and information exchange afforded by the IRWM planning process. Specific examples include moving wet-year water into districts that have available absorptive capacity and subsequently returning previously stored water in future dry years. The IRWM Group 'Report Card' in Appendix A1 provides some specific examples of projects and programs which have been completed and are able to function as a direct result of the integrated regional planning.

Neighboring or Overlapping IRWM Regions

The Poso Creek Region is bounded by The Tulare Lake Basin Portion of Kern County IRWM Plan (Kern IRWMP) and the Tule IRWM Plan (Tule IRWMP), which is shown in Figure 1.1. The Poso Creek IRWM boundary was coordinated with neighboring regions, which included the overlap with the Kern IRWMP. Defining the Region boundaries was a requirement of the DWR's Region Acceptance Process (RAP). Accordingly, as part of the RAP, a formalized agreement was reached between the Poso Creek IRWM Group and the Kern IRWMP in September 2010 with regard to defining the boundaries of the two planning efforts within Kern County. Regarding the DAC Communities within the Poso Creek IRWM Group, some have maintained a 'dual' participation in both IRWMs in order to increase their opportunities for advancing their projects and to be eligible for funding assistance. The Poso Creek IRWM Group continues to work cooperatively with the Kern IRWMP in order to effectively address inter-regional water management issues, which includes a dialogue to coordinate planning and implementation programs funded by the DWR.



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2014 Integrated Regional Water Management Plan (IRWMP) Update Kern and Tulare Counties, California	GEI Consultants	Relationship of RWMG to Poso Hydrologic Unit
Poso Creek IRWM Group		JUNE 2014 FIGURE 3.8

4.0 Regional Goals and Measurable Objectives

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Objectives' and 'Resources Management Strategies' Plan Standards, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Determine IRWM Plan objectives.	4.5
Collaborative process and tools used to establish objectives, including how they were developed, what information was considered, groups involved in development, and how final decisions are made.	4.1, 4.2, 4.3, 4.4, 4.6, 4.7, 4.8, 4.9, 4.10
Quantitative or qualitative metrics and measurable objectives.	4.5
Prioritization of objectives, or reason why not prioritized.	4.4
Specific overall goals for region.	4.4, 4.6
Consider and incorporate all RMSs into IRWM Plan.	4.8
Consider Climate Change effects on region factored into RMSs.	4.8
Address which RMSs will be implemented in achieving plan objectives.	4.8

During Plan formulation, the Poso Creek RWMG developed and evaluated Regional Goals and Measurable Objectives (both qualitative and quantitative) that provide a basis for all regional planning efforts. Regional Goals (Goals) are defined as the highest level priorities for the region, adhering to the RWMG's overarching Vision and Mission, while Measurable Objectives (Objectives) are more specific actions that can be taken to meet one or more of the goals. For the purpose of this Plan, the Objectives were evaluated for compliance with the DWR Statewide Priorities, per the IRWMP Proposition 84 Program Guidelines, and the regionally-applicable "Resource Management Strategies" (RMS) presented in the California Water Plan Update 2013 (California Water Plan). The definition and assessment of the IRWM Goals and Objectives, and the adherence to planning requirements, is described below along with the process used to identify them in later sections.

4.1 Regional Vision and Mission

The RWMG developed Vision and Mission statements to refine the Region's priorities and solidify their regionally focused planning and implementation activities. The Vision statement provides guidance and inspiration as to what the RWMG is focused on achieving in the future. The Mission statement defines the purpose of the RWMG, and what the *group* strives to accomplish in its management and planning efforts. Both statements were approved by IRWMP Participants, Stakeholders, and Interested Parties during the development of the Plan. Both the Vision and Mission statements were formalized by the RWMG in the First Amendment to the MOU, as seen in Appendix C.

Poso Creek RWMG Vision Statement

"Provide a framework for the Poso Creek IRWMP Participants, Stakeholders, and Interested Parties to identify and coordinate resource management activities through Regional Goals and Measurable Objectives."

Poso Creek RWMG Mission Statement

"Facilitate plans, programs, and projects necessary to meet the Regional Goals and Measurable Objectives, and to further sustainable resource management."

4.2 Previous Plan Objectives

In the original 2007 IRWMP, seven 'Planning Objectives' were developed to provide a framework for formulating the Region's priorities and selecting strategies and proposed projects to meet those priorities. The original Planning Objectives are listed and described below, restated from the Original Plan:

1. **Water Supply Reliability.** Two of the significant problems facing the Region are surface water supply reliability and maintaining groundwater levels. The intent of this objective was 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.
2. **Groundwater Levels.** The intent of this objective was to help insure that groundwater levels will be maintained or enhanced with economically viable pumping lifts through increased conjunctive use operations.
3. **Groundwater Quality.** Groundwater quality in the Region is generally good (Section 3.6); thus, the intent of this objective was to focus on protecting quality of groundwater and enhancing water quality when practical.
4. **Water Supply Costs.** The focus of this objective was to maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the Poso Creek Region.
5. **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 was to enhance ongoing monitoring of groundwater levels and water quality as needed as part of the implementation of projects.
6. **Environmental Resources.** Maintaining and enhancing environmental resources within and outside the Region was the focus of this objective, which included protection and enhancement of a number of wetlands within the Poso Creek Region that provide an

ecosystem of fowl, flora, and wildlife. Also acknowledged was the connection between the Region's imported supplies and the environmental issues surrounding the Sacramento-San Joaquin River Delta (Delta) and restoration of the San Joaquin River.

7. **Flood Management.** The objective was 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.

These Planning Objectives were also developed in recognition that improved water resources management would benefit inhabitants throughout the Region as well as water purveyors in other parts of California while satisfying Regional priorities. These priorities considered the IRWMP Proposition 50 Program Guidelines and the RMS presented in the California Water Plan Update 2005.

It is noted that the Planning Objectives expressed in the 2007 IRWMP adhered to the groundwater monitoring and assessment emphases of the Proposition 50 Guidelines. These objectives were reviewed during the development of the Regional Goals and Measurement Objectives in this 2014 Plan Update. The updated goals and objectives illustrate that the RWMG has since broadened their focus from water resource (specifically groundwater) management planning to more generalized resource management planning within the Region, including expanding the discussion of water supply and demand with environmental and climate change assessment related to implemented projects and programs.

4.3 Goals and Objectives Development Process

Besides reviewing the previously developed Planning Objectives, development of the 2014 Goals and Objectives included consideration of Regional priorities and planning requirements identified from the following sources:

1. Consideration of changes to the water related needs of RWMG Participants, Stakeholders, and Interested Parties;
2. Consideration of State goals and priorities from the 20x2020 Water Conservation Plan (i.e., related to water use efficiency);
3. Review of Basin Management Objectives (BMOs);
4. Consideration of California Water Code §10540 through §10543; and
5. Consideration of the 2012 DWR IRWMP Proposition 84 Guidelines (2012).

Key participants and Stakeholders have remained active in developing the planning structure and development hierarchy used by the RWMG. All Regional Goals and Measurable Objectives were identified by the RWMG Participants, Stakeholders, and Interested Parties as adhering to the Regional priorities and the RWMG Vision and Mission statements. The hierarchy and regional framework used during development of the Plan, and through implementation of various projects and programs, is shown in Figure 4.1. Shown in this figure are typical 'planning efforts' and 'implementation' tasks, illustrating the connection between the work performed by the RWMG and the overall "planning process".

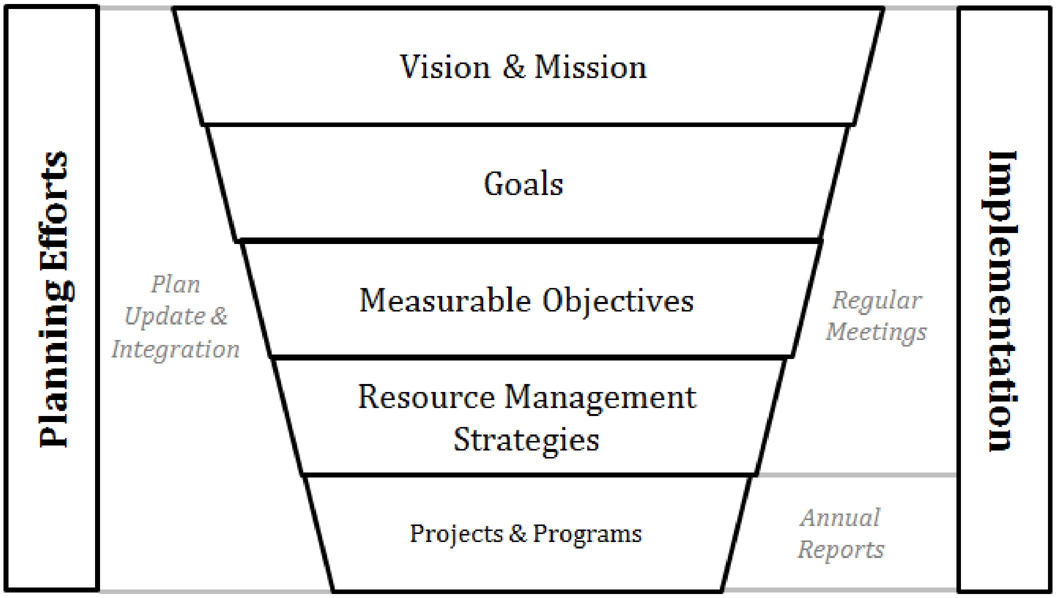


Figure 4.1 Regional Framework and IRWMP Planning Hierarchy.

Note that the connection between levels of the planning structure with Vision & Mission, Goals are not 1:1, such that, more than one Regional Goal or RMS may apply to one or more Measurable Objective. Specific Regional Goals and Measurable Objectives are discussed in the following two sections.

4.4 Regional Goals

The broadened emphasis towards more generalized resource management planning, as compared to the 2007 IRWMP, required revisions to the Goals in order to fully complement the IRWM Group's increased efforts under Proposition 84. This is not meant to suggest that the 2007 Planning Objectives (listed in Section 4.2) are no longer considered important to the IRWM Group and the RWMG, or that they no longer adhere to the Regional priorities; rather, the RWMG Participants, Stakeholders, and Interested Parties have assumed increased responsibility towards resource planning in the Region. The 2014 Goals, (shown in Figure 4.2), are seen as the highest level priorities for the Region, consolidating municipal, agricultural, social, economic, and environmental concerns.

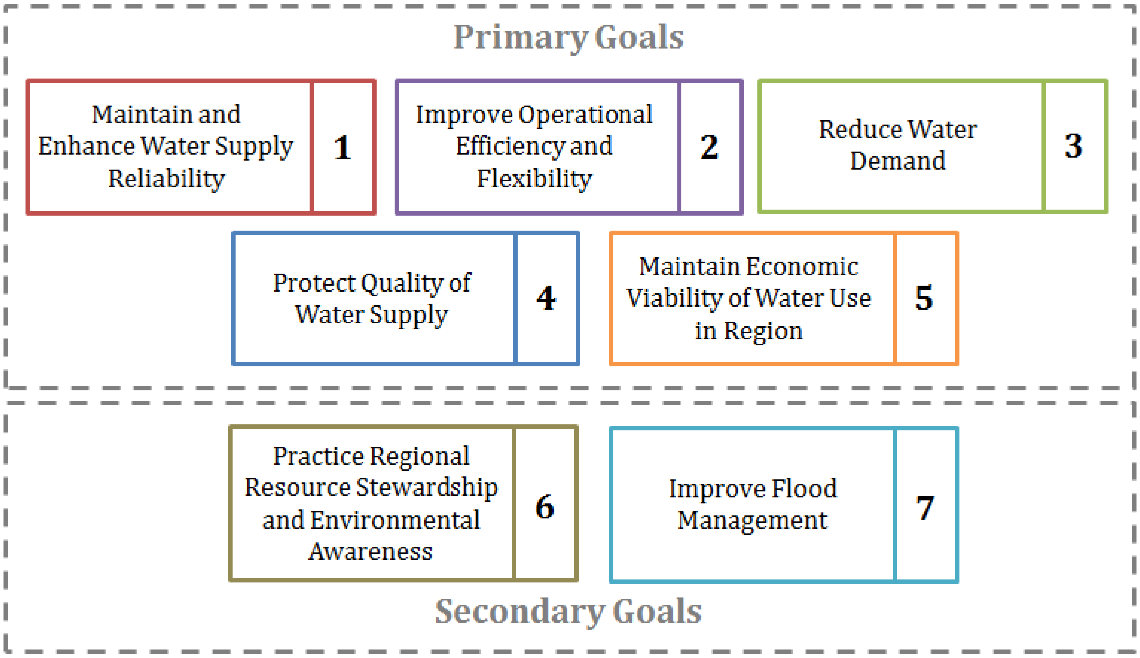


Figure 4.2 Poso Creek IRWM Regional Goals

The RWMG has determined that, based on Regional priorities, Goals 1 through 5 are designated as "Primary Regional Goals"; Goals 6 and 7, while valuable to the planning and management efforts of the Region, are designated as "Secondary Regional Goals". The emphasis on the Primary Regional Goals is such that projects and programs that are primarily associated with these goals have direct benefits and noticeable impacts on the water supplies and demands related to imported surface water or pumped groundwater for the Region. Secondary goals are viewed as promoting the sustainability within the region for municipal, agricultural, and environmental resources.

Due to the overwhelming need within the Region to meet the Primary Regional Goals, which are related to regional water supply, the RWMG's approach has been to meet the Secondary Regional Goals, where appropriate, by integrating them into a project or program that meets one or more of the Primary Regional Goals. The selection of projects or programs, based on Primary and Secondary goals, is discussed in Section 5.1. A detailed description of each of the Regional Goals, and the connection to the Measurable Objectives, is presented in Section 4.6.

4.5 Measurable Objectives

The 2014 Objectives were developed as a means of accomplishing the Goals, to directly support the DWR Statewide Priorities and the RMS applicable to the Region, and to identify projects and programs suitable for implementation to meet the Regional Priorities of the RWMG Participants, Stakeholders, and Interested Parties. Along with the Goals from Section 4.4, the following Objectives, shown in Figure 4.3, address the requirements of the CWC §10540.

A	Enhance reliability of surface water supplies delivered to region.	**H**	Enhance region-wide flood control measures.
B	Identify any significant threats to groundwater resources from overdrafting.	**I**	Promote environmental conservation and support wildlife habitat enhancement.
C	Improve regional water conveyance, direct recharge, and in-lieu service areas.	**J**	Identify drinking water quality issues of communities, water-related needs of DAC's, and consider improvements.
D	Increase absorptive capacity within the region.	**K**	Implement regional opportunities, projects, and programs.
E	Promote regional conjunctive water-use.	**L**	Implement region-wide water management actions.
F	Support groundwater monitoring activities.	**M**	Maintain compliance with State and Federal planning requirements.
G	Maintain and enhance quality of water supply.	**N**	Maintain coordination between Poso Creek RWMG Participants and Interested Parties.

Figure 4.3 Poso Creek IRWM Measurable Objectives

The Objectives identified in Figure 4.3 are assessed using measurement metrics that allow, in a practical means, monitoring achievements and quantifying progress in RWMG planning and implementation efforts. These metrics, described in connection with the Objectives in Table 4.1, are further discussed in Section 7.3 with regards to project and program monitoring.

Table 4.1 Measurement Metrics for Poso Creek IRWM Measurable Objectives

Measurable Objective Letter(s)	Qualitative or Quantitative Metric	Measurement Metric
A, C, D, E, L	Quantitative	Measure AF/Y delivered to Region. Identify deliveries to irrigation demand, in-lieu and direct spreading, to match total supplies with demand.
B, C, D, E, F, L	Quantitative	Measure static groundwater depth and annual changes in groundwater levels; as well as acres of irrigated land relying only on groundwater use.
C, D, H	Quantitative	Measure (cfs) of conveyance capacity increase, acres of in-lieu service areas, and acres of direct spreading grounds. Also measure changes in absorptive capacity (AF/M or AF/Y).

Table 4.1 (Continued) Measurement Metrics for Poso Creek IRWM Measurable Objectives

Measurement Objective Letter(s)	Qualitative or Quantitative Metric	Measurement Metric
C, J, K, L, N	Qualitative	Maintain list and reporting of regional resource management enhancement opportunities, through projects and programs
F, G	Quantitative	Report quality of water delivered into Region and within the service areas, such as TDS and other constituents.
H	Quantitative	Maintain, track, and report additional flood storage/storm water management in Region (in AF).
I	Qualitative/ Quantitative	Document projects that support environmental conservation efforts in the Region, and record the area of habitat enhancement (in acres).
J	Qualitative	Facilitate coordination of DAC studies, identify and develop community projects and programs, and document community implementation efforts.
M	Qualitative	Track requirements and maintain list of Regional and District-level planning requirements and required water management documentation.
N	Qualitative	Facilitate minimum of quarterly Public Meetings. Maintain E-mail communication list, annual solicitation of projects, and periodic reporting.

4.6 Regional Goal and Measurable Objective Linkage

The Goals, and their connection to specific Objectives, are described below in the context of Regional priorities. As previously mentioned, it is noted that some of these objectives apply to multiple Goals.

No.1 Maintain and Enhance Water Supply Reliability

Reliability of imported surface water supplies remains the most critical water concern in the Region, particularly as it relates to regulatory and operational constraints outside of the Region that have limited surface water deliveries to the Region. Reductions in the delivery of supplemental surface water supplies result in a commensurate increase in the use of groundwater. Urban and agricultural demands are met from the same groundwater basin; however, only the agricultural districts have the conveyance facilities and water supply contracts to supplement the groundwater with surface water supplies. This goal is intended to help ensure that the reliability of an adequate, supplemental surface water supply and viable groundwater supply is maintained and improved to meet current and future local and regional water needs. Figure 4.4 illustrates the connection between this goal and the Objectives listed in Section 4.5.

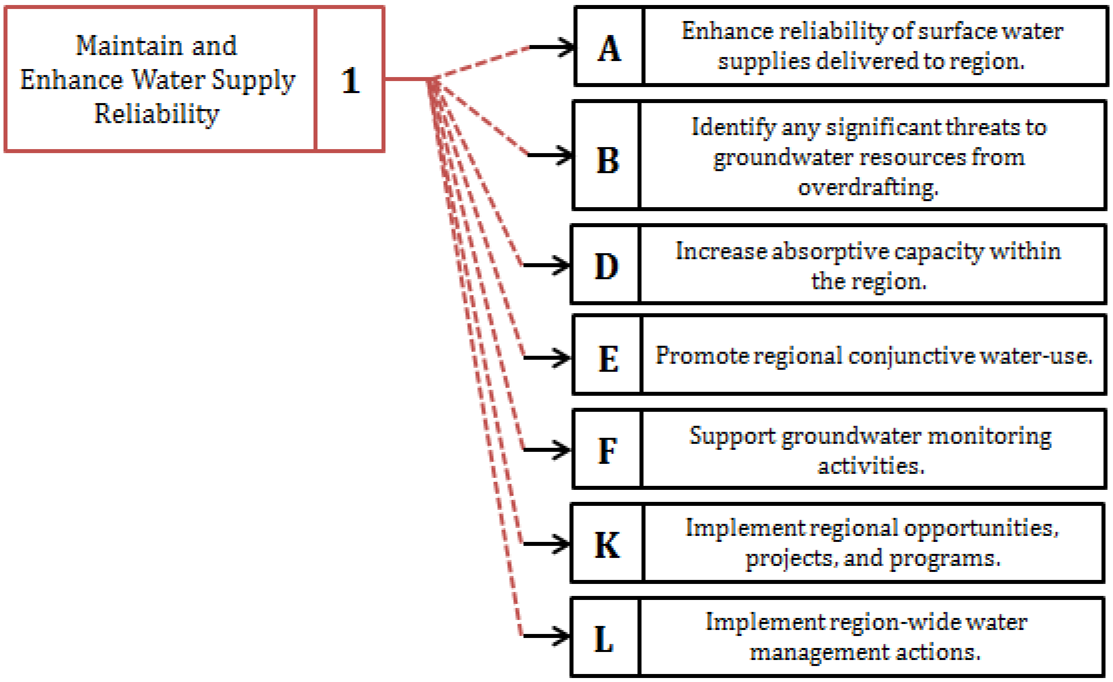


Figure 4.4 Connections between Measurable Objectives and Regional Goal No. 1

No. 2 Improve Operational Efficiency and Flexibility

Operational efficiency and flexibility are simply good "water management"; however, their importance is amplified in the context of maintaining the reliability of the Region's water supplies. Improvements to regional operational efficiency and delivery flexibility can be effected through structural improvements that enhance the efficient use of water conveyance and delivery canals, as well as non-structural improvements, which could include measures that seek to improve flexibility in the delivery of water for irrigation. The intent is to maximize the delivery of available surface water supplies to meet the annual average and critical-period regional water demands; capture and otherwise regulate short-term supplies, such as stormwater; minimize localized shortages; and identify additional sustainable water supplies at the regional and local level. Figure 4.5 illustrates the connection between this goal and the Measurable listed in Section 4.5.

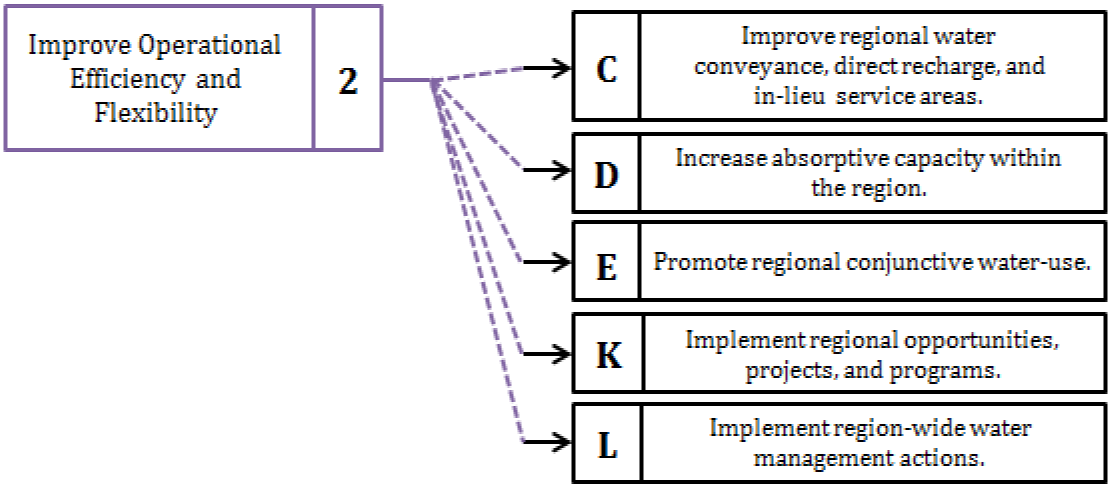


Figure 4.5 Connections between Measurable Objectives and Regional Goal #2

No. 3 Reduce Water Demand

Consideration must be given to methods for reducing water demand in the Region since the reliability of the Region's water supplies is a major issue. To the extent that the percentage of irrigated acres planted with permanent crops has increased (see Section 3.5), the Region's water demand has become more "hardened" over time, which means a firmer, more constant supply is required to maintain and irrigate crops. Reductions in surface water supplies available to the Region make it more difficult to mitigate or alleviate additional groundwater use which will occur in order to meet the hardening crop demand over time. Therefore, reduction in water demand has been identified as a goal in order to mitigate the loss of supplemental surface water supply and to help meet the competing water needs of agriculture, urban, and environmental water users in the Region. Figure 4.6 illustrates the connection between this goal and the Measurable listed in Section 4.5.

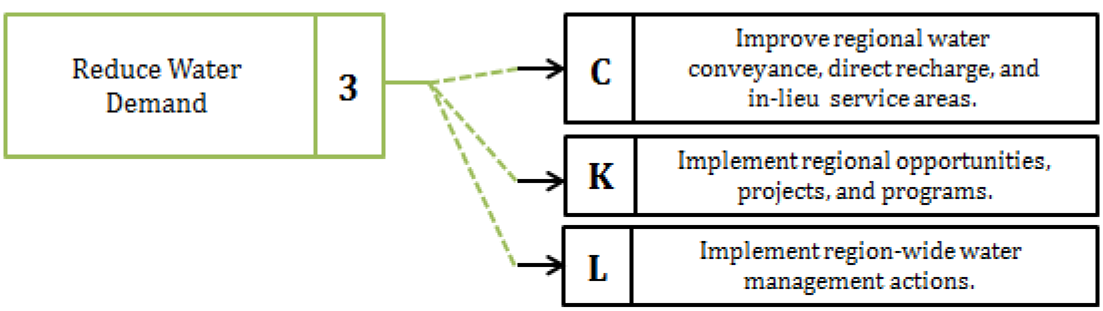


Figure 4.6 Connections between Measurable Objectives and Regional Goal No. 3

No. 4 Protect Quality of Water Supply

The quality of both the underlying groundwater and the surface water supplies is generally suitable for irrigation and other beneficial uses. The salinity of the Region's surface water supplies varies by source. The lower salinity supplies are the local Kern River water and the imported CVP-Friant water (San Joaquin River); whereas, the imported SWP water is typically higher in salinity. While the Kern River water and CVP-Friant water retain more of the character of the Sierra snowmelt, the character of the SWP water is modified as it is conveyed through the Sacramento-San Joaquin River Delta. Long-term issues which the IRWM Group and RWMG must consider include the importation of salts (with the imported water supplies) as well as exchanges which result in the use of supplies which are of lesser quality. The communities in the Region currently rely exclusively on groundwater and some face challenges in complying with drinking water standards for nitrate (NO_3), arsenic, or other constituents. This goal focuses on protecting and enhancing the quality of groundwater and surface water used for municipal, agricultural, and environmental purposes within the Region. Figure 4.7 illustrates the connection between this goal and the Objectives listed in Section 4.5.

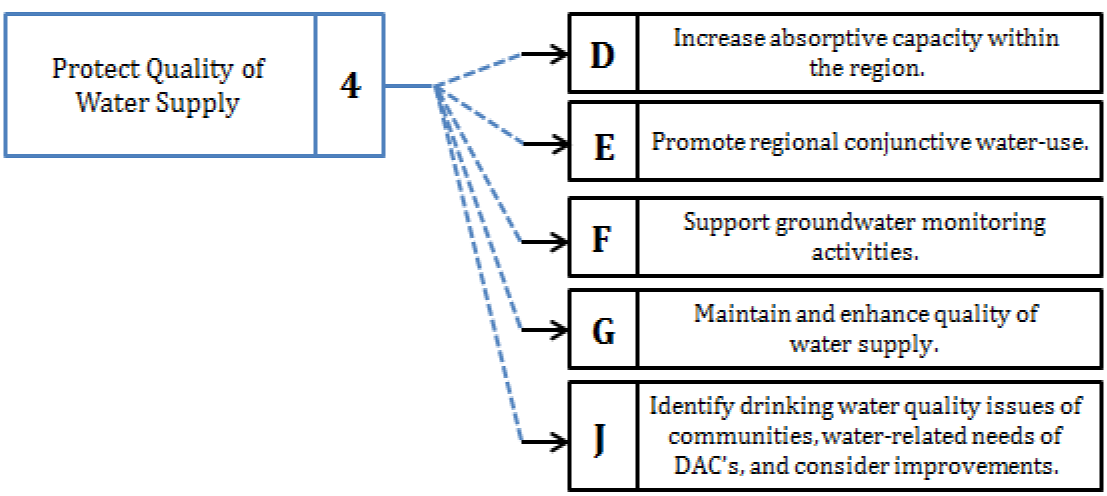


Figure 4.7 Connections between Measurable Objectives and Regional Goal No. 4

No. 5 Maintain Economic Viability of Water Use in Region

The RWMG is committed to striving to maintain economically viable pumping lifts for growers in the Region. Since agriculture in the Region produces crops for both local and world markets, maintaining a competitive role in the marketplace is a key factor to maintaining the Region's economic stability. Among other factors, the use of water supplies, including pumping groundwater or importing supplemental surface water, must remain economically viable. Accordingly, this goal focuses on maintaining water supply costs at a level commensurate with the continued economic viability of the Region's agricultural economy; maintaining reasonable and economically viable lifts for environmental water uses; and assisting communities with identifying reasonable solutions to meet drinking water needs. Figure 4.8 illustrates the connection between this goal and the Objectives listed in Section 4.5.

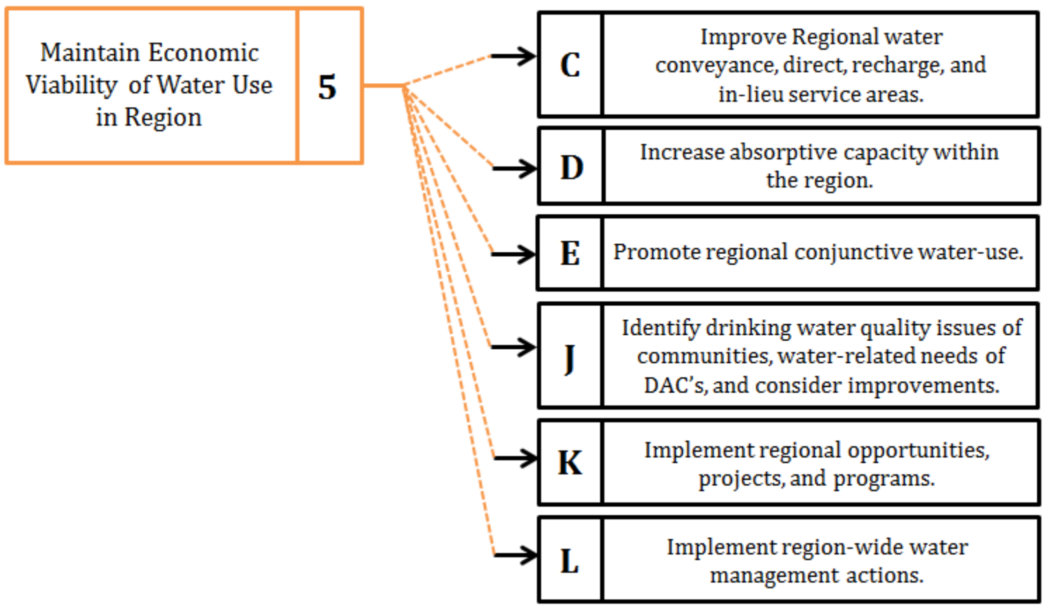


Figure 4.8 Connections between Measurable Objectives and Regional Goal No. 5

No. 6 Practice Regional Resource Stewardship and Environmental Awareness

There are wetlands and associated uplands within and surrounding the Region that provide important habitats for migratory birds and other wildlife. In addition, the connection between the RWMG's imported water supplies and the environmental concerns in the Sacramento-San Joaquin Delta and the Water Management Goal of the San Joaquin River (SJR) Restoration Program is well documented. This goal illustrates the RWMG's commitment to environmental stewardship and awareness in the Region, as well as working to alleviate environmental concerns from the use of imported surface water supplies from other watersheds and regions. Figure 4.9 illustrates the connection between this goal and the Measurable listed in Section 4.5.

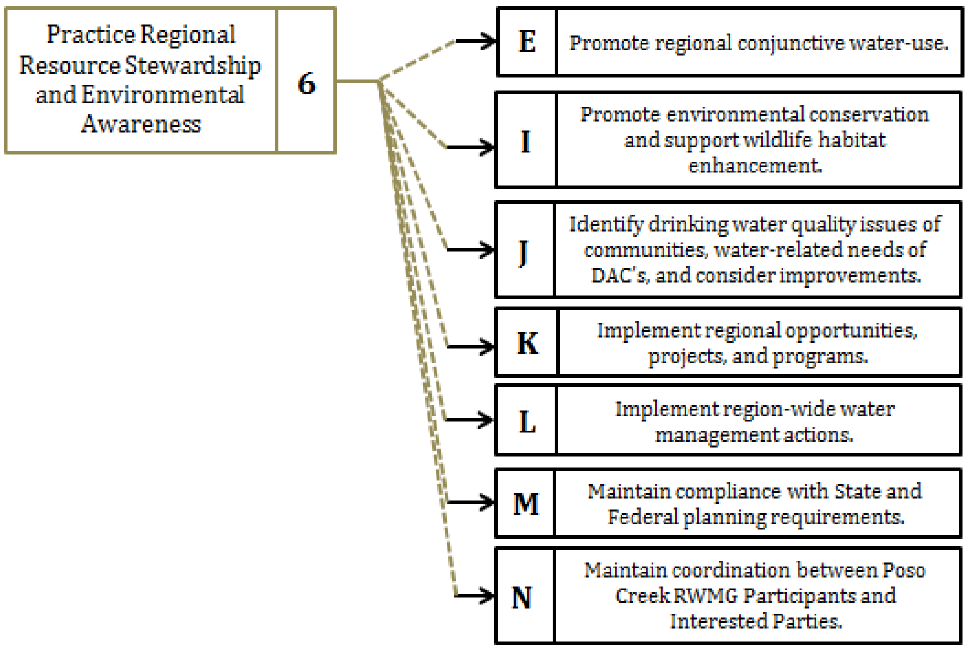


Figure 4.9 Connections between Measurable Objectives and Regional Goal No. 6

No. 7 Improve Flood Management

Flood protection is related to the health and safety of the Region's population, primarily in rural communities; minimizing flood damage losses of the various land uses; and seeking balanced management solutions with respect to cost and monetary/nonmonetary benefits. This goal is focused on improving and adapting flood management procedures and infrastructure to provide flood protection for the Region. Figure 4.10 illustrates the connection between this goal and the Objectives listed in Section 4.5.

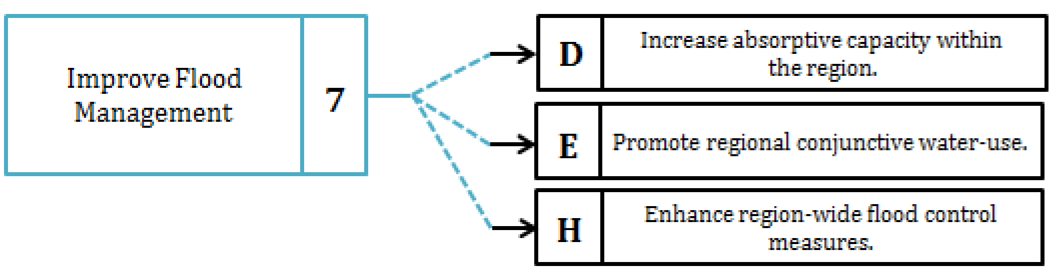


Figure 4.10 Connections between Measurable Objectives and Regional Goal No. 7

4.7 Statewide Program Preferences

Consideration of the 2012 DWR IRWMP Proposition 84 Guidelines was given during development of the 2014 IRWM Regional Goals and Management Objectives. Within these guidelines, the State of California has established and listed 15 Statewide Program Preferences (formerly Program Preferences and Statewide Priorities) for IRWMPs, which should be addressed during the IRWM planning process. Each of the Program Preferences is addressed in this Plan and Table 4.2 indicates the consistency between the Measurable Objectives and those preferences. It is noted that the connection between the Objectives and the RWMG's Goals was previously identified.

Table 4.2 IRWMP Program Preferences

Priority No.	Program Preference	Measurable Objectives
1	Include regional projects or programs.	K, L
2	Effectively integrate water management programs and projects within a hydrologic region.	L, M, N
3	Effectively resolve significant water-related conflicts within or between regions.	A, B, F, G, L, M, N
4	Contribute to attainment of one or more of the objectives of the CALFED Bay-Delta Program as follows:	
	A. Water Quality	F, G, J
	B. Levee Integrity	A, B, G
	C. Water Supply Reliability	A, B, C, D, E, L
	D. Ecosystem Restoration	I
5	Address critical water supply or water quality needs of DACs.	J, N
6	Effectively integrate water management with land use planning.	F, H, I, J, K, L, M, N
7	Effectively integrate water management with storm water planning.	H, K, M, N
8	Effectively integrate water management with drought preparedness.	A, B, C, D, E, F, G, K, L
9	Use and reuse water more effectively.	E, L
10	Climate change response actions.	B, C, D, E, H, K, L, M, N
11	Expand environmental stewardship.	I, K, L, M, N
12	Practice integrated flood management.	C, D, E, H, K, L, N
13	Protect surface water and groundwater quality.	B, C, D, E, G, J
14	Improve Tribal water and natural resources.	K, N
15	Ensure equitable distribution of benefits.	G, H, I, J, K, L, N

4.8 Resource Management Strategies

According to the California Water Plan Update 2013, a Resource Management Strategy (RMS) is defined as a technique, program, or policy that helps local agencies and governments manage their water and related resources. These strategies include both structural improvements, such as, conveyance enhancements or groundwater recharge facilities; and non-structural measures to implement program or policy solutions.

The Water Plan Update 2013 lists and describes 31 RMSs to be considered by an IRWM Group and RWMG in development of the IRWMP, as practically applicable, to diversify their water and general resource management portfolio. Each of the RMSs is addressed in this Plan and Table 4.3 indicates the consistency between the Objectives and those RMSs which were considered applicable to the Region. Included in the table are a description of each RMS, evaluation of the applicability to the Region, constraints on associated Objectives, and an assessment of the general climate change impacts from each strategy (see Section 13.0 for further discussion on the impacts of climate change on the Region). It is noted that RMSs not currently considered applicable to the Region will be periodically reviewed by the RWMG during future planning efforts. Most of the applicable RMSs are ongoing water management activities that are being practiced by the districts, communities, and environmental organizations in the Region.

Table 4.3 IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Reduce Water Demand					
Agricultural Water-Use Efficiency	X	California Senate Bill x7-7 (SBx7-7) requires agricultural water suppliers to prepare AWMPs and addresses a set of Efficient Water Management Practices (EWMPs) for regional water management and improved governance of irrigation water distribution.	A, B, C, K, L, M	Regional constraints include grower interest in technological and behavioral improvements, funding and cost-effectiveness, feasibility of converting to high-efficiency irrigation methods for certain crops and field configurations.	As climate change threatens to decrease available water supplies to the Region and create hotter and drier conditions unfavorable to growing certain crops the management of water-use for agricultural needs will become increasingly important.
Urban Water-Use Efficiency	X	SBx7-7 sets a goal of reducing per capita water by 20% by the year 2020. To meet this goal, increases to urban water-use efficiency through technological and behavioral improvements will become necessary. There are no large municipalities in the Region; however there are DACs in the region that implement water conservation measures.	A, B, C, J, K, L, M	Regional constraints are related to funding for DAC communities to implement feasible water conservation measures, such as, improvements to current water distribution networks, or for treatment and piping.	Climate change threatens to decrease available water supplies to the Region including those which are used for DAC community purposes. Drier conditions with increased daytime and nighttime temperatures means effective water management practices in populated areas will become a necessity.
Improve Flood Management					
Flood Management	X	Flood management is used to manage flood flows and to prepare for, respond to, and recover from flood conditions. Some hydrologic features, such as, the Kern River pose flood risks in the Region.	C, D, H, K	The RWMG may increase absorptive capacity. Constraints include funding and cost-effectiveness of enhancing or repairing flood control infrastructure, which is not controlled by the RWMG.	Climate change could increase the severity and intensity of flooding in the Region, meaning flood protection and management measures will need to be enhanced.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Improve Operational Efficiency and Transfers					
Conveyance (Delta)	X	A number of water users in the Region are SWP contractors, meaning water that is conveyed to their service area is diverted from the Sacramento-San Joaquin River Delta.	A, C, E, K, L	Constraints for managing water conveyed from the Delta are primarily regulatory pumping constraints leaving the Delta to the Region, as well as conveyance constraints for SWP deliveries into districts.	Climate change threatens to decrease water available from the Delta, thus decreasing the quantity of SWP deliveries to the Region. The decrease in deliveries means increased groundwater pumping to meet Regional demands.
Conveyance (Regional/Local)	X	Imported surface water and pumped groundwater in the Region are conveyed to areas of demand using conveyance infrastructure, such as, canals, pipelines, pumping plants. Conveyance facilities vary in size from small, localized distribution systems to larger-scale systems that deliver water within and across irrigation districts.	C, E, K, L	Conveyance facilities are largely restricted by the volume of water that can be delivered during flood releases or to meet peak summer demand. The acres and number of users who can receive supplemental surface water supplies to offset groundwater pumping is constrained to the delivery area of these facilities.	Climate change threatens to decrease the volume of water delivered to the Region, and cause greater variance in the availability of these limited supplies. Increased capacity for groundwater recharge will be necessary to deliver water during different times of year, when water is available, or to deliver higher volumes during shorter durations.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Improve Operational Efficiency and Transfers					
System Reoperation	X	Reoperation involves changes to operations and management of existing reservoirs and conveyance facilities to increase water related benefits. Reoperation changes considered feasible for the RWMG include irrigation districts altering operations to enhance water conveyance through interties between districts.	C, E, K, L	Constraints of altering operations and management for Participants or districts within the Region are largely based on legal obligations or water rights for users within the applicable service areas.	Changes in water demands and supplies due to climate change may force reoperation in the Region in order to adequately supply water users. Reoperation options may be re-evaluated during future planning processes.
Water Transfers	X	CWC defines water transfers as temporary or long-term changes in diversion, use, or purpose of water or water rights. Transfers are a common part of water management in the Region.	C, L	Water transfers are constrained by district regulations and policies, cost-effectiveness, and availability of conveyance capacity and the use of facilities to enable transfers.	Decreases in water supplies due to climate change may cause an increase in water or water rights transfers from those who have adequate supplies to those who do not.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Increase Water Supply					
Conjunctive Management and Groundwater Storage	X	Conjunctive use is the coordinated and planned management of both surface and groundwater resources in order to maximize their use. Since groundwater overdraft is a major concern in the Region, the RWMG actively facilitates conjunctive management and groundwater storage to alleviate issues with water supplies.	B, D, E, F, K, L	Conjunctive use includes several factors which must be considered, and monitored at a cost to regional participants. These include groundwater monitoring programs, recharge facility management, and groundwater use monitoring. Constraints include costs of constructing these facilities and management efforts.	As climate change is likely to decrease the amount of surface water available for import to the Region, it is realistic to assume a greater reliance on pumped groundwater to meet irrigation demands. Substantial efforts must be taken to encourage conjunctive management when supplemental water is available, to avoid or mitigate groundwater use.
Desalination (Brackish & Sea Water)		Desalination is the treatment of saline water to remove salts and make it available for municipal, agricultural, and environmental use. This process not only applies to seawater, but also on low-salinity (brackish) groundwater. Presently, salinity is a manageable in the region with a few saline water sources.	N/A	Some opportunities exist for desalination in the Region. The opportunities are limited to certain areas with brackish water and are not readily feasible. Desalination opportunities are being considered by the RWMG member districts and may become feasible in future planning efforts.	Salinity levels are higher on the west-side of the Region in the groundwater. If climate change decreases surface water availability, and salts continue to rise in the groundwater, desalination efforts will be needed in order to use the water for agricultural, municipal, and environmental purposes.
Precipitation Enhancement	X	Precipitation enhancement, known as 'cloud seeding', stimulates cloud formation to produce more precipitation than in natural conditions. This process is not a remedy for drought, but enhances deliveries of water to a Region in years of excess water supply.	C, K, L	North Kern WSD, a District in the Region, has participated in cloud seeding; however, the lack of steady water supplies and available funds has slowed the expansion of this program. More data are needed to assess effectiveness of cloud seeding operations.	Climate change will likely make water less available to the Region, meaning less will be available for precipitation enhancement efforts (cloud seeding).

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Increase Water Supply					
Municipal Recycled Water	X	Recycled water can be used for many purposes depending on treatment procedures. Reuse requires RWQCB approval. The RWMG actively reuses municipal water for agricultural purposes for non-edible crop irrigation and industrial processes.	J, K	The use of recycled municipal water is limited due to high treatment costs and distribution, depending on use, regulatory issues, and more importantly public acceptance and the marketability of recycled water use.	As climate change threatens to decrease water supplies to the Region, the use of recycled water, for applicable uses, will become more important in order to conserve other water supplies.
Surface Storage (CALFED/State)	X	The CALFED Bay-Delta Program is focused on water issues in the Sacramento-San Joaquin River Delta (Delta). This RMS references improvements to surface storage in the Delta while working to improve conditions. Many water users in the Region rely on Delta water via the SWP or CVP, when available.	A, C, E, K, L	The CALFED Bay-Delta Program is influencing reliability of SWP water and coordinating environmental management. Given the Delta is outside the Region. Regulatory and court-ordered constraints regarding pumping and delivery of SWP water south of the Delta are largely out of the RWMG's control.	Climate change threatens to decrease the amount of water available in regional and state-wide watersheds, including the amount of water available to pump and convey south of the Delta. To mitigate environmental concerns, less water will likely be pumped south via the SWP or CVP. As such, less surface water would be delivered to the districts.
Surface Storage (Regional/Local)	X	Surface storage references the use on or off-stream reservoirs to collect water for later release and use. Users of regional water supplies, such as, Kern River, have long relied on reservoirs like Isabella Reservoir, managed by USACE, to regulate timing of water deliveries to meet demand. Smaller localized reservoirs in the Region also exist.	C, E, K, L	The RWMG is not in control of the larger regional reservoirs, such as, Isabella Reservoir, managed by USACE used for surface storage, thus constraints on the amount of water released or allocated for regional use is factor of hydrologic year, water rights, and infrastructure constraints related to safety of dams.	The decreases or changes in timing of water available to watersheds may decrease and change the amount of water available in large surface storage reservoirs. Large reservoirs may be capable of capturing annual flow, even if it arrives at different time. Smaller localized reservoirs are important to enhance water conveyance, as they are used to regulate water to match supply with demand.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Improve Water Quality					
Drinking Water Treatment and Distribution	X	Providing a reliable supply of potable water for communities (DACs) in the Region is a goal of the IRWM Group. State and Federal drinking water standards require water treatment and distribution facilities to meet specific standards for water suppliers.	G, J, K	Communities (DACs) in the Region rely on groundwater to meet municipal demand. However, aging infrastructure and more stringent water quality standards have adversely affected the ability for DACs to provide reliably supplies.	The obligation for the IRWM Group to identify a reliable source of potable water will not be affected by climate change. The availability of the source of this water, however, may change as there may be a stronger reliance on groundwater for municipal and agricultural purposes due to decreases in surface supplies.
Groundwater Remediation/ Aquifer Remediation	X	Groundwater remediation includes the extracting of contaminated groundwater, treating it, and discharging it into water conveyance facilities or injecting it back into the underlying aquifer. Groundwater recharge in the Region is actively practiced; however, there is not a lot of groundwater remediation activity in the Region.	B, F, G, K	The Region is capable of recharging a significant amount of surface water into the groundwater using recharge ponds or through in-lieu recharge. However, remediation activity is very limited by the costs and supplies for treatment of the higher saline aquifer areas.	Groundwater is partially replenished by deep percolation during irrigation or conveyance seepage; both contribute a salt load into the aquifer making it less available over time for direct reuse. As climate change decreases water supplies for the Region, remediation efforts may need to be strengthened to recover some of this water within the Region.
Matching Water Quality to Use	X	The process of matching water quality to meet requirements for its intended beneficial use, agricultural, municipal, or environmental, is actively practiced in the Region through water quality monitoring efforts and use of treatment facilities.	G, J, K	Obstacles primarily include public acceptance for using lower quality water in any use, even if the standards are deemed applicable, and the distribution of water supplies of differing qualities around the Region.	As climate change threatens to decrease surface water supplies and create a greater reliance on groundwater, the process of matching water quality to meet intended uses will become more important to limit the costs of potentially unnecessary or avoidable treatment processes.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Improve Water Quality					
Pollution Prevention	X	Pollution prevention is separate, and arguably more cost-effective, than end-of-line treatment processes for potable or non-potable water. IRWM Group member participation in regulatory programs, for agricultural, municipal, or environment water purposes has helped to preserve good water quality in the Region.	G, I, J, K	Constraints to an active pollution prevention program include the funds needed to maintain a management program that involves water quality monitoring and to keep up with the changes to regulatory program requirements.	Pollution prevention in available water supply will become more important as water supplies become scarcer due to climate change. Keeping pollutants out of supplies helps to avoid loss of usable supplies in the Region and avoid unnecessary water treatment costs.
Salt and Salinity Management	X	Presently, salinity is a manageable issue in the Region. The IRWM Group interacts with the NRCS regarding on-farm salt management. The Irrigated Lands Regulatory Program (IRLP), of which the IRWM Group participants are members of, is also monitoring salts as an ongoing, regulatory effort in the Region.	G, K	Growers in the IRWM districts work directly with the NRCS with the objective to implement on-farm programs for salinity management. IRWM Group member districts are active in the IRLP, Central Valley Salts Coalition. Constraints include funding for the programs that monitor salts and provide on-farm support.	As climate change decreases surface water supplies available to the Region, efforts to assess salt content and salinity management will need to be strengthened to monitor the amount of salt loading in the Region and potentially, mitigate future costs for treatment.
Urban Runoff Management	X	Urban runoff generally includes both storm water and landscape irrigation water which may wash into storm drains. Both must be managed within communities (DACs) in the Region, to prevent damage to adjacent property or habitats.	J, K	Regional constrains include the extent of communities under jurisdiction of the RWMG, and the community connection with adjacent property. Many communities (DACs) do not have the funds or infrastructure to enact improvement for runoff management.	With changes in precipitation in the Region due to climate change, communities will likely have different and more variable storm water runoff to consider in operations. The potential damage to adjacent properties or habitats due to urban runoff would remain.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Practice Resource Stewardship					
Agricultural Land Stewardship	X	Stewardship is the conservation of natural resources and protection of the environment on agricultural lands. With most of the Region devoted to agricultural lands, land managers must work to protect the open space and traditional characteristics of rural communities and minimize urbanization on these lands.	K, M, N	Regional constraints include funding and incentivizing the continuation of agricultural areas through landowner incentives, regulatory barriers, and urbanization from communities within the Region and larger cities outside the Region, such as, the City of Bakersfield.	Agricultural land stewardship will become increasingly difficult as water supplies are less reliable in the Region due to climate change. It will likely be more of a challenge to continue farming with decreased surface water supplies, or having to compete with municipal users for available surface supplies.
Ecosystem Restoration	X	Ecosystem restoration references the restoration of aquatic, riparian, and floodplain areas as they are most directly affected by water and flood management actions. The IRWM Group recognizes the importance of restoration efforts to protect habitat and improve water quality for environmental resources.	I, K	Land costs in some areas and the feasibility of integrating restoration efforts into projects, programs, and daily management continues to be a constraint for ecosystem restoration efforts in the Region.	Due to the effects of climate change on water supplies in the Region, less water may be available for ecosystem restoration use for water-based habitats and the timing may change. As such, more pressure may be faced with competing priorities for environmental uses in the Region.
Forest Management		Forests are an important environmental resource leading to the production of water and timber, while providing a home for wildlife and native vegetation. Although management is important towards the sustainability of forest areas, there are no such classified areas in the Region.	N/A	No considerable opportunities for forest management in the Region.	Forest lands in surrounding areas will likely change, as climate change threatens to decrease water availability and cause unfavorable changes to temperatures and seasonal effects to wildlife and native vegetation.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Practice Resource Stewardship					
Land Use Planning and Management	X	Considerations of agriculture and urban land use in the Region while providing for the efficient use of water and preservation of water quality. The Safe Drinking Water Act (1996) requires public water systems to ensure sustainability of potable water and compliance with drinking water standards. As such, the IRWM Group considers this a priority for communities in the region.	C, H, I, K, L, N	The integration of land and water use planning is coordinated in the Region among various districts. The IRWM Group works with communities in the Region (DACs) and the districts to promote land use planning, however, differences in district responsibilities regarding local land and water use have constrained efforts.	The obligation for the IRWM Group to consider land use planning will stay the same regarding climate change. The source of Regional water may be affected, which may cause a stronger reliance on groundwater due to decreases in surface supplies. Planning efforts will need to work with communities in assuring land uses remain viable in the Region.
Recharge Area Protection	X	Protection of recharge areas is based on ensuring that areas suitable for recharge are protected from urban development and pollutants prevented from entering the groundwater. This is important to the IRWM Group as it is necessary for developing and maintaining groundwater recharge and banking projects.	C, D, F, K	As urbanization continues in the Region, high land values can make it difficult for the IRWM Group participants to protect recharge areas. However, it is uncertain if funding will inhibit the development of more recharge areas in the Region.	Recharge area protection will not likely be affected by climate change. However, changes in timing of supplies to the region would presumably mean the recharge areas would be used more to regulate supplies.
Sediment Management	X	Proper management of sediments and sediment transport provides multiple water benefits, environmental health, and economic stability. However, there is not much sediment and debris management in the Region.	K	The lack of localized sediment management efforts will inhibit the ability of the IRWM Group to monitor regional sediment and debris issues.	Climate change will not likely alter the practice of managing sediments and sediment transport (debris). However, efforts associated to this RMS may need to be diverted to other priorities due to climate change impacts on the Region.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
Practice Resource Stewardship					
Watershed Management	X	Watershed management includes the process of evaluating, planning, managing, restoring, and organizing land and other resource uses within an area that has a common drainage point, such as, the Kern River and Poso Creek.	A, D, E, I, K, L	Many watershed management programs are implemented by non-governmental organizations like the KRWCA. Coordination with these organizations, while promoting water use in the Region, continues to be a constraint with these efforts.	Climate change is expected to change precipitation and flows in many of the State's watersheds; including the most notable ones pertinent to the region, Kern River and Poso Creek. As such, local and regional water supplies will likely change in availability.
People and Water					
Economic Incentives	X	Economic incentives include financial assistance, water pricing, and water market policies intended to influence water management. Based on the extent of water users in the Region, economic incentives are prevalent but vary based on district policy.	K, L, N	The primary constraint for implementing economic incentives in the Region is funding, determining cost-effectiveness, and justifying the feasibility of financial assistance for specific cases.	Climate change effects will likely affect economic incentives, such as financial assistance for improving landowner and district water management, into incentives for mitigating the impacts of changes to water supplies in the Region.
Outreach and Engagement	X	The tools and practices by which water agencies allow public groups and individuals to contribute to water management through supporting activities and adoption of water-wise practices. As the complexity of water systems and conveyance has grown, the RWMG is committed to engaging with the public, in particular regional water users for improving water management.	J, K, L, M, N	The time, money, and employee resources needed to generate public awareness and continue engagement activities have constrained these efforts by the IRWM Group participants. As such, understanding of technological resources and utilizing outreach opportunities is a continuous practice of the IRWM Group.	The IRWM Group will disseminate information from climate change and environmental studies regarding the Poso Creek Region. Historical versus current, and expected, trends in climate and water data will need to be made aware to the public and landowners in the Region.

Table 4.3 (Continued) IRWMP Resource Management Strategies

Strategy	Applicable to Region	Applicability Assessment	Measurable Objectives	Objectives/Constraints	Climate Change Impacts
People and Water					
Water & Culture	X	Water and culture refers to the awareness of how cultural values, uses, and practices are affected by water management and how this information informs Regional policies and decisions. Since a vast majority of the Region is agricultural land, dependent on local and imported water supplies, the link between regional culture, landowners, and water management is very strong.	J, K, L, N	RWMG Participants, Stakeholders, and Interested Parties typically include landowners in the Region who are fully aware of the water management and planning efforts by the IRWM Group. For those who are not involved in the IRWMP, outreach and engagement efforts have been made a priority of the RWMG (see previous RMS).	There are some concerns regarding the culture of the Region and the acceptance of the effects of climate change and potential impacts on water. The IRWM Group will continue to make efforts to increase public awareness to the potential effects of climate change on the Region and on individual water users.
Water-Dependent Recreation		The public trust responsibility implies that local, State, and Federal agencies should manage the recreation and public access of lands and water resources within the Region. Other than the Kern National Wildlife Refuge, no major public recreational areas in the Region exist, however, some water resources and lands are devoted to recreational purposes of duck clubs.	N/A	There are practically little to none opportunities to promote or sustain water-dependent recreation in the Region. A few recreational water uses, associated with the duck clubs, are supplied through agreements for water supplies from CVP, conveyed through individual districts.	The few recreational water uses that are currently supplied with water may see changes in or elimination of supplies, as priorities are changed in the Region due to changes in overall deliveries from the effects of climate change.

Assessment of the impacts and benefits of each RMS to Regional resource management is covered in Section 6.3. Note that the connections between the Measurable Objectives and the RMSs are hinged on the connection with the RWMG's Regional Goals, as shown and explained in Section 4.6.

4.9 Other Strategies

Other miscellaneous strategies were also listed in the Water Plan Update 2013 that may be considered by an IRWM Group during development of the IRWMP, as applicable. Table 4.4 describes some of these strategies and their compliance with the Measurable Objectives, if applicable. Although some of these strategies may not be currently applicable to the Region, they provide a basis for assessing future planning efforts by the IRWM Group and will be re-evaluated going forward.

Table 4.4 IRWMP Miscellaneous Strategies

Strategy	Description	Applicable to Region	Measurable Objectives
Crop Idling for Water Transfers	Removal of lands from irrigation so water supplies can be transferred to other lands within a service area. Benefits include redistribution of water to higher priority areas and payment to water users who forego their allocated supplies. Loss of crop production, however, can have adverse social and economic impacts on the Region.	X	K, L
Dewvaporation or Atmospheric Pressure Desalination	Dewvaporation is the process of humidification-dehumidification desalination, which is the process of converting saline water to usable fresh water. Applicable to coastal regions and regions with salt increase concerns.		N/A
Fog Collection	Collection of fog for use in municipal water supplies. Applicable to coastal areas where fog events are more dense and frequent.		N/A
Irrigated Land Retirement	Permanent removal of farmland so water supplies can be transferred to other lands within a service area, or taking unproductive land out of production. 'Retired' lands can be converted to other uses with low water demand, or to habitat lands. The strategy reduces water demands, however, may have impacts to neighboring lands or have adverse social and economic impacts on the Region.	X	C, K, L

Table 4.4 (Continued) IRWMP Miscellaneous Strategies

Strategy	Description	Applicable to Region	Measurable Objectives
Rainfed Agriculture	Practice of fulfilling crop consumptive use directly by regional rainfall. Applicable to regions where rainfall frequency, duration, and amount are more predictable and reliable.		N/A
Waterbag Transport/Storage Technology	Waterbag transport and storage technologies involve diverting water in areas with excess freshwater supplies, storing the water in large inflatable bladders, and towing them to coastal regions where the water is less available. This strategy is not currently used in California due to capital costs and permitting requirements.		N/A

Regarding climate change, there is the potential that water supplies will decrease along with a water demand increase in the Region and/or increased salinity buildup. This may result in a greater need to institute and incentivize crop idling procedures or land retirement. These practices may soften the social and economic impacts of reduced cropped acres in the Region due to changes in the climate. Assessment of the impacts and benefits of generalized strategies to Regional resource management is presented in Section 6.3.

4.10 Stakeholder, Agency, and Public Involvement

As mentioned elsewhere, RWMG Participants, Stakeholders, and Interested Parties have remained active in the efforts to develop and refine the Regional Goals and Measurable Objectives. Also, as explained in Section 4.3, an effort has been made to make sure these objectives meet the DWR planning requirements. The direct involvement, outreach, and planning efforts of the RWMG Participants, Stakeholders, and Interested Parties are presented in Section 11.3.

Recall that the planning hierarchy illustrated in Figure 4.1 was used to develop the Plan and assess implementation of various project and programs. As described in the preceding sections, the IRWM Group has used the Measurable Objectives as a means of connecting the Regional Goals and Vision and Mission statements to the Statewide Priorities, RMSs, and other strategies, thereby establishing the Measurable Objectives as a DWR- and RWMG-compliant list used to assess projects and programs. This planning structure, complementary to the aforementioned planning hierarchy, is shown in Figure 4.11.

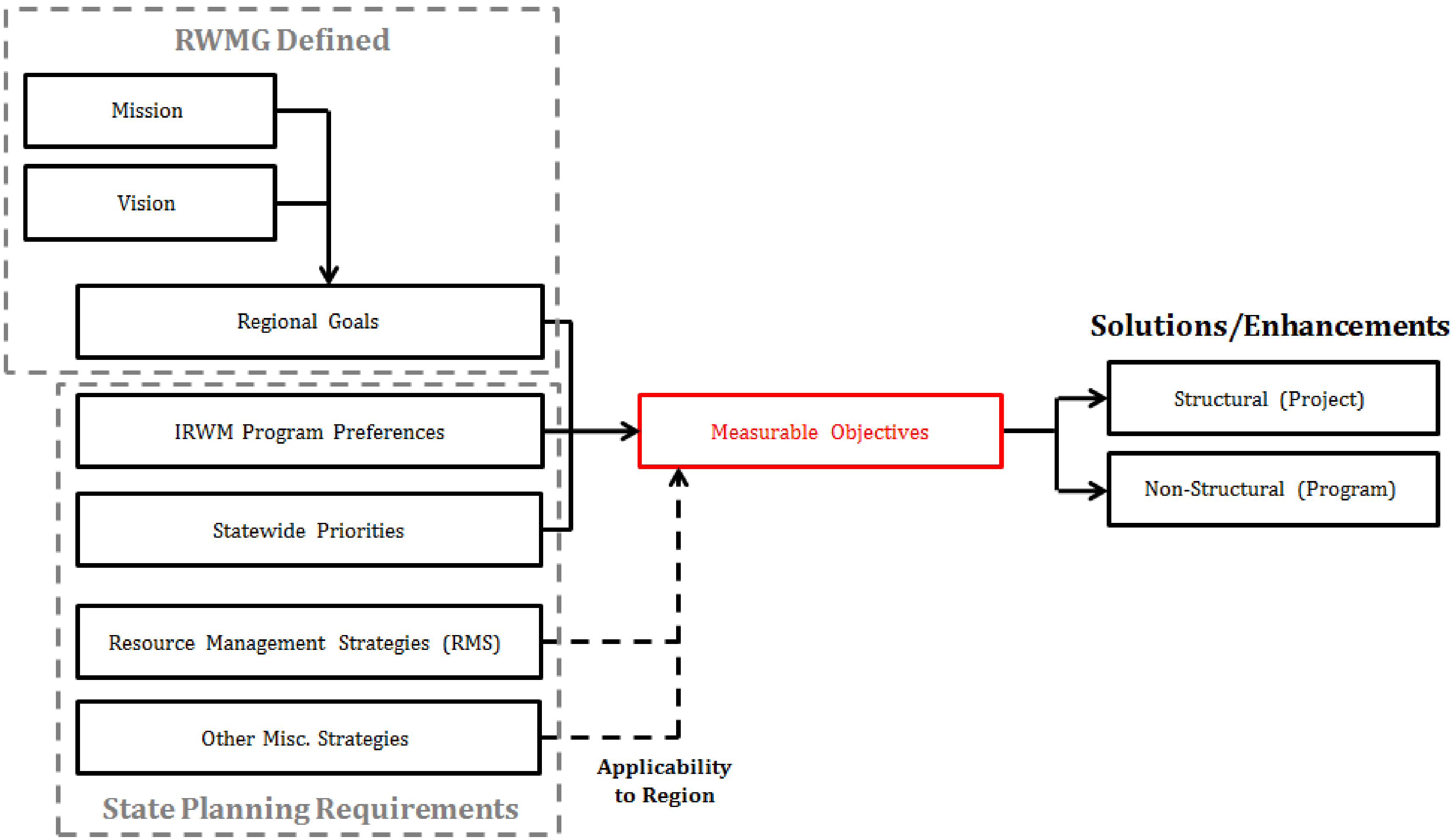


Figure 4.11 IRWMP Planning Structure.

5.0 Projects and Programs Review Process

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Project Review Process' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Procedure for submitting projects, reviewing projects, and communicating lists of selected projects.	5.1
Project contributions to plan objectives.	5.1, 5.2
Project related to Resource Management Strategies.	5.2
Project technical feasibility.	5.1
Specific benefits to DACs.	5.1, 5.4
Environmental justice considerations.	5.4
Project costs and financing.	5.3
Economic feasibility through economic analysis.	5.3
Project status.	5.5
Strategic implementation of plan and project merit.	5.1
Effects of Climate Change in the region.	5.4
Contribution of project in reducing GHGs compared to project alternatives.	5.4
Project proponents will have or adopt an IRWMP.	5.1
Projects will reduce dependency on Delta supplies.	5.4

The RWMG considers and reviews potential projects and programs for implementation following a relatively simple and flexible review process, which was originally presented in the 2007 IRWM Plan. The IRWM Group maintained then and still maintains an 'open door' policy with regard to project and program suggestions. In the 2007 IRWM Plan, selection of projects and programs emphasized the applicable Planning Objectives (principally, water supply reliability); a very similar emphasis continues in this Plan Update. Implementation of selected projects and programs depends on aligning their characteristics with appropriate funding opportunities, at least in the case of those requiring funding assistance to move forward. The review process has remained very similar to the original approach (i.e., "simple and flexible") however, the selection emphasis will shift to conformance with the Regional Goals and Measurable Objectives described in Section 4.0.

The RWMG follows relatively simple and flexible project and program review procedures to accomplishing the review process, including:

- Submission of a project/program description to the RWMG for consideration to be included in the IRWM Plan by using the Project Definition and Characterization Form (PDCF), which is included in Appendix G.

- Review of the submitted programs and projects to implement the IRWM Plan and vetting of the review at a public RWMG meeting, which is documented by RWMG Implementation meeting Agenda and Minutes.
- Maintenance and dissemination of a list of selected programs and projects, which are included in Appendices A1 and A2.

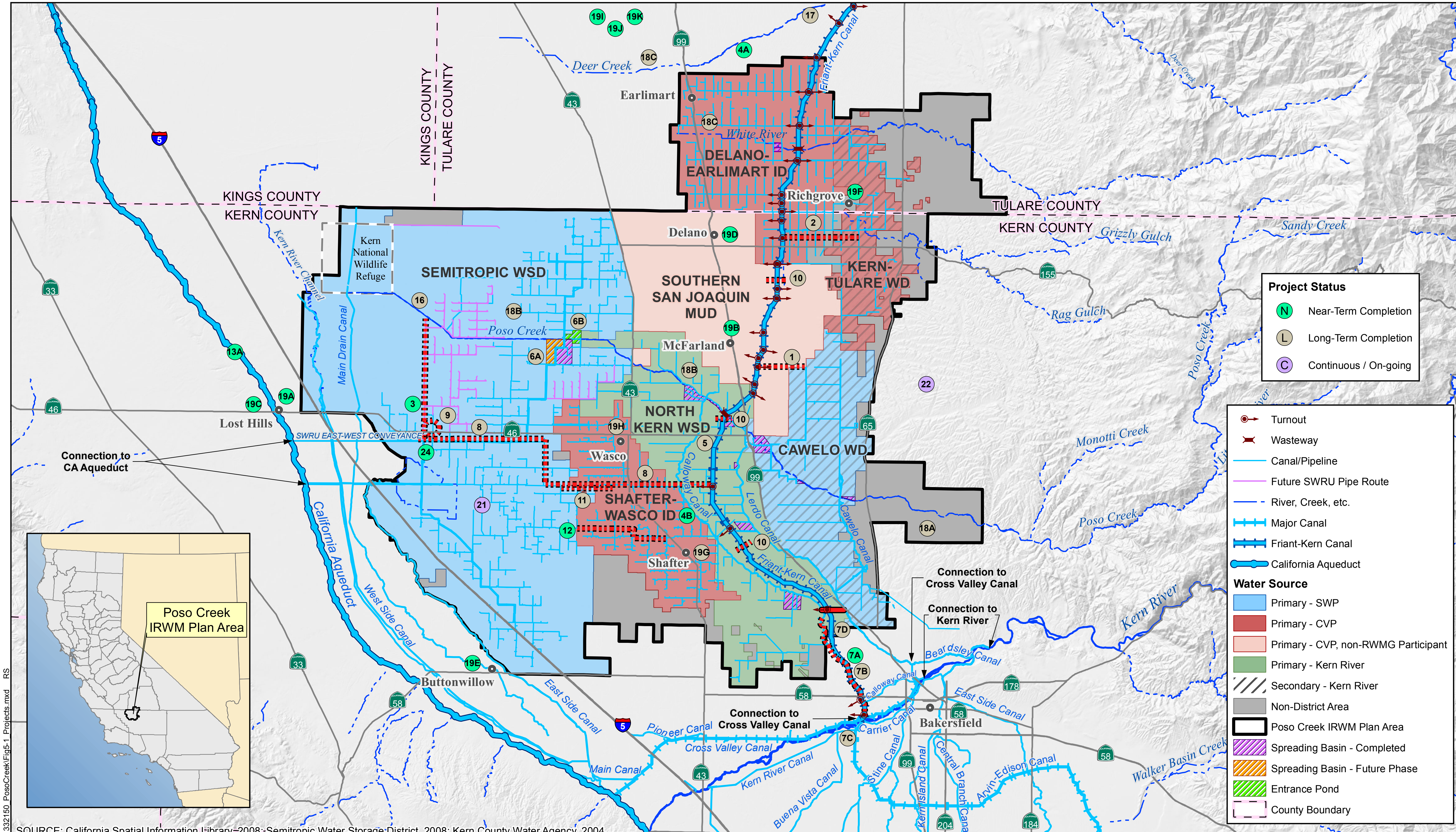
Projects and programs can be submitted to the RWMG for consideration at any time using the PDCF, after which they are further developed and refined through discussions of the IRWMP Group. The RWMG maintains a project list, shown in Appendix A2, which is linked to a map of the Region for ease of reference, as shown in Figure 5.1. Both new and revised projects and programs are considered for review by the RWMG during periodic public meetings. Projects and programs that provide benefits primarily to DACs in the Region are reviewed first by the DAC Work Group and then presented to the RWMG for discussion, consideration, and approval for inclusion in the IRWMP project list during the public meetings. Additions or modification to the list of the projects and programs included within Appendix A2 of this Plan, list will be noted in the Annual Reports.

Since the RWMG formed in 2006, it is worth noting that the IRWMP Group has successfully completed approximately $82 million in planning and project and program implementation activities, which has been the result of leveraging local monies with both State and Federal grant funding. A ‘Report Card’ has been compiled by the RWMG that identifies each of the accomplishments and a copy is included in Appendix A1. These accomplishments are the product of a RWMG review process which has been in place since 2006.

5.1 Identification and Submittal of Projects and Programs

The IRWM Group routinely identifies possible projects and programs and submits them to the RWMG for consideration for inclusion in the IRWM Plan (referred to herein as Project Submissions). This Plan Update has refined the project submittal process by modifying the project and program submittal to include use of the PDCF. Projects and programs submitted, received, and reviewed by the RWMG subsequent to the latest version of the Plan will appear in the Annual Report and in subsequent planning documents, such as, the next formalized IRWM Plan update.

New and revised Project Submissions are identified by a RWMG Participant, Stakeholder, or Interested Party, a PDCF completed, submitted, and then proposed to the RWMG for discussion during periodic, public meetings. Project Submissions follow the PDCF; an example of the PDCF is provided in Appendix G.



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2014 Integrated Regional Water Management Plan (IRWMP) Update

Kern and Tulare Counties, California

Poso Creek IRWM Group

GEI Consultants
Bookman-Edmonston Division

IRWM PLAN PROJECTS AND PROGRAMS IDENTIFIED IN THE POSO CREEK REGION

JUNE 2014

FIGURE 5.1

15-May-2014 Z:\Projects\1332150_PosoCreek\Fig5-1_Projects.mxd RS

A PDCF is expected to address the following information:

1) Generalized project background, description and characteristics, including project type, sponsor, location, estimated cost, benefits, and impacts related to the IRWMP and Region;
2) Project/program regional operation related to dry, typical, and wet hydrologic years and conditions;
3) Goals and objectives of the project or program;
4) Consistency with IRWM Plan Measurable Objectives;
5) Relationship with other projects in the IRWM Region;
6) Project impacts and benefits within the IRWMP;
7) Preliminary cost estimate;
8) Readiness to proceed; and
9) Implementation schedule.

The RWMG will disseminate a call for Project Submissions to the IRWM Group for consideration through e-mail and/or distribution at the public meetings. Following deliberation by the IRWM Group, project selection decisions by the RWMG are accomplished by a simple-majority vote at one of the aforementioned public meetings. The RWMG Participants utilize their experience managing water in the Region; their knowledge of ‘best resource management practices’, conformance with prior planning efforts, and multi-district regional benefits; and the advice of the Work Groups to assist in the approval and prioritization of submitted projects and programs. The process for selecting and reviewing Project Submissions is shown in Figure 5.2. Regarding project and programs that are intended to primarily benefit DACs, or DACs that are outside the Region boundary but are Interested Parties of the IRWM Group, the RWMG will rely on the recommendations of the DAC Work Group and the DAC Representative to assess potential benefits and provide support for project selection. As with any other project, DAC projects and programs must adhere to the IRWM Plan’s Measurable Objectives.

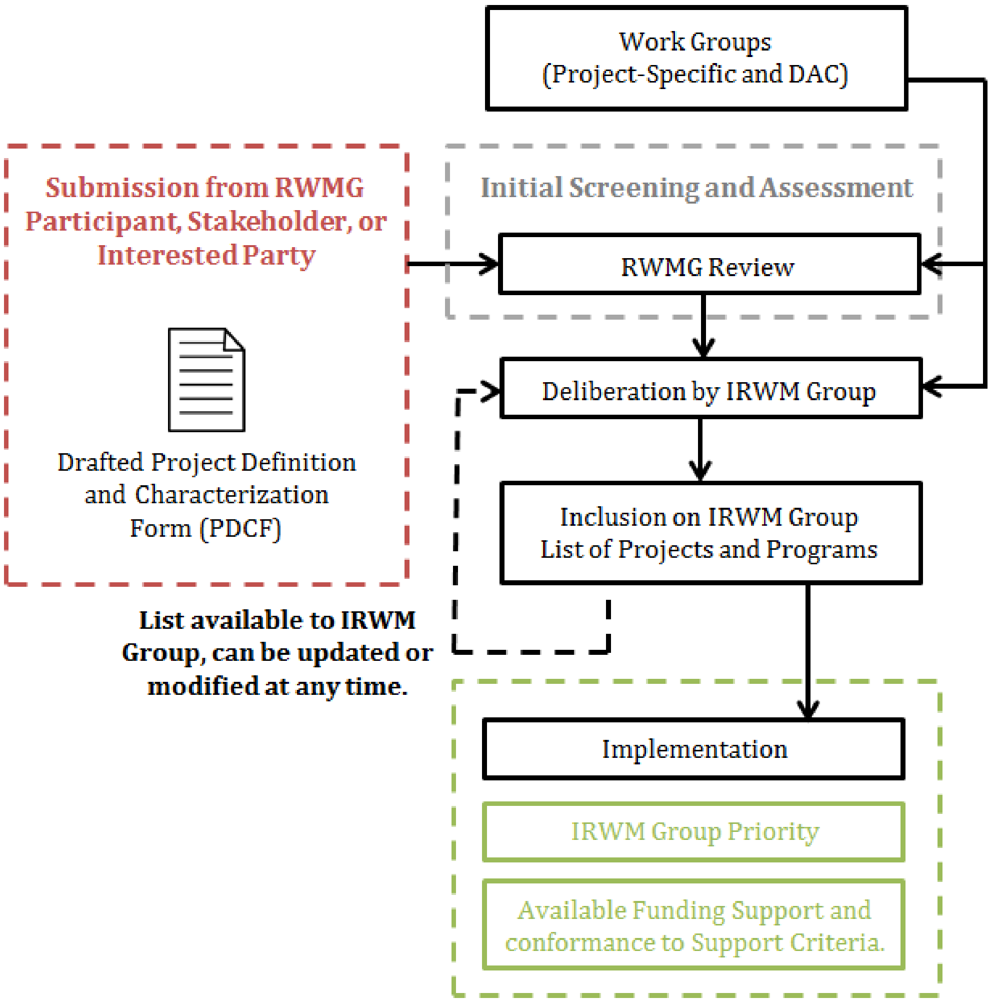

Figure 5.2 Projects and Program Submission and Review Process

In the 2007 IRWM Plan, the RWMG developed a total of 29 project and program descriptions, which were regional in nature. At the time, the IRWM Group simply categorized these projects and programs into "structural" and "non-structural" water management measures, which were aligned with the Planning Objectives and regional water management strategies of the 2007 IRWMP. For the 2014 Plan Update, the RWMG has categorized submitted and approved (for review) projects and programs using similar information, including:

- Categorize by structural "project" and non-structural "program";
- Applicable Measurable Objectives (addressed), and
- Regional, Multi-district Benefits.

As part of the adoption of the 2014 IRWMP, an updated list of the projects and programs are included in Appendix A2. The accomplishments related to completed projects and implemented programs are indicated in the Report Card (Appendix A1).

5.2 Compliance with Measurable Objectives

The 2014 IRWM Plan Objectives, as described in Section 4.5, were developed as a means of accomplishing the Regional Goals and providing direct support for the DWR Statewide Priorities and Water Plan RMSs. These Objectives provide the primary connection between regional projects and programs and other considerations in the planning structure, as identified in Figure 4.11. Submitted projects and programs are required to be compliant with these Objectives.

Project Submissions are required to provide a preliminary assessment of consistency with the Measurable Objectives, as identified in Part 4 of the submitted PDCF. In addition to this assessment, the RWMG will also compare each Project Submission to the list of Measurable Objectives directly using the resources provided by the proponent and their experience managing water and other resources in the Region. A Project Submission does not have to adhere to more than one Measurable Objective to be eligible for consideration by the RWMG; however, it is likely that a project and/or program that meets multiple objectives and provides regional benefits may be given greater consideration. It is noted that the RWMG will not approve a project and/or program for consideration unless there is a clear link, either quantitatively (preferred) or qualitatively, between one or more of the Measurable Objectives and the potential benefits of project or program implementation.

Section 4.4 of the Plan also indicates and describes the differences between Regional Goals that have been designated as “Primary” (Goals 1 through 5) and those designated as “Secondary” (Goals 6 and 7). The linkage between all Regional Goals and the Measurable Objectives is shown in Section 4.6, illustrating that the Objectives may meet one or more of the Regional Goals and vice versa. As stated, there is an overwhelming need within the Region to meet the Primary Regional Goals related to regional water supplies. Accordingly, projects and programs that adhere to these Primary Regional Goals will likely be given greater consideration. However, the RWMG actively looks to integrate Secondary Regional Goals, related to sustainability or environmental concerns in the Region, into projects or programs that meet one or more of the Primary Regional Goals.

It is noted that adherence to the Measurable Objectives implies adherence to the Statewide Program Preferences and RMSs as described in Sections 4.7 and 4.8, respectively. These, and other strategies, will be considered on a project and/or program basis based on the Measurable Objective identified. As with the other considerations, projects and/or programs that address multiple strategies and/or preferences through multiple objectives will likely be given more consideration during review.

5.3 Funding Opportunities

Since the list of regional projects and programs approved and maintained by the RWMG is subject to change with new and revised submissions, there is a need to prioritize the list when considering a specific grant funding opportunity. Generally speaking, "prioritization" is based on adherence to multiple Measurable Objectives or conformance to the Primary Regional Goals, and is subject to the needs of the entire IRWM Group as determined during the deliberation of projects and programs. Not all projects or programs on the list are prioritized; rather, certain projects or programs may be preferred, or make sense regionally to sequence in a certain order to expedite the realization of regional benefits, and therefore may be implemented earlier than others.

Project implementation has been accomplished through a mix of local and non-local funding opportunities that complement or match the local funding contribution. These funding opportunities have been from a variety of sources and programs, each with its own eligibility and selection criteria; however, to date, all have been managed under State (DWR) or Federal (USBR) authorities. The RWMG makes an effort to stay in touch with both federal and state agencies with potential funding opportunities, so as to be better prepared or positioned when funding opportunity announcements are actually issued. The IRWMP list of projects and programs is open to consideration from Stakeholders and Interested Parties, including DACs, and is discussed with the RWMG during the public meetings. Preferred projects and programs are deliberated within the IRWM Group based on their adherence to the eligibility and selection criteria for a specific funding opportunity. Similar deliberations and assessments are performed for other projects and programs on the IRWM Group's list, eventually resulting in a recommendation of the "best fit" for the given funding opportunity. While formulating the grant proposal, the RWMG primarily relies on the assistance of Work Groups, including the DAC Work Group, before making the final selection of projects and programs best suited for a given funding opportunity.

Once the IRWM Group has reached a decision, which need not be unanimous, the RWMG Participants vote on whether or not to pursue the specific funding opportunity with the selected projects and programs. Once a majority vote by the RWMG is reached, the project or program 'Sponsor(s)' will be expected to collaborate to fund the preparation of the funding proposal, utilizing internal or external resources, such as a consulting firm. In practice, one district, agency, or entity will prepare the funding proposal, even if there is more than one sponsoring entity. This is done to comply with requirements of the funding opportunity (which typically are based on a single contracting entity), as well as for the sake of efficiency and expediency, given the short time frame that is typically available for proposal preparation. The RWMG has completed several collaborative grant proposals utilizing under their MOU and a cost-sharing agreement among the sponsoring entities.

5.4 Other Considerations

Although not formally addressed on the PDCF for Project Submission, a project or program Work Group is expected to review and address the following considerations and report applicable information to the IRWM Group during the periodic meetings; initial screening and assessment; and IRWM Group deliberation processes. If no Work Group is appointed for a specific project or program submission, then the submitting party may be asked to provide this information along with the PDCF.

- Potential impacts and/or benefits to DACs in the Region. Primarily the necessity of a project or program towards meeting the critical drinking water needs of a community, and the opportunity to provide a solution that may not otherwise be accomplished due to local funding limitations.
- Potential impacts and/or benefits to environmental resources in the Region; in particular, the potential impacts on local flora and fauna, specifically, endangered species and local habitats.
- Climate change considerations, including the project's or program's impact on the Region's ability to cope with the impending impacts of a changing climate (reference Section 13.0); specifically, the potential reduction or mitigation of Greenhouse Gas (GHG) Emissions or air pollutants in the Region.
- Potential impacts and/or benefits to the water supply reliability in the Region. For instance, the impacts or reduction in water supply from the Sacramento-San Joaquin River Delta for SWP supplies, and Sierra Nevada runoff for CVP and local supplies.
- Potential impacts and/or benefits to neighboring regions (IRWM Groups), including the ability to work jointly on multi-regional water management.

5.5 Maintenance of Project and Program List

The list of the approved projects and programs is included as Appendix A2. Additions or modifications to the Project and Program list will noted in the Annual Reports. The Annual Reports will be made available to all RWMG Participants, Stakeholders, and Interested Parties. Since the list may be updated or modified periodically, the RWMG public meeting Minutes will contain recommended additions or modification to the Project and Program List. The Annual Report will note changes to the projects and programs proposed by the IRWM Group. The Lead Agency, Semitropic, maintains and provides the resources necessary for compiling the list and, therefore, can be contacted to obtain the up-to-date list.

6.0 Impacts and Benefits

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Impact and Benefit' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Potential impacts and benefits of plan implementation with the IRWM region, between regions, with DAC/EJ concerns and Native American Tribal communities.	6.1, 6.3, 6.4, 6.5
When a more detailed project-specific impact and benefit analysis will occur (prior to implementation activities).	6.6
Impacts and benefits section of the plan as part of normal plan management activities.	6.2

Identified projects and programs, as defined in Section 5.0, are expected to provide certain benefits for, and will have specific impacts on, the Region and surrounding areas. This section addresses general benefits for the Region based on estimated improvements to regional water management through the applicable RMSs. Specific impacts and benefits to IRWM Stakeholders and DACs from implementation of the Plan are also discussed.

Identifying the impacts and benefits of implementing the Plan is important for several reasons, which have been outlined in the IRWMP Proposition 84 Program Guidelines. In particular, it helps to:

1. Identify and prioritize the Regional Goals and Measureable Objectives, per the applicable RMSs (see Section 4.8);
2. Recognize and identify adverse impacts in addition to the more obvious benefits realized when implementing projects and programs;
3. Establish a benchmark for evaluating IRWMP performance.

Evaluation of Plan performance and monitoring specifications, including monitoring of impacts and benefits, are described in Section 7.3. The assessment of Regional and Inter-Regional impacts and benefits is based on generalized assumptions and qualitative assessments; it is not meant to provide a quantitative assessment of exact water savings by the implementation of individual projects or programs. However, quantitative assessments are considered and will be addressed in more detail as a project and program moves into implementation.

6.1 General and Economic Benefits of Regional Water Management

The *Findings and Conclusions* from the 2007 IRWMP identified the Region's primary issue as water supply quantity and reliability, regarding imported surface water supplies from local, State (SWP), and Federal (CVP) sources. At that time, the long-term average annual reduction in imported supplies delivered to districts and users within the Region was projected to be on the order of 100,000 acre-feet. The water supply concerns have only worsened since 2007, with decreased reliability of SWP water, which has been the result of additional regulatory/court-ordered constraints on pumping from the Sacramento-San Joaquin River Delta. The 2014 Plan Update emphasizes measures to mitigate the reduction in imported water supplies. Accordingly, most of the benefits and impacts are related to this emphasis.

As mentioned previously (reference Section 1.1), prior to forming the RWMG, each of the agricultural water districts managed their water supplies more or less independently of neighboring districts. With formation of the RWMG in 2006, the focus was broadened to the collective assets of the Region in order to enhance regional water supplies and improve regional water conveyance and conservation, all within the shared groundwater basin. Since that time, the Vision and Mission have developed and are addressed in Section 4.2. Under this umbrella, several of the projects and programs included in the 2007 IRWMP have been implemented. As described in the 2007 IRWMP, the key *benefits* to regional water management include:

- Development of long-term vision for regional water management, institutional agreements for operations between districts, and coordination regarding water quality issues;
- Improved regional water reliability and increased operational flexibility;
- Reduced potential for conflict and increased cooperation for management of water resources (supplies) across political boundaries;
- Implementation of goals and objectives that support economical and efficient use of water within the Region;
- Coordinated regional project and program development, and improved sequencing of project and program implementation;
- Established framework for sharing regional water management ideas and information;
- Shared cost for regional water planning; and
- Increased understanding of regional water quality issues.

Many of these benefits have been realized to some extent with the implementation efforts which have been ongoing since adoption of the 2007 IRWMP, as listed in Appendix A. Continuation of the efforts of the RWMG Participants, along with the involvement of Stakeholders and Interested Parties, is essential to maximizing these benefits. Conversely, the 2014 Plan Update recognizes the potential impacts that dissolution of the RWMG would have on the Region, assuming a return to more "independent" water management decisions, which could result in more conflicts between districts. Under this scenario, it is reasonable to conclude that less cooperation would result in less surface water brought into the Region, which would exacerbate declining groundwater levels and increase the potential for land surface subsidence. The regional water management which has been practiced for several years now has evidenced the successful implementation of several key regional projects and programs. These "successes" can be expected to have the effect of strengthening the will of the RWMG to continue planning and implementation efforts in the Region, which will leading to further realization of the benefits listed above.

6.2 Plan Impacts and Benefits

In addition to the benefits listed in Section 6.1, implementation of the 2014 Plan Update will provide the following benefits beyond the 2007 IRWMP:

- Broader planning focuses; from water resource management to more generalized resource management. For example, the discussion of water supply and demand has been expanded to reflect environmental and climate change assessments.
- Establishment of broader and more refined Regional Goals and Measurable Objectives (reference Sections 4.4 and 4.5).
- Greater emphasis on protection from drought conditions.
- Implementation of updated Resource Management Strategies (RMSs), including both structural and non-structural solutions (reference Section 4.8).
- Maintain compliance with State and Federal planning requirements, thereby increasing chances for obtaining funding assistance from State/Federal grant programs as a region, rather than as individual local agencies (districts).

While the 2007 IRWMP reflected the groundwater emphasis of the Proposition 50 Guidelines, the above-listed benefits illustrate the broader resource management assessment emphasis of the Proposition 84 Guidelines, which is reflected in the 2014 Plan Update. The Plan Update also reflects the management efforts and accomplishments since adoption of the 2007 IRWMP. One consequence of not developing and implementing an updated IRWMP is the risk of using potentially out-of-date information to inform planning decisions and regional priorities.

To maintain the most up-to-date Plan, the impacts and benefits assessment in the IRWMP will be periodically revised according to any revisions to the Proposition 84 IRWM Program Guidelines. Presently, assessment of impacts and benefits will comply with the following guidelines:

- Impacts and benefits will be reviewed and revised whenever the IRWMP is updated or DWR establishes new guidelines for this standard. It is expected that the IRWMP will be updated at least every 5 to 7 years.

- Impacts and benefits will be revised, as appropriate, to reflect anticipated or observed changes in the regional climate.
- Impacts and benefits will be revised to reflect lessons learned, or new impacts or benefits identified during implementation of local projects.

6.3 Resource Management Strategies

As mentioned in Section 4.8, Resource Management Strategies (RMSs) are defined as a technique, program, or policy that helps local agencies and governments manage their water and related resources. There are 31 RMSs identified in the Water Plan Update 2013 for consideration by the RWMG, and each was assessed in Table 4.3 in terms of its connection to the Measurable Objectives and the whether they are applicable to the Region. All but three of these strategies were judged to be potentially applicable.

Table 6.1 addresses the screening level assessment of the impacts and benefits of the Resource Management Strategies with regard to the Region and to surrounding areas. The impacts and benefits of the potentially applicable strategies reflect the impacts and benefits of Plan implementation.

Table 6.1 Screening-Level Assessment of Impacts and Benefits of IRWMP Resource Management Strategies

Strategy	Regional Impacts	Regional Benefits	Surrounding Area Impacts	Surrounding Area Benefits
Reduce Water Demand				
Agricultural Water-Use Efficiency	Impacts include reduced groundwater recharge from deep percolation and changes in operations for growers that may involve new hardware and maintenance.	Benefits include extended water supplies, including less water applied at farm-level and reduced water costs to users. May also decrease nutrients in deep percolation of applied water.	Interregional impacts from improvements to agricultural water-use efficiency include reduced recharge from deep percolation to aquifers that may be connected to neighboring areas.	Interregional benefits include the potential increase in water supply availability and delivery flexibility, as more efficient practices ensure less applied water and a reduction in deep percolation that may contain nutrients.
Urban Water-Use Efficiency	Impacts include changes in operations using existing municipal infrastructure by increased metering and management efforts, and potential losses in revenue with less water used.	Benefits include extended water supplies as less water is used for municipal purposes and reduced water and energy costs to regional communities.	Interregional impacts include reduced supplies to neighboring areas from improvements to urban water-use efficiency as less return flow water from watering landscape or wastewater effluent.	Interregional benefits include the potential increase in water supply availability, as more efficient practices ensure that less water will be applied and consumed.
Improve Flood Management				
Flood Management	Impacts include capital costs for projects and programs needed to manage flood flows in the Region, as well as ongoing maintenance costs, permitting costs, and emergency response planning.	Benefits include enhanced flood protection to the Region, including less flood-damage risk and the potential for recharging excess inflows for later uses.	Interregional impacts include limitations on urban and agricultural development in some high flood-risk areas, as well as increased flood management combined efforts between regions.	Interregional benefits include reduced downstream flood risk, thereby better managing excess upstream flows between regions. Will likely lead to decreased flood recovery costs due to less flood damage.
Improve Operational Efficiency and Transfers				
Conveyance (Delta)	Impacts include less supplemental (surface) water supplies and changes in operations using existing infrastructure and planning efforts.	Benefits include more effective conjunctive use operations. Also increased flexibility for deliveries.	Interregional impacts include changes in quantity and timing of deliveries from the Delta.	Interregional benefits include a positive environmental impact on the ecosystem of the Delta from an increased flexibility on demand for SWP supplies in the San Joaquin Valley.

Table 6.1 (Continued) Screening-Level Assessment of Impacts and Benefits of IRWMP Resource Management Strategies

Strategy	Regional Impacts	Regional Benefits	Surrounding Area Impacts	Surrounding Area Benefits
Improve Operational Efficiency and Transfers				
Conveyance (Regional/Local)	Impacts include less supplemental (surface) water supplies available and changes in operations using existing infrastructure and planning efforts.	Benefits include improved capacity to increase water reliability in the Region, as well as shared expenses for added flexibility for water delivery to complete transfers.	Interregional impacts include some changes in water reliability and salt content in water supplies, movement of salt between areas, and a need for increased management.	Interregional benefits include a positive impact on the groundwater system through increased flexibility for surface water deliveries.
System Reoperation	Impacts include the change of historical water supplies delivery and use in time.	Benefits include the potential enhancements to water conveyance and quality as a result of improving regional operations, including habitat considerations and improved flood protection.	Interregional impacts include greater effort for water management requirements and cooperation between regions to ensure reoperations work towards common resource management goals.	Interregional benefits include potential increase in water conveyance capacity, increase reliability of supply and flexibility for deliveries, and maintain quality of water for users.
Water Transfers	Impacts include a transfer of local water supplies to surrounding areas and other regions and the possible environmental impacts of moving water from a region.	Benefits include the efficient use of surface water supplies when available, and sources of revenue for regional water management efforts.	Interregional impacts include inflated water prices during transfer and exchange agreements, and the possible environmental impacts of moving water between regions.	Interregional benefits include agency cooperation and planning efforts that benefit multiple regions (from a water supplies standpoint).
Increase Water Supply				
Conjunctive Management and Groundwater Storage	Impacts include pumping to recover water in groundwater storage and increased data collection and monitoring costs for groundwater levels.	Benefits include being able to regulate surface supplies with varying hydrologic conditions while making effective use of the underlying groundwater basin. A successful conjunctive use strategy can help mitigate groundwater use and improve water supply reliability.	Interregional impacts include the energy used to recover water stored in groundwater bank, as well as changes to land use to allow for surface water deliveries and return of stored water.	Interregional benefits include greater water supply reliability and mitigation of curtailed supplies in particularly dry (drought) years. Effective conjunctive use management can be used to reduce flood flow in the Region and neighboring areas.

Table 6.1 (Continued) Screening-Level Assessment of Impacts and Benefits of IRWMP Resource Management Strategies

Strategy	Regional Impacts	Regional Benefits	Surrounding Area Impacts	Surrounding Area Benefits
Increase Water Supply				
Precipitation Enhancement	Impacts include altering the timing and distribution of water supplies in the Region. If water delivery is regulated by a storage reservoir, may not have any adverse impacts.	Benefits include an increase of water supply available for beneficial use in the Region.	Interregional impacts include a potential to increase water supply and the use of seeding agents in one particular area.	Interregional benefits include the potential to increase water supply, cloud build-up, and precipitation in surrounding areas to the Region.
Municipal Recycled Water	Impacts include increased costs for treatment and distribution operations, while complying with regulations and waste disposal guidelines. Process requires trained operators and secured facilities for operation.	Benefits include a reliable supply of water, regardless of hydrologic year, and the use of improved water quality (following treatment) for agricultural and environmental uses.	Interregional impacts include the energy use for operating treatment facilities or disposal of brine waste stream created by treatment process.	Interregional benefits include the potential for reducing groundwater pumping by use of recycled water, and the potential consolidation and joint-use of facilities, if feasible for the small communities in the Region.
Surface Storage (CALFED/State)	Impacts include the planning and permitting requirements, as well as the cost, for Delta Conveyance and reservoir water storage. If a failure of the major dam and reservoir (Isabella Dam) occurred, it would adversely affect the Region's ability to regulate available Kern River supplies.	Benefits include the ability to increase water supply reliability by absorbing surplus water into storage during "wet" periods to be available during "dry" periods, such as, during a drought.	Interregional impacts include reduced reliability and the potential failure of a large-scale dam and reservoir, such as Isabella Dam, leading to large-scale flooding in the downstream areas. The reductions in water reliability south of the Delta may also adversely affect local habitats.	Interregional benefits include the ability to effectively manage and distribute water sources conveyed south of the Delta or from Isabella Dam and Reservoir, leading to improved water resources management, and to the added recreational benefits a large reservoir provides, such as Lake Isabella.
Surface Storage (Regional/Local)	Impacts include the planning and permitting requirements, as well as the cost, for storage of water in a Regional reservoir, or in a local regulating reservoir.	Benefits include the ability to increase water supply reliability by absorbing surplus water into storage during "wet" periods to be available during "dry" periods, such as, during a drought.	Interregional impacts include the reduction of surplus water available for other areas.	Interregional benefits include the ability to use stored water supplies to meet transfer and exchange agreements with surrounding areas.

Table 6.1 (Continued) Screening-Level Assessment of Impacts and Benefits of IRWMP Resource Management Strategies

Strategy	Regional Impacts	Regional Benefits	Surrounding Area Impacts	Surrounding Area Benefits
Improve Water Quality				
Drinking Water Treatment and Distribution	Impacts include increased costs for treatment and distribution operations, while adhering to drinking water regulations and waste water disposal guidelines. Processes require trained operators and secured, updated facilities to maintain operations.	Benefits include public health protection, regarding potable water distribution for community users, and maintaining regulatory compliance in the Region.	Interregional impacts include the energy use for operating treatment facilities or disposal of brine waste stream created by treatment process.	Interregional benefits include the treatment of water for the smaller communities around the Region; and the potential consolidation and joint use of facilities, if feasible, for the small communities in the Region, which may lessen the associated cost requirements.
Groundwater Remediation/ Aquifer Remediation	Impacts include the cost of remediation efforts and the potential issues with public perception for treating and injecting water back into the underlying (shared) aquifers.	Benefits include the avoided costs of purchasing additional water supplies for the Region; however, groundwater remediation activity is not prevalent in the Region.	Interregional impacts include the energy use or waste stream from remediation processes being introduced to the area.	Interregional benefits include addition of supply to offset water demand in Region, with the potential of more water being available for areas outside of the Region.
Matching Water Quality to Use	Impacts include the possible environmental impacts of using lesser quality water, as well as the infrastructure and conveyance costs of delivering and differentiating water of different qualities.	Benefits include making use of available water supplies in the most effective and economical manner while avoiding potentially unnecessary water treatment.	Interregional impacts include decreases in water supply quality, particularly in groundwater where water of lesser quality is recharged or percolated.	Interregional benefits include potential partnerships between the regions for delivering and differentiating water of different qualities, possibly minimizing the water delivery costs.
Pollution Prevention	Impacts include the continuous monitoring and management efforts needed to mitigate the potential impacts of pollution. State and Federal regulations regarding pollution control will also impact the amount of water that is usable in the Region without being treated.	Benefits include improved water quality for uses in the Region, resulting from mitigating the potential impacts of pollution and meeting State and Federal regulations.	Interregional impacts include challenging monitoring efforts for multiple Regions that receive water supply from same sources, such as SWP and CVP, and being able to distinguish between natural and introduced contaminants when working towards solutions.	Interregional benefits include being able to protect water sources for their intended beneficial use from the potential impacts of pollution, such as, maintaining water quality suitable for irrigation.

Table 6.1 (Continued) Screening-Level Assessment of Impacts and Benefits of IRWMP Resource Management Strategies

Strategy	Regional Impacts	Regional Benefits	Surrounding Area Impacts	Surrounding Area Benefits
Improve Water Quality				
Salt and Salinity Management	Impacts include the movement of salts from one area in the Region to another, and the increased management efforts needed to monitor and reduce salinity concerns.	Benefits include increased longevity of irrigated lands in the Region while protecting beneficial water and soil use and postponing any potential issues with quality due to salinity content.	Interregional impacts include having to potentially retire lands due to inadequate water supplies of sufficient quality, as well as salt content build-up in the soils, and the resulting economic impacts due to land retirement.	Interregional benefits include regional collaboration and increased longevity of lands due to decreased levels of salts in water supplies and limiting saline water movement.
Urban Runoff Management	Impacts include the costs and infrastructure maintenance and enhancements necessary to manage urban runoff, thereby increasing the costs of urban development.	Benefits include the reduction in surface water pollution and minimized sedimentation problems. Urban runoff water is recharged in the Region to the groundwater basin.	Interregional impacts include possible groundwater contamination from recharged urban runoff water which is not sufficiently treated.	Interregional benefits include the water supply that is recharged into the groundwater and available to offset demand, allowing for more flexible water use within surrounding areas.
Practice Resource Stewardship				
Agricultural Land Stewardship	Impacts include the costs to implement efficient water management and resource practices by growers in the Region, likely affecting the costs of agricultural production.	Benefits include the implementation of efficient practices that increase the economic viability of agricultural lands.	Interregional impacts potentially include limiting the availability of land for conversion to urban areas to accommodate a growing population.	Interregional benefits include the preservation of agricultural and high-productivity lands.
Ecosystem Restoration	Impacts include increased costs for lands which are being restored, as well as the competing need for water supplies to restore these areas.	Benefits include the protection and enhancement of habitat resources in the Region.	Interregional impacts include opposition to restored lands and to environmental water uses for restoration efforts.	Interregional benefits include protection and enhancement of habitat resources in areas immediately surrounding the Region and providing natural water quality filtration areas.

Table 6.1 (Continued) Screening-Level Assessment of Impacts and Benefits of IRWMP Resource Management Strategies

Strategy	Regional Impacts	Regional Benefits	Surrounding Area Impacts	Surrounding Area Benefits
Practice Resource Stewardship				
Land Use Planning and Management	Impacts include the time and monetary resources required towards getting land and water use planners to coordinate on planning efforts.	Benefits include improved communication, planning, management support, and involvement among the planning groups.	Interregional impacts include overlapping efforts of various IRWMPs regarding land use planning, and the financial cost on different regions.	Interregional benefits include the potential for reduced conflicts between regions (IRWMs) when planning new projects or programs.
Recharge Area Protection	Impacts include the change in land use and the monitoring efforts needed to sustain the recharge lands. The recharge areas may also provide a home to mosquitos.	Benefits include providing a sustainable water supply that is of usable quality; in particular, once water is recharged it reduces evaporative losses. Allows for flood protection in periods of surplus water in Region.	Interregional impacts include the diversion of surface water supplies, generally surplus water in "wet" periods, away from potential recharge uses in other regions.	Interregional benefits include recharge of usable quality water into the groundwater and mitigating the impacts of groundwater pumping and ground subsidence throughout the area. Recharge areas also provide a means for employing groundwater banking efforts used to store water for other regions.
Sediment Management	Impacts include the movement of sediments and debris from one area in the Region to another, and the increased management efforts needed to monitor and reduce sediment concerns.	Benefits include increased longevity of irrigated lands in the Region due to decreased levels of sediment and debris which may damage these lands.	Interregional impacts include having to potentially remove sediment and debris from lands and the resulting economic damages to the Region and surrounding areas.	Interregional benefits include longevity of lands due to decreased levels of sediment and debris.
Watershed Management	Impacts include the challenge of getting different IRWMs and watershed management groups to work together towards a common purpose goal regarding watershed management.	Benefits include being able to communicate and offer solutions for watershed management that consider water and resource management concerns, environmental concerns, etc.	Interregional impacts include the potential overlapping of various IRWM efforts towards watershed management, as natural watersheds do not necessarily follow IRWM boundaries.	Interregional benefits include a broader impact towards watershed management for all pertinent groups. This can improve interregional collaboration and improve habitat conditions in most watersheds.

Table 6.1 (Continued) Screening-Level Assessment of Impacts and Benefits of IRWMP Resource Management Strategies

Strategy	Regional Impacts	Regional Benefits	Surrounding Area Impacts	Surrounding Area Benefits
People and Water				
Economic Incentives	Impacts include increased costs for RWMG Participants to deal with intermittent funding and IRWM program requirements. The application process is cumbersome for aspirants to complete.	Benefits include providing additional grant funding for infrastructure projects and programs in the Region. Economic incentives may lead to a decrease in water pricing, or increased economic stability in the Region.	Interregional impacts include increases in State and Federal debt due to grant funding incentives for the Region, or an inequity based on areas that receive funding.	Interregional benefits include increased absorptive capacity from project implementation in the Region allowing for water exchanges with other regions, as well as, completing the distribution of State and Federal grant funds across the State.
Outreach and Engagement	Impacts include time and monetary resources spent towards public and stakeholder outreach, including meetings and workshops for coordination efforts that require management needs and employee resources.	Benefits include improved communication and involvement among the public, stakeholders, and interested parties. Provides opportunities to support documentation of planning and management.	Interregional impacts include duplication of various IRWM efforts towards the dissemination of information regarding water management and other resource management concerns.	Interregional benefits include the potential for the IRWM Group and RWMG outreach to identify and communicate water and resource management concerns of the Region that apply to most regions in the State. Assuming most neighboring IRWMs are participating in similar efforts, this could help with public awareness.
Water & Culture	Impacts include the time and monetary resources spent towards public and stakeholder outreach, including meetings and workshops for coordination efforts that require management needs and employee resources.	Benefits include improved understanding in the public and stakeholders regarding water and resource management concerns in the Region.	Interregional impacts include duplication of various IRWM efforts towards the dissemination of information regarding water management and other culture information.	Interregional benefits include the potential for the IRWM Group and RWMG to identify and communicate water and resource management concerns of the Region that apply to most regions in the State. Assuming most neighboring IRWMs are participating in similar efforts, this could help with public awareness.

6.4 State and Federal Stakeholders

The RWMG has taken steps to engage with several state, federal, and local agencies throughout IRWMP development and implementation, which has had the effect of influencing the IRWMP planning efforts in the Region. Additional information regarding the involvement of State, Federal, and local agencies and organizations in the RWMG and Plan development is presented in Section 11.0.

Implementation of the 2014 Plan Update is expected to have the following benefits to these agencies, beyond the general regional benefits listed in Section 6.1:

- Greater flexibility in regional water demand and reduced dependence on imported water;
- Greater regional drought preparedness;
- Reduced potential for conflict and litigation, and increased cooperation regarding water supply regulations;
- Increased opportunities for data collection, data sharing, and data management that are compatible with agency practices and databases;
- Shared development and use of hydrologic models and projections, and analytical tools for regional evaluation; and
- Continued compliance with agency planning requirements.

Most agencies, however, would not be significantly impacted by incomplete implementation of the IRWM Plan or by an inactive IRWM Group. The IRWMP planning efforts enhance, but not replace, the agencies planning efforts.

6.5 Stakeholders, Interested Parties, and Disadvantaged Communities

Stakeholders, Interested Parties, and Disadvantaged Communities (DACs) are directly or indirectly impacted by IRWMP development and implementation. Stakeholders include local, neighboring districts, state-wide organizations, and agricultural water and environmental advocacy groups, who do not generally participate as members of the RWMG. DACs in the Region are directly represented through a DAC workgroup (reference Section 11.3) and participate directly in regional planning and management efforts. The RWMG has made an effort to include the Stakeholders, Interested Parties, and DACs in regional planning and management efforts and, as a result, has tailored some of the suggested projects and programs to provide direct benefits to these groups.

Implementation of the 2014 IRWMP is expected to have the following benefits to the Stakeholders, Interested Parties, and DACs, beyond the general regional benefits listed in Section 6.1:

- Increased interaction and discussion regarding water management issues, concerns, and priorities. Provides a direct opportunity for specialized workgroups to address concerns and influence resource management in the Region.
- Improved direct support for specialized workgroups and DACs, through focused projects and programs that are part of IRWMP development and implementation.
- Increased opportunities for regional enhancement through projects and programs, since IRWMP Participants, Stakeholders, and Interested Parties can submit projects and programs through the IRWMP to be considered for inclusion in grant-funding proposals.

Specialized Work Groups are not expected to be severely impacted by incomplete or inactive IRWMP implementation, besides losing the opportunity to address concerns and influence resource management on a regional scale. DACs, in particular, would presumably lose out on necessary support for specialized projects and programs that would otherwise be unfeasible for these communities to implement on their own.

While providing benefits, implementation of the IRWMP has the potential to impact environmentally-sensitive areas or communities where new projects or programs would be implemented. If such impacts can be reasonably anticipated, a review of the significance of the impacts will be conducted on a project and/or program basis prior to being approved by the RWMG.

6.6 Project and Program Specific Assessment

Measures implemented through this IRWMP will help offset the impacts to surface water supply reliability and mitigate groundwater pumping issues that are predicted for this Region. Review considerations for each project and program proposed, by the RWMG, are described in Section 5.1, including assessments of regional impacts and benefits for each measure. At a minimum, the assessment of benefits and impacts on a per-measure basis consider water resource management; economics and cost-effectiveness; environmental and climate change concerns; land use planning; and public benefit.

The RWMG's Measurable Objectives (reference Section 4.5) provide the basis for assessment of all projects and programs proposed for the Region. The group does not generally support projects or programs that will have potentially adverse impacts to the Region including environmental and economic, unless those impacts are mitigated and the potential benefits to resource and water management outweigh the impact.

7.0 Plan Performance, Monitoring, and Data Management

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Plan Performance and Monitoring' and 'Data Management' Plan Standards, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Performance measures and monitoring methods to ensure that IRWM objectives are met.	7.1
Methodology that the RWMG will use to oversee and evaluate implementation of projects.	7.2, 7.3
Describe data needs within the region.	7.4
Describe typical data collection techniques.	7.4
Describe stakeholder contributions of data.	7.4
Describe entity responsible for maintaining data.	7.4
Describe QA/QC measures.	7.4
Describe process for sharing data collected for IRWMP implementation.	7.5
Describe how a Data Management System supports the efforts to share collected data.	7.5
Outline of how data will remain compatible with the State databases.	7.5

The stated intent of the Plan Performance and Monitoring standard is to ensure that the RWMG is efficiently making progress towards meeting the Measurable Objectives set forth in the Plan, implementing the projects and programs listed in the Plan, and that the implementation of each project and program is monitored to comply with all applicable rules, laws, and permit requirements. The following subsections address each of these considerations. In addition, the last two subsections address data needs, collection, management, and sharing.

7.1 IRWM Measurable Objectives

The IRWM Measurable Objectives are set forth in Section 4.5, along with measurement metrics as described in Table 4.1. These metrics include both quantitative and qualitative measurements and relates each metric to one or more of the Objectives. In many cases, a given metric supports several Objectives. By use of these metrics, progress in meeting the IRWMP objectives will be evaluated. Recall that projects and/or programs identified in the Plan are required to meet at least one of the Plan's Objectives (reference Section 5.2). Accordingly, as projects and programs are proposed, one or more of the IRWMP Objectives are identified and linked to the specific project during preparation and submittal of a PDCF (reference Appendix G) to the RWMG.

7.2 Implementation of IRWM Projects and Programs

The IRWM Group has successfully implemented projects and programs since formation of the 2007 IRWMP, and the RWMG has developed a "Report Card" (reference Appendix A1) that captures the planning and implementation activity since their formation. The RWMG intends to update the Report Card annually for the purpose of tracking progress with regard to project/program implementation. Beyond the Report Card, a list of project and program submissions that are 'ready' for implementation will be maintained by the RWMG and will be included in an Annual Report, prepared under the direction of the IRWM Lead Agency (shown in Appendix A2). The Annual Report will also include documentation of the RWMG's progress towards meeting the Regional Goals and Objectives through project/program implementation.

In addition to the "formal" tracking procedures described above, the RWMG reports progress on planning and implementation activity at IRWM Group meetings, which are open to the public (Interested Parties). The IRWM Lead Agency prepares meeting agendas and minutes which include a report on each implementation activity performed or discussed, and a report from each active Work Group regarding project and program submissions. As projects and/or programs are selected and subsequently implemented, the progress of each project towards accomplishing a defined set of measurement metrics is reported at the IRWM Group meetings.

7.3 Project and Program Specific Monitoring

Each project/program submission has a "Sponsor", who is the implementing agency, organization, or individual that is identified in the PDCF for the project/program. The Sponsor, has the primary responsibility for development of the project- and program-specific monitoring plan and is responsible for implementing the monitoring plan during project construction (in the case of a structural project) and during project operations. In general, a monitoring plan would not be prepared until a project/program is selected by the RWMG. The Sponsor will be required to prepare a preliminary project- and program-specific monitoring plan prior to inclusion in a proposal for funding assistance. In this regard, DWR has provided the following guidance for the contents of a project-specific monitoring plan (reference the Prop. 84 IRWM Guidelines):

1) A clear and concise table describing what is being monitored (quantitatively or qualitatively) for each project. Examples include monitoring for depth to groundwater, volume of flow through a new conveyance facility or intertie, or increased absorptive capacity;
2) Measures to remedy or react to problems encountered during monitoring;
3) Location and frequency of monitoring;
4) Monitoring protocols/methodologies, including who will perform the monitoring;

5) Procedures to keep track of what is monitored and identification of who will retain the collected data. The monitoring plan will need to indicate if the collected data are appropriate for inclusion in statewide databases; and
6) A procedure to ensure the monitoring schedule is maintained and that adequate resources (including funding) are available to maintain monitoring of the project throughout the scheduled monitoring timeframe.

The above should be considered guidelines, inasmuch as each project is unique and may require either more or less detail. Once funded, any preliminary designs or preliminary environmental compliance documents are finalized, which allows the preliminary monitoring plan to be finalized as well. At this point, all applicable rules, laws, and permit requirements that need to be followed prior to and during project implementation are identified.

As each project is developed, an environmental compliance document is prepared under the California Environmental Quality Act (CEQA) and/or the National Environmental Policy Act (NEPA) guidelines. While project Sponsors are expected to provide the RWMG with progress reports and project completion reports, the ultimate responsibility for implementation of the monitoring plan rests with the Sponsor. For example, as a structural project moves into the construction phase, the Sponsor will cause to be prepared contracting documents that contain any applicable provisions in the monitoring plan to ensure that contractors follow applicable rules, laws, and permit requirements during construction.

Regarding any "lessons learned" from project- and program- specific monitoring efforts, the project Sponsor is expected to communicate these to the RWMG, preferably in writing. The RWMG recognizes that information can be gained from the project-specific monitoring to improve the RWMG's ability to implement future projects in the Plan. For example, as newly constructed water conveyance interties are operated in the Region, water delivery and operation information is collected to support the applicable performance measures. Water delivery information is reported to the funding agency as part of required documentation of the performance of the improvement. Performance information is shared with the RWMG who can then utilize the information when considering future projects in updated IRWM Plans or reporting documents.

7.4 Data Collection and Management

The stated purposes for the IRWM Data Management Standard are to ensure efficient use of available data for the Region; stakeholder access to the data; and effective integration into existing State databases as needed. In this context, "data" refers primarily to the periodic "measurement" of climate parameters, water deliveries, groundwater pumping, spreading, groundwater levels, and water quality. Land use surveys are also included, inasmuch as they involve a periodic assessment of the acreage of each of several categories of land use and, in the case of agriculture, the acreage of each of several crop types. These data needs are listed in Table 7.1 below, along with the entities making the measurements, which are identified in the table as "primary" data collectors.

Table 7.1 Data Needs, Collection, and Management List

Data Type	Data Needs	Data Collection		DMS[1]
		Primary	Secondary	
Hydrology	Kern River Runoff Index	City of Bakersfield	KCWA	KCWA: Annual Water Supply Report
	CVP Allocations	USBR		
	SWP Allocations	DWR	KCWA	KCWA: Annual Water Supply Report
	Poso Creek Discharge	Cawelo WD		
Climate	Rainfall	DWR-CIMIS[2], NWS, Kern County, USDA	KCWA	KCWA: Annual Water Supply Report, DWR: CIMIS Web-data, NWS Web-data
	Temperature	DWR-CIMIS[2], NWS		CIMIS Web-data, NWS Web-data
	Pan Evaporation	DWR-CIMIS[2], USDA	KCWA	KCWA: Annual Water Supply Report, DWR: CIMIS Web-data
	Evapo-transpiration (ETo)	DWR-CIMIS		CIMIS Web-data
Land Use		Districts, Kern County Agricultural Commissioner, DWR, FMMP	KCWA, USBR	MS Excel, Geographic Spatial Data (GIS)[3]

* See List of Acronyms for specific data sources and references.
[1] Data Management System (DMS).
[2] California Irrigation Management Information System (CIMIS) active stations are located in the Region, including Stations No. 5 (Shafter), No. 31 (McFarland/Kern Farms), No. 54 (Blackwells Corner), and No. 182 (Delano).
[3] Historically, individual districts used spreadsheets (e.g., MS Excel); however, the Kern County Agricultural Commissioner, DWR, and California Farmland Mapping and Monitoring Program (FMMP) have recently converted land use information into GIS-based files.

Table 7.1 (Continued) Data Needs, Collection, and Management List

Data Type	Data Needs	Data Collection		DMS[1]
		Primary	Secondary	
Surface Water Deliveries to Region	Kern River	City of Bakersfield	KCWA	KCWA: Annual Water Supply Report
	CVP (Friant-Kern)	USBR, FWA	KCWA	KCWA: Annual Water Supply Report
	SWP (California Aqueduct)	KCWA		KCWA: Annual Water Supply Report
District Water Deliveries (to landowners)		Districts		WIMIS, STORM, and MS Excel[2]
District Water Deliveries (to Spreading Ponds/Recharge)		Districts		MS Excel[2]
District Groundwater Pumping		Districts		MS Excel[2]
M&I Water Deliveries		Cities, Community Service District	KCWA	UWMPs[3], KCWA: Annual Water Supply Report
Groundwater Levels		Districts, DWR, KCWA	DWR, DWR-CASGEM, KCWA, USBR	DWR: Water Data Library (online)[4], KCWA: Groundwater Data Manager (MS Access)[5]
Water Quality	CVP Surface Water	USBR	FWA	
	SWP Surface Water	DWR		DWR: Water Data Library (online)
	Groundwater	Districts, KCWA	Kern County, KCWA, KRCWA	KCWA: Groundwater Data Manager (MS Access)[6]

* See List of Acronyms for specific data sources and references.
[1] Data Management System (DMS).
[2] In general, individual districts use spreadsheets (e.g., MS Excel) for data management.
[3] UWMPs are updated every five years and provide the actual deliveries for the five-year period, as well as projected deliveries going forward.
[4] In addition to measurements, hydrographs can be downloaded from the DWR's website.
[5] KCWA prepares annual contour maps for depth to groundwater and for groundwater elevations. This data can be queried for the Region and write the data to MS Access or MS Excel.
[6] KCWA can query data for the Region and write data to MS Access or MS Excel.

In addition to the local water districts and irrigation districts, the primary data collectors include other local, state and federal agencies. The local water districts and irrigation districts are the stakeholders which contribute the most significant body of primary data, which includes the following:

- Volume of district water delivered to farms.
- Volume of groundwater pumped from district-owned and –operated wells.
- Volume of water delivered to spreading ponds for groundwater recharge.
- Depth to groundwater at individual deep wells.
- Water quality reports for groundwater samples.
- Crop surveys.

With regard to data collection techniques, flowmeters are the basis for most measurements of water volume. Protocols for the measurement of depth to groundwater and for collecting water samples are set forth in the Groundwater Management Plans that have been adopted by each of the districts. Crop surveys are typically conducted through a combination of inspection of aerial photographs and field inspection, with acreages based on the estimated fraction of a land section, Assessor's parcel acreage, and/or measurements based on aerial photographs.

These data have been collected and managed within the Region for decades. Data management systems vary from simple spreadsheets to more powerful and/or larger database software applications. As a generalization, more frequent measurements generate more data, which tends to favor database software, such as Microsoft Access. Measurement frequency varies from "daily" in the case of climate and most measurements of water volume, to "annual" in the case of land use surveys. In addition to the primary data collectors, there are agencies which collect and "house" data from primary sources, which are identified in Table 7.1 as "secondary" data collectors.

As indicated in Table 7.1, one of the most significant secondary sources of data for the Region is the Kern County Water Agency (KCWA). Formed in the 1960s, KCWA has been preparing an annual water supply report since the 1970s. While this report covers a larger area, the data are presented in a manner which allows data relevant to the Region to be identified. This report is made available to the public and is an important means of sharing data. In addition to this report, KCWA maintains a comprehensive groundwater database, which houses both water level and water quality data throughout the San Joaquin Valley portion of Kern County. This database is an MS Access application which can be queried (by KCWA staff) to yield all data relevant to the Region. The water level database includes measurements by KCWA and DWR staffs, as well as measurements by individual water districts which are supplied to KCWA.

So long as KCWA continues its historical data management role, reliance will continue to be placed on KCWA for these data. Most of the remaining data consist of the district-level water operations data which are collected and maintained by each of the water districts and irrigation districts in the Region. Water operations data QA/QC begins with following established data collection protocols and continues by reconciling or otherwise balancing all water supplies with all water uses.

In the fall of 2013, the Central Valley Regional Water Quality Control Board (CVRWQCB) adopted a General Order which will require monitoring of the quality of groundwater under its Irrigated Lands Regulatory Program. The Kern River Watershed Coalition Authority (KRWCA) and the broader San Joaquin Valley Water Quality Coalition will be responsible for compliance with these new monitoring requirements on behalf of their members. Going forward, the KRWCA will likely be a significant clearinghouse for groundwater quality data. Since compliance with the General Order is in its infancy, it is speculative as to the availability of these data; however, the KRWCA will likely employ a significant data management system.

In addition to the QA/QC which occurs at the primary source by following established data collection protocols, data which are entered into KCWA's database are also subject to QA/QC measures related to data entry. With regard to water levels, KCWA uses DWR's system of carrying any field-level qualifications into the database, such as "well pumping nearby", etc. To some extent, the final level of QA/QC for water level data occurs when the data are charted over time and/or compared to measurements at adjacent wells. In this manner, questionable measurements are identified and flagged. Regarding water quality, QA/QC at the database level is much improved with advent of moving these data electronically from the testing/reporting laboratory into the database.

7.5 Data Sharing and Compatibility with Agency Databases

As previously mentioned, to a very large extent, most of the necessary data collection and management has been ongoing for decades, and the KCWA has been the single largest clearinghouse for data at the regional level. With regard to data sharing, recall that KCWA prepares and makes available an annual water supply report which presents annual data and, in some cases, time series data. In addition to tables, the reports include many charts and figures to better communicate the data. For many years, these annual reports were distributed in a hard copy format; however, in recent years, they have been released in PDF file-format, which will make distribution of these reports both easier and broader. As for KCWA's groundwater database, it is understood that they have cooperated with DWR for many years in sharing water level data, and DWR's water level database is available on their *Water Data Library* website. In addition, the recently developed CASGEM program makes groundwater level data available, and several wells within the Region are included in that program, which are monitored by the individual water districts and irrigation districts within the Region.

While KCWA does not house the intra-district water operations data for the water districts and irrigation districts in the Region, Agricultural Water Management Plans and federal Water Conservation Plans provide vehicles for presenting and sharing much of these data. Each of the water districts and irrigation districts in the Region has prepared or is preparing one of these plans, which are periodically updated.

Since most of the necessary data collection and management has been in place for some time, there has not been a compelling need to add another "layer". Rather, the RWMG intends to create a "roadmap" to the sources of data in order to facilitate data sharing and will consider establishing an on-line library of selected reports. Table 7.1 effectively provides a "roadmap". With that said, the time may come when there is a clear and demonstrated need to do more; accordingly, this is a topic which will be revisited periodically with the IRWM Group. The RWMG will facilitate data requests by providing direction to the best source of the requested data.

As mentioned in Section 7.1, the RWMG also maintains a list of proposed or accepted projects and programs, and data collection is maintained by the Project Sponsor, both at the feasibility level and upon implementation. To the extent that grant funding is involved, Project-level data are typically presented in a grant proposal at the feasibility stage, while performance data are presented in satisfaction of grant reporting requirements following implementation.

With regard to compatibility with State databases, KCWA presently cooperates with DWR with regard to groundwater level data; individual districts are participating in the CASGEM program; and Agricultural Water Management Plans, Groundwater Management Plans, and Urban Water Management Plans are being prepared according to State guidelines. Finally, it is anticipated that the KRWCA will be coordinating the development of its data management system with the CVRWQCB and will therefore meet State requirements.

8.0 Funding Opportunities

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Finance' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Plan for implementation and financing of projects and programs.	8.1, 8.2, 8.3
Known and possible funding sources, programs, and grant opportunities for the development and ongoing funding of the IRWMP.	8.1, 8.2
Funding mechanisms, including water enterprise funds, rate structures, and private financing options, for projects that implement the IRWMP.	8.1, 8.2
Explanation of the certainty and longevity of known or potential funding for the IRWMP and projects that implement the Plan.	8.1, 8.2, 8.3
How operation and maintenance (O&M) costs for project that implement the IRWMP would be covered and certainty of operation and maintenance funding.	8.4

The Poso Creek IRWM Group, like other IRWM planning groups, requires funding for operations, technical studies, annual reporting, IRWM Plan updates, and grant applications. The funding sources, agreements, and mechanisms that are necessary to accomplish the Regional Goals and Measurable Objectives (see Sections 4.4 and 4.5) will vary depending on the project or program, and the funding opportunities available at the time of project/program implementation (which can include a combination of local, state, and/or federal monies). In this regard, the RWMG tracks possible funding opportunities, and seeks to maintain flexibility within the Plan to "match" a given funding opportunity with the projects/programs. In this manner, it is the RWMG's intent to optimize the implementation of projects. At each public meeting, known funding opportunities are shared with all attendees and are circulated via the meeting agenda and minutes to the Interested Parties via an e-mail communication.

The role of the RWMG with regard to financial administration and funding opportunities is addressed in the governing MOU, which is included as Appendix C and further discussed in Section 2.1. Note that the RWMG does not have the authority to fund or accept loans or grant contracts, therefore, one (or more) of the participating districts will assume the role of 'primary applicant(s)' based on benefits received and/or the location within a district's service area of the particular project/program.

8.1 Funding Plan Activities

To date, the responsibility for funding the IRWM (Plan) activities has been assumed by the RWMG Participants. The RWMG has successfully supplemented local funding with state and federal grant funding for both planning activities and project/program implementation. At the time of RWMG formation, a DWR-provided Proposition 50 planning grant of almost $500,000 helped to complete the Original 2007 Poso Creek IRWMP. Since then, most of the cost of maintaining the planning activity has been borne by the RWMG Participants under a cost-sharing agreement contained in the MOU. To date, activities have taken place to maintain compliance with updated state planning requirements, which were added to the DWR's IRWM Guideline Requirements since the initial IRWM Plan adoption, as well as the formulation of projects and programs that comply with the Regional Goals and Measurable Objectives of the IRWM Group. At the beginning of each year, an annual budget is developed and put to a vote by the RWMG that is based on the projected activities for the year. The annual budget includes funding for core planning and general coordination activities, plus focused planning and implementation efforts identified by the IRWM Group.

As previously stated in the discussion of Governance (reference Section 2.4), the RWMG intends to prepare an Annual Report to document accomplishments and progress, data management, and note any changes to governance or policies. It is also intended that the report will contain a copy of the annual budget, which will serve to convey IRWM Group activities and identify the IRWM program costs to Stakeholders and Interested Parties. For example, Table 8.1 has been prepared to illustrate the type of project/program budgetary information that could be presented in the Annual report with regard to planning and implementation financing. The RWMG intends to maintain the IRWM list of accomplishments and budgets as part of the annual reporting.

Updates to IRWM Planning

Funding for the 2014 IRWM Plan update is being shared by the districts whose project was the largest beneficiary of the Proposition 84, Round 1 Implementation Grant Award (reference Section 1.3) inasmuch as compliance with DWR's updated IRWM planning requirements was a condition of this grant award.

IRWM Plan Implementation

The Poso Creek IRWM Plan has been (and is being) implemented utilizing multiple sources of funding to accomplish an impressive list of regional water and resource management measures, including the projects and programs listed in Appendix A2. The list includes structural projects and non-structural programs pursuant to the Plan's Regional Goals and Measurable Objectives. The proposed projects/programs were selected with the Primary Regional Goal in mind; to increase regional water supply reliability in response to a common concern faced by all water users in the Region --- the significant reduction of surface water supplies available to the Region. Through the actions of water districts and local agencies in the Region, various financial resources have supplemented local funding in order to implement

Table 8.1 IRWM Group Planning and Implementation Financing Table Format

Year(s)[1]	Activity Title	Activity Type[2]	Category[3]	Purpose[4]	Support Agency[5]	Applicant[6]	*Continued (next)*
	Example 1	Program (Planning)	1		DWR	IRWM Group	
	Example 2	Program (Grant App)	2		USBR	RWMG	
	Example 3	Project	3			District	

Continued (previous)	Measurable Objectives[7]	Applicant(s) Share[8]	Applicant %	State Grant Share[8]	State Grant %	Federal Grant Share[8]	Federal %	Total Costs
		$	%	$	%	$	%	$
		$	%	$	%	$	%	$
		$	%	$	%	$	%	$

* Note that 'District' would refer to a specific RWMG Participant(s) that applied for a grant that is related to the IRWMP.

[1] Year project or program was approved by the RWMG for inclusion in the IRWMP, following submission. May include 'final year' if project or program is completely implemented/constructed.

[2] Activity type in terms of project (structural enhancement) or program (non-structural). Programs are differentiated between 'planning' (e.g., IRWM Plans and other planning documents) or 'grant apps' (e.g., IRWM Program grant applications).

[3] "Category" number is used primarily for reference to categorize projects and programs implemented prior to this IRWMP Update and before the defined Goals and Objectives contained in the IRWMP Update. Sections include emphases on (1) Planning and IRWM Program Compliance Activities, (2) Community, Industrial, and Environmental - Specific Activities, and (3) Regional Infrastructure Enhancements and Program Activities.

[4] Generalized purpose for completing a project or program (e.g., Prop. 84 Planning, IRWM Guidelines, etc.)

[5] Agency(ies) that support or requires specific projects or programs that are required of the IRWM Group (e.g., DWR-required IRWM Plan Updates).

[6] Specific applicant(s) for grant-funding support for a specific project or program.

[7] Applicable Measurable Objectives met by a specific project or program, as defined in Section 4.5.

[8] Assuming grant-funding for project or program, the specific share of Total Costs awarded by State or Federal sources (primarily the Support Agency), and the total costs shared by the applicant (IRWM Group, District, etc.)

projects and programs. Local funding has been supplemented by Federal and State grant funding sources. Local funding has been contributed by the sponsoring agency(ies) through a combination of general fund and bond monies, both of which are ultimately funded by the landowners within the agency(ies).

The Poso Creek IRWM Group 'Report Card' (which has been included as Appendix A1) identifies approximately $82 million of expenditures for projects and programs which have been implemented since adoption of the 2007 IRWMP. Of the total accomplishments identified and funded, approximately $15 million was funded through various State-administered funding sources (principally DWR), and $13 million from various Federal sources (principally USBR). Both sources supplement the $54 million in local (applicant) expenditures. The identified funding summary does not include the many in-kind hours contributed by RWMG Participant (district) staff, as well as individual Stakeholders and Interested Parties. Communities have also successfully obtained nearly $7 million in State funding from various sources outside of the IRWM program to aid in implementing projects and programs, primarily for DACs in and around the Region (their role is further explained in Section 11.3). Of this total State amount that has been awarded to the Region's entities through the IRWM source of State funding, $1 million was received by the communities (DACs) and roughly $7 million by the districts through a grant funded by the Proposition 84 (Round 1 IRWM Implementation funds). Most of the projects and programs that received Federal and State grant funding are either successfully completed or under construction (reference the Report Card in Appendix A1).

8.2 Federal, State, and Local Funding Sources

In general, funding sources to implement the IRWM Plan have come from local district or agency funds that have been supplemented by State and Federal grant funds. Prominent examples of state and federal funding opportunities have included the following:

- *USBR Mid-Pacific Region CALFED Water Use Efficiency Grant Program*: established to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.
- *USBR Mid-Pacific Region WaterSMART Grant Program*: part of the strategic plan for implementing the Secure Water Act that includes the facilitation of basin-wide water management improvements.
- *DWR Proposition 50 Agricultural Water Conservation Program*
- *DWR Proposition 84 Integrated Regional Water Management (IRWM) Grants Program*

The costs to prepare grant applications, project support documentation, project status reports, and grant completion reports have typically been funded by the RWMG Participants. In this regard, the RWMG has also worked with districts and communities in the Region that find it extremely difficult to fund the preparation of detailed and expensive applications.

8.3 Funding Certainty and Longevity

Individual districts and communities within the Region have, in general, been successful at funding and implementing projects and programs, which is documented in the IRWM Group 'Report Card' (reference Appendix A1). In this regard, the IRWM Group has effectively integrated local funding sources with federal sources (such as the USBR WaterSMART program) and state sources (such as the Water Use Efficiency programs). The IRWM Group seeks to maintain flexibility within the Plan to "match" a given funding opportunity with the projects/programs. In this manner, it is the RWMG's intent to optimize the implementation of projects.

Although obtaining funding through grant applications is never certain, and is largely out of the IRWM Group's control, the IRWM Group has practiced an approach whereby consideration is given to projects/programs that are best suited for a given funding opportunity. Notwithstanding this observation, funding opportunities are available to all participating entities. As the IRWM Group continues to implement projects and programs, it is presumed that any future grant applications will be strengthened as the already-implemented projects and programs realize regional benefits. Fundamentally, the RWMG does not rely on external (grant) funding to sustain the IRWM Group, thereby avoiding the uncertainty of securing funds in order to practice regional planning. Several key projects are now constructed and operational, which provide purpose and momentum to the RWMG to continue to implement projects identified in the IRWM Plan. Due to the scale of some of the identified projects, they cannot be easily developed or implemented without external funding to supplement the local funding. Accordingly, it is reasonable to expect that the RWMG will continue its past practice of integrating state and federal funding opportunities with local funds.

As part of the annual budgeting process, the RWMG will assess the longevity of funding by considering funding that is already in place under existing contracts, funding agreements that may be pending, and any near-term funding opportunities that may ensure the implementation of the scheduled projects or programs. In general, funds which have been secured help to stabilize the activities through the contracted period, barring extreme circumstances, such as the DWR shut-down in 2010. However, in some cases, funding can even be accelerated under different circumstances, such as, the economic crisis that led to Federal Stimulus funding of projects within the Region and the acceleration of IRWM funds to help address the 2014 drought conditions in California. The longevity of the funding sources from USBR or DWR, to potentially provide new funds to the Region in the future, is also somewhat uncertain as State and Federal legislative and executive branches control budgets for these agencies and, in effect, the amount of funding available to grant programs. The IRWM Group, and in particular the

RWMG, the will remain vigilant regarding potential sources of grant funding from State and/or Federal agencies and continue to communicate the availability of grant funding opportunities with the Plan participants, Stakeholders, or Interested Parties.

It is reasonable to expect that the longevity of the IRWM Group will be driven by need and accomplishments, both of which have been significant. The need remains significant, and the IRWM Group's record of accomplishments provides considerable momentum to extend this record. Since the majority of the RWMG consists of district staff, they are available to meet on a regular basis. It has been more challenging to maintain functions outside of the agricultural water district charter, such as, directly assisting communities within the Region or directly assisting other functions, such as, developing habitat suitable for wildlife. Some of the Region's challenges align with the emerging IRWM investment strategies identified by the DWR during recent strategic plan workshops. In particular, DWR states in the draft strategic plan: "Key considerations for these strategies are structuring financial assistance in a manner that fosters collaboration and cooperation among regions, providing flexibility for local circumstances, and lowering barriers for participation in IRWM."

Emerging IRWM Investment Strategies derived from stakeholder input at the strategic plan workshops are listed following:

- Provide base-level funding to all active regional water management groups in the state to help support key operations, including stakeholder engagement and regional planning.
- Allocate funds to substantially increase the state's level of service to regional water management groups, including technical support, data management systems, water management analysis tools, and public outreach.
- Provide non-competitive funding to regional water management groups to address statewide priorities, such as disadvantaged community critical water supply needs, inter-regional groundwater overdraft conditions, reduced dependence on the Sacramento-San Joaquin River Delta, and source area protection.
- Continue competitive grants to assist regional water management groups in meeting water management needs of their regions, while promoting local project selection and prioritization processes.
- Invest in state leadership and innovation to better support IRWM through the alignment of state and federal policies, programs, and regulations.

8.4 Funding Project and Program Operation and Maintenance

Operation and Maintenance (O&M) costs are included in the evaluation of both economic and financial feasibility for a given project/program. Any given agency has certain statutory authorities with regard to the means by which it collects monies to fund its operations. Each of the water management agencies/districts within the Region typically collects its monies through a combination of acreage assessments and water-use assessments so as to balance the agency's/district's budget. Accordingly, the landowners within the district(s) which is(are) responsible for constructing and operating a project are responsible for the O&M costs. The certainty of this funding is as certain as the future viability of the given district(s), most of which have been operating for several decades. In summary, the RWMG is not responsible for covering the costs of O&M expenses; rather, individual project/program sponsors or beneficiaries are responsible for these ongoing costs and monitoring metrics (see Section 7.3).

9.0 Technical Analysis

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Technical Analysis' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Data and technical analysis used in development of the plan.	9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7

In particular, this section describes the technical information which was relied upon, as well as the analyses and methods which were employed, in the preparation of this Plan. To a large extent, the data and analyses which provided the basis for the 2007 IRWMP remain valid, particularly as it relates to the development of the historical baseline (1981-2005) of water supplies and demands in the Region. For ease of reference, the relevant chapters from the 2007 IRWMP are included herein as Appendices F1 through F3.

Three primary sources of surface water supplies are imported to the Region, which supplement groundwater pumping (reference Section 3.3). Given the changing and declining reliability of these supplies; the expiration of the SWP contracts in 2035, as well as the time that it will take to implement a Delta "fix" (i.e., state-wide efforts to improve reliability of Delta exported-supplies while adhering to environmental concerns); a 20-year planning horizon is considered reasonable for the purpose of projecting water supplies and demands in the Region. The technical analyses related to the evaluation of regional water supplies and demands included the following elements, each of which is briefly described in the subsections which follow:

- Surface Water Use
- Land Use
- Groundwater Levels
- Absorptive Capability
- Projected Availability of Surface Water Supplies
- Projected Change in Water Demand
- Projected Change in Use of Surface Water Supplies

9.1 Surface Water Use

Each of the water agencies within the Region maintains records of surface water diversions. Monthly data were collected from each agency for the 25-year period extending from 1981 through 2005; which provided the historical baseline which was evaluated in the 2007 IRWMP. The sources of water supply included Kern River, Poso Creek, State Water Project, and the Central Valley Project. The annual fluctuation in the amount of water delivered into the Region from each of these sources of supply is illustrated in Figure 9.1 for the historical baseline.

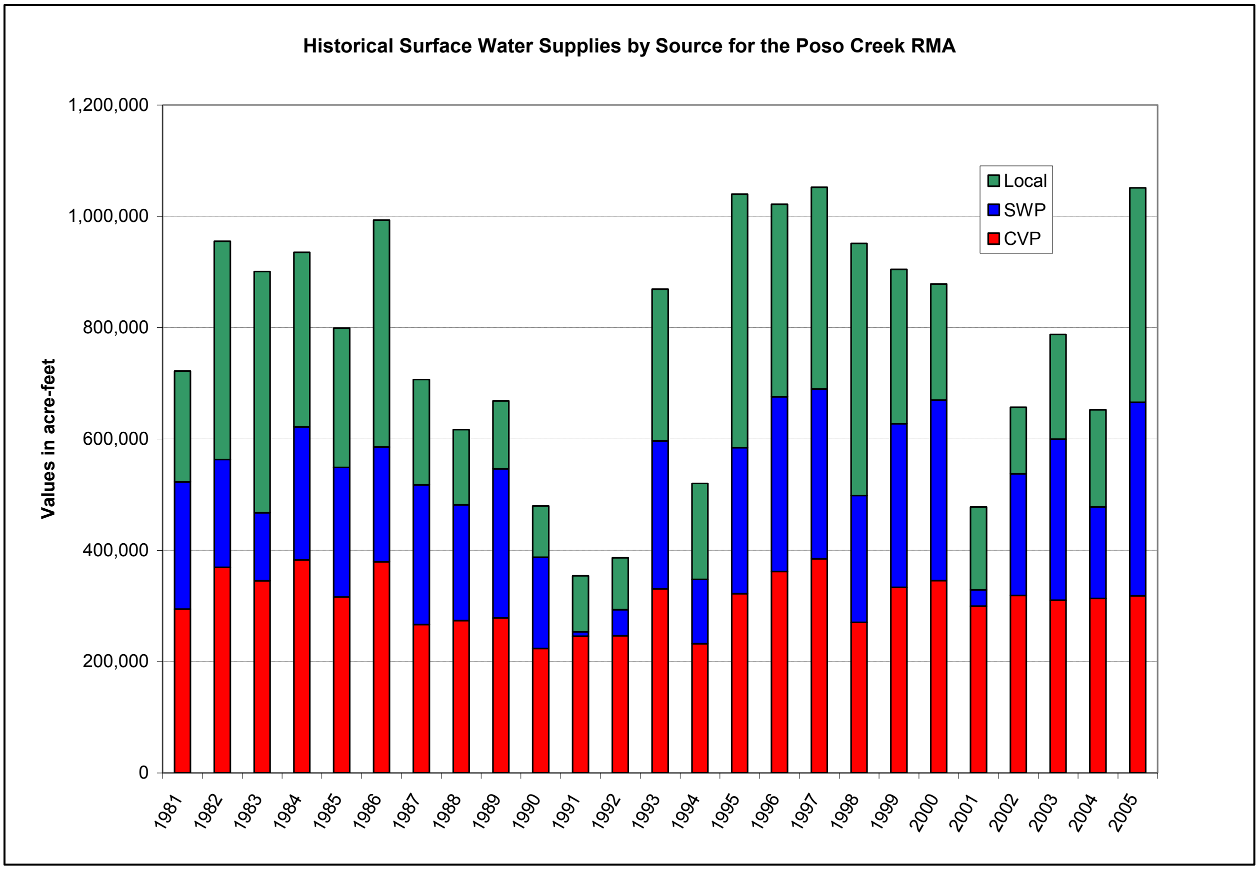

Figure 9.1 Annual Fluctuations in Surface Water Supplies Delivered to the Region.

These data provided the historical baseline against which to measure projected changes in the availability and use of surface water going forward (reference Section 3.5 and Appendix F2). Changes in the availability of surface water can be the result of regulatory changes, climate change (reference Sections 3 and 13.1), and water rights litigation.

9.2 Land Use

Each of the districts within the Region annually performs a land use survey within its boundaries and maintains records of same. These data were collected annually for the historical baseline (1981 through 2005), and the total irrigated area was calculated for each year. In Figure 9.2, the annual irrigated acreage totals were charted over time to identify any apparent trends over this 25-year period for the purpose of assessing future water demands for irrigated agriculture. The figure illustrates an increasing trend in the acreage of permanent crops, which is also confirmed in the 2013 land use data which is presented in Table 3.2 of this 2014 Plan Update (reference Section 3.2).

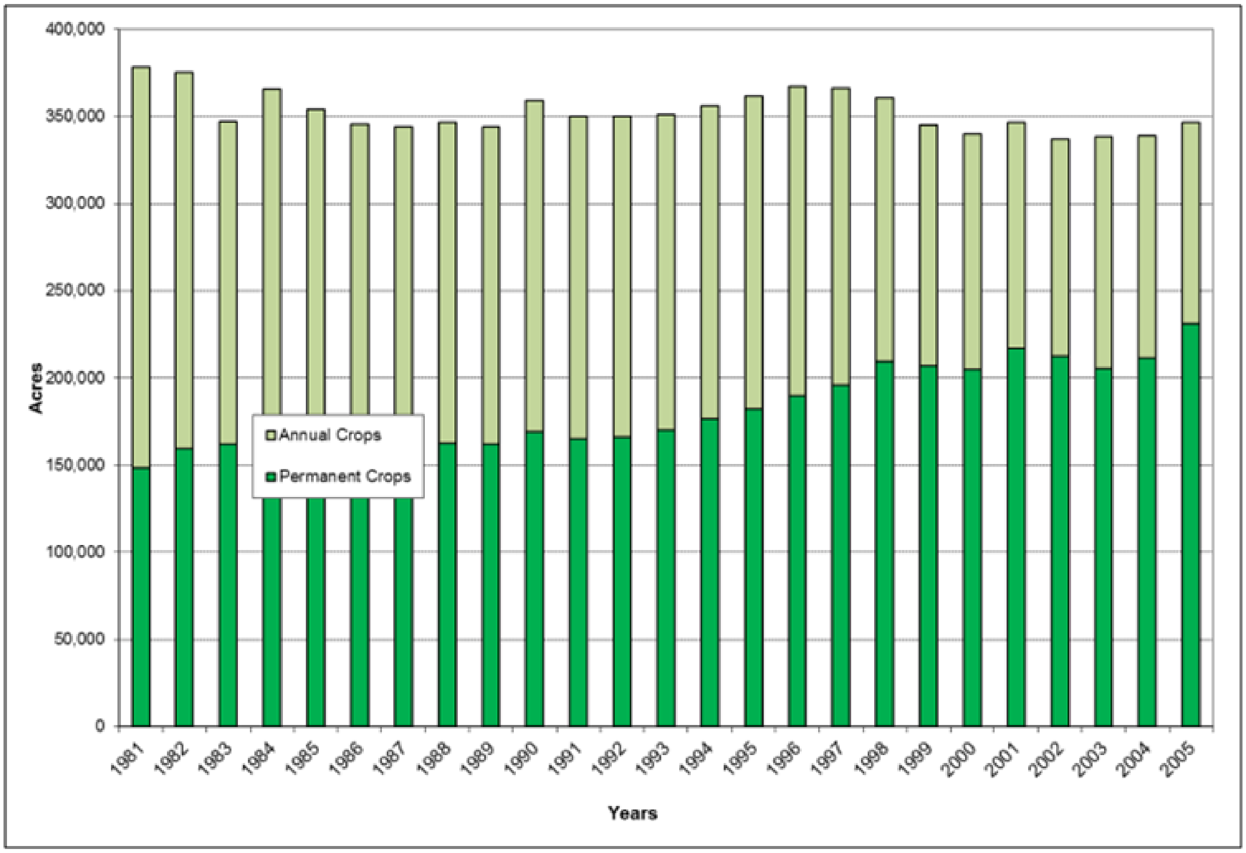

Figure 9.2 Annual Fluctuations of Irrigated Acreage in the Region.

9.3 Groundwater Levels

Typically on a semiannual basis (spring and fall), each of the districts within the Region measures the static depth to groundwater in a number of deep wells within its boundaries. The wells are spatially distributed throughout each district's service area. Data were collected and compiled for the average of the spring water-level measurements for each district. While each district was the primary source of the necessary data, other sources included DWR and USBR. For each agency, the average (static) depth to groundwater was charted over time (1981-2005) and compared one to the other, as well as to the corresponding diversion of surface water to the Region. This largely graphical analysis was conducted for the purpose of evaluating the relationship between surface water diversions and groundwater levels, as well as the similarities in the groundwater level response between the areas represented by each agency. Figure 9.3 presents these average water level data for each of the agencies within the Region. Groundwater use in the Region was further discussed in Section 3.4.

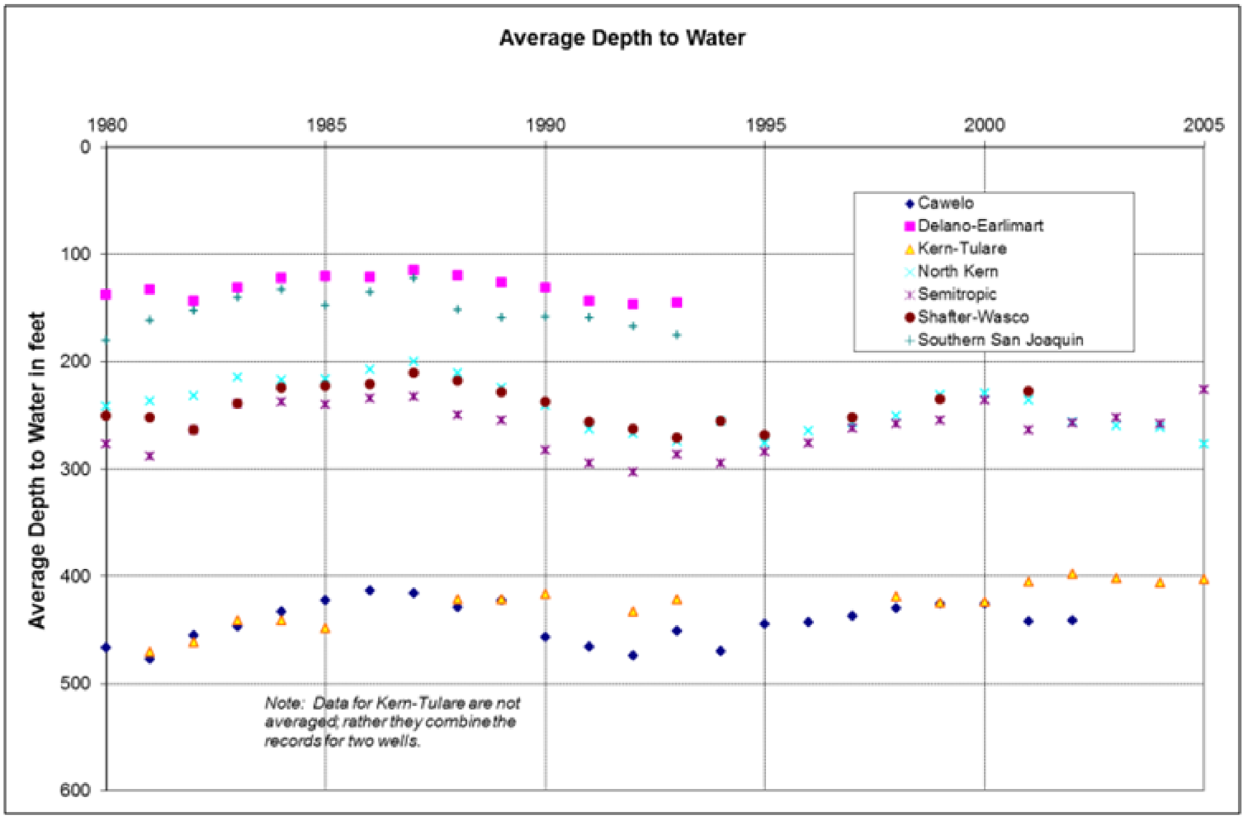

Figure 9.3 Annual Fluctuations of Average Depths to Groundwater in the Region.

9.4 Absorptive Capacity

Absorptive capacity refers to the ability to divert and beneficially use available surface water supplies within the Region. There are two components to absorptive capacity; an irrigation component, where surface water supplies are used to meet irrigation demands; and a spreading component, where surface water supplies are delivered to spreading basins to recharge underlying groundwater. As part of the 2007 IRWMP baseline analysis, each component was determined on a district-by-district basis by inspection of records of historical monthly deliveries to irrigation and spreading which were provided by each district. In other words, actual operational experience was the basis for assessment of the reasonable maximum irrigation deliveries and spreading deliveries under present conditions (all on a monthly basis). Figure 9.4 was prepared to illustrate the Region's average monthly absorptive capacity under the level of development which corresponded to the end of the historical baseline.

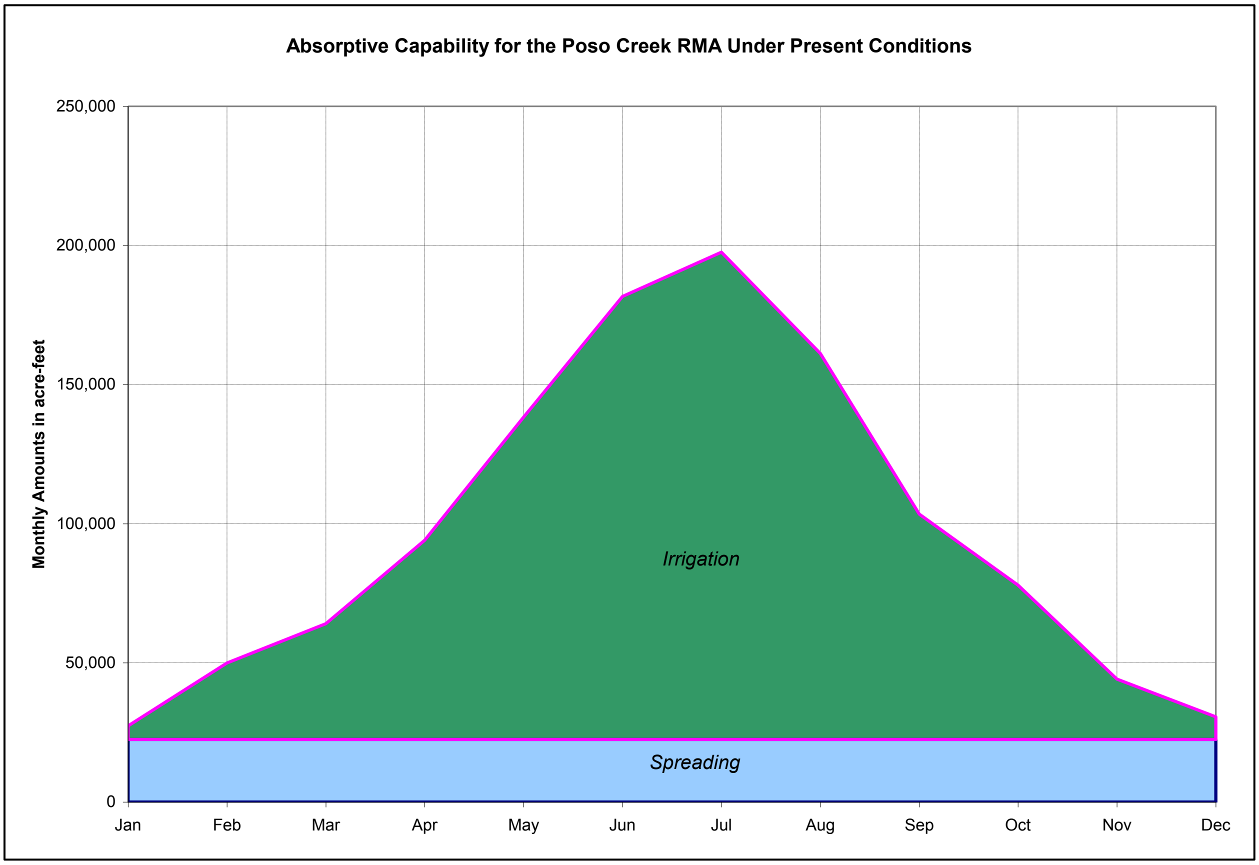

Figure 9.4 Average Monthly Absorptive Capacity in the Region.

9.5 Projected Availability of Surface Water Supplies

Surface water sources are subject to natural variations in hydrology. However, the three principal sources are subject to reductions in the available supply as compared to the historical baseline for reasons not related to hydrology (reference Section 9.1). These sources primarily include the Kern River and the two sources of imported supplies; the SWP and the CVP. The following subsections address the availability and reliability concerns regarding these sources of supply, (reference Sections 3.1, 3.5 and Appendix F1).

State Water Project (SWP)

Monthly data were obtained from DWR in support of the projected annual availability of "Table A" and "Article 21" water found in the 2005 SWP Delivery Reliability Report for the period extending from calendar year 1922 through 1993. These data were obtained for "Study 4" and "Study 5", which reflect 2005 (existing) and 2025 (future) conditions of development, respectively. Within the Poso Creek Region, Semitropic WSD and Cawelo WD are "member units" of the Kern County Water Agency and contract for the delivery of SWP water. Each district's pro rata share of "Table A" and "Article 21" water was determined on the basis of contractual entitlement.

With regard to hydrology, a long-term change in climate would necessarily result in a change in hydrology and a corresponding change in the availability of surface water supplies. DWR has considered climate change in its projections of SWP deliveries beginning with the 2007 SWP Delivery Reliability Report. Following is a table which summarizes the history of the projections which are presented in the SWP Delivery Reliability Reports, beginning with the 2005 report, which was relied upon during development of the 2007 IRWMP.

Table 9.1 Summary of SWP Delivery Reliability Report Projections

SWP Delivery Reliability Report	Existing Conditions		Future Conditions (without anticipated Climate Change)[1]		Future Conditions (with anticipated Climate Change)[1]	
	Table A %	Article 21 (1,000 AF)	Table A %	Article 21 (1,000 AF)	Table A %	Article 21 (1,000 AF)
2005	68%	262	77%	124	--	--
2007	63%	85	66-71%	36	63-71%	26-33
2009	60%	85	62%	62	60%	60
2011	61%	76	62%	54	60%	50
2013	62%	58	62%	60	58%	62

* Source: SWP Delivery Reliability Reports (2013 Draft is latest).
[1] "Future" = "Existing" plus 20 years. Anticipated climate change impacts are further explained in Section 13.0.

Inspection of this table indicates that relatively significant changes in the projections have occurred since the 2005 report. Most recently, the Draft 2013 SWP Delivery Reliability Report relied on a model developed by the Max Planck Institute ("ECHAM5") to reflect climate change. In the without-climate change scenario, "Table A" deliveries were estimated to average 62 percent over the long term; however, the with-climate change scenario indicated an average of 58 percent.

Central Valley Project (CVP)

Projections of the availability of contract water supplies to each of the three CVP-Friant contractors in the Region were obtained from Mr. Dan Steiner for the period extending from 1922 through 2004. Mr. Steiner is a consulting engineer who has been involved for many years with the San Joaquin River Settlement and has modeled the availability of water under the terms of the Settlement through the use of a computerized operations simulation model which was developed for that purpose. In particular, Mr. Steiner provided data for three types of water:

"Class 1", "Class 2", and "Other". It is noteworthy that this model has also been used as the development tool for the simulation of Friant Division operations within CALSIM II[1].

Kern River

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) of the City's Kern River supplies into the Poso Creek Region. The basic term of these contracts expired at the end of 2011 and, while the contracts provide for an extension term, the City of Bakersfield has advised that this supply will no longer be available to the Poso Creek Region. In addition, the City of Bakersfield has filed to appropriate other Kern River supplies which have historically been diverted and used in the Poso Creek Region; however, the outcome of this filing remains speculative at this time. Accordingly, solely for the purpose of this Plan, it has been assumed that the above-referenced 70,000 acre-feet will no longer be available and that all other Kern River supplies historically used within the Region will be unaffected.

9.6 Projected Change in Water Demand

Irrigated agriculture is the predominant water use in the Region. Irrigation water requirements could change as a result of a change in total irrigated acreage, a change in crop types, and/or a change in crop evapotranspiration owing to climate change. Either an increasing or decreasing trend in total irrigated acreage would likely have the most significant potential to change the demand for water, particularly over a 20-year planning horizon. Accordingly, the total irrigated acreage within the Region was tabulated and charted over time in order to evaluate the year-to-year fluctuations and to identify any apparent trends (reference Figure 9.2). With regard to changes in crop types, the increasing trend in permanent plantings is having the effect of increasing demand to the extent that the annual crops which are being replaced have a lower irrigation water requirement. Finally, it is noteworthy that any additional urban development would remove a like amount of irrigated agriculture, which would simply trade one demand for another, with little measurable change in total demand over the 20-year planning horizon (reference Section 3.2 and Appendix F2).

9.7 Projected Change in Use of Surface Water Supplies

A spreadsheet model was developed by GEI Consultants to perform operations studies on a monthly basis (reference Appendix F2). 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

[1] Water resources planning software regarding CVP delivery and reliability in the Central Valley developed and maintained by the DWR.

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) Consider the extent to which unregulated supplies available to a given district satisfy the irrigation absorptive capability of that district (on a monthly basis).

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

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

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. The projected diversion and use of water under this scenario was then compared to the historical baseline to assess the impact of the projected changes in the availability of water supplies to the Region. Necessarily, the operations studies include many assumptions and criteria. The model was developed in a manner which facilitates sensitivity analyses with regard to the assumptions and criteria which are expressed quantitatively. Finally, this same model was used to evaluate the water supply accomplishments attributable to improvements in absorptive capacity which would result from implementation of proposed projects.

10.0 Relation to Water Resources and Land-Use Planning

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Relation to Local Water Planning' and 'Relation to Local Land Use Planning' Plan Standards, which includes the requirements shown in the following table along with identification of the specific subsection(s) where each requirement is addressed.

Requirement	Plan Section(s)
List local water plans used in IRWM plan.	10.1
Plan relation to other planning documents and programs.	10.2
Dynamics between IRWM plan and other planning documents.	10.2
RWMG coordination to water management planning activities.	10.1, 10.2
Current relationship between local land use planning, regional water issues, and water management objectives.	10.3
Future plans to further a collaborative, proactive relationship between land use planners and water managers.	10.3

This section addresses the relation between the IRWM Group, specifically the RWMG Participants, and local water and land-use planning efforts. Local water plans are discussed in the context of planning which considers some portion of the Region, generally the service areas of the water management districts, as well as, other regional plans that affect the planning and management of the Region. As such, regional planning efforts are still local in nature; however, they encompass not only this Region, but neighboring areas as well. This distinction between local and regional planning efforts is made only for the purpose of clarity in the Plan. As the following discussion illustrates, there are many water planning efforts which commenced, were completed, or were updated since adoption of the original IRWM Plan in 2007. In essence, the updated Plan addresses the water and land use planning efforts since the original IRWM Plan adoption.

10.1 Local Water Planning and Management

With the exception of one relatively small area, the Region is completely covered with the jurisdictions of water management districts, none of which overlap. All of these districts are focused on water resource management, primarily for irrigated agriculture within their boundaries, and they include the following types of districts, as defined by the CWC: Water District, Irrigation District, Water Storage District, and Municipal Utility District. All of the surface water brought into the Region is the result of water management actions and planning efforts by these districts (Section 3.5). These districts were formed for the purpose of securing and managing surface water supplies conjunctively with the underlying groundwater within its jurisdiction. While the boundaries of these districts do not overlap, the underlying groundwater basin is common to all users since the underlying groundwater is hydrologically connected. With the exception of the cities within the Region, these districts have been responsible for preparing most of the local water management planning documents which are specific and unique to areas within the Region.

When formed, each of the districts prepared planning documents which evaluated available water supplies, projected water demands, static groundwater levels and quality conditions, all for the purpose of assessing the need for supplemental water supplies. These documents, which were prepared in the 1950s, 1960s, and 1970s, provided a proverbial 'road map' for each district's operations for many years. Over time, with increasing costs and an increased emphasis on irrigation efficiency, combined with increasing uncertainty in supplemental water supplies, a new emphasis was placed on planning efforts leading to the preparation of Groundwater Management Plans (GWMPs), Agricultural Water Management Plans (AWMPs), and Water Conservation Plans (WCPs) managed and reviewed by DWR and/or USBR. On the municipal side, cities have traditionally prepared General Plans providing a detailed documentation of the physical, social, and economic needs of a municipality and its people. Three of the cities in the Region are required to prepare UWMPs, which provide considerably more detail regarding municipal water supplies and demands. Table 10.1 provides a summary of the agricultural and municipal agencies which have completed the planning documents mentioned above.

Table 10.1 Status Summary of Local Water Planning Efforts (Year Adopted)

Entity	Groundwater Mgmt. Plan	Agricultural Water Mgmt. Plan	Water Conservation Plan	Urban Water Mgmt. Plan	General Plan
Regional Districts					
Semitropic	2012	2013	--	--	--
North Kern	2012	2014	--	--	--
Cawelo	2007	2014	2010	--	--
Shafter-Wasco	2007	--	2013	--	--
Kern-Tulare	2012	--	2013	--	--
Delano-Earlimart	2007	--	2013	--	--
Southern San Joaquin MUD	--	--	2013	--	--
Regional Cities					
City of Delano	--	--	--	2010	2005
City of McFarland	--	--	--	--	2011[1]
City of Shafter	--	--	--	2010	2005
City of Wasco	--	--	--	2010	2002

[1]*City of McFarland Land Use Element Update*

As noted in Table 10.1, several plans have been prepared or updated since adoption of the Poso Creek IRWMP in 2007, and have been considered in the preparation of this Plan Update. Each of the above-listed local plans is applicable to the jurisdiction of the preparing entity; the city limits or sphere of influence for the cities, and the official boundaries for each of the districts reflecting the reach of their statutory authority. The boundaries of the districts were set at the time of formation and have only changed with relatively infrequent annexations or de-annexations, all of which must be processed through the Kern County Local Agency Formation Commission (LAFCO) or county-applicable LAFCOs. The Poso Creek IRWM Plan is a direct reflection of the above-listed local planning efforts inasmuch as all but one of the districts located in the Region are active members of the RWMG, either as a direct RWMG Participant or Stakeholder. The principal local planning efforts which were considered and reflected in the preparation of this Plan Update are described in the subsections which follow.

Groundwater Management Plans

All six of the local GWMPs in the Region have been prepared by members of the RWMG, and each plan is applicable to each member's jurisdiction (reference Table 10.1). However, the common groundwater basin provides a common denominator, which tends to unify the Region with regard to water management objectives and strategies especially regarding groundwater use. The Basin Management Objectives (BMOs) articulated in each of these plans, representing the basis for water management, are summarized below:

- Semitropic Water Storage District, Latest Plan: 2012
    1. Maintain groundwater levels at economically viable pumping lifts for the overlying agricultural uses.
    2. Protect groundwater quality in general and minimize increases in salinity.
    3. Avoid conditions conducive to inelastic land surface subsidence.
    4. Protect and preserve surface water rights and contracts.
    5. Protect and preserve surface water quality.
- North Kern Water Storage District, Latest Plan: 2012
    1. Maintain groundwater levels at economically viable pumping lifts for the overlying agricultural uses.
    2. Protect groundwater quality in general and minimize increases in salinity.
    3. Avoid conditions conducive to inelastic land surface subsidence.
    4. Protect and preserve surface water rights and contracts.
    5. Protect and preserve surface water quality.
- Cawelo Water District, Latest Plan:2007
    1. Provide basin users with a long-term, reliable and affordable high-quality groundwater supply.
    2. Maintain the rights and beneficial uses of groundwater users within the basin.
    3. Maintain local control over groundwater to the fullest extent possible.

4. Promote public participation and involvement in local groundwater management efforts.
5. Develop an effective dispute-resolution mechanism.
6. Develop funding mechanisms for the groundwater management plan.

- Shafter-Wasco Irrigation District, Latest Plan:2007
  1. To promote and realize groundwater resource protection.
  2. To facilitate groundwater resource sustainability.
  3. To develop groundwater resource understanding.
  4. To develop groundwater basin understanding.
  5. To promote and facilitate information dissemination regarding the groundwater resource.

- Kern-Tulare Water District, Latest Plan:2012
  1. Maintain or improve groundwater levels within the District.
  2. Control degradation of groundwater quality.
  3. Limit land subsidence.

- Delano-Earlimart Irrigation District, Latest Plan:2007
  1. Stakeholder Involvement.
  2. Monitoring Program.
  3. Groundwater Resources Protection.
  4. Groundwater Sustainability.
  5. Groundwater Operations.
  6. Groundwater Planning and Management.

The common theme among these BMOs is groundwater quality and quantity protection and sustainability, which is carried into the IRWM Plan and represents several of the IRWM Group's Measurable Objectives (Section 4.5). At the present time, the BMOs do not include specific triggers, limits, or other criteria with regard to water levels or water quality and the use of groundwater to meet demands in each of the districts. If specific triggers, limits, or other criteria are adopted in the future, then these would have to be reconciled and reflected in a future update of the IRWM Plan.

The GWMPs are not required to be updated on a regular schedule; rather, they have been updated or amended in response to changed conditions, adoption of new management strategies, and/or changes in statutory requirements related to the content or preparation of a plan. In this regard, three of the six plans have been updated since adoption of the original IRWM Plan in 2007. Moreover, with updates to the IRWM Plan the most recent local plans will be considered.

Agricultural Water Management Plans

Three of the districts, primarily the State (SWP) and Kern River water supply contractors, have prepared or are in the process of preparing and adopting AWMPs in compliance with the requirements of the Water Conservation Act of 2009 (SBx7-7); the Agricultural Water Management Planning Act, and the Agricultural Water Measurement Regulation requirements (reference Table 10.1) Four districts, primarily Federal (CVP) water supply contractors, prepare a plan with similar content as a requirement of their water supply contracts with the federal government. These latter plans, formally referred to as WCPs, are now referred to as Water Management Plans (WMPs). Both AWMPs and WMPs are applicable to each district's jurisdiction. Unlike the GWMPs, which are linked by virtue of the common groundwater basin, the AWMPs amount to more of a 'report card' on the adoption and implementation of 'best management practices' within the jurisdiction of the agency preparing the plan, referred to as 'Efficient Water Management Practices'. In addition, the plans provide information respecting water supplies and water uses which is useful in the context of the IRWM Plan. Similar to UWMPs, SB7x7 stipulates that the AWMPs are to be updated every five years, beginning with 2015 to reflect the changing climate and management conditions in a water management district. Note that whenever there is a need to update the IRWM Plan, the most recent AWMPs and WMPs for regional districts will be considered. It is beneficial to the IRWM planning process that the AGWMPs and UWMPs are on a coordinated update schedule.

Urban Water Management Plans

Three cities within the Region are required to prepare an UWMP, and all three have met the requirements of the latest 2010 update (reference Table 10.1). While each plan is applicable to the jurisdiction of the city which prepared it, all three cities rely solely on groundwater pumped from the Region's common groundwater basin, which creates shared water management goals and strategies for all water users in the basin. These plans are especially useful in projecting growth in water use over time, with regards to increasing populations and municipal water use, and progress with regard to water recycling and treatment. These plans are updated every five years, with the next plan required for the 2015 update.

General Plans

In compliance with state requirements, all cities within the Region prepare and periodically amend General Plans addressing the physical, social, and economic needs of the land within their present and presumed future boundaries (reference Table 10.1). With regard to content, the state requires that certain planning and management elements be addressed. With regards to regional water and resource planning, one of those elements is "Conservation" intended to address the conservation, development, and use of natural resources, including, but not limited to, water resources. For example, the conservation element within the General Plan for the City of Wasco contains objects to protect natural resources including groundwater to meet the needs of present and future generations. The General Plan contains policies and standards that recognize the importance to 1) protect areas of natural groundwater recharge, 2) expand programs to enhance groundwater recharge in order to maintain groundwater levels, 3) continue water conservations, and 4) protect human health by monitoring. To protect human health, the City groundwater resources will be monitored on a regular basis to test for bacteriological and toxic chemical components. Each city General Plan has similar objectives, policies, and standards within each planning element. By design, and the infrequent nature of updating these plans, they typically consider a 20- to 30-year planning horizon for resource and conservation management which is used to address municipal concerns in this Plan

Since the formation of the RWMG, draft plans, such as GWMPs or AWMPs, tend to be distributed among each the members of the RWMG as well as any Stakeholders or Interested Parties. These documents are included on the RWMG meeting agenda in order to monitor progress as well as to receive input, specifically regarding adoption or the intent to update/draft a planning document. These meetings are public meetings and are noticed to all who have requested to be on the distribution list (including Stakeholders and Interested Parties). This continued practice of transparency, specifically with the planning documents adopted by the districts, agencies, or cities in the Region, will help to facilitate the coordination of local and regional planning efforts going forward.

The regional collaboration involved in preparation of the Plan has and will continue to highlight the interests, strategies, and actions related to water resource management which are common throughout the Region. This has the effect of underscoring the similarities and thereby the benefits of working together to leverage the collective water management assets of the Region. In this manner, all regional planning efforts feed back to the local planning and decision making efforts by each of the districts, agencies, or cities.

10.2 Regional Water Planning and Management

The planning efforts described in Section 10.1 are limited to those that are unique to some part of the Region; however, there are other regional planning efforts and entities with which to coordinate throughout the development of the Plan. Note that these planning efforts remain “local” in nature, inasmuch as they are all limited to Kern County and overlap the Poso Creek Region. Table 10.2 provides a list of these planning efforts and entities.

Table 10.2 Summary of Regional Water Planning Efforts by Local Entities

Entity	Authority	Planning Efforts
County of Kern	County	General Plan (2009)[4]
Kern Council of Governments	JPA	Kern Regional Blueprint Program (2008)
Kern County Water Agency (KCWA)	Special Act	Kern IRWMP (2011)
Kern Groundwater Management Committee	JPA[1]	Regional Groundwater Management Plan (2015)[1]
Kern River Watershed Coalition Authority	JPA	Compliance with RWQCB's General Order R5-2013-0120
North West Kern RCD	RCD[3]	Soil and water protection and conservation.
U.S. Army Corps of Engineers (USACE)[2]	Federal	Feasibility of a flood control dam on Poso Creek.

[1] *Formation of Joint Powers Authority (JPA) in progress. Completion of Regional GWMP anticipated by 2015.*
[2] *Investigation undertaken at request of, and with partial funding by, local agencies.*
[3] *Initially formed as a "Soil Conservation District".*
[4] *Year reflects the last plan amendment.*

It is noted that since the 2007 adoption of the original IRWM Plan, the updated Kern IRWM Plan was prepared and adopted (2011), the Kern Groundwater Management Committee (KGMC) was organized, and the Kern River Watershed Coalition Authority (KRWCA) was formed, illustrating dynamic nature of water planning in the Region and the requirement of the IRWM Group to be engaged in regional and neighboring planning efforts. As described hereinafter, the entities listed in Table 10.2 have taken steps to become actively engaged in the water planning dialogue and members of the RWMG participate in several other water planning forums.

County of Kern

In broad terms, a General Plan is a long-term planning document which provides guidance to County officials who are charged with making decisions affecting the growth and resources within the unincorporated areas of the county. The County of Kern's General Plan, last amended in 2009, includes five objectives, two of which are pertinent to the management and planning efforts of the IRWM Group, as follows:

- Adopt policies and goals that reflect the County's on-going commitment to consult and cooperate with Federal, State, regional, and local agencies to plan for the long-term future of Kern County.
- Ensure the protection of environmental resources and the development of adequate infrastructure with specific emphasis on conserving agricultural areas, discouraging unplanned urban growth, ensuring water supplies and acceptable quality for future growth, and addressing air quality issues.

These two objectives are noteworthy in the context of the Plan, inasmuch as they affirm the County's commitment to consultation and cooperation with local planning efforts with regard to, among other matters, ensuring that water supplies are adequate in both quantity and quality. Specific policies regarding water resources are articulated in the 'Land Use/Conservation/Open Space Element' of the County's General Plan. Following the policies are several implementation measures, the most pertinent (to the IRWM Group) of which is reproduced following.

- Encourage effective groundwater resource management for the long-term benefit of the County through the following:
- Promote groundwater recharge activities in various zone districts.
- Support for the development of UWMPs and promote Department of Water Resources grant funding for all water providers.
- Support the development of GWMPs.
- Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater and desalination.

These objectives and implementation measures clearly articulate the County's support for local water planning, as well as specific water management practices which are captured in the Plan. The County even goes as far as reviewing certain water planning documents in the normal course of business, such as UWMPs, Water Supply Assessments, and environmental assessment (CEQA) documents. In 2011, the then current Director of the County's Development Services Agency prepared correspondence to the Board of Supervisors which set forth an approach "… to proactively engage in water planning and groundwater management issues" by prioritizing the County's participation in the various water planning forums within the County. Since that statement, the County has been hosting and participating in meetings of the KGMC. All RWMG Participant members have also participated in these meetings.

Kern Council of Governments

The Kern Council of Governments (Kern COG) includes the County of Kern and the eleven incorporated cities within the County, four of which are located within the Poso Creek Region; namely, the cities of Delano, McFarland, Shafter, and Wasco. This association of city and county governments was formed to address transportation issues within Kern County. Several years ago, Kern COG commissioned a public outreach program with a broader scope, which is known as the Kern Regional Blueprint Program. This Program was designed to develop a preferred vision for transportation, land use, and the environment with the significant growth in population which is anticipated over the next 40 years. The following, taken from a Kern COG summary brochure, describes the intended effect of the program.

The Kern Regional Blueprint is a new resource and communication tool for our region that will help our local communities accommodate future growth in new ways that preserve their community values and achieve their visions. We can achieve this through improved regional and local decision-making and increased involvement of all interests and segments of the population. The program strives to strengthen local decision-making through regional collaboration and integrated planning.

Released in December of 2009, the final report for the Kern Regional Blueprint Program identified top issues for the future, which included the following discussion with regard to "water".

Many participants acknowledged the importance of maintaining an adequate water supply and noted that water quantity and quality are essential to supporting future growth. Participants recognized water as a limited resource and generally agreed that moderate to major change be initiated through proactive comprehensive planning of future development, and significant government regulation. Conservation will be necessary both at household and industrial levels. Many also noted the local impacts of exporting local water supplies. Some participants suggested considering new water quality standards, expanding use of gray water, developing mutual-cost programs, improving supply management, implementing price inflation adjustments for low-income community members, and promoting xeriscape landscaping. Additionally, some participants noted that flood protection should be a key element addressed in new developments.

Kern COG has provided an important bridge between local and regional planning, specifically between the county and city governments in the Region, which is reflected in the Plan Update.

Kern County Water Agency (KCWA)

The KCWA is a 'Special Act District' formed for the principal purpose of contracting with the State of California for the importation of SWP water to Kern County, and the administration of that contract among the many individual districts within the County which are contracted with KCWA for the delivery and use of that water, as explained in Section 3.5. These districts are referred to as "Member Units" in the context of KCWA planning and management and they include two districts in the RWMG (Cawelo and Semitropic). Accordingly, the RWMG remains explicitly linked to the planning activities of KCWA and vice versa. Most recently, the KCWA has led the development of the Kern IRWM Plan update (2011), whose region encompasses the San Joaquin Valley portion of Kern County, including much of the Poso Creek Region. Considerable effort was expended in coordinating the development of the Kern IRWMP with the existing Poso Creek IRWMP, especially to resolve the boundary overlap issues. The KCWA continues to be notified of all meetings of the RWMG.

Kern Groundwater Management Committee

In 2011, discussions among representatives of local public agencies (within the Kern County subbasin) commenced with regard to region-wide groundwater management. While most of the public agencies had prepared GMPs for their individual jurisdictions, regional groundwater management planning had not been completed to provide a link between the individual documents and the individual BMOs. This dialogue was initiated in early-2012 in the form of noticed public meetings (as the KGMC), being hosted by the County of Kern. Committee purposes include the following[1]:

- Coordinating groundwater management programs and activities.
- Identifying and addressing issues pertaining to sustainable groundwater management.
- Establishing a framework for local groundwater management.

Periodic meetings have continued and have resulted in the retention of a Consultant (GEI Consultants, Inc., Bakersfield, CA) to prepare a Regional Groundwater Management Plan pertaining to the entire Kern County Subbasin and applicable districts and entities. The Committee is also moving forward with organizing itself as a Joint Powers Authority (JPA). Most of the RWMG members participating in this Committee and are expected to join the JPA in the near-future.

Kern River Watershed Coalition Authority

In late-2011, several public agencies in Kern County executed a Joint Powers Agreement which formed the KRWCA for the primary purpose of interfacing with the Central Valley Regional Water Quality Control Board (CVRWQCB, Regional Board) on behalf of the landowners within their jurisdictions with regard to the drafting and implementation of a new long-term Irrigated Lands Regulatory Program (ILRP). These public agencies include four districts within the Poso Creek Region, all of which are also members of the RWMG. In late-2013, the Regional Board adopted a new program in the form of Tulare Lake Basin General Order No. 5-2013-0120, which requires compliance with its waste discharge requirements for any irrigated land with the potential to discharge to surface water or groundwater. The Authority's goals are listed following (KRWCA, 2013):

- Facilitate regulatory compliance for the General Order for Coalition Members.
- Continued advocacy for growers on water quality issues in various forums.
- Develop and implement economical and scientifically valid water quality monitoring programs for surface water and groundwater in the region.

[1] Kern Groundwater Management Committee Request for Proposals for Consulting Services for Development of a Groundwater Management Plan.

With the Regional Board's adoption of the new General Order, the Authority is moving forward with the implementation and compliance phase. Future plan updates will benefit from the water quality monitoring programs developed by the Authority, and will include the planning and management enhancements proposed under this program.

North West Kern Resource Conservation District (NWKRCD)

The NWKRCD had its beginnings in the 1960s, with the formation of local Soil Conservation Districts. The RCD is organized for the protection and conservation of soil and water resources in an area of almost 600,000 acres, which includes the Poso Creek Region as mentioned in Section 3.7. Recall that the NWKRCD has been an active member of the RWMG since its formation. The NWKRCD's goals and objectives relate to the following: technical assistance, public awareness, conservation education, cooperation with other agencies (Federal, State, and local), and conservation district operations. Among its many activities, the RCD reviews and comments on land use boundary changes and on-farm conservation efforts, which were addressed in the formation of the Plan.

U.S. Army Corps of Engineers (USACE)

Though not a local agency, the USACE is included in this discussion inasmuch as they have undertaken investigation of the feasibility of constructing and operating a dam on Poso Creek, primarily for flood control purposes, at the suggestion of and partial funding by local agencies. In particular, these agencies include the County of Kern, the KCWA, and three districts within the RWMG (namely Cawelo, North Kern, and Semitropic). Aside from local rainfall and its attendant drainage, Poso Creek is the principal flood control concern in the Region as noted in Table 13.3. The NWKRCD coordinates with these agencies with regard to the maintenance of the Poso Creek channel within the Region for flood control purposes.

10.3 Local Water and Land-Use Planning Efforts

In essence, each land use has implications regarding water use; for example, golf course, residential development, irrigated agriculture, or undeveloped open space. In addition to the water "duty", which represents the minimum water demand associated with each, land use can also impact water management particularly for the districts and agencies who share the common groundwater basin as a water resource. For example, recharge can and does occur through the deep percolation of applied irrigation water and through the purposeful use of spreading ponds. Accordingly, land-use decisions are also water-use and water-management decisions and must be addressed in a proper management and planning fashion that allows for the involvement of stakeholders or interested parties. The current relationship between land-use and water-management decision makers is described in this section, along with some thoughts regarding the potential to improve coordination going forward.

Current Relationship

In general, most land-use planning activities and actions rest with the county and the cities, with their visions and policies articulated in their respective General Plans. The Kern Council of Governments is a forum which brings the County of Kern and the incorporated cities together. While their principal purpose has been to coordinate transportation planning, they have taken steps to broaden that mission as previously explained. In particular the Kern COG has recently commissioned a public outreach program which is known as the Kern Regional Blueprint Program (2008). This Program was designed to develop a preferred vision for transportation, land use, and the environment with the significant growth in population which is anticipated over the next 40 years. Provision of an “adequate water supply” was identified as one of the top issues going forward and has gained traction as a common issue between the Kern COG and the IRWM Group.

The County of Kern has, for a long time, appointed water managers from throughout the County to the Kern County Water Resources Committee (KCWRC), which has the duty “*To advise and make recommendations to the Board of Supervisors with respect to the water resources and groundwater quality issues of Kern County*”. In addition to participation by two members of the Board of Supervisors and the County’s Director of the Development Services Agency, 20 members are appointed by the Board of Supervisors. This has become a beneficial forum for dialogue between those responsible for land-use decisions and those responsible for water resources planning and management. While regular meetings of this Committee have been suspended, meetings are called on an as-needed basis. For example, several years ago, meetings were relatively frequent as the County formulated a plan to address concerns regarding the land spreading of biosolids. With regard to participation in various water forums, it is understood that prioritization is necessary owing to the number of forums/meetings and staff limitations.

In addition to the long-standing KCWRC, the County has more recently formulated a plan for actively participating in the dialogue with those responsible for water resources planning and management within the County. The Director of the County’s Development Services Agency articulated his position in this regard in a letter report to the County Board of Supervisors (2011), which included the following:

Since the County has legal authority over development and land use and is subject to State laws requiring a link between adequate water supplies and new development, it is of importance to the County to coordinate and actively participate in groundwater planning matters. The County’ broader interest of assuring that adequate water resources will be available to accommodate future growth for a variety of economic pursuits is also reason for the County’s engagement in water planning and management matters.

This same letter report recommended the following actions in this regard:

- Schedule tri-annual meetings with the KCWA staff and prepare water issue and program status reports for the Board of Supervisors.
- Continue to implement water laws and programs and comment on water planning proposals.
- Prioritized participation in water program meetings.

As described hereinabove, in 2012, the County began hosting and participating in meetings of the newly formed Kern Groundwater Management Committee (KGWMC). Since that time, the KGWMC has authorized the preparation of a Regional Groundwater Management Plan. This KGWMC has continued to meet and currently provides the largest forum for water and land-use planners to dialogue. In addition to County representatives, participation includes cities and districts. While these meetings are separate from the RWMG meetings, most of the RWMG members participate in this forum and are helping to fund the Regional Groundwater Management Plan.

Though attendance at Board of Supervisors' meetings, City Council meetings, or Planning Commission meetings is not regular, these meetings are attended by water managers in the Region from time to time when land use or project decisions are pending which have the potential to affect water supply or water quality. While the governance of the RWMG does not presently include a County representative, it does include a representative of the cities in the Region (see the list of IRWM Group participants at the front of the Plan) and there has been an open exchange of information.

Future Improvements

A potential opportunity for improving the working relationship between water managers and land-use planners is the KCWRC. This committee should meet on a "regular" schedule, perhaps quarterly as opposed to an "as needed" basis, which would support an ongoing dialogue and set the stage for identifying and addressing potential water- and land-use issues before they become full-fledged issues. While these meetings will have a broader geographic scope, it is expected that it would serve the purposes of the Region with regard to this important dialogue. It is noteworthy that all three of the principal sources of surface water supplies within the County, SWP, CVP, and local watershed sources, as well as groundwater, are relevant to the Region. In addition to reports on the various sources of supplies, the agenda could include a status report from the RWMG. Other actions that could be considered to improve the working relationship between planning groups may include:

- Encourage the County of Kern in its plan to actively participate in water planning and management through prioritized participation in the various water forums.
- Provide an annual briefing to County planners on the RWMG's activities over the last year, as well as those activities which are anticipated for the year ahead.
- Review and comment on draft updates to the UWMPs in the Region.

11.0 Stakeholder and Public Involvement

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Stakeholder Involvement' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Public process that provides outreach and opportunity to participate in IRWM plan.	11.4, 11.5
Process to involve and facilitate stakeholders during development and implementation of plan regardless of ability to pay; include barriers of involvement.	11.1
Involvement of DACs and tribal communities.	11.3
Decision-making process and roles that stakeholders can occupy.	11.1
Stakeholders necessity to address objectives and RMSs.	11.1
Collaborative process will engage a balance in interest groups.	11.1

Recall that classifications of IRWM Group involvement include Stakeholders, or members that are directly involved with or potentially affected by the planning and management efforts of the RWMG; and Interested Parties which are any private or public entities that have interest in the Poso Creek regional planning process but may or may not be directly involved (includes individual or general public interests within the IRWM Group). The RWMG makes a concerted effort to recruit and engage regional Stakeholders and Interested Parties that provide valued input on matters pertaining to their interests and the enhancement of water management in the entire Poso Creek Region. This section includes discussion regarding the involvement of Stakeholders and Interested Parties with planning and implementation activities in the Region, including State and Federal agencies, as well as the RWMG's outreach strategy for maintaining and extending participation in the IRWM Group.

11.1 Regional Stakeholders & Interested Parties

Stakeholders (either as individual entities or organizations) and Interested Parties are critical to informing the IRWM process and supporting the RWMG in their development, update, and implementation of the IRWM Plan for regional planning and implementation efforts. These groups provide their input or contribute to discussions through participation in meetings and an open-discussion for communications platform, or through direct involvement in project or program work groups. For instance, the RWMG continues to rely on key Stakeholders who represent DAC interests and/or wildlife interests to provide information to address the objectives and RMS that are outside the responsibilities of an agricultural water district or the expertise of the district staff.

The RWMG maintains a transparent governance structure where all Stakeholders and Interested Parties are afforded the opportunity to contribute to the decisions made by the RWMG through participation in various Work Groups, as described in Section 2.3. Inasmuch as Stakeholders are directly involved with or potentially affected by RWMG decisions, they may hold more weight when working with the RWMG during the project or program review process. However, interest and participation in regional planning efforts by all of these groups is vital to the success of the IRWM Group and vital to the ability of the RWMG to accomplish their Regional Goals and Measurable Objectives.

CWC §10541(g) requires that the development of an IRWM Plan includes the opportunity for participation from appropriate local agencies (Interested Parties) and Stakeholders, as applicable to the Region. In this regard, the CWC identifies 13 different Stakeholder and local agency categories as listed below:

1. Wholesale and retail water purveyors, including a local agency, mutual water company, or a water corporation [WP].
2. Wastewater agencies [WW].
3. Flood control agencies [FA].
4. Municipal/county governments & special districts [GD].
5. Electrical corporations [EC].
6. Native American tribes that have lands within the Region [NA].
7. Self-supplied water users, including agricultural, industrial, residential, park districts, school districts, colleges and universities, and others [SS].
8. Environmental stewardship organizations, including watershed groups, fishing groups, land conservancies, and environmental groups [ES].
9. Community organizations, including landowner organizations, taxpayer groups, and recreational interests [CO].
10. Industry organizations representing agriculture, developers, and other industries appropriate to the Region [IO].
11. State, federal, and regional agencies or universities, with specific responsibilities or knowledge within the Region [SF].
12. Disadvantaged community members and representatives, including environmental justice organizations, neighborhood councils, and social justice organizations [DC].
13. Any other interested groups appropriate to the Region [OT].

The Stakeholders and Interested Parties involved in the IRWM Group are listed in the 'IRWM Participating Districts & Agencies' tables at the beginning of the Plan, and each have been identified with one of the above-described categories. The RWMG continues to make a concerted effort to encourage Stakeholder and local agency groups to participate in the regional planning and implementation processes, specifically those efforts during which decisions are made that may directly or indirectly affect these groups.

While significant outreach was performed during the development of the 2007 IRWM Plan, outreach efforts have continued through consistent periodic meetings of the IRWM Group, attendance of DWR IRWM planning workshops, and maintenance of e-mail communication list. These activities have consistently, over time, attracted more Stakeholders or Interested Parties to participate in the IRWM Group. An indication of the consistent involvement is evident by the Poso Creek IRWM Plan Implementation Meeting Attendance Log. Neighboring community water districts, such as the Angiola Water District and Allensworth Community Services District, have attended and regularly participated in RWMG meetings. Wildlife habitat interests associated with the Kern National Wildlife Refuge, the local duck clubs, the Tulare Basin Wildlife Partners, and the Semitropic Wildlife Improvement District receive the regular communication from the IRWM Group and work with the water districts to incorporate habitat components into water reliability projects that adhere to the Measurable Objectives stated in Section 4.5 (specifically Objectives “I”, “K”, and “L”). The Watershed Coordinators, the Federal Natural Resources Conservation Service (NRCS) and the USBR, and representatives for the incorporated and unincorporated DAC communities also interact regularly within the IRWM Group and with the RWMG. Several of the Stakeholders or Interested Parties, such as, the NRCS, the USBR, and DWR, are funding projects implemented by the RWMG.

The RWMG recognizes that some of these groups, such as, Native American tribes may not reside within the IRWMP boundary. The RWMG also recognizes that DAC communities may have limited financial resources and limited available time to participate directly in the IRWM Group meetings and implementation efforts, thus require additional communication and effort to effectively coordinate regional planning. There is also the risk that a time commitment or participation costs may deter other potentially willing individuals or organizations from participating in regional planning. The RWMG encourages individuals or organizations to participate under the classification of Interested Parties. To reduce any potential issues for an Interested Party to be involved due to cost, no fees are charged for direct involvement in the IRWM Group nor are they required to make a certain time commitment. These groups are free to attend the periodic monthly meetings and voice their concerns or input to the RWMG, and may participate in project or program Work Groups. The list of Interested Parties in the tables at the beginning of the Plan indicates those individuals or agencies which have been involved in the IRWM Group in the past to some extent serving on a work group for projects or programs that concern neighboring districts or agencies. The list is not exclusive, and may be altered over time as involvement in the IRWM Group changes, including changes between IRWM participant classifications, such as an Interested Party becoming a Stakeholder.

11.2 State, Federal, and Local Stakeholders

To this point, State and Federal Stakeholders have primarily referred to the DWR and USBR, respectively. Periodically, a representative from the DWR phones in or attends the RWMG meetings in person. Federal and state agency representatives also participate in field tours of projects when under construction. The Friant Water Users Authority interacts with the IRWM Group through several member water districts and is supportive of conveyance improvements (regional interties) that connect facilities in water districts with federal and non-federal water contracts.

The DWR has been largely responsible for providing the Proposition 84 Guidelines for regional planning and both the DWR and USBR have provided grant funding assistance to implement the projects and programs that accomplish the Regional Goals and Measurable Objectives of the IRWM Plan. The RWMG has worked directly with the agencies, specifically the DWR, through meetings and continuous communication to ensure that all regional efforts, such as the IRWM Plan itself, are compliant with all rules and regulations within the California Water Code governing regional water management. Since most of the water management districts in the Region are also State (SWP) and Federal (CVP) water supply contractors (as discussed in Section 3.3), these agencies also have a great deal of input on and stake in the planning and management decisions made by the RWMG. For the purposes of this IRWM Plan, these agencies are considered Stakeholders (as defined in Section 1.0), but are not 'directly' involved in the IRWM governance efforts nor do they pay fees to maintain the group since involvement is generally related to regulatory matters and planning review.

There are other State and Local agencies that are involved in the Poso Creek IRWM Group, such as, the Friant Water Users Authority that participate as Interested Party. The Interested Party groups have an interest in the planning and implementation efforts of the IRWM Group, but are not necessarily involved with project and program details or impacted by the planning efforts. The RWMG maintains contact with these agencies and encourages them to provide regulatory and planning review assistance based on project and program submissions on an as-needed basis.

The RWMG also maintains contact with the staff of several legislators within the State and Federal government for the purposes of maintaining awareness regarding State and Federal regulatory efforts and to expresses the interests of the IRWM Group to legislative representatives. Legislators whose jurisdictions include all or part of the Poso Creek Region include the following:

- Congressman Kevin McCarthy (23rd District of California, US Representative)
- Congressman Jim Costa (16th District of California, US Representative)
- Congressman Devin Nunes (22nd District of California, US Representative)
- Assembly Member Jean Fuller (State Assembly Member, 18th District)

- Assembly Member Rudy Salas (State Assembly Member, 32nd District)
- Assembly Member Shannon Grove (State Assembly Member, 34th District)
- Senator Andy Vidak (State Senator, 16th District)
- Senator Jean Fuller (State Senator, 18th District)

Note that several of the State and Federal Stakeholders interact with the Poso Creek Group as part of their agency providing funding assistance to construct projects; however, they were not directly involved in developing the original IRWM Plan or the 2014 Update. The Plan has provided the basis for establishing the Regional Goals and Measurable Objectives (reference Sections 4.4 and 4.5) used for submitting projects and programs for State and Federal grant funding applications and maintaining contact with legislative and agency representation. As such, the involvement in the IRWM Group from these contacts has been somewhat indirect, but significant towards regional planning and implementation efforts.

11.3 Other Stakeholders and Disadvantaged Communities

As mentioned in Section 6.5, several other Stakeholders have some connection to IRWMP development and implementation. These other stakeholders include local and state-wide organizations, agricultural water and environmental advocacy groups, and neighboring IRWM groups that are generally considered Interested Parties. DACs in the Region are directly represented through a DAC Work Group (reference Section 11.4) and participate directly in regional planning and management efforts. The RWMG has made a concerted effort to include some of these other Stakeholders and DACs in regional planning and management efforts, through involvement in RWMG meetings and formalized Work Groups (reference Section 2.3). The RWMG has tailored some of the planning and implementation efforts to provide direct benefits to these groups, such as applying for federal assistance through the Rural Water Supply Program.

All of the incorporated and unincorporated cities and communities in the Region qualify as “economically disadvantaged communities” based on the statewide median household income (as described in Section 3.9). DAC participation in the IRWM Group was formalized through the formation of a DAC Work Group, which also includes an elected DAC Representative who is a voting member of the RWMG. The voting DAC Representative reflects the substantial consideration given to the DAC communities’ needs during development and review of the Plan. Recall that one of the IRWM Group’s Measurable Objectives, was based on addressing the water-related needs of these DACs (see Objective “J” in Section 4.5).

Disadvantaged communities within the Central Valley, including those within this Region, are further represented by Self-Help Enterprises (SHE), a non-profit entity that provides technical services and support for families and communities to compete for resources in lower socioeconomic areas. The RWMG has worked closely with SHE for many years to identify DAC concerns and to promote potential solutions, either as standalone projects or programs or as a component of an IRWM grant submission. In other words, proposed projects or programs that address DAC concerns are considered for IRWM funding opportunities, with specific benefits addressed in Project Descriptions. The RWMG recognizes that DACs have limited economic resources to utilize in addressing their concerns as an individual entity. Accordingly, the DAC Representative participates in the RWMG at no cost but, as a voting member, is in a position to influence in IRWM planning and implementation efforts. The RWMG makes a concerted effort, in coordination with SHE as appropriate, to assist these communities in qualifying for grant funding based on the goals and objectives of the IRWM Plan.

It is noted that there are no Native American tribal communities located in the Region (as mentioned in Section 3.9). Accordingly, there is no direct representation for Native American interests in Poso Creek IRWM planning and implementation efforts.

11.4 Public Involvement and Outreach

The RWMG has developed and implemented a Public Involvement Process to ensure that the public is informed in the planning and implementation efforts undertaken by the IRWM Group, including the development and adoption of the IRWM Plan. This process is detailed in the Public Involvement Plan (PIP) drafted by the IRWM Group in September 2013, and is included in Appendix H. The PIP expresses the desire of the IRWM Group to ensure the public is aware of the existence of the Poso Creek IRWM Group for the Region, and their efforts towards addressing water management enhancements through planning and project/program implementation, and to promote public awareness regarding water resources issues in the Region. The PIP will be updated as the need for greater or improved public involvement or outreach is identified. Development and adoption of the 2014 IRWM Plan update, and public involvement, followed the processes described in Sections 2.5 and 2.6, respectively.

As previously mentioned, the general public is encouraged to become involved in the IRWM Group as an Interested Party by attending the periodic monthly meetings or actively communicating with the RWMG through e-mail, letters, or other methods of communication. The lead agency, Semitropic WSD, maintains and archives information dedicated to the IRWM, including a schedule of meeting dates, agendas and minutes, list of RWMG Participants, Stakeholders, and Interested Parties, and documentation including the Plan. The RWMG makes available information and copies of the documentation to the public upon request. During development of the IRWM Plan, the RWMG also developed an easy-to-read brochure to communicate the background, vision, and mission of the IRWM Group to any interested parties or public.

11.5 Continuous Outreach and Involvement Strategies

Most potential Stakeholders or Interested Parties in the Region are already aware of the efforts by the IRWM Group and have chosen to participate in the group to some extent through periodically participating in the RWMG meetings or receiving communication through the RWMG Chairman's e-mail list. The RWMG will continue to follow the PIP to expand involvement and outreach efforts. The PIP will be periodically assessed and updated if the need for improved outreach is identified. The RWMG will consider the effectiveness of the public outreach strategies as part of their annual reporting.

12.0 Coordination and Integration Standards

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Coordination' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Process to coordinate water management projects and activities of participating local agencies and stakeholders to avoid conflicts and take advantage of efficiencies.	12.1, 12.2
Neighboring IRWM efforts and ways to cooperate.	12.4
Areas where a state, federal, or local agency can assist in communication or cooperation.	12.3

The IRWM Group views 'coordination efforts' as the public outreach and organization of members, including RWMG Participants, Stakeholders, and Interested Parties, encouraging them to work together to accomplish the Regional Goals and Measurable Objectives stated in the IRWM Plan (reference Sections 4.4 and 4.5, respectively). These efforts can apply to specific tasks, and therefore may be facilitated via work group, or may be implemented by the group as on-going policies or procedures implied under the guise of day-to-day management of the IRWM Group. The goals of IRWM coordination include the following:

- Identification of opportunities to address project or program proposals that accomplish the goals and objectives of the IRWM Plan, while providing benefits to the IRWM members including RWMG Participants, Stakeholders, and Interested Parties, or inter-regional partners within neighboring IRWM groups;
- Awareness of inter-regional planning and implementation efforts, or individualized efforts within the Region, leading to a reduction in conflicts between these groups;
- Awareness of State and Federal agency resources, guidelines, and grant funding opportunities that align with local resources.

The IRWM Group has successfully planned and implemented various projects and programs in the Region that fit the goals and objectives of the IRWM Group. The implementation activity combines the viewpoints, participation, and diverse opinions of the participants and helps to focus them on unified efforts towards enhanced water management in the Region, thus, effectively accomplishing 'integration' of the group (reference Section 12.2). The following section describes the coordination efforts and processes for integrating water and resource management efforts by the IRWM Group.

12.1 Coordination and Integration in IRWM Group Activities

The IRWM Group governance structure fosters and promotes both the integration and coordination of member districts, agencies, and interests (reference Section 2.2). Recall that the RWMG Participants entered into an MOU that provides an organizational structure for the IRWM Group to be governed. As stated previously, the effectiveness of the governance is dependent on the effectiveness of the individual leaders within each of the participating organizations, their roles and responsibilities, communication between these organizations, and contributions through established relationships which successfully binds the group together. In particular, the RWMG Participants came together with the idea that integrating their respective water resource and infrastructure assets would yield shared benefits in excess of what could be accomplished individually.

The RWMG Participants, and the DAC Work Group, are integrated into the planning and implementation efforts via their roles on the RWMG. Stakeholders and Interested Parties, including the general public or private/public organizations, may participate in the RWMG meetings and can serve on project or program work groups. The RWMG uses a variety of outreach methods to disseminate information regarding the IRWM Group's efforts, to foster interest in the group's planning processes, or to solicit comments on development of the Plan (reference Section 11.4).

Regarding project or program assessment and selection (for implementation), the RWMG uses an integrated process to solicit and review projects as described in Section 5.1. This process uses input from the RWMG, the Chairperson, and the assigned Work Groups which consist of IRWM members from the list of RWMG Participants, Stakeholders, and Interested Parties with a direct interest in a particular project or program. The process is meant to integrate and improve coordination between all IRWM Group participants and the RWMG Participants, who will eventually vote to determine the status for implementation per the IRWM Plan. The general benefits and impacts of implementing different types of projects, for entities within the Region and neighboring areas are discussed in Section 6.0. This information is intended to assist in the submission of new projects or programs for consideration by the RWMG, as well as to improve coordination during the review (and potential implementation) process. It is noted that the RWMG maintains a list of submitted projects and programs so that all parties are aware of the proposed efforts, to avoid complications or duplicated submissions. The projects and programs list is updated on an as-needed basis, and will be incorporated into the RWMG's Annual Report.

12.2 Resource Integration

As previously mentioned, the Region includes important water resources and related infrastructure that facilitates local district and agency water management, and also facilitates regional water management between districts. Most of the entities within the Region either pump from the underlying groundwater, a hydrologically-connected and shared groundwater subbasin (reference Section 3.4), or they conjunctively use surface water supplies from State, Federal, or Local sources, along with the underlying groundwater. Surface water use is governed by the water supply contracts under which those supplies are brought into the Region (reference Section 3.5). The integration and coordinated use of these resources involves data sharing, technical expertise, and management of the infrastructure operated by each district of the IRWM Group. The IRWMP enhances resource integration by focusing on improvements to regional planning and implementation or regional facilities ahead of individual district efforts.

12.3 State and Federal Agency Assistance

Involvement of State and Federal agencies in the RWMG's planning and implementation efforts of the RWMG is covered in Section 11.2 of the Plan Update. These agencies can assist the IRWM Group by providing updated guidelines for regional planning, working with the IRWM Group to ensure all efforts meet those guidelines, and by making grant funding available to accomplish the Regional Goals and Measurable Objectives stated in the IRWM Plan. Recently, the DWR has completed updates to the IRWM program guidelines that provide improved procedures and thus improving the effectiveness of the IRWMP program.

12.4 Neighboring IRWM Regions

The RWMG has committed considerable time and effort to support and strengthen working relationships with neighboring IRWM regions, specifically that immediately neighbor the Poso Creek Region and located within the DWR-specified Tulare Basin Funding Area (as shown in Figure 1.1). The Poso Creek IRWM Group has participated in a leadership role for this funding area in the past to help facilitate and to assist the DWR to coordinate interregional planning activities. Conflicts and issues with these other IRWM regions in recent-years have been minimal, as their boundaries are now well defined. Overlap issues have been resolved as noted in Section 3.11. Accordingly, the IRWM Group has remained actively involved with these neighboring regions through coordinated efforts which are described in Section 2.7. The IRWM Group maintains contact primarily with the Tule River, Kaweah, and Kings Basin IRWM groups to the north, the Kern IRWM group to the west, south, and east, and the Southern Sierra IRWM group to the east. Representatives of the RWMG have routinely met with surrounding IRWM groups at monthly Tulare Basin Funding Area coordination meetings and have worked cooperatively on matching neighboring boundaries in the past and focusing on projects or programs that impact areas adjacent to boundary lines. It was suggested that areas of "white space" (i.e., areas that are not governed by water management districts or agencies) that do not have an IRWM sponsor, including areas outside of Poso Creek Region or other IRWM regions, be provided a method for inclusion in an the IRWMP Program within the Tulare Basin Funding Area, as stated in the regular regional meetings.

Sections 6.2 and 6.3 describe how the Regional Goals and Measurable Objectives including the RMSs and project or program implementation may impact or provide benefits to the neighboring regions. As implied in that section, these regions face similar concerns regarding agricultural demand, reduced reliability of imported surface water supplies, and increased use of groundwater. Accordingly, the IRWM Group considers the greater impacts and benefits for planning and implementation efforts, and actively coordinates these efforts with the neighboring IRWM groups. It is noted that neighboring IRWM groups are encouraged to participate in Poso Creek IRWM Group efforts that may be of interest; either as Interested Parties or through participation in designated work groups (reference Section 2.3) that involve joint projects or programs or may involve resolving common issues.

13.0 Climate Change Assessment

In accordance with the IRWMP Proposition 84 Program Guidelines, this section addresses the 'Climate Change' Plan Standard, which includes the requirements shown in the following table (along with identification of the specific subsection(s) where each requirement is addressed).

Requirement	Plan Section(s)
Evaluate IRWM region's vulnerabilities to climate change and potential adaptation responses based on vulnerabilities assessment in the DWR Climate Change Handbook for Regional Water Planning.	13.1, 13.2, 13.3
Process that considers GHG emissions when choosing between project alternatives.	13.4
List of prioritized vulnerabilities based on vulnerability assessment and IRWM's decision making process.	13.3
Plan, program, or methodology for further data gathering and analysis of prioritized vulnerabilities.	13.3, 13.5
Climate change as part of project review process.	13.5

Climate change refers to the long-term change in the statistical distribution of weather patterns in precipitation, temperature, wind, and severe weather events over a period of time of decades and centuries with respect to 'historically-expected' (average) weather conditions. Climate change can occur from both natural and anthropogenic causes; however, many scientists feel that the high levels of anthropogenic greenhouse gas emissions have accelerated the rate of natural climate change. The potential impacts of climate change are far reaching, and the progression of these changes on environmental conditions has differed around the world.

Specific climate change impacts on the Region over time are difficult to predict. Rather, generalized effects on the regional and statewide climates can be predicted, such as changes in the volume, nature, and timing of precipitation in watersheds that provide water supplies for regional users. However, uncertainty in these predictions means the IRWM Group must adequately prepare for a large range of potential future conditions regarding water supplies and demand in the Region. The following section provides an assessment of the potential impacts of climate change on the Region, including an assessment of regional vulnerability, and the RWMG's response to these potential impacts.

13.1 Effects of Climate Change on Regional Water Supplies

As mentioned in Section 3.3, the surface water supplies for many of the districts in the Region are currently dictated by changes in the volume, nature, and timing of precipitation in the Sierra Nevada Mountains, which affects both local (Kern River and Poso Creek) and imported (SWP and CVP) water supplies. Accordingly, any adverse effects from climate change on the runoff from these watersheds would aggravate the ability of these districts to provide water supplies which are adequate to meet regional demands.

Regarding the State (SWP) and Federal (CVP) surface water supplies, the DWR examined 12 future climate scenarios in a report titled 'Using Future Climate Projections to Support Water Resources Decision Making in California' (Chung et al. 2009) to assess future reliability issues with these sources due to climate change. The 12 statewide scenarios represent projections from six Global Climate Models for higher and lower greenhouse gas emissions while taking into account potential Delta salinity intrusion due to sea level rise. For all climate projections studied, the reliability and overall volume of water delivered by the SWP and CVP water supply systems is expected to be reduced. For instance, by mid-century, median Delta exports through the SWP's Banks Pumping Plant are expected to be reduced by 7 percent for the lower greenhouse gas emissions scenario and by 10 percent for the higher emissions scenario. Mid-century changes in Delta exports for the 12 future climate scenarios range from an increase of 2 percent to a decrease of 19 percent. Current long-term reliability predictions of surface water deliveries via the California Aqueduct are expected to average 60 percent of contract amounts (DWR, 2011). Decreases in annual Delta exports due to climate change would reduce reliability even further, resulting in less water delivered south of the Delta, which directly affects the amount of water supplied to the Poso Creek Region.

Several investigations were conducted by the USGS California Water Science Center (CAWSC) regarding hydrological effects of climate scenarios in the Sierra Nevada Mountain Range (USGS 2009; Water Resources Research, 2012). As previously noted, the Region's surface water supplies are dependent on runoff from the Sierras. Each of these investigations predict that California's climate will become warmer (+2 to +4° C) and drier (10-15 percent) during the mid- to late-21st century, relative to historical conditions. These scenarios were based on a commonly accepted projection of 21st century climate from the GFDL CM2.1 (Geophysical Fluid Dynamics Lab Climate Model 2.1) global climate model, responding to assumptions of rapidly increasing greenhouse-gas emissions. If these predictions materialize, runoff from the Sierra Nevada Mountains is expected to be much less reliable, with quantities presumably declining over time. Reduced surface water deliveries for agriculture in the Central Valley, combined with increased demands for irrigation water due to the increasingly warmer, drier climate, will result in increased use of groundwater, the impacts of which could include the following:

- Reduced base flow in streams;
- Reduced groundwater outflows;
- Increased depths to groundwater; and
- Increased land subsidence.

All other things being equal, increased depths to groundwater will result in increased power and energy requirements for groundwater pumping, which has its own greenhouse gas implications.

Local communities, rural residences, and businesses rely on groundwater from the Kern County Subbasin as their main supply (reference Section 3.4). Should climate change result in a reduction in water available from surface supplies, the increased frequency and quantity of groundwater pumping by agricultural water districts and other users will lead to a decrease of groundwater in storage without the necessary means of replenishing the depleted groundwater from storage. According to another CAWSC study (Proceedings of the Eighth International Symposium on Land Subsidence, 2010); Kern County may expect land surface subsidence to resume with the dewatering of aquifer materials beyond that which has been experienced historically.

13.2 Effects of Climate Change on Agricultural Water Demand

The effects of climate change are expected to increase both daytime and nighttime temperatures in the Central Valley, resulting in lengthening of the growing season under much drier conditions. This general increase in temperatures, coupled with greater variability and unpredictability in precipitation, is expected to lead to increases in evapotranspiration resulting from warmer seasons; thereby creating an increase in agricultural water demand for irrigation, with potentially greater year-to-year variability.

As noted in Section 3.2, permanent crops, such as, grapes and fruit and nut trees, account for around 67 percent of the total irrigated area in the Region. These types of crops generally require adequate winter chill to produce economically viable yield. Increased temperatures in the Central Valley are expected to reduce winter chill hours, thus causing adverse effects on crop yield. By the end of the century, the winter chill needed for these crops is predicted to disappear. Today, the number of hours of winter chill in the San Joaquin Valley has shrunk from about 1,500 a few decades ago, to approximately 1,000 to 1,200 hours (PLoS ONE, 2009). Some farmers are beginning to overcome this change by using new plant varieties.

Studies with neighboring IRWM Groups are now underway to prepare farmers for the likely impacts of climate change. Such efforts include breeding varieties of fruit trees which can withstand the decreased winter chill hours, developing tools to aid the crops in coping with reduced chill, and researching the temperature responses of particular orchard crops to better understand potential long-term effects. However, some solutions, such as replanting orchards with altered crop varieties or the installation of tools, may not be feasible for many growers.

13.3 Regional Vulnerability Assessment

Table 13.1 provides an assessment of the regional vulnerability to the potential climate change impacts using the 'Vulnerability Assessment Checklist', found in the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011). This checklist provides a further evaluation of the effects on regional water demands and supplies, as well as water quality, flooding events, environmental and ecosystems, and hydropower systems.

Vulnerability ratings, identified in Table 13.1, are based on presumed level of impact to Regional conditions based on climate change considerations given in the checklist. For this assessment, the following rating system was used:

- "High" rating: expected impacts of climate change on listed item pose a severe risk to regional operations in the future, including, impacts that greatly inhibit the ability of water management districts to deliver water supplies to users within the region.
- "Medium" rating: expected impacts of climate change on listed item pose a moderate risk to regional operations in the future, including, impacts that require management and planning changes in order to mitigate adverse effects.
- "Low" rating: expected impacts of climate change on listed item pose a low risk to regional operations in the future, including, impacts that may be mitigated through relatively simple planning or management changes, but are not critical to regional operations.
- "Not Applicable" (N/A) to the Region, or impacts that will not affect regional operations.

Table 13.1 IRWMP Climate Change Vulnerability Assessments

List No.[1]	Checklist Item	Regional Conditions	Vul. Rating[2]
I. Water Demand Assessment			
I.A	Are there major industries that require cooling/process water in your planning region?	Currently, requirements for cooling/process water are insignificant in the Region.	Low
I.B	Does water use vary by more than 50% seasonally in parts of your region?	Yes. Water for irrigated agriculture is the predominant use of water in the Region. While annual water demands are fairly consistent from year to year, there is considerable seasonal variation, with the highest demands occurring in the summer and lowest demands in the winter. .	Medium
I.C	Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as long heat lingers before night-time cooling, be prohibitive for some crops?	All crops grown in the Region are climate sensitive to some extent. Modest shifts in heating and cooling patterns are likely to affect crop yield; however, significant shifts could affect the viability of continuing to grow certain crops. Trends regarding accumulated winter chill were investigated by Baldocchi and Wong (2008) for climate stations located throughout the Central Valley. One station was located within the Region; it is a CIMIS station located near the City of Shafter (which is in the south-central portion of the Region). In contrast to many stations in other areas of the state, the record for this station did not evidence a negative (or adverse) trend with regard to chill hours; however, it did show a negative trend with regard to chilling-degree hours.	Medium
I.D	Do groundwater supplies in your region lack resiliency after drought years?	Groundwater levels will decline with a period of dry years. The resiliency of the Region's groundwater resource is directly related to the reliability of imported surface water supplies since groundwater is used to meet demands that are not fulfilled by surface water supplies. To this extent, "resiliency" has been reduced.	High

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.	Checklist Item	Regional Conditions	Vul. Rating
I. Water Demand Assessment			
I.E	Are water use curtailment measures effective in your region?	There has been a trend in the Region toward permanent crops, which has resulted in permanent crops accounting for 65% to 75% of the irrigated acreage within the Region. To this extent, the potential to curtail water use in any given year by fallowing has been reduced. Some districts have also initiated permanent demand reduction by purchasing and retiring land from irrigated agricultural uses. Water use efficiency improvements within a conjunctive use basin, overlying usable groundwater, may improve the effectiveness of water use; however, they do not curtail consumptive water use.	Medium
I.F	Are some in-stream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?	While there are no in-stream flow requirements within the Region, the surface water supplies which are available to the Region may be affected by such requirements at the sources of these supplies (SWP, CVP, and Kern River).	N/A
II. Water Supply Assessment			
II.A	Does a portion of the water supply in your region come from snowmelt?	Yes. All surface water inflows are primarily a function of snowmelt runoff; however, the snowmelt does not occur within the Region.	High
II.B	Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?	Yes. Regional water supplies include water diverted from the Delta (both SWP and CVP water); the San Joaquin River (via the Friant Division of the CVP); and the Kern River (reference Section 3.3). Both the San Joaquin River and the Kern River have their watersheds in the Sierra Nevada Mountains, which have been identified as climate-sensitive.	High

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.	Checklist Item	Regional Conditions	Vul. Rating
II. Water Supply Assessment			
II.C	Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?	No.	N/A
II.D	Would your region have difficulty in storing carryover surpluses from year to year?	There is limited carryover available for SWP water in San Luis Reservoir. Carryover of Kern River water in Isabella Reservoir is limited by the Reservoir's flood control purpose and USACE Regulations. Carryover of CVP water in Millerton Reservoir is essentially non-existent. The most effective means of local regulation is through the use of available groundwater storage. The Region includes major water conveyance facilities, as well as significant in-lieu and direct recharge capabilities, which facilitate groundwater storage. There are opportunities to expand the Region's groundwater storage capabilities.	High
II.E	Has your region faced a drought in the past during which it failed to meet local water demands?	No. Water demands have been met through the use of groundwater which, during drought, can result in significant declines in groundwater levels. To the extent that surface water supplies are reduced in the future (as a result of climate change and/or regulatory constraints), recharge will be reduced, which will affect the availability of groundwater for meeting local water demands. In addition, hardening of the Region's demand (with an increased percentage of permanent crops) increases the likelihood of water supply deficiencies going forward.	High
II.F	Does your region have invasive species management issues at your facilities, along conveyance structure, or in habitat areas?	Invasive species issues are minimal in the Region, primarily consisting of algae growth in canals during times of low conveyance with low velocities or ponded water conditions.	Low

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.	Checklist Item	Regional Conditions	Vul. Rating
III. Water Quality Assessment			
III.A	Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?	Wildfires are not a threat within the Region; however, wildfires are a threat in the Kern River watershed. Wildfires and subsequent erosion upstream of Isabella Reservoir would likely be mitigated by detention in the reservoir. Wildfires and subsequent erosion downstream of the reservoir would have greater potential to affect the irrigation operations in the Region, particularly those relying on micro-irrigation methods. Depending on timing, direct recharge of groundwater in spreading ponds could also be adversely impacted. There would be no threat to M&I uses within the Region since all such uses are met with groundwater.	Low
III.B	Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?	Some local and regional canals seasonally have algae blooms that require maintenance, including minimal treatment or cleanup efforts. Algae blooms may become more frequent with climate change as a result of increased temperatures in the Region and less water moving through the canals.	Low
III.C	Are seasonal flows decreasing for some water-bodies in your region? If so, are the reduced low flows limiting the water-bodies' assimilative capacity?	Poso Creek is the only "water body" in the Region with seasonal flows; however, whether seasonal flows are decreasing is unknown.	N/A
III.D	Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?	No.	N/A
III.E	Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?	No. M&I uses in the Region are supplied by groundwater pumping and surface water supplies are not treated for irrigation use.	N/A

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.	Checklist Item	Regional Conditions	Vul. Rating
IV. Sea Level Rise Assessment			
IV.A	Has coastal erosion already been observed in your region?	The Poso Creek Region is located in the Southern San Joaquin Valley, and the concerns regarding coastal regions are not applicable.	N/A
IV.B	Are there coastal structures, such as levees or breakwaters, in your region?		N/A
IV.C	Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation at less than six feet above mean sea level in your region?		N/A
IV.D	Are there climate-sensitive low-lying coastal habitats in your region?		N/A
IV.E	Are there areas in your region that currently flood during high tides or storm surges?		N/A
IV.F	Do tidal gauges along the coastal parts of your region show an increase over the past several decades?		N/A

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.	Checklist Item	Regional Conditions	Vul. Rating
V. Flooding Assessment			
V.A	Does critical infrastructure in your region lie within the 200-year floodplain?	Although flows in Poso Creek are infrequent, flooding of adjacent lands has occurred from time to time. The Poso Creek floodplain traverses the northern portion of the Region from east to west. Most of the area within the floodplain consists of irrigated agriculture; however, a reach of State Highway 99 and a portion of the City of McFarland are also included. Highway 99 is a major north-south transportation corridor, the disruption of which would have public safety, as well as economic, implications.	Medium
V.B	Does part of your region lie within the Sacramento-San Joaquin Drainage District?	No.	N/A
V.C	Does aging critical flood protection infrastructure exist in your region?	No. As mentioned in Section 3.5, storage restrictions have been in place on Isabella Reservoir since 2006 and will remain in place until dam safety concerns are adequately addressed. While Isabella Reservoir does not present a flood control issue for the Region, it is a water supply issue, inasmuch as it regulates the delivery of Kern River water to the Region. Members of the RWMG have actively encouraged the USACE to expedite the "fix" for Isabella Dam deficiencies.	Medium
V.D	Have flood control facilities (such as impoundment structures) been insufficient in the past?	While there are not any flood control impoundment structures in the Region, investigations have been conducted in the past with regard to the feasibility of constructing a dam on Poso Creek (which has yet to pass the benefit-cost test).	Low
V.E	Are wildfires a concern in parts of your region?	As noted in III.A (above), wildfires are not a concern in the Region; however, wildfires are a concern in the watersheds that provide the Region with its surface water supplies.	Low

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.	Checklist Item	Regional Conditions	Vul. Rating
VI. Ecosystem and Habitat Vulnerability Assessment			
VI.A	Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?	Coastal aquatic habitats are not applicable to the Region. The potential for erosion or sedimentation exists along the channel of Poso Creek. Significant flow in Poso Creek is very infrequent.	Low
VI.B	Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?	No.	Low
VI.C	Do climate-sensitive fauna or flora populations live in your region?	No.	Low
VI.D	Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?	Yes. They consist of San Joaquin Kit Fox, Tipton Kangaroo Rat, and San Joaquin Wooly Threads. Whether or not changes in species distribution have occurred is unknown. In this regard, it is noted that the IRWM Group supports the management efforts for endangered and threatened species led by the Tulare Basin Wildlife Partners, who actively monitor species distribution and habitat changes in the Region.	Medium
VI.E	Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?	Recreational water use in the Region is limited to duck clubs which rely on seasonal flooding of ponds which have been developed for that purpose.	Low
VI.F	Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?	No.	N/A
VI.G	Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?	The Kern National Wildlife Refuge is located within the Region and manages some wetlands; however, coast storms are not possible in the Region, owing to its location in the southern San Joaquin Valley.	N/A

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.[1]	Checklist Item	Regional Conditions	Vul. Rating
VII. Hydropower Reliance Assessment			
VI.H	Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change?	No. The Central Valley of California, where the Poso Creek Region is located, is not listed as one of the 'Top 10' habitats vulnerable to Climate Change according to the 'It's Getting Hot Out There: Top 10 Places to Save for Endangered Species in a Warming World' Report (Endangered Species Coalition, 2010).	N/A
VI.I	Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Is there infrastructure projects planned that might preclude species movement?	The Region includes the Kern National Wildlife Refuge, the Goose Lake bed, temporary wetlands in the form of duck clubs, and the channel of Poso Creek. Poso Creek traverses the Region from east to west and connects with the Refuge. The channel of Poso Creek provides an east-west movement corridor for wildlife, which extends from the foothills in the east to the trough of the San Joaquin Valley in the west. Flow in this reach of Poso Creek is infrequent. While infrastructure projects are planned which involve Poso Creek, they would not adversely affect the use of Poso Creek as a wildlife movement corridor. In particular, maintenance of the channel's flow carrying capacity is compatible with its use as a movement corridor. The RWMG has planned some projects and programs, pursuant to the Measurable Objectives (see Section 4.5, objective "I") to improve existing facilities while not changing the movement corridors.	Low
VII.A	Is hydropower a source of electricity in your region?	PG&E and SCE provide electrical service in the Region, and their sources of electricity are many and varied. As of 2012, SCE's electrical generation portfolio included less than 10% hydropower, while PG&E's was a little more than 10%. In both cases, the hydrogenation takes place outside of the Region. Hydropower generation within the Region is very minor and is incidental to the operation of irrigation conveyance and distribution facilities.	Low

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.1 (Continued) IRWMP Climate Change Vulnerability Assessments

List No.[1]	Checklist Item	Regional Conditions	Vul. Rating
VII. Hydropower Reliance Assessment			
VII.B	Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?	It is reasonable to expect that energy needs in the Region will increase in the future as a result of several factors, which include changes in land use from agricultural uses to urban uses; increases in groundwater pumping with reductions in historically available surface water supplies (i.e., as a result of climate-induced changes in hydrology and/or increased regulatory constraints on surface water supplies imported to the Region); and increases in groundwater pumping to satisfy higher ET requirements for irrigated agriculture (i.e., to the extent that "climate change" results in higher ET). There is one existing small hydropower facility and there is one under development. The existing facility is driven by imported SWP supplies and the same will be true of the facility which is under development. The combined capacity will be very small compared to the energy requirements of the Region, particularly during "dry" years. Future plans for hydropower generation facilities in the Region are unknown; however, any such plans would be limited to small hydropower which is incidental to the operation of irrigation conveyance and distribution systems. In this regard, based on currently available technology, solar generation is more likely than small hydropower.	Low

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Table 13.2 summarizes the results of the vulnerability assessment presented in Table 13.1. The seven sections of the assessment are listed in order of vulnerability, from highest to lowest.

Table 13.2 IRWMP Climate Change Vulnerability Assessment Score-Sheet

Section No. [1]	Section Title	Vulnerability Rating			
		High	Medium	Low	N/A
II	Water Supply Assessment	4	0	1	1
I	Water Demand Assessment	1	3	1	1
V	Flooding Assessment	0	2	2	1
VI	Ecosystem and Habitat Vulnerability Assessment	0	1	4	2
III	Water Quality Assessment	0	0	2	3
VII	Hydropower Reliance Assessment	0	0	3	1
IV	Sea Level Rise Assessment	0	0	0	6
Total Climate Change Assessment Score		5	6	13	15

[1] Numbers based on checklist shown in Section 4.3 of the 'Climate Change Handbook for Regional Water Planning' (DWR, 2011).

Based on the vulnerability assessment summarized in Table 13.2, "Water Supply" and "Water Demand" appear to have the highest level of vulnerability to potential Climate Change impacts in the Region. This confirms the projected outlook for the Region presented in Sections 13.1 and 13.2, respectively. This emphasis is also evident by the defined "Primary Regional Goals" identified in Section 4.4, and the basis by which projects and programs are assessed as described in Section 7.3. The remaining sections assessed in Table 13.1, while important, do not pose as much of a projected risk to regional water resources operations or management efforts.

13.4 Mitigation of Greenhouse Gas Emissions

As mentioned above, many scientists believe that one of the primary drivers behind the worsening of climate change effects is the emission of greenhouse gases (GHG) that absorb and emit infrared radiation, effectively trapping heat in the Earth's atmosphere. Under Assembly Bill 32 (AB 32), GHGs are defined as carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. Anthropogenic releases of these GHGs from the burning of fossil fuels have presumably accelerated the rate of natural climate change. Along with the extensive clearing of native forests, the entrapment of GHGs in the atmosphere has progressively increased the global temperature to levels that are expected to exceed historical patterns as early as the mid-21st century (Camilo *et al.*, 2013).

While the RWMG is not responsible for air quality management or GHG measurement in the Region, they are in a position to assist in the mitigation of GHG emissions by selecting and promoting projects and programs that help to reduce regional emissions. Projects and programs are emphasized on the direct and noticeable impacts to water supplies and demands in the Region, which is identified in the Primary Regional Goals; however, all other things being equal, the RWMG would defer to projects that also result in a reduction to GHG emissions or contribute to climate change response strategies. Accordingly, the RWMG considers the mitigation of GHG emissions as part of the Measurable Objectives, as outlined in Section 4.5, under the promotion of environmental conservation, see Objective "I", and follows the assessment through the submission and review process for projects and programs shown in Section 7.3 under the consistency with IRWM Measurable Objectives. For example, the RWMG may review a water conservation measure based on the ability to reduce energy demands to pump and convey water supplies which, in effect reduces an amount of GHGs emitted from those processes. Another example includes the expansion of environmental habitats areas in the Region, or retirement of agricultural land, which may be used to sequester carbon via the eventual growth of native vegetation. The RWMG expects project and program submissions to clearly, and in some instances quantitatively, explain the benefits towards GHG mitigation or Climate Change preparedness in submitted PDCFs (reference Section 5.1).

Regarding structural project implementation, the California Environmental Quality Act (CEQA) requires the calculation of GHG emissions from the construction and operation of newly developed projects (post July 2012). Emissions must be calculated using the California Emissions Estimator Model, which quantifies potential pollutants and GHG emissions based on design data. Once a project is selected for possible implementation, the RWMG requires this model be used in order to be considered for funding and compliant with CEQA requirements.

13.5 Climate Change Response and Monitoring Efforts

The RWMG Participants have taken numerous steps in order to adapt to the projected impacts of climate change effects on the Region. As noted in Table 13.2, the Region appears most vulnerable with regard to maintaining adequate water supplies to meet demand. As such, many of these measures have been focused on management and planning efforts that work to better prepare the regional water users in the event of multiple potential impacts, as opposed to focusing on a single specific impact, such as, the impact of temperature increase on water demand and water supplies.

In some cases, adaptations to water management in the Region, however, are not easily made and may be largely out of the RWMG's control. For instance, conjunctive use is practiced in the Region by the irrigation interests, which effectively means that groundwater is utilized to meet irrigation water requirements when supplemental surface water supplies are not available. The production and delivery of groundwater requires considerably more energy (kWh) than the delivery of surface water. Groundwater pumping lifts range from 250 to 400 feet or more in some parts of the Region, and groundwater plays an important role in terms of water supplies as described in Section 3.4. Accordingly, with any reduction in the reliability of surface water supplies delivered into the Region, there is a corresponding increase in the use of energy to deliver water, which typically results in an increase in the GHG emissions attributable to energy generation.

The following strategies were deemed the most practical and effective for climate change preparation in the Region, while also providing measurable benefits to current water management practices:

- Expand in-lieu service areas in the Region, by expanding water conveyance to lands which are currently dependent solely on groundwater supplies (i.e., reduce dependency on groundwater basin during "wetter" periods).
- Improve agricultural and urban water use efficiency.
- Expand groundwater recharge and banking efforts through expansion of spreading pond acreage to capture surplus wet-period water supplies and thereby help to maintain groundwater levels.
- Encourage changes in regional crop varieties that are more resistant to climate change.

The RWMG emphasizes these strategies not only in response to climate, but also to cope with significant surface water supply deficiencies that have already faced the Region. The Regional Goals and Measurable Objectives stated in this Plan are based on the enhancement of water management in the Region, which directly addresses water supply and demand impacts due to fluctuations in hydrologic conditions, including those potential impacts due to climate change. The selection of projects and programs that accomplish the goals and objectives of the Plan is based on adherence to the RWMG's water management efforts, with consideration of climate change affects, as discussed previously in Section 5.0. Figure 13.1 illustrates how the RWMG addresses climate change in the context of IRWM planning efforts.

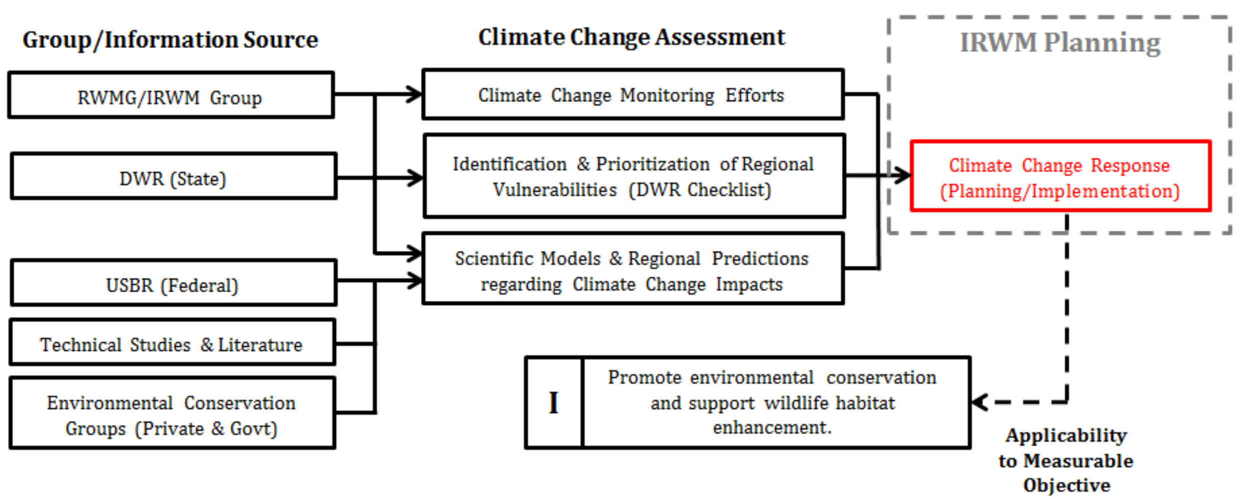

Figure 13.1 Regional Climate Change Planning Structure

Key indicators of climate change will be monitored with regard to changes in the hydrology of surface water sources available to the Region, as well as changing conditions within the Region. The RWMG will work with the DWR in an effort to continue to provide adequate surface water supplies to meet regional changing conditions. The districts in the Region have little to no control over the reliability and availability of its imported water supplies; accordingly, efforts are expected to remain focused on maximizing the use of the imported water supplies, whenever they are available. This has been and will continue to be accomplished through the conjunctive management of both surface water and groundwater resources. However, as previously noted, any reduction in surface water supplies can be expected to increase the use of energy in the Region, which would result in an assumed increase in GHG emissions at the source of the increased generation of electrical energy.

The science behind climate change, and the models and tools used to measure and predict specific impacts, are constantly changing. As a result, the RWMG will actively monitor climate change literature, legislation, and modeling results and will update planning and management efforts accordingly.

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The following is a list of references cited throughout the Plan, in alphabetical order. These references, in particular, the cited sections, subsections, or quoted text are available upon request.

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APPENDIX A

Poso Creek Integrated Regional Water Management (IRWM) Group
Project and Program Lists

APPENDIX A1

Project and Program Report List (Historical) and IRWM Report Card

APPENDIX A2

Plan Project and Program List

APPENDIX A1

Project and Program Report List (Historical) and IRWM Report Card

Poso Creek IRWM Project and Program Report List

Category (for historical reference):
1. Planning and IRWM Compliance
2. Community, Industrial, and Enviornmental-Specific
3. Regional Projects and Programs

Year(s)	Activity Title	Activity Type	Category	Purpose	Applicant	Measurable Objective(s)*	IRWM-Based Support	Applicant(s) Share	Applicant %	State Grant Share	State Grant %	Federal Grant Share	Federal Grant %	Total Cost(s)
2006-2007	Poso Creek IRWM Plan	Program (Planning)	1	Prop 50 Planning	IRWM Group	Objectives Defined		$214,600	30%	$499,435	70%	$0	0%	$714,035
2007	Implementation Grant App	Program (Grant App)	1	Prop 50 Planning	IRWM Group	B, C, E, F, K, L		$30,000	100%	$0	0%	$0	0%	$30,000
2007	SOR Planning Grant App	Program (Grant App)	1	Reclamation Programs	IRWM Group	B, E, F, I, K, L		$25,000	100%	$0	0%	$0	0%	$25,000
2007	Groundwater Monitoring Improvement Project	Project	3	Local Groundwater Assistance	Semitropic	B, F, G, K, L, M		$0	0%	$250,000	100%	$0	0%	$250,000
2008-2010	Institutional Agreements	Program (Planning)	3	System Optimization Review	IRWM Group	B, E, F, I, K, L		$0	0%	$0	0%	$300,000	100%	$300,000
2009	Governance MOU Development	Program (Planning)	1	IRWM Guidelines	RWMG	M, N		$3,600	100%	$0	0%	$0	0%	$3,600
2009	Region Acceptance Process - I	Program (Planning)	1	IRWM Guidelines	IRWM Group	E, F, K, L, M, N		$57,343	100%	$0	0%	$0	0%	$57,343
2009	RWMG Activity and Regional GW Bank CEQA	Program (Planning)	3	Groundwater Banking/Permitting	IRWM Group	B, C, E, F, K, L		$64,879	100%	$0	0%	$0	0%	$64,879
2010	Governance MOU Review	Program (Planning)	1	IRWM Guidelines	RWMG	M, N		$2,888	100%	$0	0%	$0	0%	$2,888
2010	SOR Application	Program (Planning)	1	Reclamation Programs	IRWM Group	E, I, K, L		$19,335	100%	$0	0%	$0	0%	$19,335
2010	RWMG Activity -Regional GW Bank Env Doc and RAP II	Program (Planning)	3	IRWM Guidelines	IRWM Group	C, D, E, G, K, L, M, N		$121,234	100%	$0	0%	$0	0%	$121,234
2010	Regional GW Bank EA	Program (Planning)	3	Groundwater Banking/Permitting	RWMG	C, D, E, G, K, L, M, N		$19,163	100%	$0	0%	$0	0%	$19,163
2010 - 2011	Rural Water Supply Application	Program (Grant App)	2	Reclamation Programs	IRWM Group	I, K, L		$16,482	100%	$0	0%	$0	0%	$16,482
2010 - 2011	Prop 84, Rnd1 Imp App	Program (Grant App)	1	Prop 84 Planning	IRWM Group	All Objectives		$148,760	100%	$0	0%	$0	0%	$148,760
2010 - 2011	Urban Water Management Plans[1]	Program (Planning)	2	DWR Requirement	Cities of Delano, Shafter, and Wasco	E, F, G, J, M, N		$100,000	100%	$0	0%	$0	0%	$100,000
2011	RWMG Activity	Program (Planning)	1	IRWM Guidelines	IRWM Group	B, C, D, E, J, K, L, M, N		$39,683	100%	$0	0%	$0	0%	$39,683
2012	Regional GW Bank EA	Program (Planning)	3	Groundwater Banking/Permitting	IRWM Group	C, D, E, G, K, L, M, N		$21,000	100%	$0	0%	$0	0%	$21,000
2012	RWMG Activity	Program (Planning)	1	IRWM Guidelines	RWMG	B, C, D, E, J, K, L, M, N		$9,560	100%	$0	0%	$0	0%	$9,560
2012	Planning Grant App	Program (Grant App)	1	Prop 84 Planning	IRWM Group	All Objectives		$26,057	100%	$0	0%	$0	0%	$26,057
2012	Regional GW Bank EA	Program (Planning)	3	Groundwater Banking/Permitting	RWMG	C, D, E, G, K, L, M, N		$1,625	100%	$0	0%	$0	0%	$1,625
2012	LGA Grant to North Kern	Program (Planning)	3	Local Groundwater Assistance	IRWM Group	B, F, K, L, M		$25,000	11%	$200,000	89%	$0	0%	$225,000
2012	CASGEM[1]	Program	1	DWR Requirement	RWMG	B, F, G, K, L, M		$60,000	100%	$0	0%	$0	0%	$60,000
2013	RWMG Activity	Program (Planning)	1	IRWM Guidelines	RWMG	B, C, D, E, J, K, L, M, N		$21,374	100%	$0	0%	$0	0%	$21,374
2013	Prop 84 Plan Update Prep	Program (Planning)	1	Prop 84 Planning	IRWM Group	Objectives Defined		$28,687	100%	$0	0%	$0	0%	$28,687
2013	Poso Imp Rnd2 App	Program (Grant App)	1	Prop 84 Planning	IRWM Group	All Objectives		$50,000	100%	$0	0%	$0	0%	$50,000
2013	SJR Rest - Madera Ave Intertie App	Program (Grant App)	3	Reclamation Programs	Shafter-Wasco	C, D, E, G, H, K, L		$38,231	100%	$0	0%	$0	0%	$38,231
2013 - 2014	Ag Water Management Plans[1]	Program (Planning)	1	DWR Requirement	Semitropic, North Kern, and Cawelo	E, F, G, I, M, N		$50,000	33%	$100,000	67%	$0	0%	$150,000

1 Activity uses estimated figures based on type and similarities to previous activites.
2 Information for activity not yet obtained from applicant.
* Measurable Objectives from Plan applied to historical projects and programs retroactively.

Poso Creek IRWM Project and Program Report List

Category (for historical reference):
1. Planning and IRWM Compliance
2. Community, Industrial, and Enviornmental-Specific
3. Regional Projects and Programs

Year(s)	Activity Title	Activity Type	Category	Purpose	Applicant	Measurable Objective(s)*	IRWM-Based Support	Applicant(s) Share	Applicant %	State Grant Share	State Grant %	Federal Grant Share	Federal Grant %	Total Cost(s)
2011 - 2015	Ag Water Conservation Plans[1]	Program (Planning)	1	Reclamation Programs	Kern-Tulare and Shafter-Wasco	E, F, G, I, M, N		$30,000	100%	$0	0%	$0	0%	$30,000
2013 - 2014	Stored Water Recovery Unit - Habitat Conservation Plan[2]	Program (Planning)	2	Groundwater Banking/Permitting	Semitropic	C, D, E, F, I, K, L, M		$0	0%	$0	0%	$0	0%	$0
2012 - 2015	Irrigated Lands Waiver and Central Valley Salts[2]	Program (Planning)	3	DWR Requirement	Districts in Kern County	E, F, G, I, M, N		$0	0%	$0	0%	$0	0%	$0
2014	Prop 84 Plan Update[1]	Program (Planning)	1	Prop 84 Planning	IRWM Group	Objectives Defined		$150,000	100%	$0	0%	$0	0%	$150,000
2010	Water Meter Installation in Wasco[2]	Project	2	DAC Assistance	City of Wasco	J, K, L, M		$0	0%	$0	0%	$0	0%	$0
2010	Wastewater Treatment Plant Improvements in Buttonwillow	Project	2	DAC Assistance	Community of Buttonwillow	G, J, K, L		$722,012	25%	$2,000,000	70%	$144,800	5%	$2,866,812
2011	Extend Shafter Wastewater Collection System to North Shafter	Project	2	DAC Assistance	Community of North Shafter	G, J, K, L		$0	0%	$1,925,000	100%	$0	0%	$1,925,000
2011	Maple School Water Consolidation	Project	2	DAC Assistance	Maple School District	G, J, K, L		$0	0%	$551,113	100%	$0	0%	$551,113
2013	Habitat Improvement on Pond-Poso Spreading Basins	Project	2	General Resource Stewardship	Semitropic	I, K, L	Yes	$37,700	50%	$37,300	50%	$0	0%	$75,000
2013	DAC Feasibility Level Study - Assessment	Program (Planning)	2	DAC Assistance	Community of Allensworth	J, K, L	Yes	$0	0%	$50,000	100%	$0	0%	$50,000
2013	DAC Feasibility Level Study - Assessment and Design	Program (Planning)	2	DAC Assistance	Lost Hills Utility District	J, K, L	Yes	$0	0%	$75,000	100%	$0	0%	$75,000
2013	Consolidation of Bishop Acres into City of Shafter Water Supply System	Project	2	DAC Assistance	Community of Bishop Acres	G, J, K, L	Yes	$30,000	7%	$431,344	93%	$0	0%	$461,344
2013	North Shafter Sewer Service Connections	Project	2	DAC Assistance	Community of North Shafter	G, J, K, L	Yes	$23,000	5%	$481,900	95%	$0	0%	$504,900
2013+	On-Farm Mobile Lab, Water use-Efficiency Services	Project	2	Water Conservation	North West Kern RCD	C, E, K, L	Yes	$154,000	65%	$82,400	35%	$0	0%	$236,400
2013	Meter Installation in DAC Service Area	Project	2	DAC Assistance	City of Shafter	J, K, L, M	Yes	$50,100	22%	$174,856	78%	$0	0%	$224,956
2006	Frian-Kern Turnout No. 1 & Deep Wells	Project	3	Conveyance/Infrastructure	North Kern	C, D, E, G, K, L		$933,000	45%	$1,131,000	55%	$0	0%	$2,064,000
2007	P-1030 In-Lieu Service Area	Project	3	Groundwater Banking/Permitting	Semitropic	A, C, D, E, H, K, L		$13,725,000	100%	$0	0%	$0	0%	$13,725,000
2007	P-565 In-Lieu Service Area	Project	3	Groundwater Banking/Permitting	Semitropic	A, C, D, E, H, K, L		$15,550,000	100%	$0	0%	$0	0%	$15,550,000
2009	P-1030 Extension	Project	3	Groundwater Banking/Permitting	Semitropic	A, C, D, E, H, K, L		$600,000	100%	$0	0%	$0	0%	$600,000
2010	Conservation Improvements for Return of Banked Water[1]	Project	3	Groundwater Banking/Permitting	Semitropic	C, D, E, H, K, L		$350,000	54%	$0	0%	$300,000	46%	$650,000
2007 - 2011	Pond-Poso Spreading and Recovery Facility - Permitting, Env Doc, Spreading Basins and Conveyance Structures	Project	3	Conveyance/Infrastructure	Semitropic	C, D, E, G, H, K, L		$4,423,000	68%	$0	0%	$2,050,000	32%	$6,473,000
2011	Friant Kern Canal 400 CFS Turnout No. 2	Project	3	Conveyance/Infrastructure	North Kern	C, D, E, H, K, L		$606,000	67%	$0	0%	$300,000	33%	$906,000
2011	South Intertie between North Kern and Shafter-Wasco	Project	3	Conveyance/Infrastructure	Shafter-Wasco	C, D, E, H, K, L		$296,076	50%	$0	0%	$296,076	50%	$592,152
2011	Turnipseed GW Banking Enhancement along White River	Project	3	Groundwater Banking/Permitting	Delano-Earlimart	C, D, E, H, K, L		$2,000,000	56%	$0	0%	$1,550,000	44%	$3,550,000

1 Activity uses estimated figures based on type and similarities to previous activites.
2 Information for activity not yet obtained from applicant.
* Measurable Objectives from Plan applied to historical projects and programs retroactively.

Category (for historical reference):
1. Planning and IRWM Compliance
2. Community, Industrial, and Enviornmental-Specific
3. Regional Projects and Programs

Year(s)	Activity Title	Activity Type	Category	Purpose	Applicant	Measurable Objective(s)*	IRWM-Based Support	Applicant(s) Share	Applicant %	State Grant Share	State Grant %	Federal Grant Share	Federal Grant %	Total Cost(s)
2011	Calloway Canal to Lerdo Canal Intertie[1]	Project	3	Conveyance/Infrastructure	North Kern and Cawelo	A, C, D, E, H, K, L		$6,000,000	55%	$0	0%	$5,000,000	45%	$11,000,000
2012	North Intertie between North Kern and Shafter-Wasco	Project	3	Conveyance/Infrastructure	Shafter-Wasco	C, D, E, H, K, L		$501,302	63%	$0	0%	$296,490	37%	$797,792
2011 - 2012	Groundwater Bank Improvements in Northwestern Kern County	Program (Planning)	1	Groundwater Banking/Permitting	Semitropic	A, C, D, E, H, K, L		$1,000,000	52%	$0	0%	$917,000	48%	$1,917,000
2012 - 2014	Pilot Arsenic Treatment Plant[2]	Project	3	Local Groundwater Assistance	Semitropic	G, I, K, L		$0	0%	$0	0%	$0	0%	$0
2012	Bay-Delta Ag Water Use Efficiency, NRCS on-farm funding	Project	3	General Resource Stewardship	Semitropic	I, K, L		$0	0%	$0	0%	$1,000,000	100%	$1,000,000
2011 - 2013	Ag WUE On-Farm Mobile Lab Services	Project	3	General Resource Stewardship	North West Kern RCD	I, K, L		$154,000	65%	$82,400	35%	$0	0%	$236,400
2013	Cross Valley Canal to Calloway Canal Intertie	Project	3	Conveyance/Infrastructure	North Kern and Cawelo	A, C, D, E, H, K, L	Yes	$4,913,700	42%	$6,882,200	58%	$0	0%	$11,795,900
2012-2014	Bay-Delta Ag Water Use Efficiency	Project	3	Conveyance/Infrastructure	Semitropic	C, E, I, K, L		$763,470	52%	$0	0%	$711,170	48%	$1,474,640
2013 - 2016	SWRU - HCP[2]	Program (Planning)	3	General Resource Stewardship	Semitropic	I, L, M		$0	0%	$0	0%	$0	0%	$0

1 Activity uses estimated figures based on type and similarities to previous activites.
2 Information for activity not yet obtained from applicant.
* Measurable Objectives from Plan applied to historical projects and programs retroactively.

Poso Creek IRWM Report Card

Report Card Generated on: 5/30/2014

Based on Activity Type	Total Cost(s)	Percent of Costs	Number	Percent
Program	$60,000.00	0.1%	1	1.7%
Program (Grant App)	$334,530.00	0.4%	7	11.7%
Program (Planning)	$4,121,406.00	5.0%	26	43.3%
Project	$77,510,409.00	94.5%	26	43.3%
Total	$82,026,345.00		60	

Based on Year	Total Cost(s)	Percent of Costs	Number	Percent
2006	$2,778,035.00	3.4%	2	3.3%
2007	$36,053,000.00	44.0%	6	10.0%
2008	$300,000.00	0.4%	1	1.7%
2009	$725,822.00	0.9%	4	6.7%
2010	$3,944,674.00	4.8%	10	16.7%
2011	$20,747,348.00	25.3%	10	16.7%
2012	$3,615,674.00	4.4%	11	18.3%
2013	$13,711,792.00	16.7%	15	25.0%
2014	$150,000.00	0.2%	1	1.7%
Total	$82,026,345.00		60	

Based on Category	Total Cost(s)	Percent of Costs	Number	Percent
1. Planning and IRWM Compliance	$3,483,322.00	4.2%	19	31.7%
2. Community, Industrial, and Environ...	$7,087,007.00	8.6%	14	23.3%
3. Regional Projects and Programs	$71,456,016.00	87.1%	27	45.0%
Total	$82,026,345.00		60	

Based on Purpose (as stated)	Total Cost(s)	Percent of Costs	Number	Percent
Conveyance/Infrastructure	$35,103,484.00	42.8%	8	13.3%
DAC Assistance	$6,659,125.00	8.1%	9	15.0%
DWR Requirement	$310,000.00	0.4%	4	6.7%
General Resource Stewardship	$1,311,400.00	1.6%	4	6.7%
Groundwater Banking/Permitting	$36,098,667.00	44.0%	11	18.3%
IRWM Guidelines	$255,682.00	0.3%	7	11.7%
Local Groundwater Assistance	$475,000.00	0.6%	3	5.0%
Prop 50 Planning	$744,035.00	0.9%	2	3.3%
Prop 84 Planning	$403,504.00	0.5%	5	8.3%
Reclamation Programs	$129,048.00	0.2%	5	8.3%
System Optimization Review	$300,000.00	0.4%	1	1.7%
Water Conservation	$236,400.00	0.3%	1	1.7%
Total	$82,026,345.00		60	

Based on Funding Support	Total Cost(s)	Percent of Costs	Number[1]	Percent[2]
Applicant Share	$54,206,861.00	66.1%	48	80.0%
State IRWM Grant Support (DWR)	$8,215,000.00	10.0%	8	13.3%
Other State Grant Support (DWR)	$6,738,948.00	8.2%	9	15.0%
Federal Grant Support (USBR)	$12,865,536.00	15.7%	12	20.0%
Total	$82,026,345.00		60	

[1] Split funding shares are counted individually, represents total number of activities supported.

[2] Percentage of total number of activities that funding source was involved with.

Poso Creek IRWMP Report Card Summary

The (historical) Project and Program Report List (List) and Report Card on the previous pages identify and categorize accomplishments that have occurred since the formation of the IRWM Group. All items are differentiated between structural "projects" (e.g., conveyance and infrastructure enhancements) and non-structural "programs" (e.g. planning and management documents, and grant funding applications).

The List contains completed project costs and some estimates of activity that has occurred, to capture funding over time for the IRWM-related activities and the accomplishments. The List also contains activities specifically related to on-going IRWM coordination and completion of DWR's IRWM eligibility requirements, applications for special planning studies and implementation grants, and project implemented with local, state, and federal funding. The Poso Creek RWMG maintains a regular meeting schedule and has provided local (applicant) funding towards accomplishing specific planning activity that has achieved the following accomplishments:

- Incorporated DAC, flood control, and wildlife enhancement projects into planning through regular monthly meeting activity;
- Signed Governance MOU and cost sharing agreement;
- Elected DAC Representative to RWMG as part of the Governance;
- Developed DAC projects with assistance from incorporated cities and Self-Help Enterprises;
- Participated in coordination meetings with neighboring IRWMs in Tulare Basin;
- IRWM Representative of Stakeholder Oversight Advisory Committee for developing the Tulare Lake Basin Disadvantaged Community Water Study;
- Obtained Region Acceptance through DWR's Region Acceptance Process;
- Developed CEQA and NEPA documents to allow environmental approval for the six districts within the Poso Creek Region to bank, transfer, and exchange surface supplies for the next 25-years; this institutional change is expected to recover at least 15,000 acre-feet per year of the lost supply to the Region, and
- Remained focused on *regional* improvements by completing the following water supply enhancement projects utilizing local, state, and federal funding.

The following are some of the key conclusions from the Report Card sheet:

1) Since 2006 the IWMP Group has invested approximately $54 million of applicant/local funding towards completion of projects and programs identified in the Original 2007 IRWM Plan and implemented by entities within the IRWM Group, principally the RWMG.

2) Specific districts, agencies, organizations, and individuals within the IRWM Group have received around $15 million in State grant award funding (primarily DWR awards for IRWM and other purposes) and $13 million in Federal grant award funding (primarily USBR awards) to accomplish said projects and programs.
3) The IRWM Group has identified approximately $1.4 million as State categorized costs, which are related to the IRWM Group activities including program compliance and planning activities (e.g., sum of IRWM Guidelines, Prop 50 Planning, and Prop 84 Planning). In other words, these identified costs were part of the IRWM Groups' efforts to remain an active, eligible IRWM Program Participant. Note that the State awarded grant funding received to date has been around $15 million ($8 million of which was specific to the IRWM Program), representing the level of local investment that has occurred to maintain eligibility for the IRWM program.
4) Approximately $7 million of State and Federal funding has gone towards nine projects and programs categorized as DAC Assistance (i.e., projects and programs with an emphasis on meeting the needs of economically-disadvantaged communities in the Region). DAC-related projects have accounted for 15 percent of the total activities performed by the IRWM Group.
5) The largest funded purpose is for Groundwater Banking activities followed by investment in Conveyance/Infrastructure that serves as mechanisms to deliver or return water from groundwater banking facilities. A total of 13 percent of projects and programs completed by the IRWM Group has been related to Conveyance/Infrastructure (43 percent of costs), while 18 percent has been towards Groundwater Banking-specific activities (44 percent of costs).

The regional approach taken by the IRWM Group has led to the successful completion of approximately $82 million in planning, project (structural) and program (non-structural) implementation activities to enhance water resources management and thereby mitigate the actual and anticipated reductions to surface water supplies delivered to the region. These efforts have helped to increase water use effectiveness in the region through greater absorption and groundwater recharge and have helped to alleviate some of the water resources issues that are otherwise unresolvable and unmanageable under an individualized district planning focus. The IRWM Group will continue to explore and develop new projects and programs, with the intent on maintaining their success, by actively applying for local, State, and Federal grant opportunities when made available.

APPENDIX A2

Plan Project and Program List

Poso Creek IRWM Project and Program Report List

Active Projects and Programs (Based on IRWM Group Submissions)

The tables on the following pages include the 45 projects and programs which have been submitted by the districts, agencies, organizations, and individuals that participate in the IRWM Group. Each project and program was reviewed by the RWMG and various Work Groups as to how they achieve the Regional Goals and Measurable Objectives set forth in the IRWM Plan (2014 Plan Update, Sections 4.4 and 4.5, respectively). Applicable Measurable Objectives and Applicant(s) are identified, and each project and program is labeled with a “Map No.” corresponding to the locations in and around the Region as shown in Figure 5.1 of the Plan.

The projects and programs are also classified by a “status”, meaning the readiness for implementation and/or inclusion in grant funding applications. These designations are not part of a formal submission or review process, but are simply used by the IRWM Group as a means of tracking approved projects and programs. The following are the three statuses used:

1) “Near Term” (N), meaning a project or program has already been subjected to planning and preliminary design phases. These activities are effectively ready form implementation and will likely be included in grant applications, assuming they met funding opportunity guidelines.
2) “Long Term” (L), meaning a project or program that is only in the conceptual phase, potentially with some minor planning or design documentation. Although these activities may be streamlined to meet grant funding opportunities (i.e., pushed towards implementation readiness for a particular grant application), in general, more planning and design work will need to performed by the Applicant and IRWM Group. As such, these activities will likely be “ready” in more than one year from the release of this Plan.
3) “Continuous/On-Going” (C), meaning a project or program which has begun but is not subjected to a near-term end (completion) date. The implementation of these activities continues over a longer period to time, with support from the IRWM Group.

The projects and programs listed in the Plan vary in terms of their generalized Purpose(s) towards the water supply and management concerns of the IRWM Group. Note that many of these projects and programs were submitted prior to or following adoption of the latest Plan. As such, the RWMG is making a concerted effort to refile and organize PDCFs for each of these activities which formally defines the purposes of each project/program, as well as an estimation of regional impacts and benefits. A PDCF for each project and program will be made available to the IRWM Group as they are compiled.

Poso Creek IRWM Project and Program Report List

Active Projects and Programs (Based on IRWM Group Submissions)
List Printed on: 5/30/2014

Map No.[1]	Status[2]	Year(s)[3]	Activity Title	Activity Type	Purpose	Applicant	Measurable Objective(s)*	Estimated Total Cost(s)
1	L	2014+	Connect Friant-Kern Canal Turnout to Cawelo's North System	Project	Expand In-Lieu Service Areas	Cawelo WD	C, D, E, K, L	
2	L	2014+	Cecil Avenue Piepline Capacity Expansion	Project	Modify Water Conveyance Systems	Kern-Tulare WD	C, D, E, K, L	$ 8,500,000
3	N	2012-2020	Stored Water Recovery Unit	Project	Expand In-Lieu Service Areas	Semitropic WSD	A, C, D, E, F, G, K, L	$ 32,000,000
4A	N	2013-2016	GW-Banking (North of DEID with Pixley ID)	Project	Expand Direct Recharge Facilities	Delano-Earlimart ID	C, D, E, F, G, H, K, L	$ 37,000,000
4B	N	2014+	GW-Banking (SWID at Kimberlina)	Project	Expand Direct Recharge Facilities	Shafter-Wasco ID	C, D, E, F, G, H, K, L	$ 6,000,000
5	L	2014+	G-W Banking Conveyance Improvements to North Kern WSD Recharge and Recovery Facilities, and G-W Recovery Wells	Project	Expand Direct Recharge Facilities	North Kern WSD	C, D, E, F, G, H, K, L	
6A	L	2014+	Phase II: Pond Poso Spreading and Recovery Facility	Project	Expand Direct Recharge Facilities	Semitropic WSD	C, D, E, F, G, H, K, L	
6B	L	2014+	Pond-Poso Entrance Ponds	Project	Expand Direct Recharge Facilities	Semitropic WSD	C, D, E, F, G, H, K, L	
7A	N	2013-2016	Calloway Canal Improvements: Lining Hagemann Rd. to Calloway Dr.	Project	Modify Water Conveyance Systems	North Kern WSD, Cawelo WD	C, D, E, F, G, H, K, L	$ 8,200,000
7B	L	2014+	Calloway Canal Improvements: Calloway Canal to Friant Kern Canal Intertie	Project	Modify Water Conveyance Systems	Delano-Earlimart ID	C, E, G, H, K, L	
7C	L	2014+	Calloway Canal Improvements: Siphon at CVC to Calloway Intertie	Project	Modify Water Conveyance Systems	North Kern WSD	C, E, G, H, K, L	$ 2,000,000
7D	L	2014+	Calloway Canal Improvements: 8-1 Pumping Plant Connection to Friant-Kern Canal	Project	Modify Water Conveyance Systems	North Kern WSD	C, E, G, H, K, L	

1 See Figure 5.1 for locations around region, labeled according to 'Map No.'
2 Status based on activity readiness for implementation, see description page for letters.
3 Anticipated year(s) of implementation or planning/preliminary design.

Poso Creek IRWM Project and Program Report List

Active Projects and Programs (Based on IRWM Group Submissions)
List Printed on: 5/30/2014

Map No.[1]	Status[2]	Year(s)[3]	Activity Title	Activity Type	Purpose	Applicant	Measurable Objective(s)*	Estimated Total Cost(s)
8	L	2014+	Multi-District Conveyance Facility (CA Aqueduct to Friant-Kern Canal)	Project	Modify Water Conveyance Systems	Semitropic WSD	A, C, D, E, F, G, H, K, L	$ 70,000,000
9	L	2014+	Arsenic Treatment Plant	Project	Modify Water Conveyance Systems	Semitropic WSD	G, K, L	
10	L	2014+	Reverse Flow in the Friant-Kern Canal	Project	Modify Water Conveyance Systems	Kern-Tulare WD	C, E, K, L	
11	L	2014+	Shafter-Wasco/Semitropic Intertie on Kimberlina Rd.	Project	Modify Water Conveyance Systems	Semitropic WSD, Shafter-Wasco ID	C, D, E, F, G, H, K, L	$ 20,000,000
12	N	2013-2016	Shafter-Wasco/Semitropic Intertie on Madera Ave.	Project	Modify Water Conveyance Systems	Semitropic WSD, Shafter-Wasco ID	C, D, E, F, G, H, K, L	$ 11,000,000
13	L	2014+	G-W Banking for Parties Outside Poso Creek IRWMP Region	Program	Non-Structural Enhancement to Regional Water Management	Semitropic WSD	A, C, D, E, F, G, H, K, L, N	
13A	N	2014	Reverse Flow in the CA Aqueduct	Program	Non-Structural Enhancement to Regional Water Management	Semitropic WSD	C, E, K, L	
14	N	2014+	Optimizing Region's Pumping Lifts	Program	Non-Structural Enhancement to Regional Water Management	Poso Creek IRWM Group	C, E, F, K, L	
15	N	2014	Enhance Groundwater Monitoring and/or Modeling	Program	Non-Structural Enhancement to Regional Water Management	Poso Creek IRWM Group	F, G, K, L, M, N	
16	L	2014+	Wildlife Improvement Projects in IRWMP Region (coordination with TBWP)	Project	Enhance Environmental Resources	Poso Creek IRWM Group	I, K, L	
17	L	2014+	Enviornemntal Water Management in Support of Wildlife Settlements Outside of IRWMP Region	Project	Enhance Environmental Resources	Poso Creek IRWM Group	I, K, L	

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2 Status based on activity readiness for implementation, see description page for letters.
3 Anticipated year(s) of implementation or planning/preliminary design.

Poso Creek IRWM Project and Program Report List

Active Projects and Programs (Based on IRWM Group Submissions)
List Printed on: 5/30/2014

Map No.[1]	Status[2]	Year(s)[3]	Activity Title	Activity Type	Purpose	Applicant	Measurable Objective(s)*	Estimated Total Cost(s)
18A	L	2014+	The Poso Creek Flood Control and Water Conservation Reservoir Project	Project	Enhance Flood Control	Semitropic WSD, North Kern WSD, Cawelo WD, County of Kern	H, I, K, L	
18B	L	2014+	Flood Management and Habitat Restoration Improvemetns along Poso Creek Flood Channel	Project	Enhance Flood Control	North West Kern RCD	H, I, K, L	
18C	L	2014+	Flood Management and Habitat Restoration Improvemetns in McFarland Area	Project	Enhance Flood Control	City of McFarland	H, I, K, L	
19	L	2014+	Enhance Water Supply, Address Drinking Water Treatment Needs, and Upgrade Waste Water Treatment Facilities	Project	Assist Economically-Disadvantaged Communities	Various	C, G, J, K, L	
19A	N	2015	Lost Hills Groundwater Well (Potable Supply) and Storage Tank Replacement	Project	Assist Economically-Disadvantaged Communities (Water Supply)	Lost Hills Utility District	C, G, J, K, L	$ 2,200,000
19B	N	2014	Stormwater Improvement in McFarland	Project	Assist Economically-Disadvantaged Communities (Enhance Flood Control)	City of McFarland	H, J, K, L	
19C	N	2014+	Lost Hills Repair and Upgrade Wastewater Treatment Plant	Project	Assist Economically-Disadvantaged Communities (Wastewater Treatment)	City of Lost Hills	C, G, J, K, L	
19D	N	2014+	Delano Wastewater Treatment Plant Upgrade and Effluent Reuse	Project	Assist Economically-Disadvantaged Communities (Wastewater Treatment)	City of Delano	C, G, J, K, L	

1 See Figure 5.1 for locations around region, labeled according to 'Map No.'
2 Status based on activity readiness for implementation, see description page for letters.
3 Anticipated year(s) of implementation or planning/preliminary design.

Poso Creek IRWM Project and Program Report List

Active Projects and Programs (Based on IRWM Group Submissions)
List Printed on: 5/30/2014

Map No.[1]	Status[2]	Year(s)[3]	Activity Title	Activity Type	Purpose	Applicant	Measurable Objective(s)*	Estimated Total Cost(s)
19E	N	2014+	Buttonwillow Wastewater Treatment Plant Upgrade	Project	Assist Economically-Disadvantaged Communities (Wastewater Treatment)	Community of Buttonwillow	C, G, J, K, L	
19F	N	2014+	Richgrove Water and Wastewater Treatment Plant Upgrade	Project	Assist Economically-Disadvantaged Communities (Wastewater Treatment)	Community of Richgrove	C, G, J, K, L	
19G	L	2014+	South Shafter Wastewater Treatment Plant Upgrade	Project	Assist Economically-Disadvantaged Communities (Wastewater Treatment)	Community of South Shafter	C, G, J, K, L	
19H	L	2014+	Wasco Drinking Water Storage Tank	Project	Assist Economically-Disadvantaged Communities (Water Supply)	City of Wasco	C, G, J, K, L	
19I	N	2014+	Alpaugh Distribution Network Leak Detection and Repair	Project	Assist Economically-Disadvantaged Communities (Water Supply)	Community of Alpaugh	C, G, J, K, L	
19J	N	2014+	Allensworth SCADA and Tank Replacement System	Project	Assist Economically-Disadvantaged Communities (Water Supply)	Community of Allensworth	C, G, J, K, L	
19K	N	2014+	Allensworth Distribution Network Leak Detection and Repair	Project	Assist Economically-Disadvantaged Communities (Water Supply)	Community of Allensworth	C, G, J, K, L	
20	C	2012	On-Farm Mobile Lab, Water Efficiency Services	Project	Water Conservation	North West Kern RCD	C, E, K, L	
21	C	2013	Demand Reduction/Land Retirement	Program	Water Conservation	Semitropic WSD	I, K, L	
22	C/N	2006-2014+	Oilfield Produced Water Supplies	Project	Alternative Water Supply to Reduce Dependence on Traditional Supplies	Cawelo WD, Semitropic WSD, Kern-Tulare WD	A, C, E, G, K, L	
23	C	2012	NRCS On-Farm Programs for Water Quality and Supply Conservation	Program	Water Conservation	Poso Creek IRWM Group	C, E, G, K, L	

1 See Figure 5.1 for locations around region, labeled according to 'Map No.'
2 Status based on activity readiness for implementation, see description page for letters.
3 Anticipated year(s) of implementation or planning/preliminary design.

Poso Creek IRWM Project and Program Report List

Active Projects and Programs (Based on IRWM Group Submissions)
List Printed on: 5/30/2014

Map No.[1]	Status[2]	Year(s)[3]	Activity Title	Activity Type	Purpose	Applicant	Measurable Objective(s)*	Estimated Total Cost(s)
24	N	2014-2016	Meter Testing Facility	Project	Water Conservation	Semitropic WSD	C, F, K, L	$ 200,000
25	N	2014	Semitropic Groundwater Model Update	Program	Assess Groundwater Uses in Region	Semitropic WSD	B, F, K, L, M, N	
26	N	2014	Regional Groundwater Assessment	Program	Assess Groundwater Uses in Region	Poso Creek IRWM Group, Kern Groundwater Monitoring Committee	B, F, K, L, M, N	

1 See Figure 5.1 for locations around region, labeled according to 'Map No.'
2 Status based on activity readiness for implementation, see description page for letters.
3 Anticipated year(s) of implementation or planning/preliminary design.

APPENDIX B

Description of the Regional Water Management Group (RWMG) Participants of the Integrated Regional Water Management (IRWM) Group

Following are brief descriptions of each of the RWMG Participants involved in the Poso Creek IRWM Group planning and implementation efforts. In particular, this is to describe the water management history and current practices that influence the assets, issues, and needs identified in the Plan. Refer to the 'IRWM Participating Districts & Agencies' tables at the beginning of the Plan for a list of these participants, and Figure 1.2 for their locations.

Regional Water Management Group (RWMG) Participants

Semitropic Water Storage District (SWSD)

IRWM Lead Agency

Address: 1101 Central Avenue
Wasco, CA 93280
Phone: (661) 758-5113
Website: http://www.semitropic.com/

The Semitropic Water Storage District (SWSD, Semitropic) is a 221,000-acre Water Storage District located along the western portion of the Poso Creek Region, formed by local farmers in 1958 for the purpose of obtaining surface water supplies to supplement the pumping of groundwater for agricultural (irrigation) demand. During the late 1960s and early 1970s, Semitropic formulated, adopted, and implemented a project to import SWP water. The importation of SWP water commenced in the early 1970s and continues today under a contract with the KCWA for 155,000 acre-feet per year; however, the amount diverted in any given year is a function of hydrology and regulatory constraints on moving water south of the Sacramento-San Joaquin River Delta. The diversion of SWP water is through metered turnouts located along the California Aqueduct (extending along western border of District). The District maintains two primary conveyance routes; one to deliver irrigation water to the northern portion of the District, and one to deliver water to the southern portion of the District.

In the 1990s, the District developed a major groundwater banking program. Under this program, Semitropic regulates and recharges wet-year surface water supplies into the underlying groundwater basin for subsequent recovery during times of water supply deficiencies. Semitropic has long-term contracts with several banking partners, both in/near the Poso Creek Region and around the state. At the end of 2011, Semitropic held more than 900,000 acre-feet in groundwater storage on behalf of its banking partners. The groundwater banking program and water supplies are further discussed in Semitropic's 2013 Agricultural Water Management Plan, which was adopted and submitted to the DWR. The topography in the District consists mostly of relatively flat lands which contain a mixture of annual crops (47 percent, including cotton, alfalfa, and grain) and permanent crops (53 percent, primarily nut trees). Semitropic has remained a member of the RWMG since its formation in 2006, taking on the role of IRWM Lead Agency when it comes to managing RWMG and IRWM Group affairs and maintaining compliance with State and Federal planning requirements. Owing primarily to its groundwater banking program, the District not only plays an important role in regional water management, but in the management of water supplies for agencies ranging from the Bay area to San Diego. Accordingly, Semitropic brings an important mix of assets, issues, and needs to the IRWM Group's planning and implementation efforts.

North Kern Water Storage District (NKWSD)

Address: P.O. Box 81435
Bakersfield, CA 93380
Phone: (661) 746-3364
Website: http://www.northkernwsd.com/

The North Kern Water Storage District (NKWSD, North Kern) is a 60,000-acre Water Storage District, with a separately managed improvement district (Rosedale Ranch Improvement District) which encompasses another 7,400 acres. Located in the south-central portion of the Poso Creek Region, the District was formed in 1935, with adoption and implementation of its original project occurring in the early 1950s. The purpose of the District was to obtain surface water supplies to supplement the pumping of groundwater to meet irrigation water requirements. North Kern purchased the use of certain Kern River water rights that yield a highly variable supply from year to year. Accordingly, North Kern constructed 1,500 acres of dedicated spreading grounds to assist in regulating this supply. With the subsequent purchase of conservation space in the nearby USACE-operated Isabella Reservoir, North Kern increased its ability to regulate its Kern River water supplies. In addition to seasonal regulation, Isabella Reservoir provides North Kern with a contract right to year-to-year carryover storage which ranges from 34,000 to 48,000 acre-feet. In 1976, North Kern contracted with the City of Bakersfield for the relatively "firm" annual diversion and delivery of 20,000 acre-feet. The District's topography evidences a gentle east-to-west slope. About 85 percent of the District's cropped lands have been developed to low-volume irrigated permanent crops --- primarily nut trees and grapes. North Kern has remained a member of the RWMG since its formation in 2006 bringing an important mix of assets to the IRWM Group's planning and implementation efforts, which include Kern River water rights; conservation storage space in Isabella Reservoir; significant main conveyance facilities; access to the Friant-Kern Canal; and very effective water spreading facilities.

Cawelo Water District (CWD)

Address: 17207 Industrial Farm Rd.
Bakersfield, CA 93308
Phone: (661) 393-6070

The Cawelo Water District (CWD, Cawelo) consists of 44,700 acres in total area, with approximately 35,900 irrigated acres, of which 33,000 acres presently served with surface supplies delivered by the District. Cawelo is located in the southeastern portion of the Poso

Creek Region, formed by local farmers in 1965 for the purpose of obtaining surface water supplies to supplement the pumping of groundwater for irrigation. Cawelo imports SWP water under a 1972 contract with the KCWA for 38,200 acre-feet per year, which is diverted from the California Aqueduct and conveyed in the Cross Valley Canal (CVC) as far as Bakersfield, thence pumped into North Kern's Beardsley-Lerdo canal system, and finally lifted one more time into Cawelo. Another (historically) major source of surface water supply is Kern River water, which has been diverted under a 1976 contract with the City of Bakersfield for an average annual supply of around 27,000 acre-feet. The contract with the City expired in 2011, and Cawelo has been in discussions to reach a new agreement to continue the diversion of Kern River water. The CWD also receives 20,000 to 35,000 acre-feet per year of reclaimed oilfield-produced water under contracts with operators of nearby oilfields, all in conformance with the water quality and waste discharge requirements of the Central Valley Regional Water Quality Control Board. These supplies are further discussed in Cawelo's 2014 Agricultural Water Management Plan, which was adopted by the District and has been submitted to the DWR. The topography in the District is characterized by flat to rolling land with an east-to-west slope, which has resulted in a large percentage of low-volume irrigated permanent crops, such as citrus, nut trees, and grapes. In fact, permanent crops account for around 82 percent of the total cropped acreage in CWD's service area. Cawelo has remained a member of the RWMG since its formation in 2006, bringing an important mix of assets, issues, and needs to the IRWM Group's planning and implementation efforts.

Shafter-Wasco Irrigation District (SWID)

Address: 16294 Central Valley Hwy.
Wasco, CA 93280
Phone: (661) 758-5153
Website: http://www.swid.org/

SWID
Shafter-Wasco Irrigation District

The Shafter-Wasco Irrigation District (SWID, Shafter-Wasco) encompasses almost 39,000 acres, and is located in the south-central portion of the Poso Creek Region. Similar to its neighbors, the District was formed by local farmers in 1937 for the purpose of obtaining surface water supplies to supplement the pumping of groundwater for crop irrigation. Shafter-Wasco imports CVP-Friant water under a contract with the USBR (originally executed in 1955) for a maximum of 89,600 acre-feet per year (50,000 acre-feet of Class 1water, and 39,600 acre-feet of Class 2 water). Diversions from the Friant-Kern Canal are by gravity and are made at two locations; one which serves the north half of the District, and one that serves the south half of the District. From time to time, additional supplies have been available from USBR during wet years and have typically been of relatively short duration (historically referred to as "Section 215" water). It is worth noting that Shafter-Wasco is in a strategic position with regard to facilitating transfers and exchanges with neighboring districts and agencies. Accordingly, the District has routinely worked with neighboring districts to maximize the use of surface water supplies available to the Region. The District's operations, including transfer and exchange activities, are further discussed in Shafter-Wasco's 2013 Water Conservation Plan, which was adopted by the District and submitted to the USBR. The topography in the District is relatively flat, with a gentle east-to-west slope. District lands include a large percentage of low-volume irrigated and highly managed permanent crops, primarily consisting of nut trees and grapes; however, the District's area is home to two of the Region's cities; the City of Shafter and the City of Wasco. Shafter-Wasco has remained a member of the RWMG since its formation in 2006, bringing an important mix of assets, issues, and needs to the IRWM Group's planning and implementation efforts.

Kern-Tulare Water District (KTWD)

Address: 5001 California Ave. #202
Bakersfield, CA 93309
Phone: (661) 393-6070

The Kern-Tulare Water District (KTWD, Kern-Tulare) is an approximately 19,000-acre Water District located in the northeast portion of the Poso Creek Region, which was formed by local farmers in 1974 for the purpose of obtaining surface water supplies to supplement the pumping of groundwater to meet irrigation demands. In 2009, Kern-Tulare joined service areas with the Rag Gulch Water District in order to better manage their collective water supplies and more effectively enter into contracts for imported surface water supplies. The combined districts retained the Kern-Tulare name, and subsequent references herein are to the combined service areas and assets. Kern-Tulare imports CVP-Delta water under a contract with the USBR for a maximum of 53,300 acre-feet per year, which is delivered by exchange through pumped diversions along the Friant-Kern Canal, which is located to the west of the District. From time to time, additional supplies have been available from the Friant Division, typically during wet years and of relatively short duration. Another (historically) major source of surface water supply is Kern River water which has been diverted under a 1976 contract with the City of Bakersfield for an average annual supply of 23,000 acre-feet. The contract with the City expired in 2012, and Kern-Tulare has been in discussions to reach a new agreement to continue the diversion of Kern River water. These supplies are further discussed in Kern-Tulare's 2013 Water Conservation Plan which was adopted by the District and submitted to the USBR. Located near the foothills of the nearby Greenhorn Mountains to the east, the District's topography consists of rolling lands sloping in a westerly direction, which has resulted in a large percentage of low-volume irrigated permanent crops, consisting primarily of citrus, nut trees, and grapes. Kern-Tulare has remained a member of the RWMG since its formation in 2006, bringing an important mix of assets, issues, and needs to the IRWM Group's planning and implementation efforts.

Delano-Earlimart Irrigation District (DEID)

Address: 14181 Avenue 24
Delano, CA 93215
Phone: (661) 725-2526
Website: http://www.deid.org/

The Delano-Earlimart Irrigation District (DEID, Delano-Earlimart) is a 56,500-acre Irrigation District located in the north-central portion of the Poso Creek Region, which was formed by local farmers in 1938 for the purpose of obtaining surface water supplies to supplement the pumping of groundwater to meet irrigation water requirements. Delano-Earlimart imports CVP-Friant water under a 1951 contract with the USBR for a maximum contract amount of 183,300 acre-feet per year (108,800 acre-feet of Class 1 water and 74,500 acre-feet of Class 2 water) through both gravity and pumped diversions along the Friant-Kern Canal, which extends north-south through the east half of the District. District operations are further discussed in Delano-Earlimart's 2013 Water Conservation Plan, which was adopted by the District and submitted to the USBR. The District's topography is relatively flat, with a mild slope towards the west. The District has been fully developed to irrigated agriculture for decades, about 80 percent of which is presently planted to low-volume irrigated permanent crops, primarily nut trees and grapes. Delano-Earlimart has remained a member of the RWMG since its formation in 2006, and was active in the development of the original 2007 IRWM Plan. As of 2014, the DEID has become a temporary non-paying member, prompted by the severe drought conditions of 2014, which has strained their resources. Notwithstanding this decision, the District intends to remain active in the RWMG's planning and implementation efforts.

North West Kern Resource Conservation District (NWKRCD)

Address: 5000 California Ave. #100
Bakersfield, CA 93309
Phone: (661) 336-0967

The North West Kern Resource Conservation District (NWKRCD, North West Kern) had its beginnings in the 1960s, with the formation of local Soil Conservation Districts. The RCD is organized for the protection and conservation of soil and water resources in an area of almost 600,000 acres, which includes the Poso Creek Region. Unlike other districts in the Region, North West Kern does not have any direct responsibility for management of the Region's water supplies; rather, they provide guidance to growers regarding the on-farm management of their water supplies. In this regard, North West Kern also operates a Mobile Irrigation Lab (Mobile Lab) service for irrigation system evaluation, to assess distribution uniformity of applied irrigation water and the water-use efficiency of irrigation systems around the Region. North West Kern has remained a member of the RWMG since its formation in 2006, occupying the role of assisting landowners around the Region in their on-farm planning and implementation efforts.

Disadvantaged Community (DAC) Representative
Phone: (661) 758-5113

As mentioned in Section 2.2 of the Plan, the RWMG includes a DAC Representative as part of the RWMG's DAC Work Group (Poso Creek Region Disadvantaged Communities Group) to represent the interests and needs of DACs in the Poso Creek Region. The DAC Representative (individual) is selected via a nomination process by the IRWM Group members. Upon nomination, the DACs within the Region (reference Table 3.4) each votes for a nominee, with the successful nominee serving a two-year term with no limit on the number of terms that an individual can serve. The DAC Representative works directly with the DACs in the Region, Self-Help, and the CWC through regular meetings and open communications which are relayed to the IRWM Group throughout the planning and implementation efforts.

APPENDIX C

Memorandum of Understanding (MOU), adopted May 2010, for the Regional Water Management Group (RWMG) including the MOU First Amendment (2014)

POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT PLAN REGION

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding, hereafter referred to as "MOU" is made and entered into by and between the districts that adopted the Poso Creek Integrated Regional Water Management Plan (Original Districts): CAWELO WATER DISTRICT, DELANO-EARLIMART IRRIGATION DISTRICT, KERN-TULARE WATER DISTRICT, NORTH KERN WATER STORAGE DISTRICT, SEMITROPIC WATER STORAGE DISTRICT, SHAFTER-WASCO IRRIGATION DISTRICT, NORTH WEST KERN RESOURCE CONSERVATION DISTRICT; and the POSO CREEK REGION DISADVANTAGED COMMUNITIES (DACs) Group. Said Districts and DAC Group shall be, for collective purposes, hereafter referred to as the "Parties." The term "Parties" shall include any parties that are added to the agreement pursuant to the provisions of this MOU.

RECITALS

This MOU is made with reference to the following facts:

1. An initial meeting was held on April 20, 2005, to solicit input from the participating agencies regarding the preparation of an Integrated Regional Water Management Plan (IRWMP). Semitropic Water Storage District (Semitropic) submitted an application to the California Department of Water Resources and received funding for preparation of the Plan that started January 1, 2006. Semitropic acted as the Lead Agency in the development of the Poso Creek Integrated Regional Management Plan (Plan) and was responsible for all administrative reporting associated with the planning process, organized the monthly meetings, and facilitated data exchanges among participants of the Plan. The Plan was completed in July of 2007 and adopted by the Poso Creek Regional Management Group (RMG). As part of the Plan implementation, the Parties continue to meet monthly to coordinate implementation of the Plan's water management strategies and objectives. The RMG has functioned under this shared interest to develop, adopt, and implement the Plan and with Semitropic serving as the Lead Agency since inception. The purpose of executing this MOU is to formally identify the Parties' commitment to participating in various regional planning efforts as a RMG of the Poso Creek IRWMP Region.

2. The RMG that formulated and adopted the Plan is comprised of water districts that supply water to agricultural land and one resource conservation district that provides water conservation field services support to the districts. The Parties 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. For the purpose of evaluating water supplies, demands, and operations, Southern San Joaquin Municipal Utilities District (SSJMUD) was included in the regional analysis.

3. For decades, the Parties have operated portions of the common groundwater basin conjunctively with the available surface supplies, as described in the Plan. 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 confluence 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 --- make it an ideal location to regulate surface supplies conjunctively with groundwater to the benefit of the

agriculture-based economy and disadvantaged communities within this Region and within 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 improve the local and state-wide 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.

4. 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 Plan contains seven planning objectives, namely:

1. Maintain and improve water supply reliability;
2. Maintain groundwater levels at economically viable pumping lifts;
3. Protect the quality of groundwater and enhance the quality of groundwater 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, through further consultations, including consultations with stakeholders, these objectives were expanded to include objectives 6 and 7, and now represent the views of all Parties. Several stakeholders have participated in the monthly meetings following the Plan adoption and collaborated with the RMG to integrate their water-related projects into the Plan. Some of the participating stakeholders include Self-Help Enterprises, Tulare Basin Wildlife Partners, California Water Institute of CSU Fresno, Community Water Center, and the Sequoia River Lands Trust.

5. As part of the Plan implementation, the RMG has committed to cooperating in other planning efforts for the Tulare Lake Basin. Semitropic, acting as the lead agency, signed the Joint Powers Agreement for the Tulare Lake Hydrologic Region Water-Related Entities. The Poso RMG has coordinated their Region boundary with neighboring IRWMPs through collaboration within the JPA. The RMG developed this MOU in cooperation with the DACs within the Poso Creek Region, including the North Group of Four Cities that participated in the development of the Kern IRWMP. Since Plan adoption, the RMG has added one position as a voting member representative of the DACs within the Poso Creek Region as further defined herein.

6. This MOU is consistent with the Integrated Regional Water Management Planning Act

effective March 1, 2009 (Act).

NOW, THEREFORE, in consideration of the mutual promises, covenants and conditions hereinafter set forth, it is agreed by and among the parties as follows:

ARTICLE I - DEFINITIONS

As used in this MOU, unless the context requires otherwise, the meaning of the terms used in this MOU shall be as follows:

Section 1.01 Regional Management Group (RMG) means the Original Districts and the DAC Group, recognized by this MOU, that functions as the governing body consisting of a representative from each Party.

Section 1.02 Participating Parties means the Parties representing the RMG and individual members of the Stakeholder Group.

Section 1.03 Plan means the Poso Creek Integrated Regional Water Management Plan adopted on July 26, 2007, including any modification thereof duly adopted by the RMG.

Section 1.04 Project means a project contained within the Plan.

Section 1.05 Project Agreement means an agreement among Participating Parties who undertaking a Project.

Section 1.06 Stakeholder means an entity or organization that has requested to participate in the Plan that is within or adjacent to the Region boundary as defined in the Plan and consistent with the needs and objectives stated in the Plan.

Section 1.07 DAC Representative means the representative selected from the body of disadvantage communities (DAC Group) within the Poso Creek Region Stakeholders that is recognized as a single voting entity for the purpose of governance of the RMG.

Section 1.08 Kern County IRWMP Stakeholder Representative means the representative selected from the body of Participants within the Kern IRWMP Region that is recognized as a single non-voting entity for the purpose of coordination of planning.

ARTICLE II - CREATION OF RMG MOU

Section 2.01 Existence of RMG. Since March of 2006 there has been in existence a group consisting of some of the Participating Parties which later became the RMG and is now formally recognized as the governing body through this MOU.

Section 2.02 Term. This MOU shall be effective from the date of execution until terminated.

Section 2.03 Purpose. The purpose of this MOU is to provide for the governance of the Poso Creek RMG for the study, promotion and development of water management-related projects and programs and to encourage and facilitate design, financing, acquisition, construction and/or operation of same by some or all of the Participating Parties.

Section 2.04 Powers. The RMG shall have the power to study, promote and develop water management-related projects and programs and to encourage and facilitate design, financing, acquisition, construction and/or operation of same by some or all of the Participating Parties. The RMG is not authorized to finance, acquire, construct or operate Projects. It is contemplated at such time projects are ready to proceed that some or all of the Parties will enter Project Agreements for implementation of projects.

ARTICLE III - INTERNAL ORGANIZATION

Section 3.01 Governing Body. The business of the Poso Creek Plan shall be conducted by the RMG. One such representative and one alternate representative shall be selected and designated in writing from time to time by the governing body of each of the Parties. A representative of each of the Parties shall sit on the RMG, which shall be selected as provided in Section 3.02 of this MOU. The role of each alternate representative shall be to assume the duties of the representative appointed by his or her member entity, in the case of absence, unavailability, or conflict by such representative and/or in the event such representative declines to serve in a capacity otherwise required for such representative. The representatives and alternates so named shall continue to serve until their respective successors are appointed.

Section 3.02 Selection of the voting representative and alternate representative to the RMG from the Disadvantaged Community (DAC) Group. The DAC Group shall be entitled to one representative and one alternate representative on the RMG of its own selection. Selection of the DAC Group representative and alternate shall be administered by the Original Districts as follows: a letter soliciting nomination of a RMG candidate to represent the DAC Group will be sent to each DAC within the Poso Creek Region, Self-Help Enterprises, Inc., and the Community Water Center. From the responses received, a list of candidates will be complied and a ballot distributed to all DACs within the Poso Creek Region; each DAC having one vote in the election. Upon receipt of all ballots within a stated time period, the individual with the most votes shall become the DAC Group representative and the individual with the second most votes shall be the alternate. Said representative and alternate shall serve a two-year term with no limit on the number of terms that an individual can serve.

Section 3.03 Selection of the non-voting representative and alternate representative to the RMG from the Kern IRWMP Stakeholder Participants. The Kern IRWMP Participants shall be entitled to one representative and one alternate representative on the RMG of its own selection. Selection of the Kern IRWMP representative and alternate shall be administered by the Kern IRWMP Executive Committee. Upon selection by the Kern IRWMP Executive Committee, the representatives' names shall be forwarded to the then sitting RMG for acknowledgement. Said representative and alternate shall serve a two-year term with no limit on the number of terms that an individual can serve.

Section 3.04 Voting Percentage. Each RMG member shall have an equal vote on all matters affecting or undertaken by the Plan Participants. A simple majority vote of those present and voting shall be required for administrative or financial issues coming before the RMG except as otherwise provided in section 7.02 hereof. Project issues shall be decided by the Project participants in accordance with the Project Agreement.

Section 3.05 Tie Breaking. In the event of a tie vote for administrative or financial issues, the vote of the DAC Representative will be omitted for purposes of breaking the tie. In the event that this does not break the tie, the vote of the North West Kern Resources Conservation District (NWKRCD) will be omitted for purposes of breaking the tie.

Section 3.06 Meetings.

(a) The RMG shall hold at least one regular meeting per year, and by action of the RMG entered on its minutes, may provide for the holding of regular meetings at more frequent intervals. The date upon which, and the hour and place at which, each such regular meeting shall be held shall be fixed by action of the RMG recorded on its minutes. Special meetings of the RMG may be called in accordance with the provisions of Section 54956 of the California Government Code. Whether or not required by law, all meetings of the RMG shall be called, held, noticed and conducted subject to the provisions of the Ralph M. Brown Act (Sections 54950, *et seq.* of the California Government Code). Compensation and reimbursable expenses of the RMG members shall be set from time to time by resolution of the RMG.

(b) A quorum of the RMG shall consist of a majority of the RMG, except that less than a quorum may adjourn from time to time in accordance with law.

(c) The representatives shall select, from among their members, the following officers:

- a chairman who shall be presiding officer of all RMG meetings;
- a vice chairman who shall serve in the absence of the chairman.
- a secretary, who shall be responsible for keeping the minutes of all meetings of the RMG and all other official records of the RMG;
- a treasurer, with duties further outlined in Article IV of this MOU.

Each officer shall serve a two-year term with no limit on the number of terms that an individual can serve, provided however that the office shall be declared vacant if the person serving dies, resigns, or is removed by his or her member entity as its representative to the RMG, or if his or her member entity withdraws from this MOU pursuant to any of the provisions hereof. The representatives may also appoint such other officers and employees as it deems necessary to carry out the purposes of this MOU.

ARTICLE IV - FINANCIAL PROVISIONS

Section 4.01 Fiscal Year. The fiscal year of the RMG shall be the 12 months commencing January 1 and ending December 31. The RMG may modify the fiscal year by resolution.

Section 4.02 Depository; Treasurer. The representatives shall appoint a Treasurer for the RMG . The Treasurer shall be the depositary and shall have custody of all money of the RMG, from whatever sources.

All funds of the RMG shall be strictly, and separately, accounted for, and regular reports shall be rendered of all receipts and disbursements, at least quarterly during the fiscal year. The books and records of the RMG shall be open to inspection by the Parties; The RMG may contract with an independent certified public accountant to make an annual audit of the accounts and records of the RMG.

Grant funds received by the RMG in its own name shall be disbursed and accounted for as required by law.

Section 4.03 Budget. The RMG will prepare a budget for review and adoption if it determines that it is advisable to do so.

Section 4.04 Contributions and Payments for General and Mutual Expenses.

(a) Contributions from the Parties and from the Stakeholder Group shall be made to the RMG to meet the expenses of the RMG in carrying out its purposes. Payments of public funds may be made to defray the costs incurred in carrying out such powers, and advances of funds may be made for such purposes, to be repaid as provided in this MOU, or in amendments hereto. Personnel, equipment or property of one or more of the Parties may be used in lieu of other contributions or advances, upon approval of the RMG.

(b) The allocation of the expenses shall be in accordance with the attached "Cost Share %"at Exhibit "A" hereto. Participation in expenses by the NWKRCD and the DACs are not anticipated, however, future agreements may be entered into to reallocate expenses as needed. Expenses under a Project Agreement shall be allocated in accordance with such Agreement.

ARTICLE V - WITHDRAWAL OF PARTIES OR STAKEHOLDER GROUP MEMBERS

Section 5.01 Withdrawal from RMG. Any one of the Parties to this MOU who wishes to withdraw permanently from this MOU may do so upon providing ninety (90) days written notice to the RMG which notice shall contain the unconditional resolution of the governing board of said entity requesting withdrawal from the MOU. Said notice of termination shall be effective ninety (90) days from the date of its delivery to the RMG, or such lesser period as is established by the remaining Parties and no further action of the RMG shall be required in connection therewith.

Any Stakeholder who no longer wishes to associate with the RMG may do so upon providing thirty (30) days written notice to the RMG. Said notice of termination shall be effective thirty (30) days from the date of its delivery to the RMG. No further action of the RMG shall be required in connection therewith.

The withdrawing entity shall be responsible for its share of all costs, expenses, advances, and other obligations of the RMG while such withdrawing entity was a Party and the withdrawing entity or beneficiary shall also be responsible for any claims, demands, damages or liability arising from the initiation of this MOU through the date of the effectiveness of such withdrawal. The remaining Participating Parties shall have the option of discontinuing the RMG and/or acquiring the interests of the departed entity and maintaining the same proportional interest as the remaining Participating Parties, as is set forth in Article IV above.

Section 5.02 Refunds. No withdrawing entity shall be entitled to a refund of any payments made in connection with administrative and general expenses of the RMG and/or payments made in furtherance of a Project. Unexpended funds, which have not been committed for expenditure on any Project shall be remitted to the withdrawing entity in proportion to their payment, and shall be returned within thirty (30) days of the effective date of the withdrawal.

ARTICLE VI - RELATIONSHIP OF THE RMG AND PARTIES/STAKEHOLDERS

Section 6.01 Not a Separate Entity. The RMG is not a separate public entity and is recognized as a group of cooperating entities mutually pursuing a common purpose as stated in the Plan and through this MOU.

Section 6.02 Additional Parties. Additional entities may join in this MOU and become Parties upon unanimous consent of the then-existing Parties. The terms and conditions of such joinder shall be set forth in an amendment to this MOU, signed by all of the then-existing parties, and shall be consistent with any contracts of the RMG then in effect.

Section 6.03 Disposition of Property Upon Termination. Upon termination of this MOU, any surplus money or other property on hand shall be returned to the then-existing Parties and any Stakeholders that have participated financially in proportion to their respective contributions.

ARTICLE VII - MISCELLANEOUS PROVISIONS

Section 7.01 Dispute Resolution . All controversies among the Parties and the Stakeholders arising out of an action or decision of the RMG, or concerning the administration of this MOU shall be addressed in accordance with the provisions of this paragraph. Within ten (10) days after the action or decision has been taken, the aggrieved entity shall give written notice to the RMG and to other affected Parties or Stakeholder, stating the controversy. Within ten (10) days, thereafter, the aggrieved entity and the RMG shall meet and attempt to resolve the controversy. If following such meeting the affected Party or stakeholder is not satisfied, it may pursue whatever remedy it has.

Section 7.02 Further Amendment of this MOU. This MOU may be amended by an agreement approved by the governing boards of at least 2/3rds of the voting Parties. Approval of the RMG shall not be required for the amendment hereof provided, however any amendement of the cost share % as provided at Section 4.05 (b) shall require approval of the governing bodies of all Parties.

Section 7.03 Severability. Should any part, term or provision of this MOU be decided by the courts to be illegal or in conflict with any laws of the State of California or otherwise rendered unenforceable or ineffectual, the validity of the remaining portions, terms or provisions shall not be affected thereby.

Section 7.04 Assignment, Binding on Successors. Except as otherwise provided in this MOU, the rights and duties of the Parties to this MOU may not be assigned or delegated without the advance written consent of all of the other Parties, and any attempt to assign or delegate such rights or duties in contravention of this Section shall be null and void. Any approved assignment or delegation shall be consistent with the terms of any contracts of the RMG then in effect. This MOU shall inure to the benefit of, and be binding upon, the successors and assigns of the parties hereto.

Section 7.05 Notices. Any notice authorized or required to be given pursuant to this MOU shall be in writing and shall be deemed to have been given when mailed, postage prepaid, or delivered during working hours to the following addresses, or to such changed addresses as are communicated to the RMG and the Parties in writing:

CAWELO WATER DISTRICT
17207 Industrial Farm Road
Bakersfield, CA 93308-9519

DELANO-EARLIMART IRRIGATION DISTRICT
14181 Avenue 24
Delano, CA 93215

KERN-TULARE WATER DISTRICT
5001 California Avenue, Suite 202
Bakersfield, CA 93309

NORTH KERN WATER STORAGE DISTRICT
P.O. Box 81435
Bakersfield, CA 93380-1435

NORTH WEST KERN RESOURCE CONSERVATION DISTRICT
5000 California Ave., Ste. 100
Bakersfield, CA 93309

SHAFTER-WASCO IRRIGATION DISTRICT
P.O. Box 1168
Wasco, CA 93280

SEMITROPIC WATER STORAGE DISTRICT
P.O. Box Z
Wasco, CA 93280

DAC REPRESENTATIVE
CITY OF XXX
Street Address
City, CA XXXXX

Agreed to this 12 day of MAY, 2010:

SEMITROPIC WATER STORAGE DISTRICT

By ________________________

By Gen. Mgr.

DELANO-EARLIMART IRRIGATION DISTRICT

By Harold D M

By President of the Board

CAWELO WATER DISTRICT

By ________________________

By GENERAL MANAGER

KERN-TULARE WATER DISTRICT

By H. C. Oakes

By General Manager

SHAFTER-WASCO IRRIGATION DISTRICT

By________________________

By General Manager-Secretary

NORTH KERN WATER STORAGE DISTRICT

By________________________

By General Manager

NORTH WEST KERN RESOURCE CONSERVATION DISTRICT

By________________________

By District Manager

DAC REPRESENTATIVE

By________________________

City of Shafter

By Public Works Director

Exhibit A - Poso Creek IRWM RWMG Cost Allocation

Example for $1,000 expense	$1,000.00
1st 50%, (Split Evenly)	$500.00
2nd 50% (Split by Acreage)	$500.00

District	Irrigated	Acres Split		Even Split		Total Share	Combined Split	
	Acres	Percent	Amount	Percent	Amount	Amount	Percent	Amount
Cawelo	40,257	11.54%	$57.71	16.67%	$83.33	$141.04	14.10%	$141.04
Delano-Earlimart	50,822	14.57%	$72.85	16.67%	$83.33	$156.19	15.62%	$156.19
Kern-Tulare	20,654	5.92%	$29.61	16.67%	$83.33	$112.94	11.29%	$112.94
North Kern	64,326	18.44%	$92.21	16.67%	$83.33	$175.54	17.55%	$175.54
Semitropic	142,724	40.92%	$204.59	16.67%	$83.33	$287.93	28.79%	$287.93
Shafter Wasco	30,016	8.61%	$43.03	16.67%	$83.33	$126.36	12.64%	$126.36
Total	348,799	100.00%	$500.00	100.00%	$500.00	$1,000.00	100.00%	$1,000.00

A *First Amendment to the Poso Creek Integrated Regional Water Management Plan (IRWMP) Memorandum of Understanding (MOU)* (Amendment) has been drafted and is currently under review and consideration by the Regional Water Management Group (RWMG). This Amendment contains language which expresses the continued participation of the RWMG in regional water management activities and reflects the updated Regional Goals and Measurable Objectives set forth in the 2014 IRWM Plan Update. Once adopted, a copy of the Amendment will be contained with the original MOU in this appendix.

APPENDIX D

Public Notices for Integrated Regional Water Management (IRWM) Plan Update

NOTICE OF INTENTION TO PREPARE AN UPDATE TO THE POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Poso Creek Regional Water Management Group (Group) intends to prepare an update to the July 2007 Poso Creek Integrated Regional Water Management Plan (IRWMP), with the objective of completing that process by June 2014. The Group was formally organized under a May 2010 Memorandum of Understanding which includes Cawelo Water District, Delano-Earlimart Irrigation District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Semitropic Water Storage District, Shafter-Wasco Irrigation District, and a Disadvantaged Community Representative. The updated IRWMP will be prepared in accordance with the State of California Department of Water Resources Integrated Regional Water Management Planning Act Guidelines (Guidelines, 2012).

Landowners and other interested parties who wish to participate in updating the IRWMP, may do so by submitting a written request to *Paul Oshel, District Engineer, Semitropic Water Storage District, 1101 Central Avenue, Wasco, CA 93280*. Following completion of preparation of the updated IRWMP, the Group will consider adoption; however, prior to adoption, a Notice of Intent to Adopt the updated IRWMP will be noticed in accordance with Government Code 6066, similar to this published notice.

PROOF OF PUBLICATION

GEI Consultants
FEB 04 2014
RECEIVED–BFL

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA
County of Kern } ss.

I, the undersigned, 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 part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Shafter Press*, a newspaper of general circulation, printed and published weekly, in the City of Shafter, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 29926, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit: January 15, 22 2014

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Diane Owens
(Signature)

Executed on 1-22-14
at Shafter, California

The *SHAFTER PRESS*
PO Box 1600
Shafter, CA 93263

Phone (661) 746-4942

PUBLIC NOTICE

NOTICE OF INTENTION TO PREPARE AN UPDATE TO THE POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT PLAN

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Publish *Shafter Press* January 15, 22, 2014

PROOF OF PUBLICATION

GEI Consultants
FEB 04 2014
RECEIVED–BFL

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA } ss.
County of Kern

I, the undersigned, 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 part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Wasco Tribune*, a newspaper of general circulation, printed and published weekly, in the City of Wasco, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 1838950, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit:

January 15, 22, 2014

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

(Signature)

Executed on 1-22-14
at Wasco, California

The *WASCO TRIBUNE*
PO Box 1600
Shafter, CA 93263

Phone (661) 746-4942

PUBLIC NOTICE

NOTICE OF INTENTION TO PREPARE AN UPDATE TO THE POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT PLAN

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Landowners and other interested parties who wish to participate in updating the IRWMP, may do so by submitting a written request to *Paul Oshel, District Engineer, Semitropic Water Storage District, 1101 Central Avenue, Wasco, CA 93280*. Following completion of preparation of the updated IRWMP, the Group will consider adoption; however, prior to adoption, a Notice of Intent to Adopt the updated IRWMP will be noticed in accordance with Government Code 6066, similar to this published notice.

Publish *Wasco Tribune* January 15, 22, 2014

PROOF OF PUBLICATION

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA
County of Kern } ss.

I, the undersigned, 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 part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Delano Record*, a newspaper of general circulation, printed and published weekly, in the City of Delano, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 21125, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit:

January 16, 23, 2014

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

(Signature)

Executed on 1-23-14
at Delano, California

The *DELANO RECORD*
PO Box 1600
Shafter, CA 93263

Phone (661) 746-4942

PUBLIC NOTICE

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Publish *Delano Record* January 16, 23, 2014

POSO CREEK IRWM
Regional Water Management Group

NOTICE OF INTENT TO ADOPT AN UPDATE TO THE POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN, in accordance with Government Code 6066, that the Poso Creek Regional Water Management Group (RWMG) intends to adopt an update to the 2007 Poso Creek Integrated Regional Water Management Plan (IRWMP) at a future RWMG meeting. The RWMG includes Cawelo Water District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Semitropic Water Storage District, Shafter-Wasco Irrigation District, and a Disadvantaged Community Representative. The updated IRWMP was prepared in accordance with the State of California Department of Water Resources Integrated Regional Water Management Planning Act Guidelines (November 2012).

The RWMG published its Notice of Intent to prepare an update of the 2007 IRWMP in January 2014, at which time landowners and other interested parties were invited to participate in preparation of the updated IRWMP. An Update Workgroup, consisting of IRWMP representatives and Stakeholders, has been meeting since December 2013 to develop the updated IRWMP. The Workgroup has reviewed draft materials and the DWR Guidelines in preparing the updated IRWMP. Presentation of the draft materials has occurred at the regular meetings of the RWMG to inform the RWMG, Stakeholders, and Interested Parties.

The RWMG is now soliciting comments on the updated IRWMP, which will be available beginning May 16th on the Semitropic WSD's website (www.semitropic.com). Comments may be submitted in writing to *Paul Oshel, District Engineer, Semitropic Water Storage District, 1101 Central Avenue, Wasco, CA 93280*. The RWMG will consider comments at their next meeting on June 3rd, at or subsequent to which adoption is anticipated.

PROOF OF PUBLICATION

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA } ss.
County of Kern

I, the undersigned, 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 part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Wasco Tribune*, a newspaper of general circulation, printed and published weekly, in the City of Wasco, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 1838950, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit:

May 14, 21, 2014

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

(Signature)

Executed on 5-21-14
at Wasco, California

(5 1/2) # 33.00 x 2 = 66.00

The *WASCO TRIBUNE*
PO Box 1600
Shafter, CA 93263

Phone (661) 746-4942

PUBLIC NOTICE

NOTICE OF INTENT TO ADOPT AN UPDATE TO THE POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT PLAN

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Publish *Wasco Tribune* May 14, 21, 2014

PROOF OF PUBLICATION

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA } ss.
County of Kern

I, the undersigned, 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 part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Wasco Tribune*, a newspaper of general circulation, printed and published weekly, in the City of Wasco, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 1838950, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit:

May 14, 21, 2014

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Diane Burns

(Signature)

Executed on 5-21-14
at Wasco, California

The *WASCO TRIBUNE*
PO Box 1600
Shafter, CA 93263

Phone (661) 746-4942

PUBLIC NOTICE

NOTICE OF INTENT TO ADOPT AN UPDATE TO THE POSO CREEK INTEGRATED REGIONAL WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN, in accordance with Government Code 6066, that the Poso Creek Regional Water Management Group (RWMG) intends to adopt an update to the 2007 Poso Creek Integrated Regional Water Management Plan (IRWMP) at a future RWMG meeting. The RWMG includes Cawelo Water District, Kern-Tulare Water District, North Kern Water Storage District, North West Kern Resource Conservation District, Semitropic Water Storage District, Shafter-Wasco Irrigation District, and a Disadvantaged Community Representative. The updated IRWMP was prepared in accordance with the State of California Department of Water Resources Integrated Regional Water Management Planning Act Guidelines (November 2012).

The RWMG published its Notice of Intent to prepare an update of the 2007 IRWMP in January 2014, at which time landowners and other interested parties were invited to participate in preparation of the updated IRWMP. An Update Workgroup, consisting of IRWMP representatives and Stakeholders, has been meeting since December 2013 to develop the updated IRWMP. The Workgroup has reviewed draft materials and the DWR Guidelines in preparing the updated IRWMP. Presentation of the draft materials has occurred at the regular meetings of the RWMG to inform the RWMG, Stakeholders, and Interested Parties.

The RWMG is now soliciting comments on the updated IRWMP, which will be available beginning May 16th on the Semitropic WSD s website www.semitropic.com/pubsarchive.htm. Comments may be submitted in writing to *Paul Oshel, District Engineer, Semitropic Water Storage District, 1101 Central Avenue, Wasco, CA 93280*. The RWMG will consider comments at their next meeting on June 3rd, at or subsequent to which adoption is anticipated.

Publish *Wasco Tribune* May 14, 21, 2014

PROOF OF PUBLICATION

(2015.5 C.C.P.)
(GENERAL FORM)

STATE OF CALIFORNIA } ss.
County of Kern

I, the undersigned, 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 part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Delano Record*, a newspaper of general circulation, printed and published weekly, in the City of Delano, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 21125, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit:

May 15, 22, 2014

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Diane Olvera
(Signature)

Executed on 5-22-14
at Delano, California

(5B) 33.00 X2= 66.00

The *DELANO RECORD*
PO Box 1600
Shafter, CA 93263

Phone (661) 746-4942

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Publish *Delano Record* May 15, 22, 2014

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I, the undersigned, 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 part of or interested in the above entitled matter. I am the chief clerk/publisher of *The Shafter Press*, a newspaper of general circulation, printed and published weekly, in the City of Shafter, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court order number 29926, of the County of Kern; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and in any supplement thereof on the following dates, to-wit: May 14, 21, 2014

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Diane Givens
(Signature)

Executed on 5-21-14
at Shafter, California

(5½) $ 33^00 x2 = 66^00

The *SHAFTER PRESS*
PO Box 1600
Shafter, CA 93263

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Publish *Shafter Press* May 14, 21, 2014

APPENDIX E

Resolution of Integrated Regional Water Management (IRWM) Plan Update Adoption by the Regional Water Management Group (RWMG)

A *Resolution of Integrated Regional Water Management (IRWM) Plan Update Adoption* (Resolution) will be filed following approval of the 2014 IRWM Plan Update by the Regional Water Management Group (RWMG), on behalf of the IRWM Group. A copy of the Resolution will be contained in this appendix.

APPENDIX F

Poso Creek Regional Water Demand and Supply Analyses
from the 2007 Integrated Regional Water Management Plan (IRWMP)[1]

APPENDIX F1

Chapter 4: Historical and Projected Water Supplies

APPENDIX F2

Chapter 5: Historical Water Use and Projected Water Demand

APPENDIX F3

Chapter 7: Water Supply Operations Studies

[1] Appendix includes chapters copied directly from the 2007 IRWMP, as referenced throughout this Plan. Refer to the 2007 IRWMP for more information regarding figures, tables, and references for this text.. Acronyms from these chapters are included in the List of Acronyms at the beginning of this Plan.

APPENDIX F1

Chapter 4: Historical and Projected Water Supplies

4 Historical and Projected Water Supplies

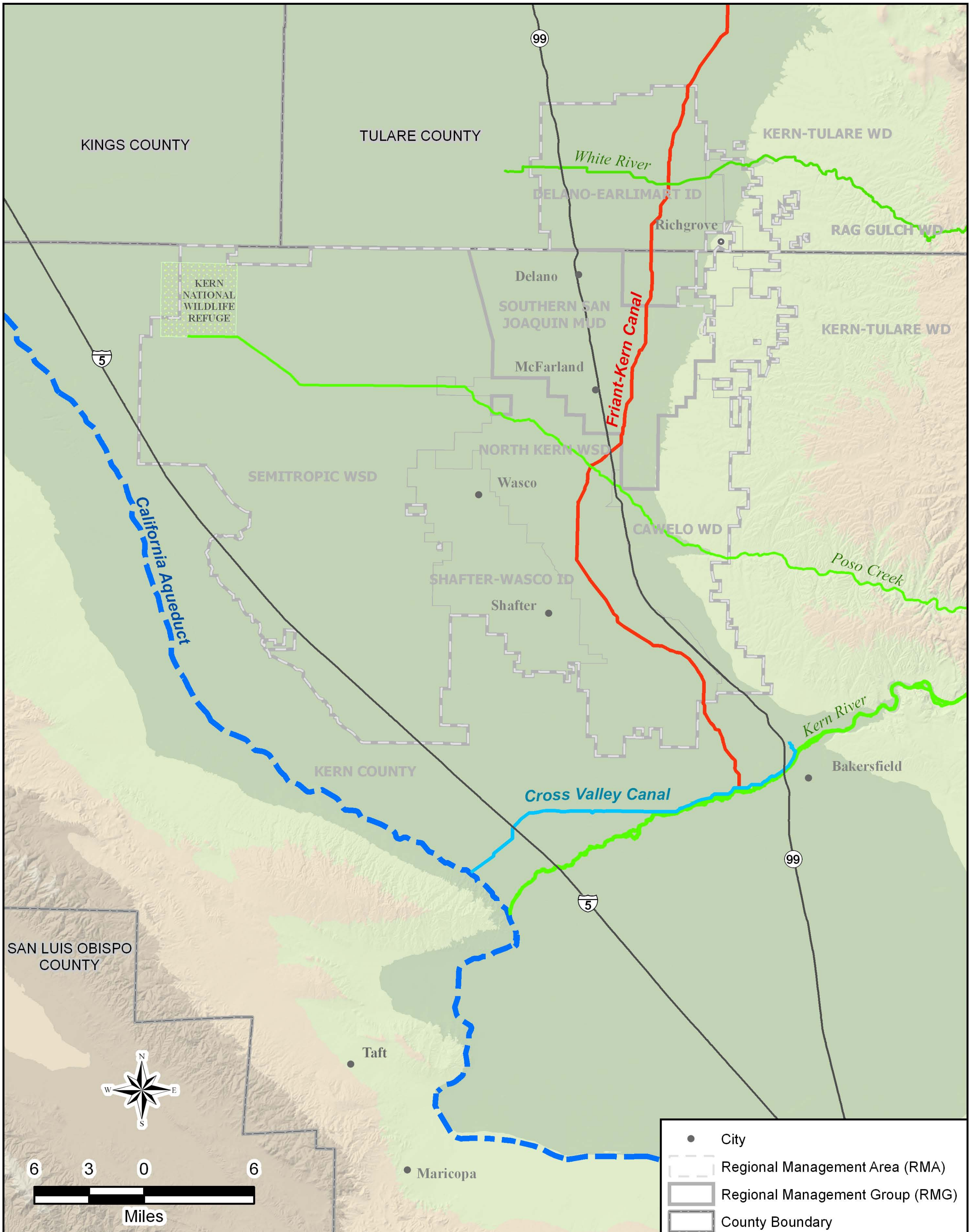
The fundamental questions which are addressed in this section are …

- *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	GEI Consultants Bookman-Edmonston Division	Cross Roads of the California Aqueduct, Friant-Kern Canal and the Kern River
Poso Creek Regional Management Group		JUNE 2007 FIGURE 4-1

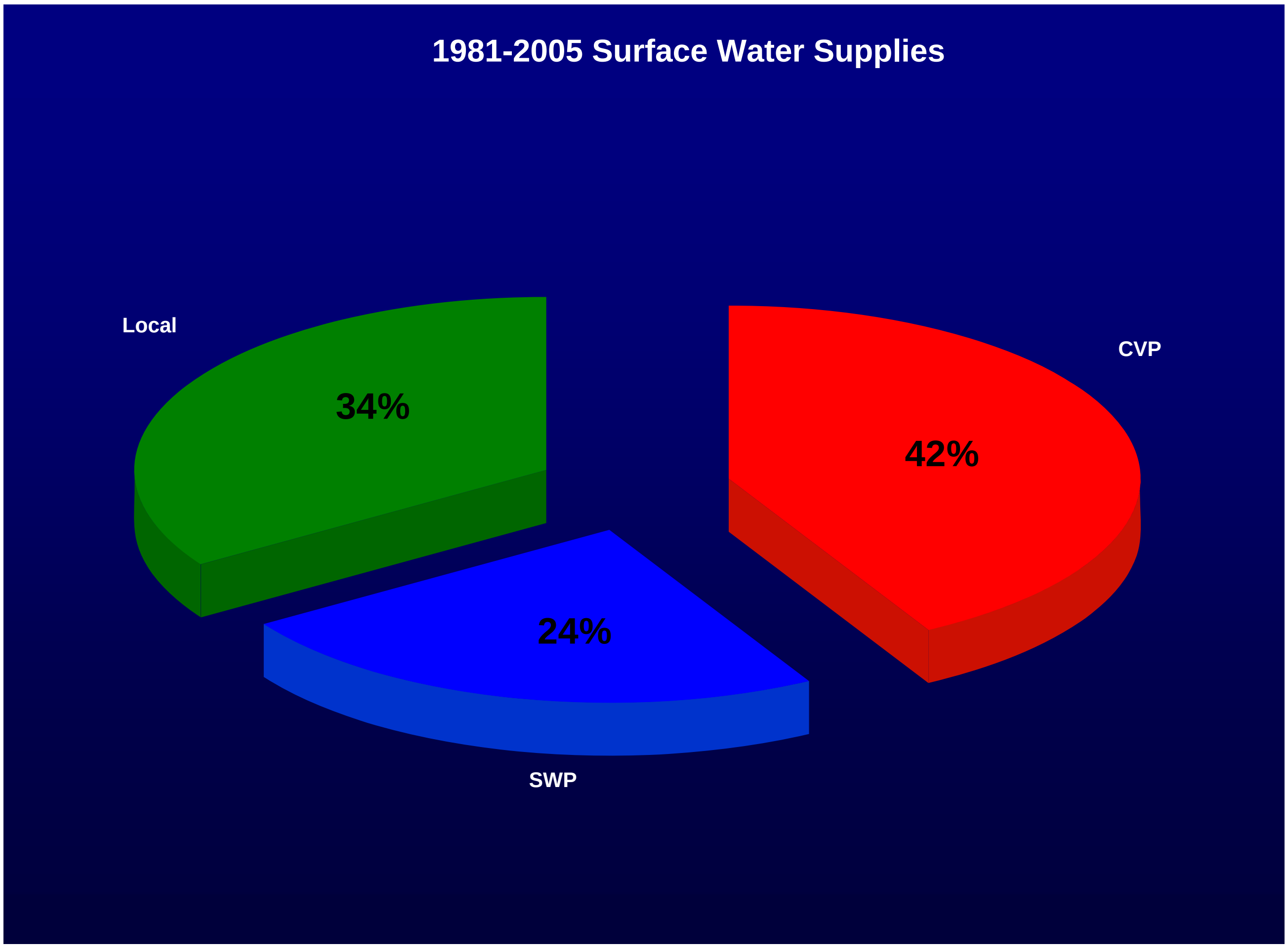
The Poso Creek Regional Management Group (RMG) members are listed, along with their respective sources of water supply, in Table 4-1. These water sources are discussed in more detail in subsequent sections of this chapter.

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.

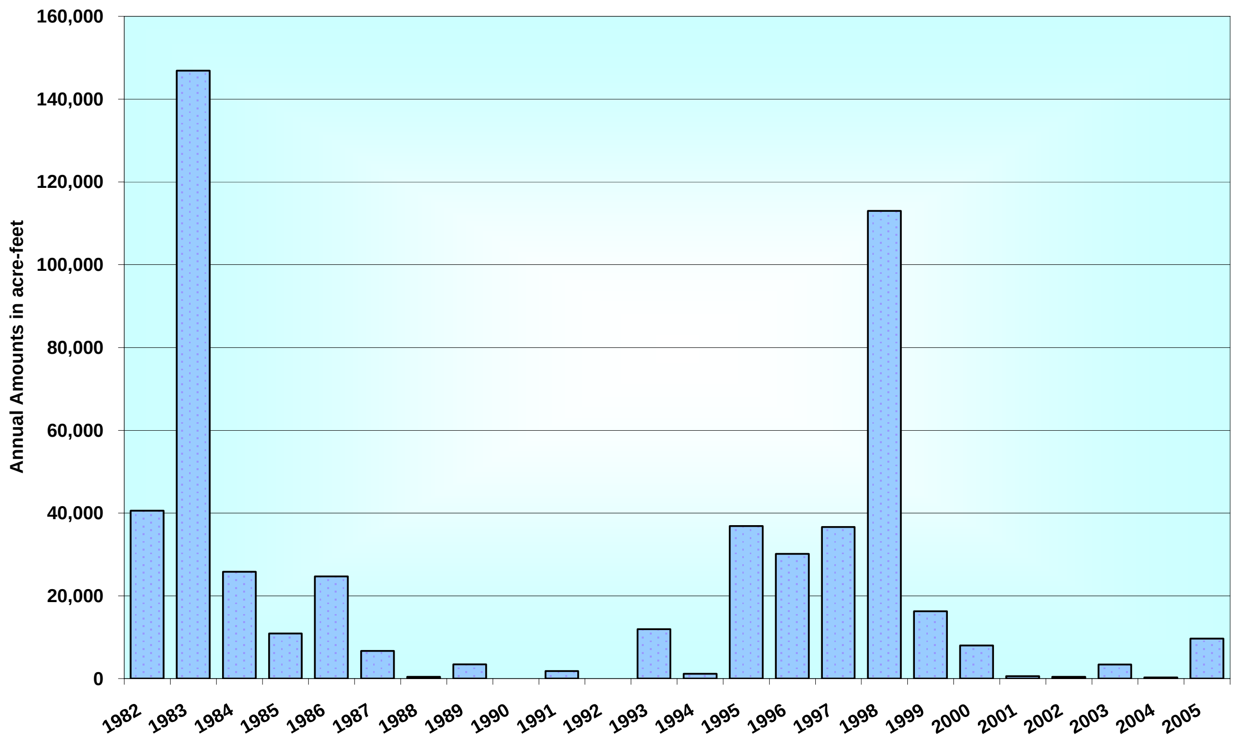
Commencing in 1997, diversions have been governed by an agreement[3] between North Kern, Cawelo, and Semitropic, who collectively share the runoff of Poso Creek. Under the agreement, riparian users are first satisfied, after which the sharing between the parties is in accordance with the following schedule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

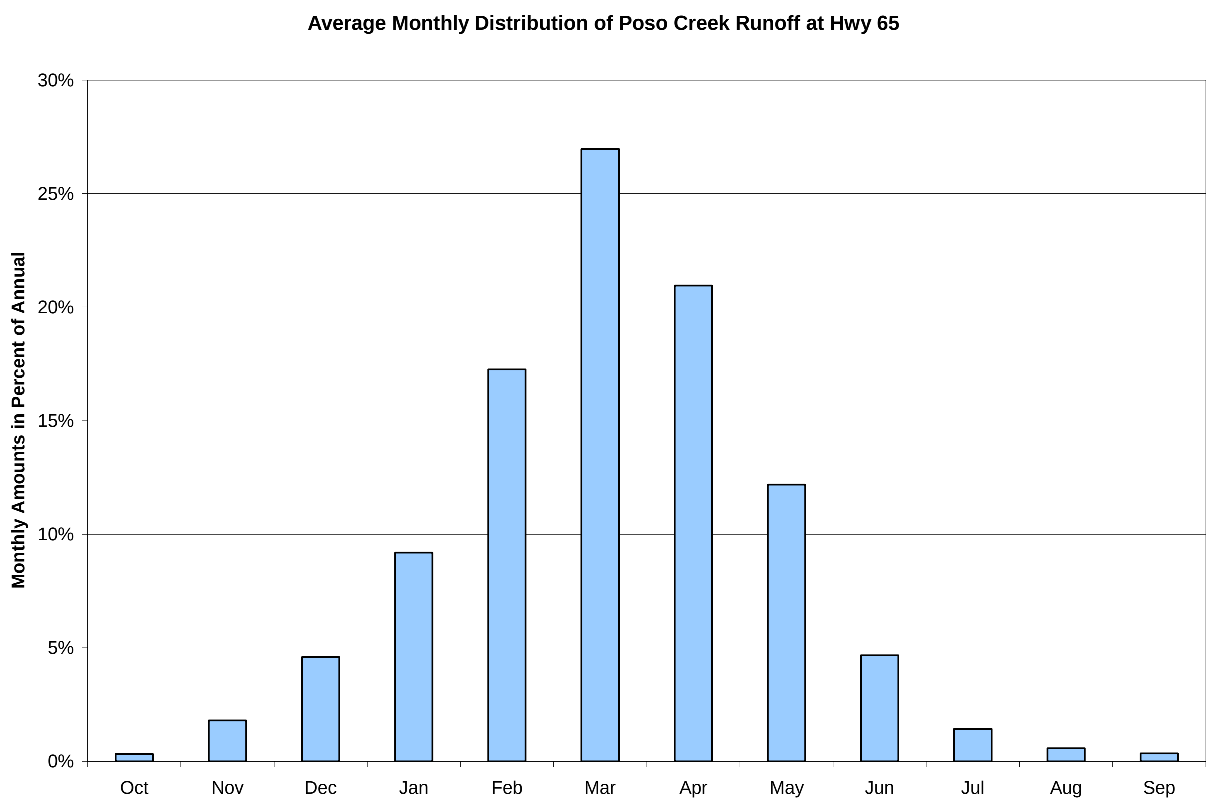
Less than 135 cfs	*Cawelo*
Between 135 cfs and 300 cfs	*North Kern*
Between 300 cfs and 685 cfs	*Semitropic*
Over 685 cfs	*North Kern*

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




Average Monthly Distribution of Poso Creek Runoff at Hwy 65
Monthly Amounts in Percent of Annual
30%
25%
20%
15%
10%
5%
0%
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep

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

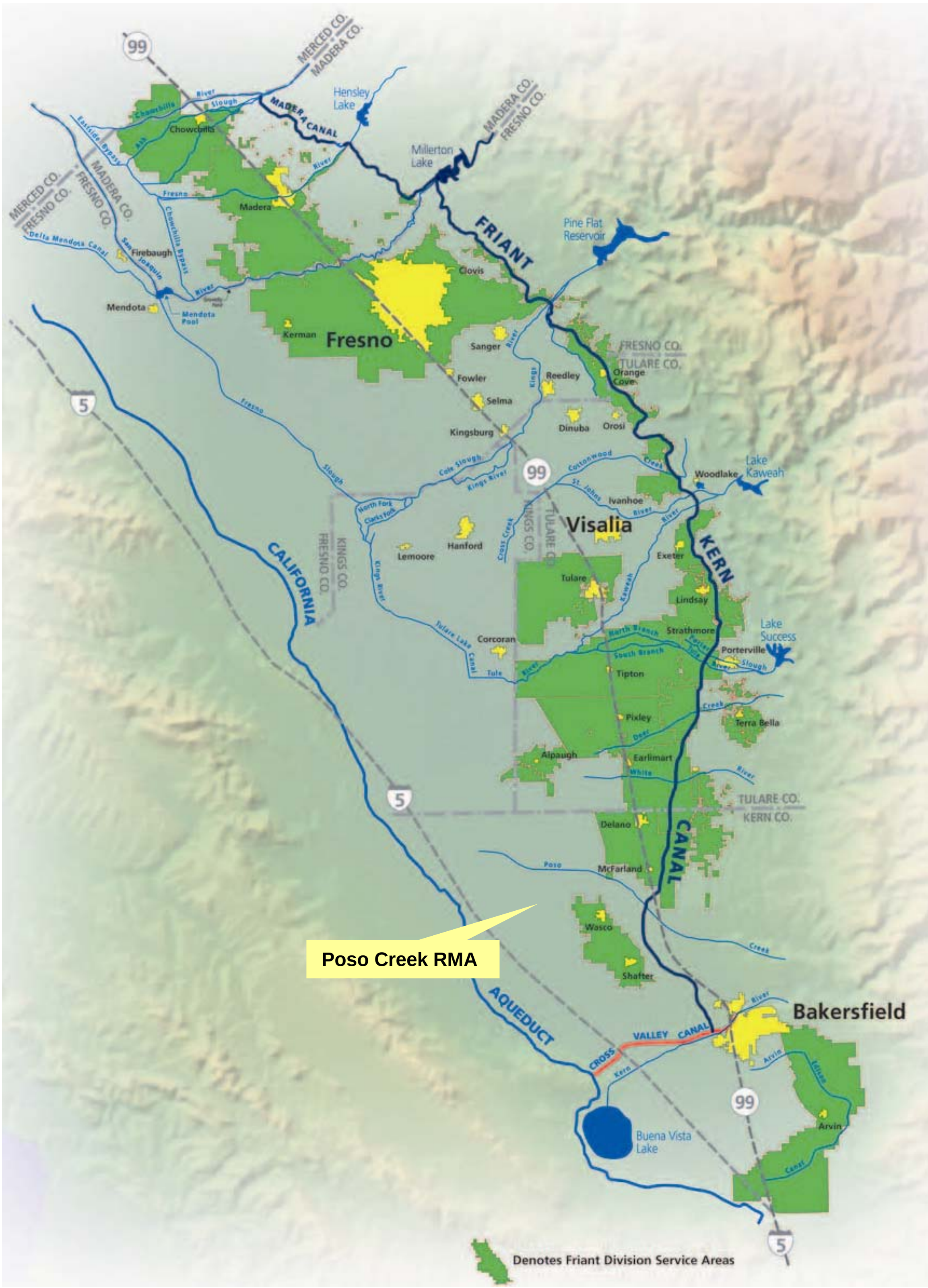
Water recycling within the Region includes both M&I wastewater effluent and water used to create waterfowl habitat in the Kern National Wildlife Refuge.

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.

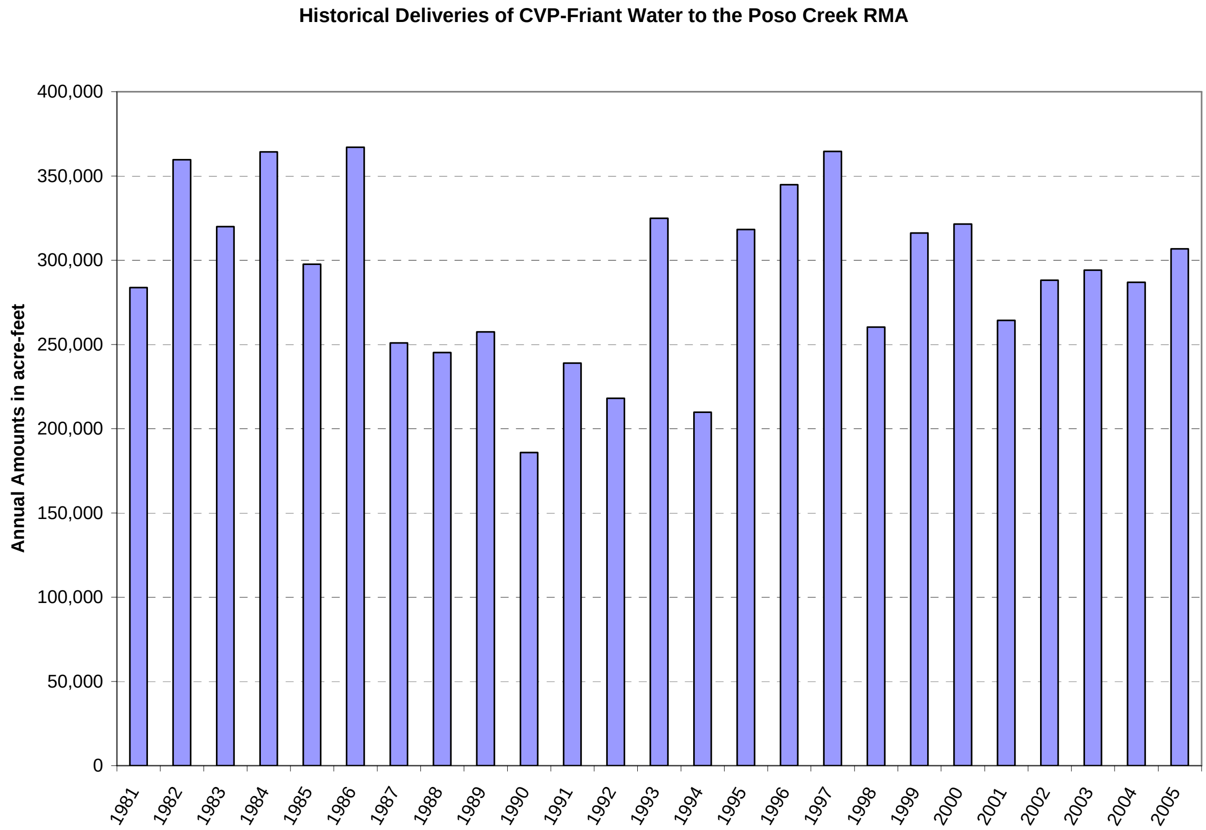
4.2.5 Central Valley Project – Delta Division

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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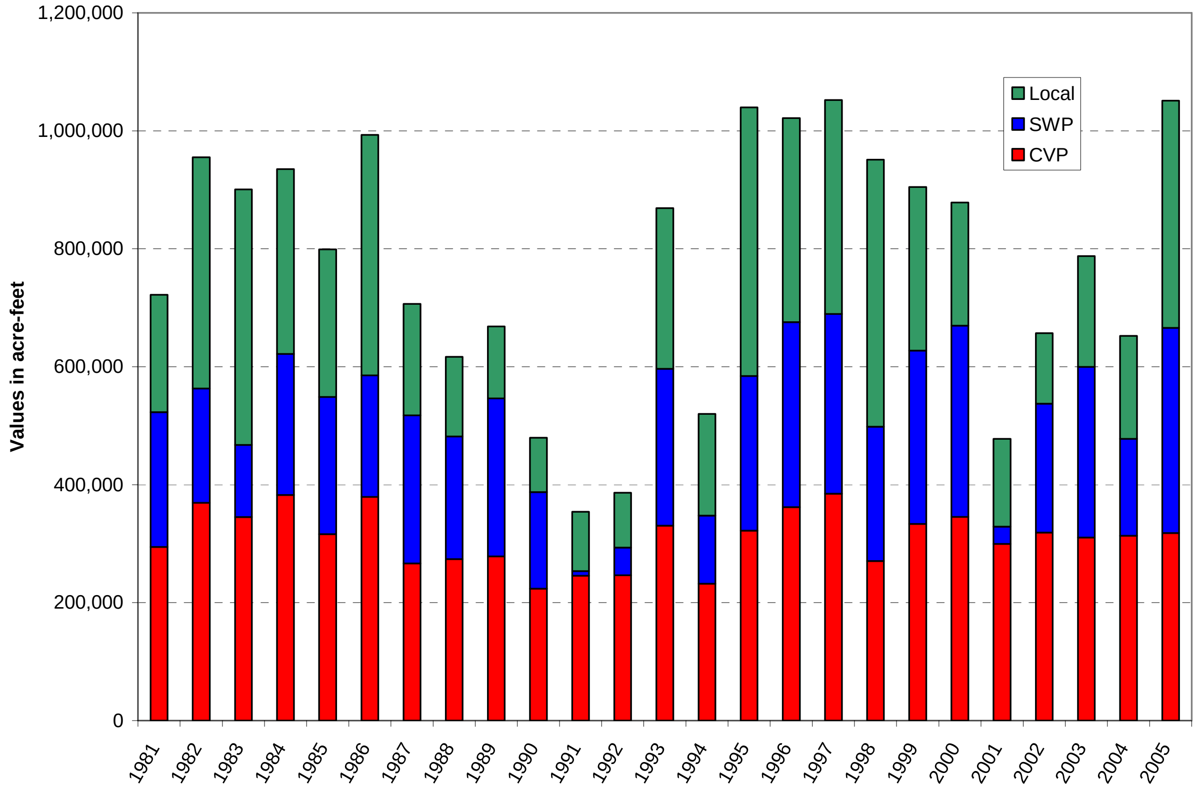
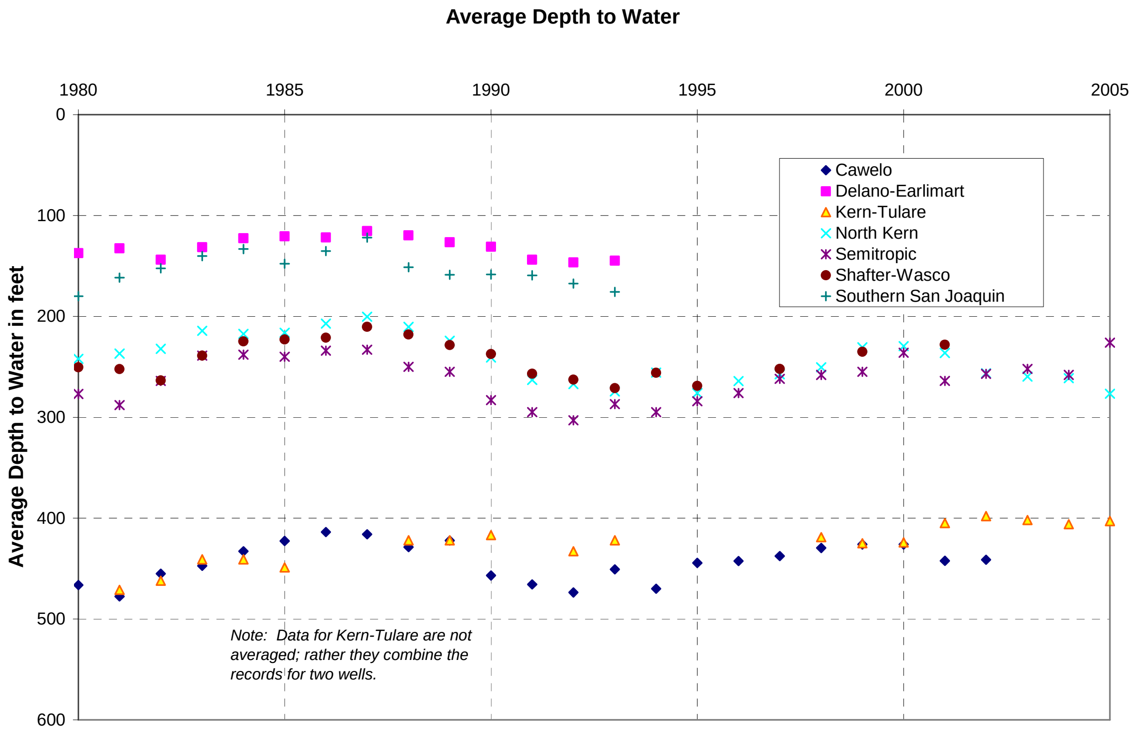
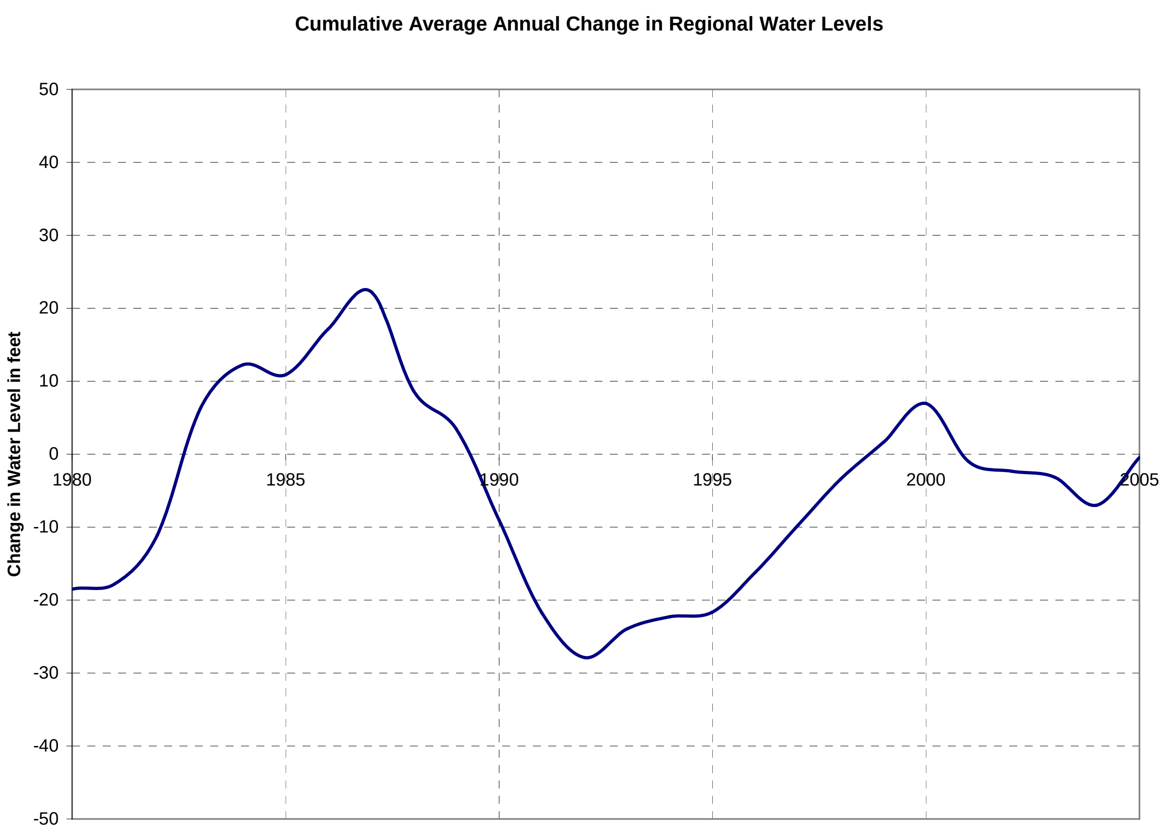
Historical Surface Water Supplies by Source for the Poso Creek RMA

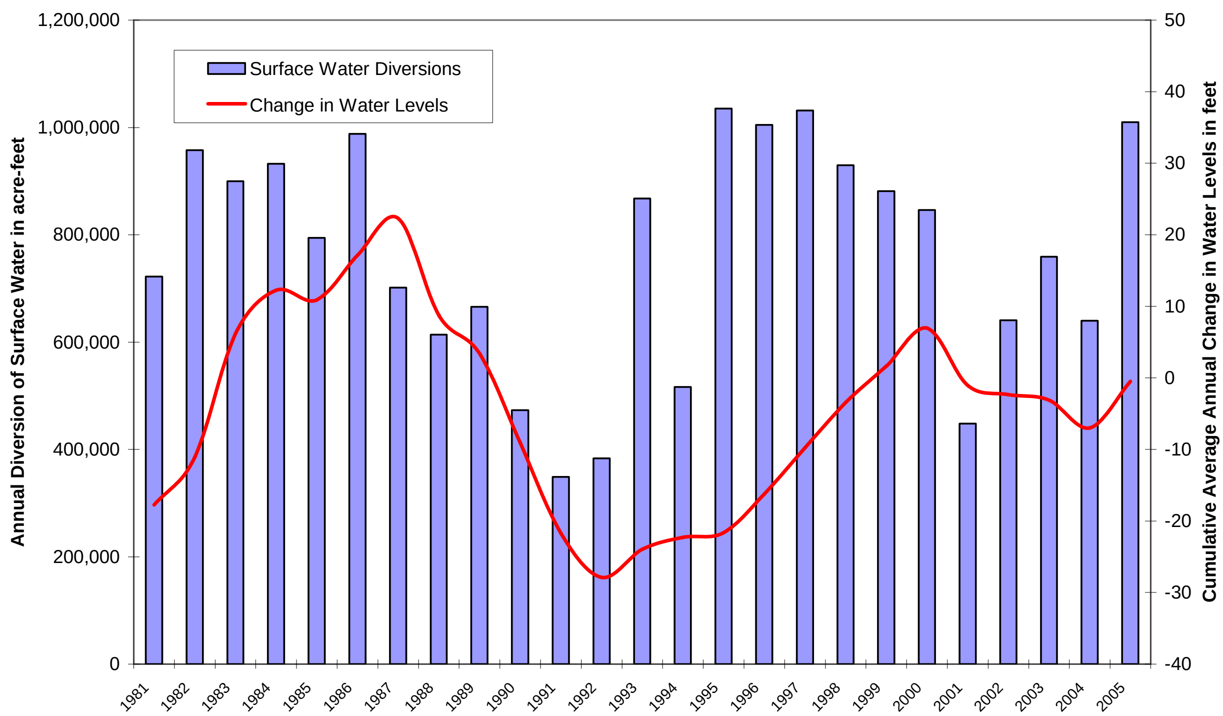






Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Average Depth to Water and Cumulative Average Annual Change in Regional Water Levels
Poso Creek Regional Management Group		June 2007 Figure 4-8

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 4-9

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*.

<u>*Class 1 and Class 2 Water*</u> - 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.

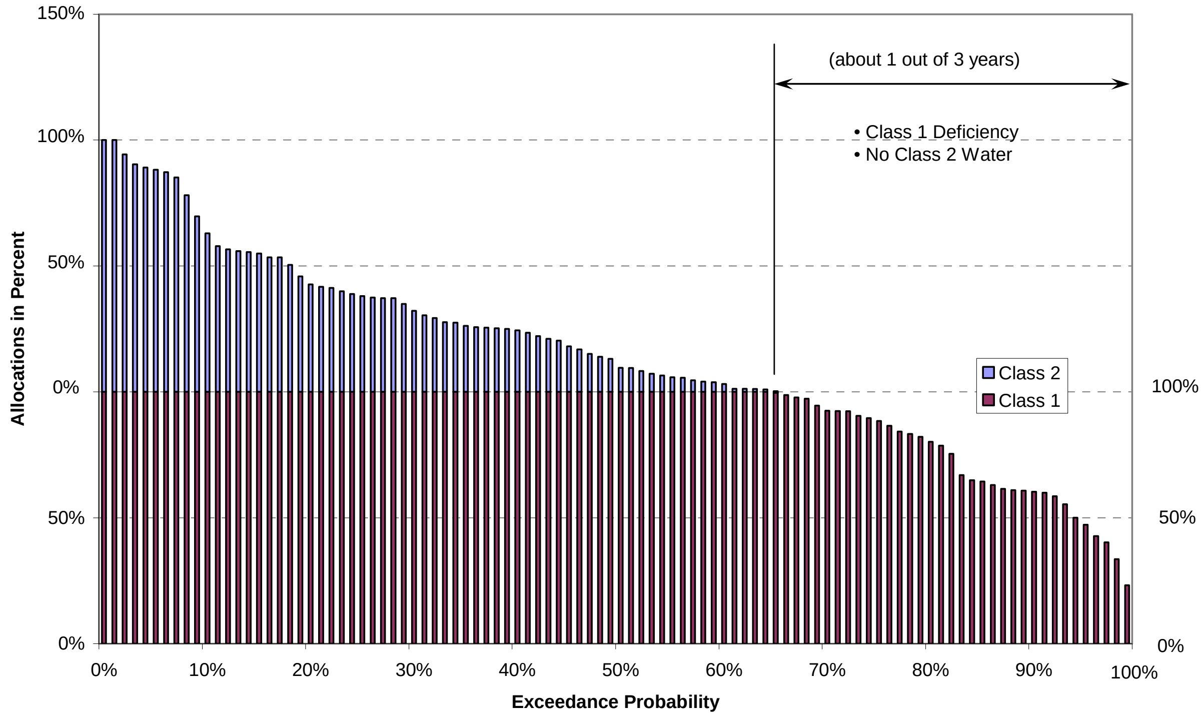
Table 4-5

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%

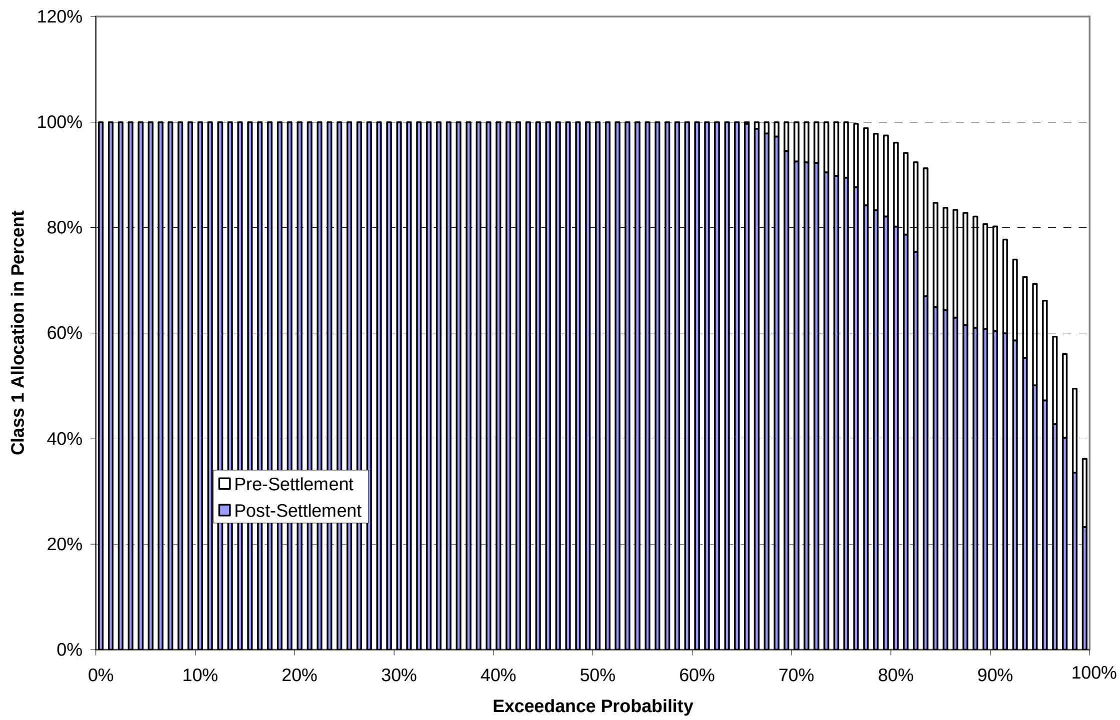
Water Year	Friant-Kern Class 1 Allocation	Friant-Kern Class 2 Allocation
1959	93%	0%
1960	57%	0%
1961	41%	0%
1962	100%	30%
1963	100%	39%
1964	92%	0%
1965	100%	38%
1966	100%	6%
1967	100%	88%
1968	82%	0%
1969	100%	91%
1970	100%	14%
1971	100%	10%
1972	89%	0%
1973	100%	27%
1974	100%	37%
1975	100%	31%
1976	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

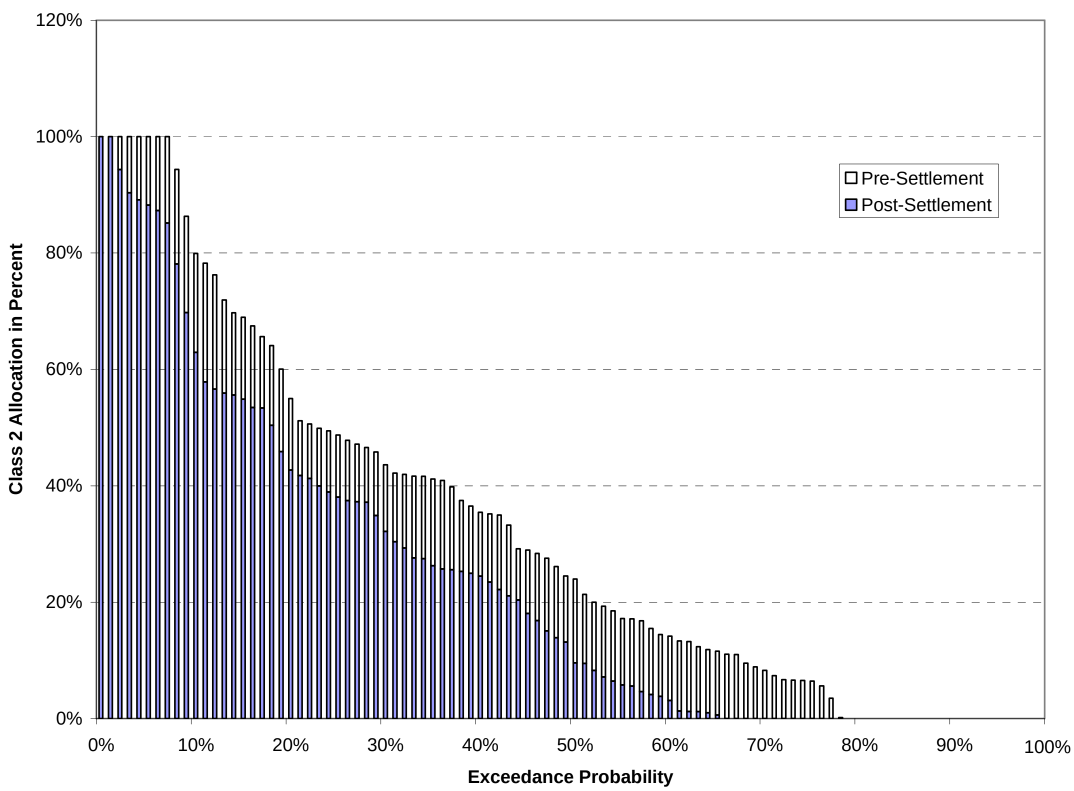


Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Exceedance Probability of Friant Class 1 and Class 2 Allocations Under Post-Settlement Conditions	
Poso Creek Regional Management Group		June 2007	Figure 4-10

Exceedance Probability of Friant Class 1 Allocations



Exceedance Probability of Friant Class 2 Allocations



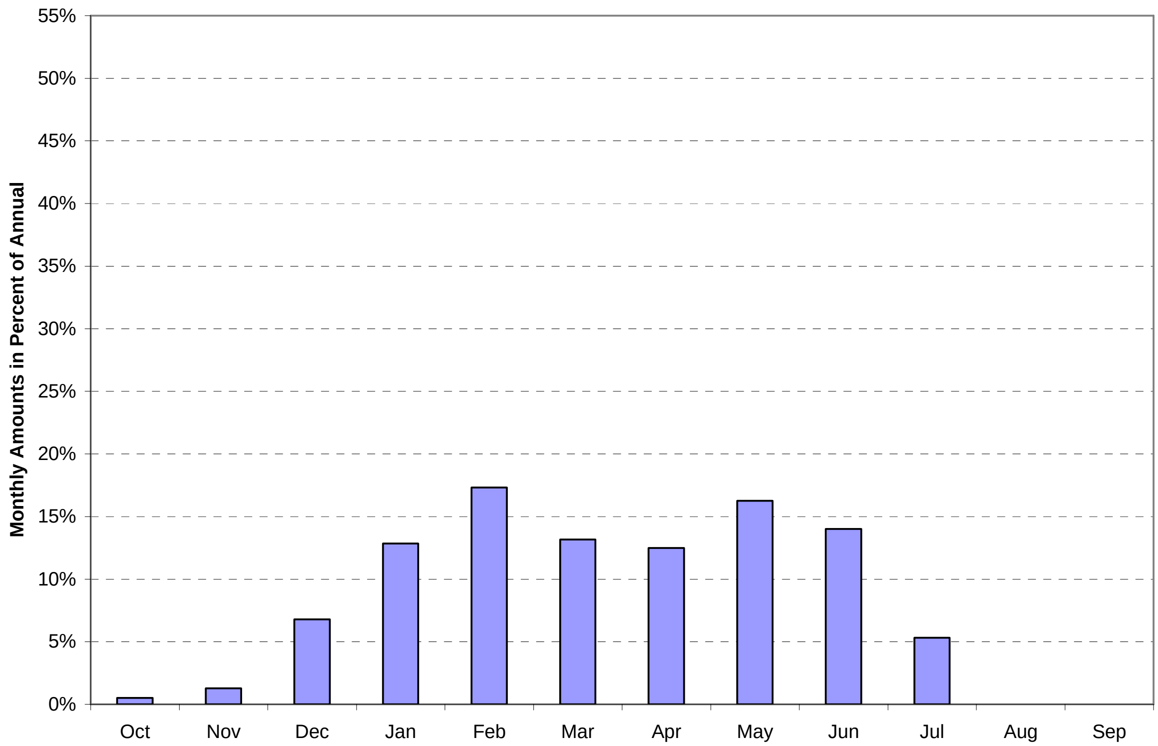
Poso Creek Integrated Regional Water Management Plan	GEI Consultants Bookman-Edmonston Division	Exceedance Probability of Friant Class 1 and Class 2 Allocations
Poso Creek Regional Management Group		June 2007 Figure 4-11

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	

Average Monthly Distribution of "Other" Friant Water Under Post-Settlement Conditions



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: (1922-1994	68%	76%

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

(values in acre-feet)

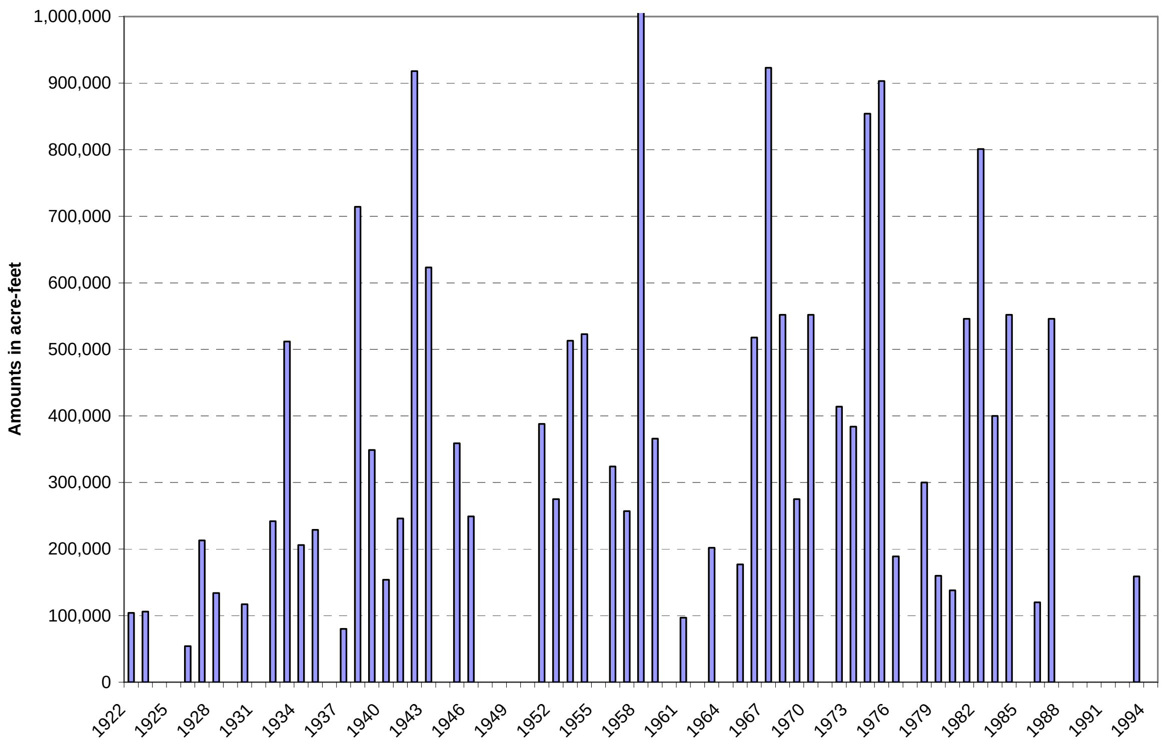
Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Calendar Year
1922	0	0	87,900	16,000	0	0	0	0	0	0	0	0	103,900	**1922**
1923	52,900	53,400	0	0	0	0	0	0	0	0	0	0	106,300	**1923**
1924	0	0	0	0	0	0	0	0	0	0	0	0	0	**1924**
1925	0	0	0	0	0	0	0	0	0	0	0	0	0	**1925**
1926	0	54,300	0	0	0	0	0	0	0	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"

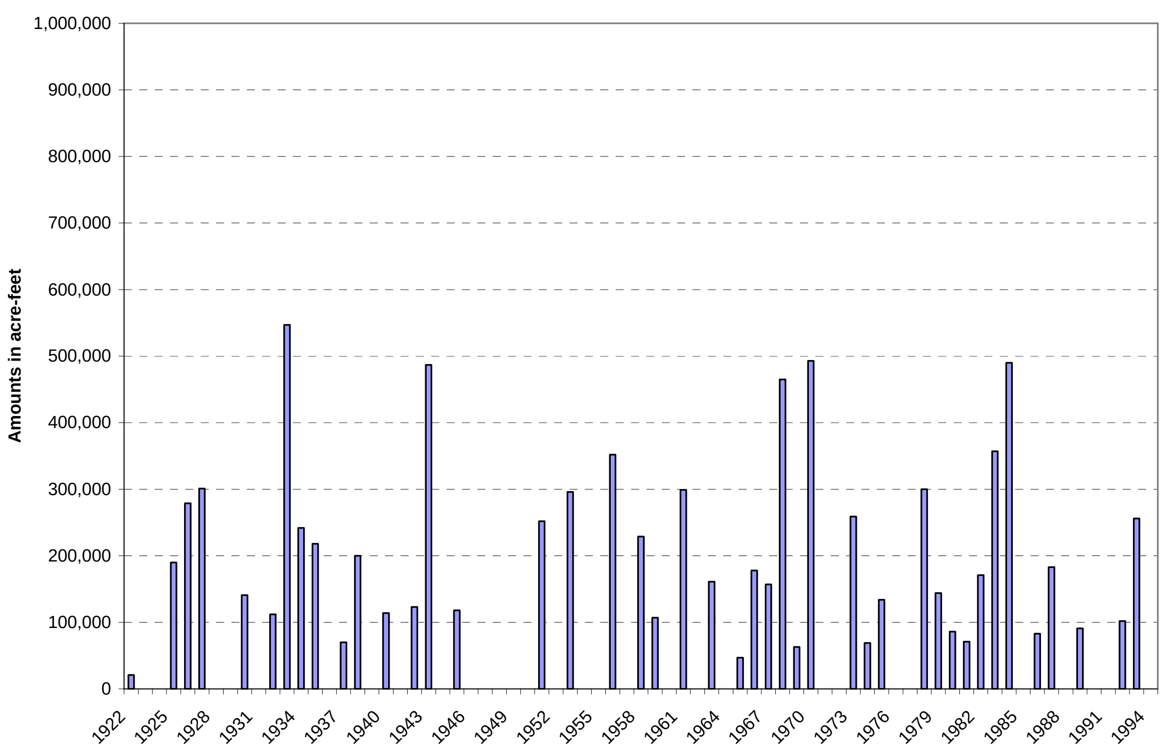
(values in acre-feet)

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	

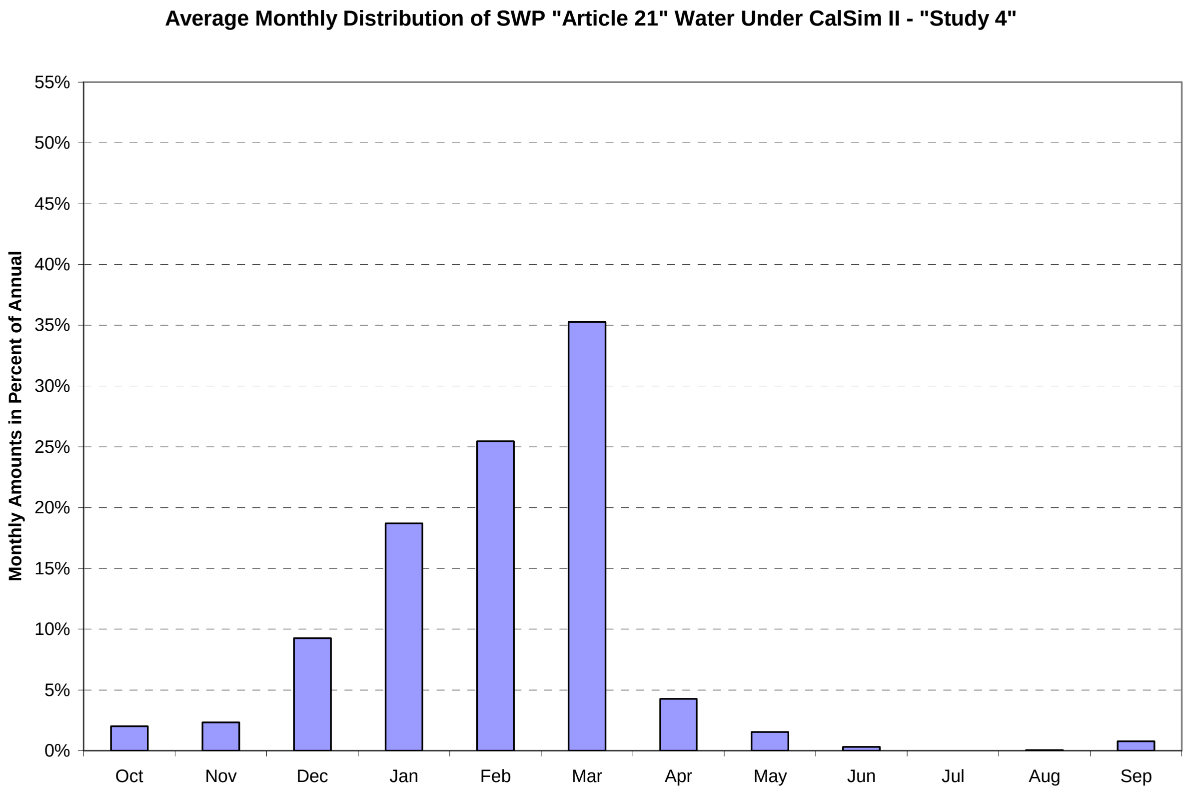
Projected System-Wide Availability of SWP "Article 21" Water Under CalSim II - "Study 4"

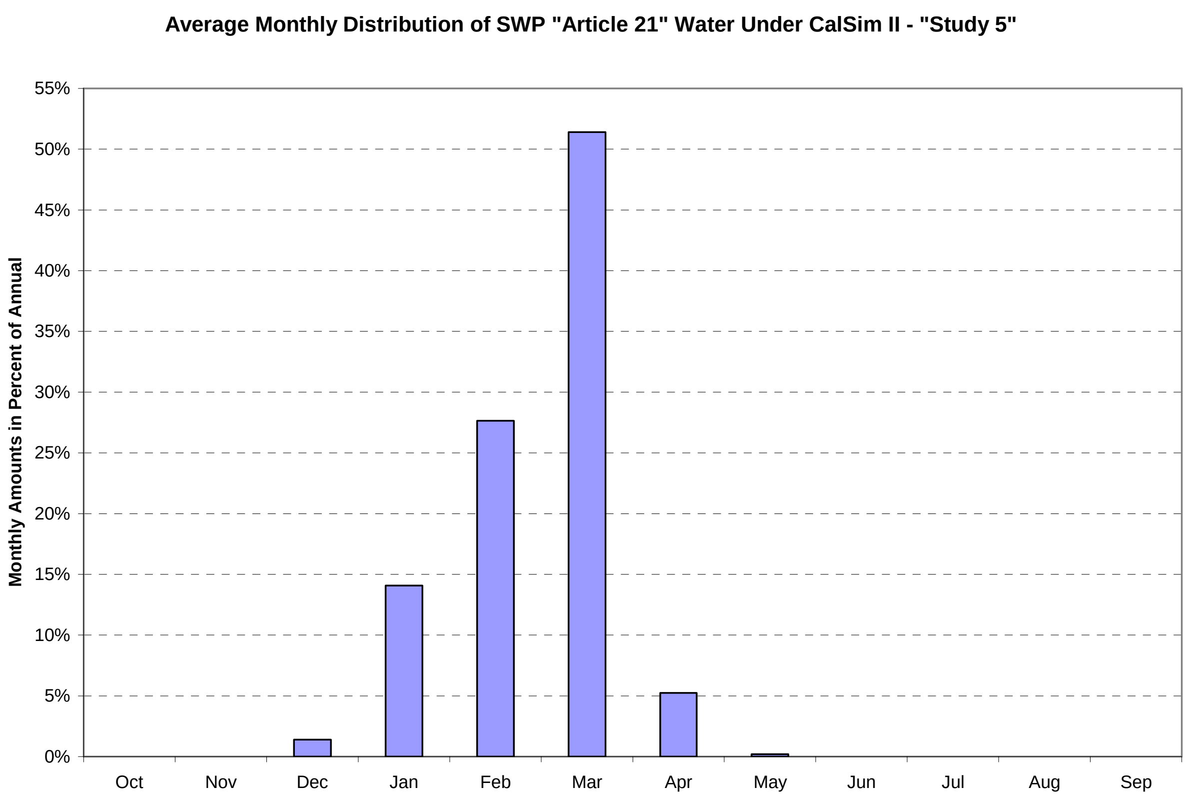


Projected System-Wide Availability of SWP "Article 21" Water Under CalSim II - "Study 5"



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

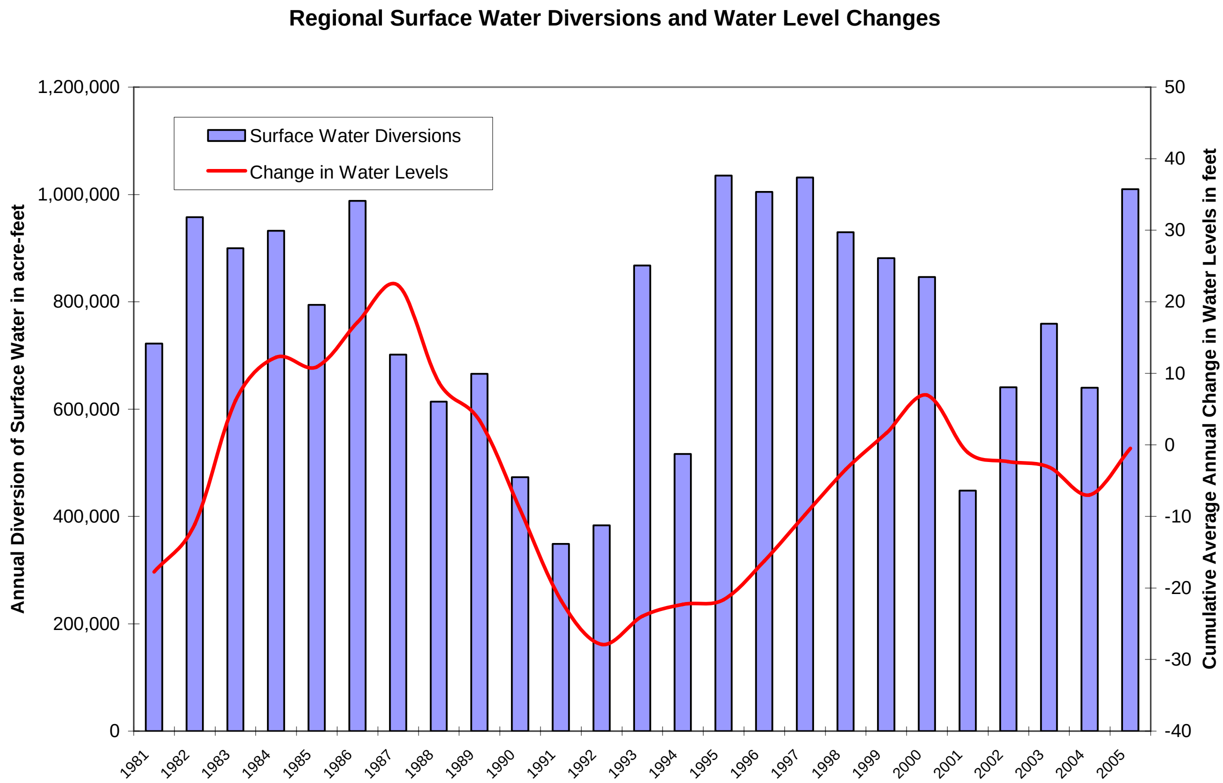
4.3.8 Summary

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.



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

APPENDIX F2

Chapter 5: Historical Water Use and Projected Water Demand

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

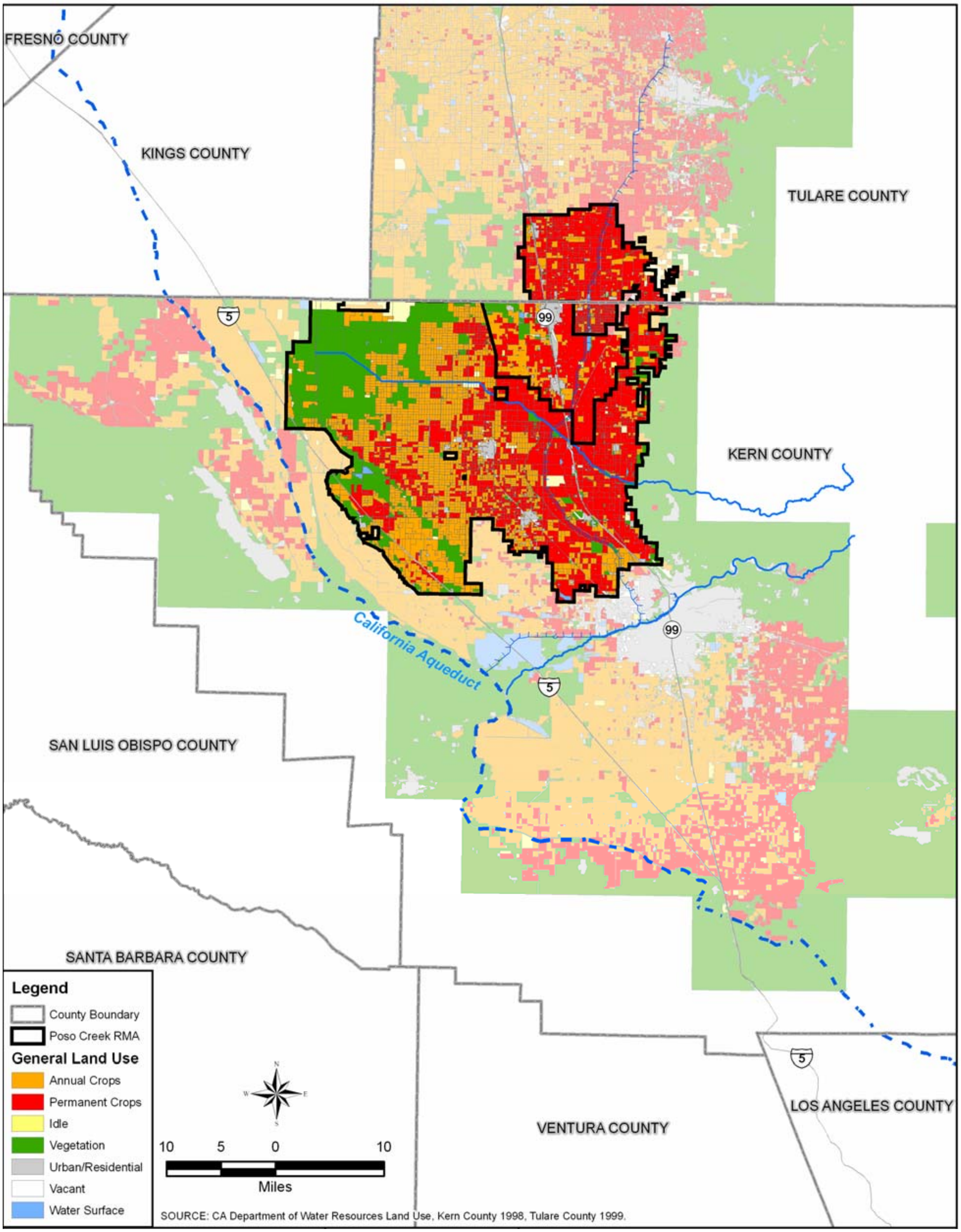
The present utilization of water supplies in the San Joaquin Valley portion of Kern County is predominantly for irrigated agriculture, which is also true for the Poso Creek RMA. As a generalization, all of the lands in the Poso Creek RMA are underlain by useable groundwater. Accordingly, to the extent 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

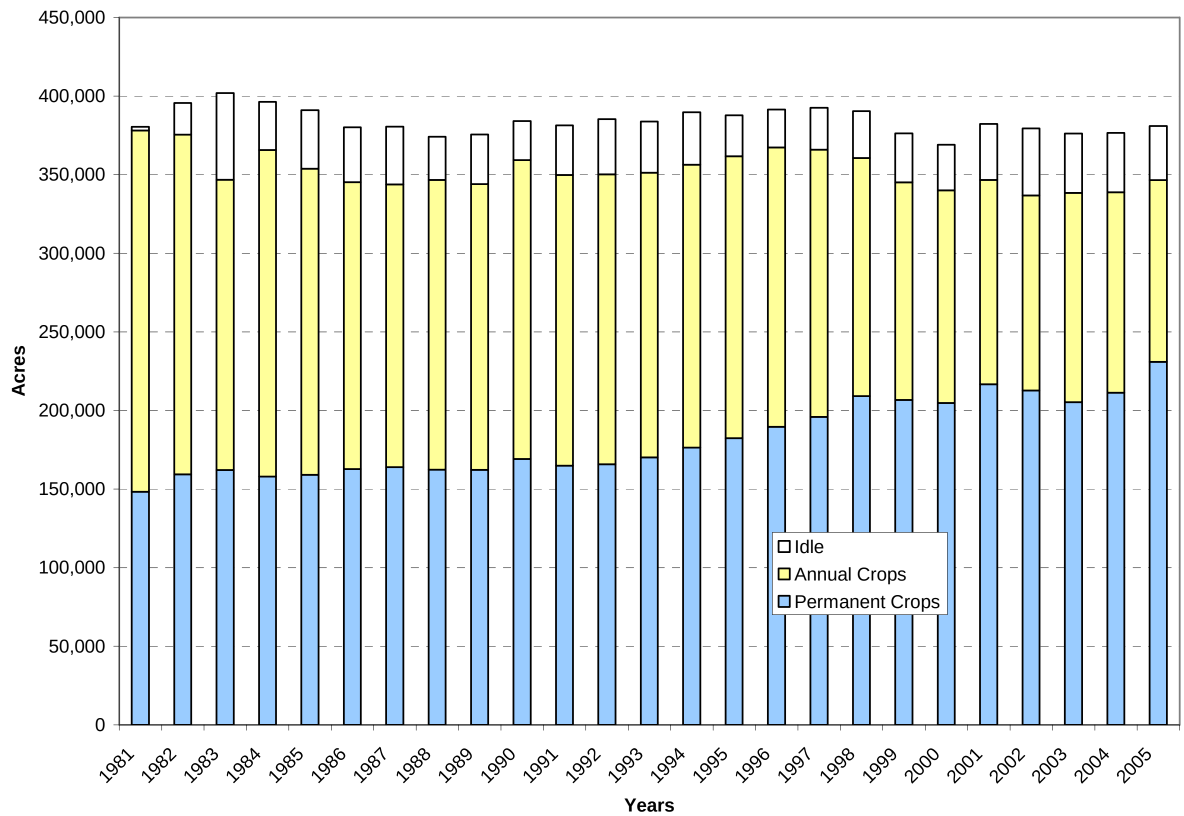
The historical use of water for irrigation, municipal and industrial, environmental and recreational, and groundwater replenishment is presented in the following paragraphs.

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.

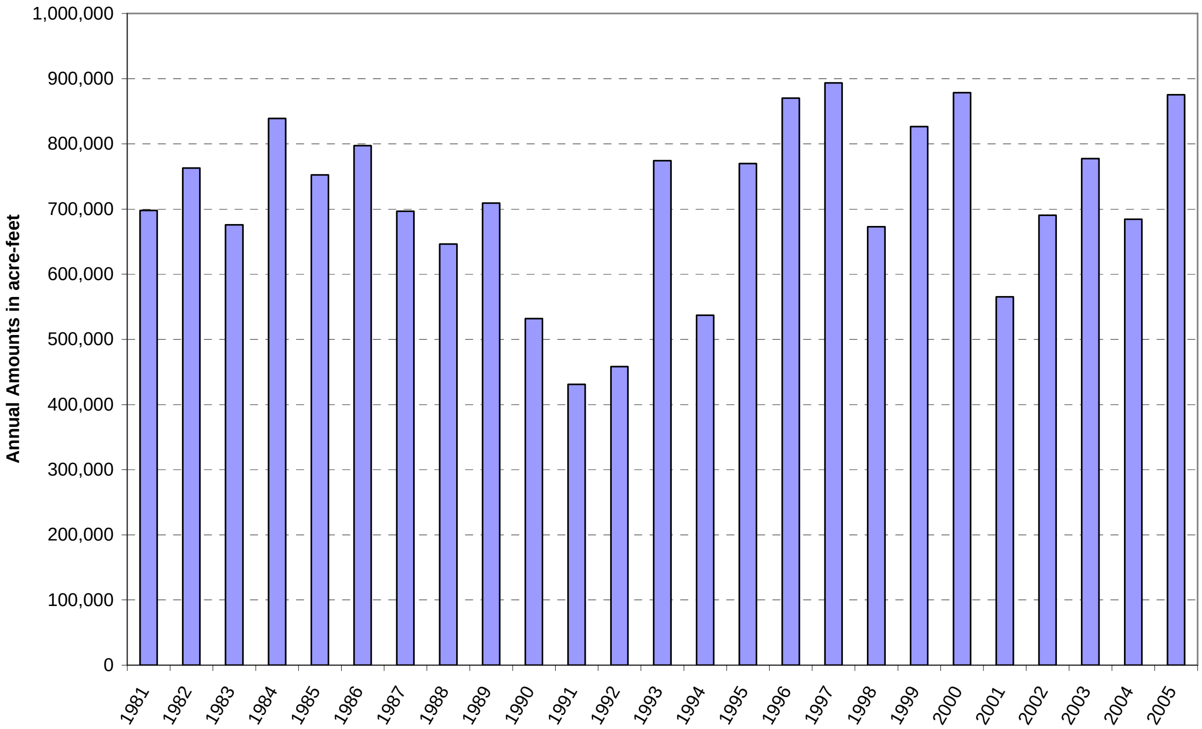
Table 5-1

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



5.2.2 Municipal and Industrial

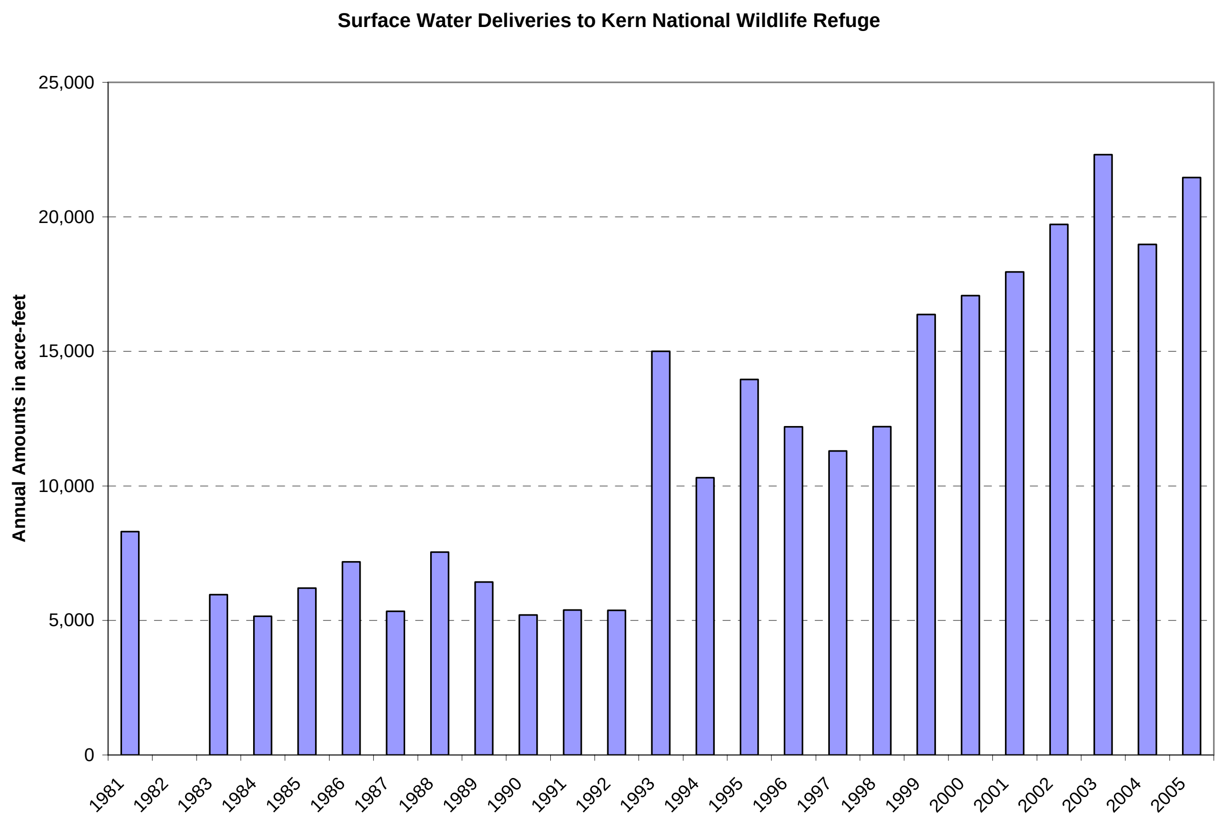
To date, water for municipal and industrial purposes in the Region has been provided solely by pumped groundwater. These uses are concentrated in the communities of Shafter, Wasco, McFarland, and Delano. Currently, the combined population of these communities is on the order of 120,000, which represents 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.

<u>*Kern National Wildlife Refuge*</u> - 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.


Surface Water Deliveries to Kern National Wildlife Refuge
Annual Amounts in acre-feet
25,000
20,000
15,000
10,000
5,000
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005

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.

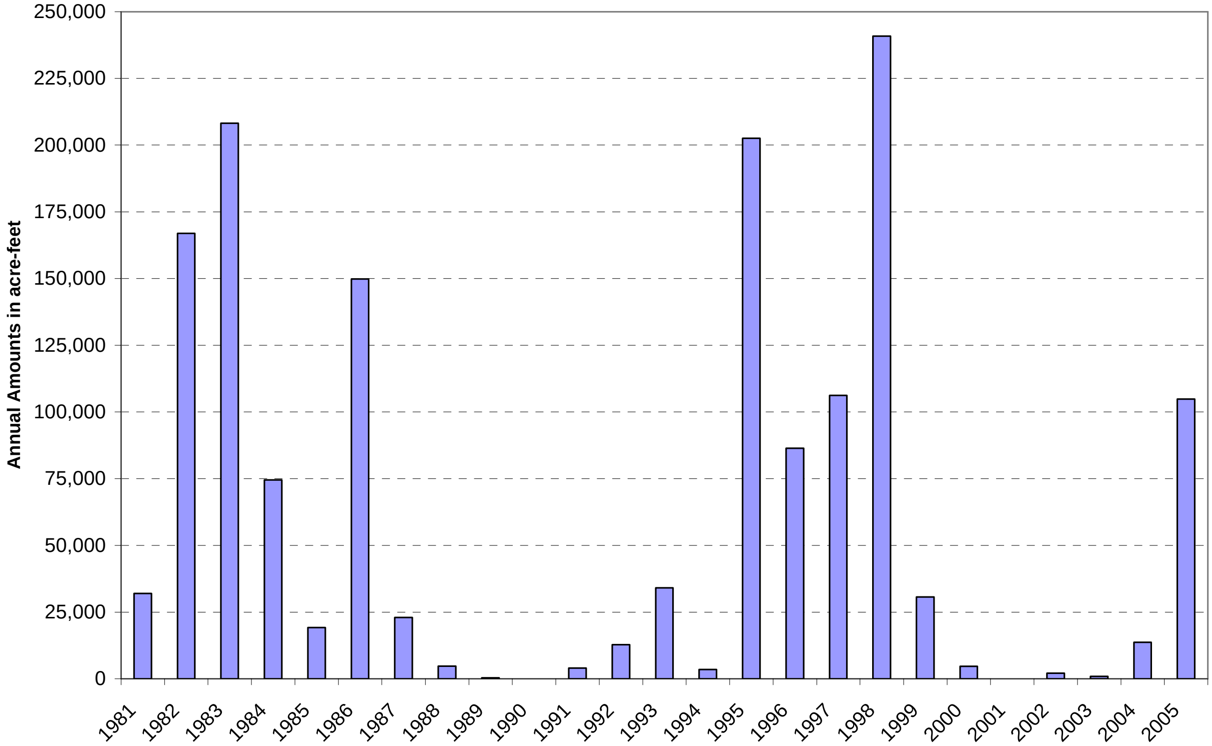
5.2.4 Groundwater Replenishment

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.

North Kern Deliveries to Spreading



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.

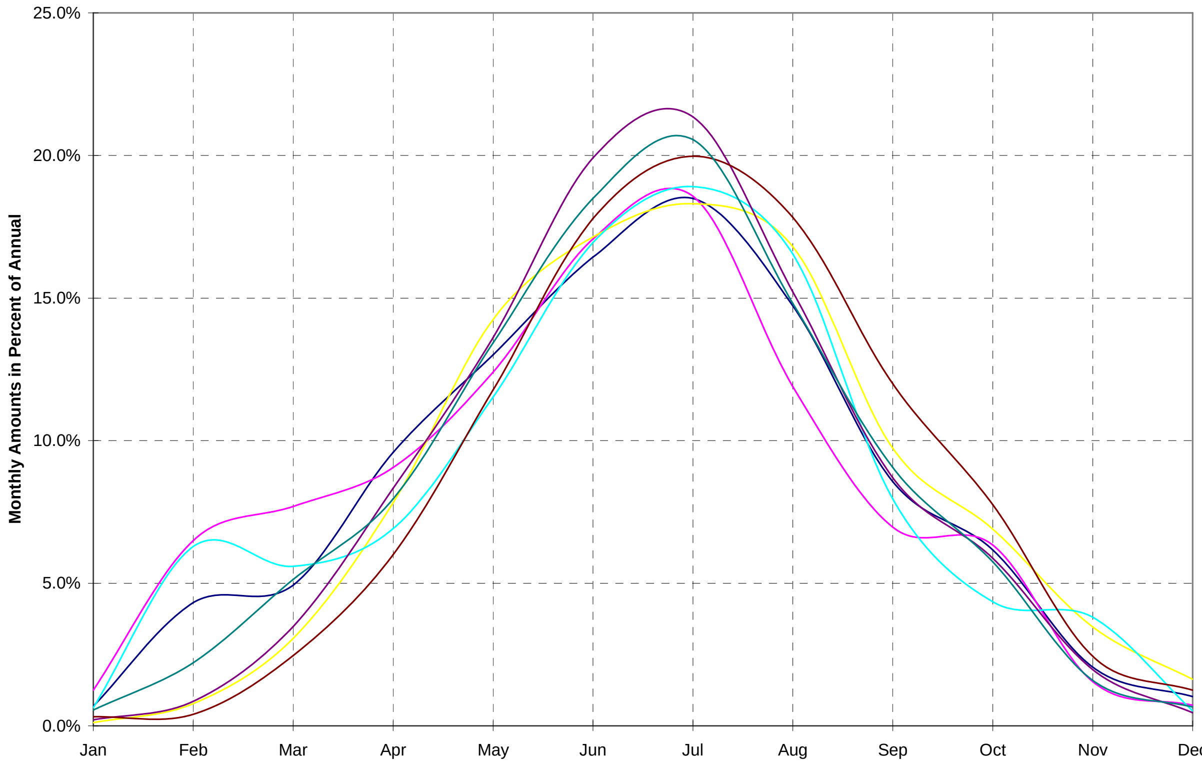
Table 5-2

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.

Monthly Irrigation Delivery Patterns



5.3.2 Municipal and Industrial

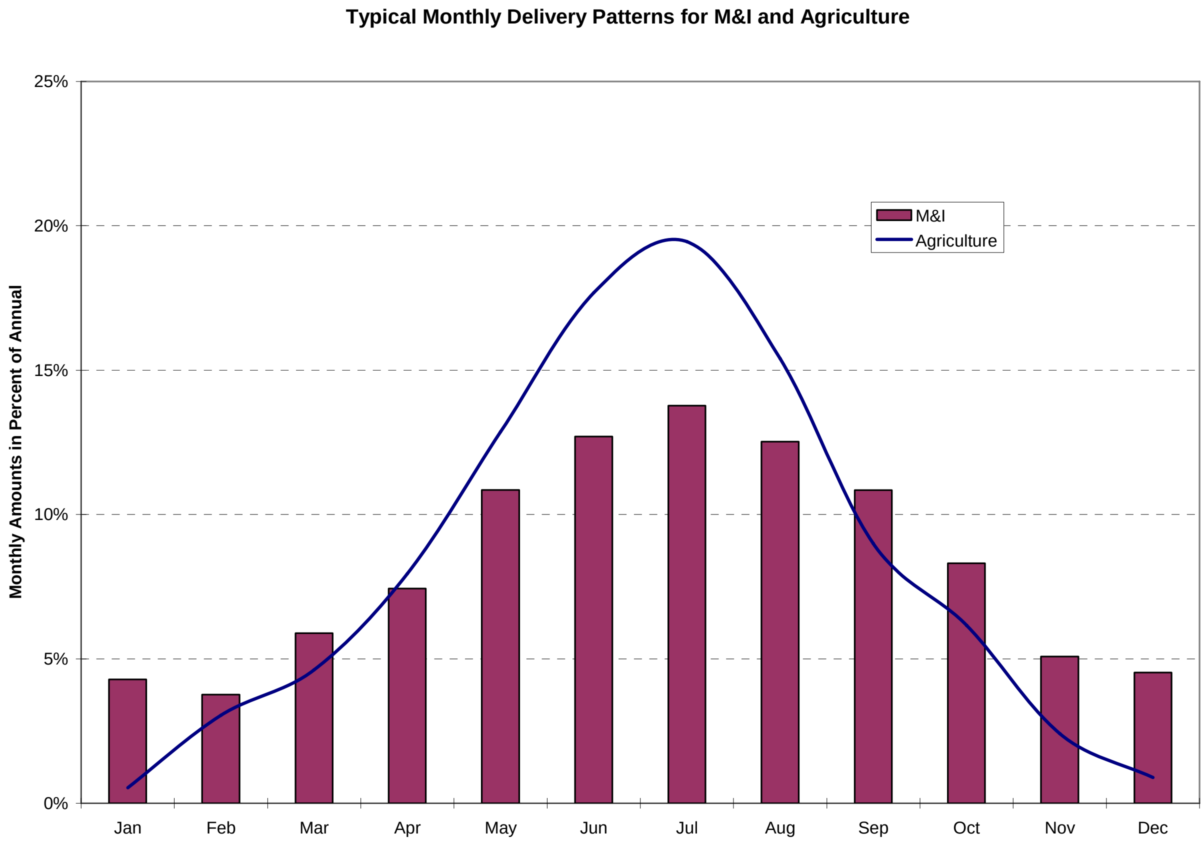
Recall (from Section 5.2.2) that the observed population growth rate for the Region was about 5 percent annually since 1990. Assuming that this rate continues, the population of the Region could double in the next 15 years. Similarly, gross water use can be expected to double, from the current estimate 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.

APPENDIX F3

Chapter 7: Water Supply Operations Studies

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.

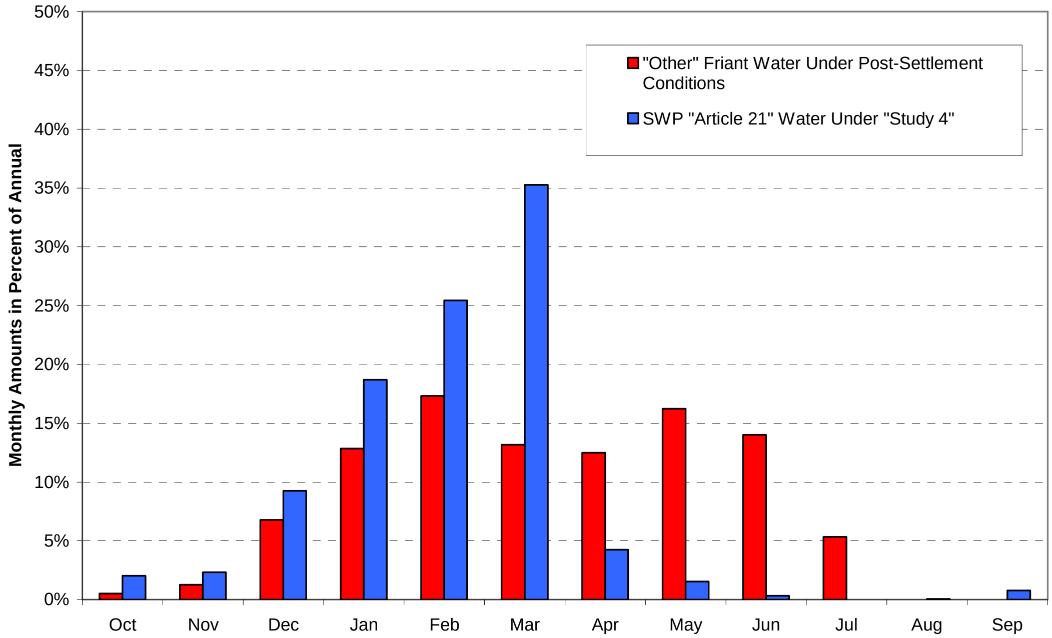
7.1.3 Conveyance Capacity

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.

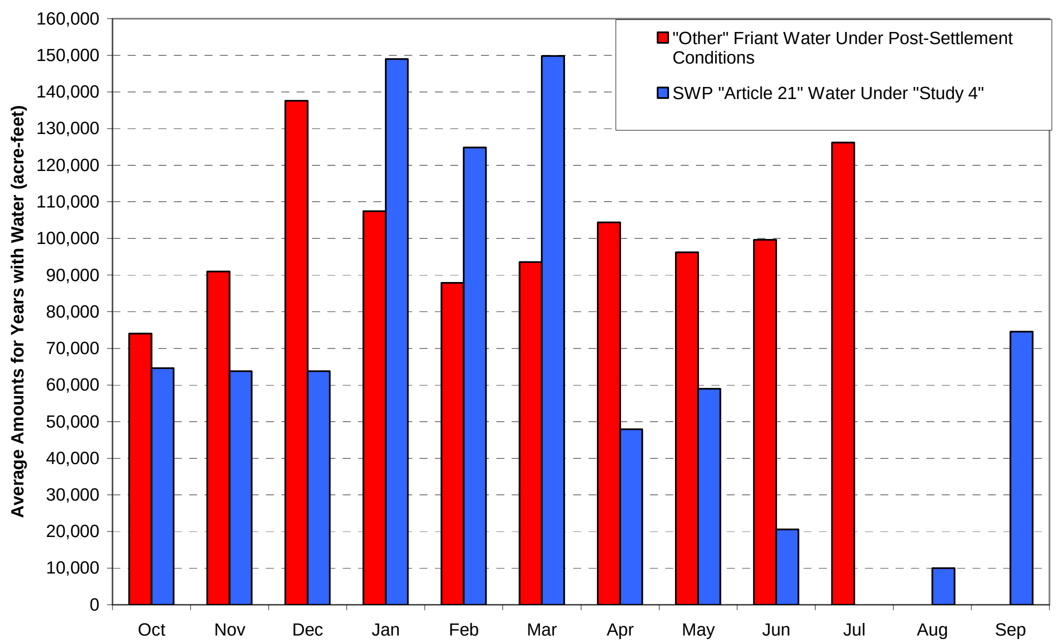
<u>California Aqueduct</u> - The projections of *Article 21* water include consideration of pumping capacity at the Banks Pumping Plant; accordingly, no further constraints were considered in conveying the water south in the California Aqueduct.

<u>Friant-Kern Canal</u> - 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.

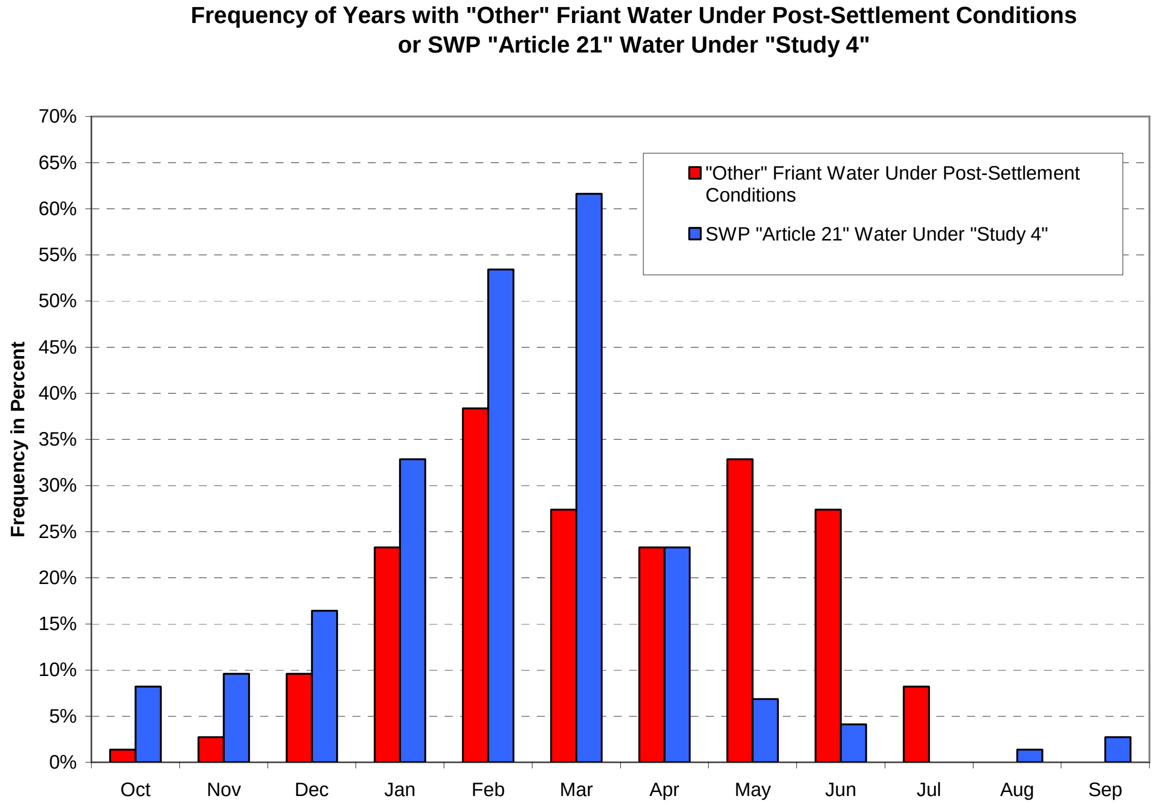
Average Monthly Distribution of "Other" Friant Water Under Post-Settlement Conditions and SWP "Article 21" Water Under "Study 4"



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



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

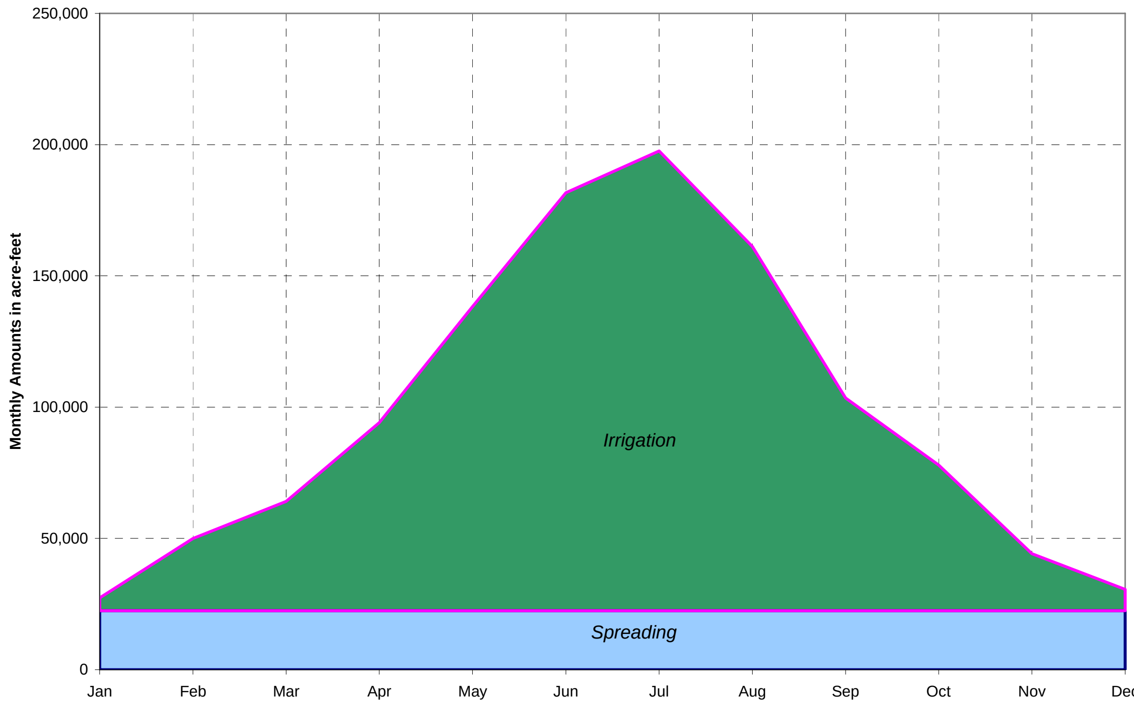
Cawelo	75,000	af
Delano-Earlimart	135,000	
Kern-Tulare & Rag Gulch	45,000	
North Kern	140,000	
Semitropic	310,000	
Shafter-Wasco	70,000	
Southern San Joaquin	125,000	
	900,000	af

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.

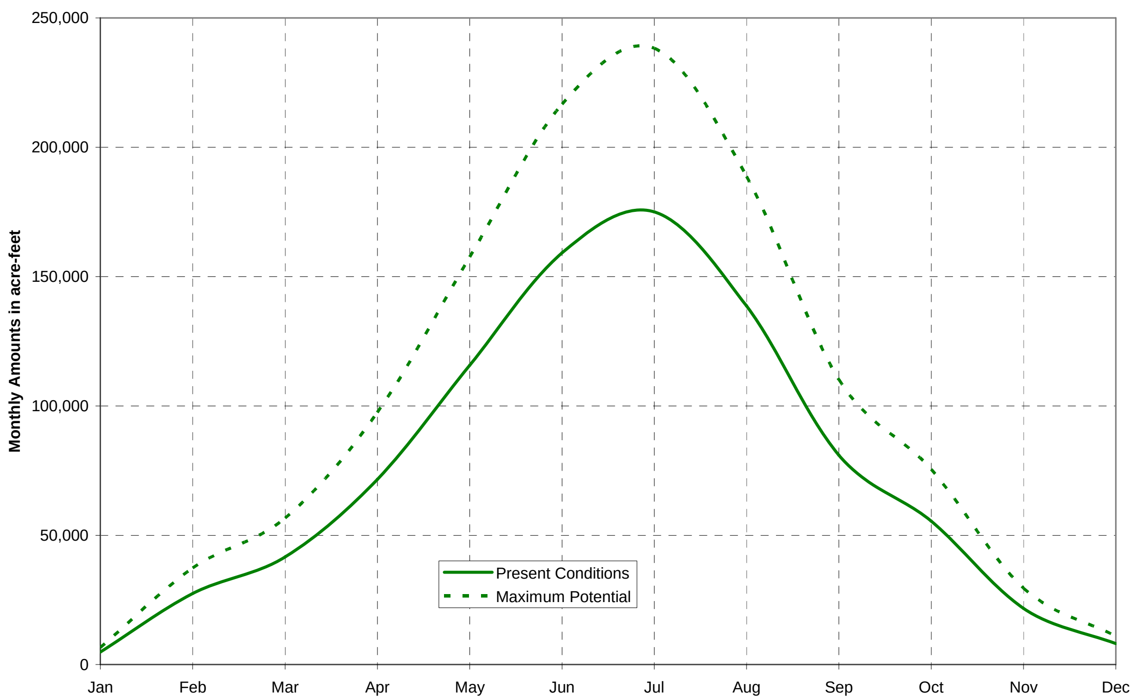
7.1.5 Projected Use of Available Surface Water Supplies

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.

APPENDIX G

Project Definition and Characterization Form (PDCF) Submission Form[1] for Project/Program inclusion in the Integrated Regional Water Management (IRWM) Plan

[1] Appendix includes PDCF as of June 2014. Contact the IRWM Lead Agency for most up-to-date PDCF form, may be different from the form included in this Appendix.

Project Definition and Characterization Form (PDCF)

Project and Program Submission Form for the Poso Creek Integrated Regional Water Management Plan (IRWMP) 2014 Update

Please mail completed form to the following address, or bring complete form to one of the regular IRWM meetings (as scheduled);

Poso Creek RWMG
c/o Semitropic WSD
1101 Central Avenue
Wasco, CA 93280

For questions or concerns regarding the form, please contact:

Paul Oshel, Poso Creek IRWM Representative
(661-758-5113)

1.0 Background Information

Please provide the following information regarding the project/program sponsor.

Implementing Agency/ Organization / Individual:

____

Agency / Organization / Individual Address:

____
____
____

Possible Partnering Agencies:

____
____

Contact Person Name:

____

Title:

____

Telephone: ______________ Fax: ______________

Email:

____

Please provide the following information regarding the proposed project or program. Check the box that applies:

☐ Project (e.g. structural enhancements, infrastructure upgrades, etc.)

☐ Program (e.g. policy updates, management suggestions, etc.)

Project or Program Name:

Project or Program Cooperating Agency/Organization(s), including potential funding sources (e.g., Kern County Water Agency, DWR/USBR Funding, environmental or agricultural groups):

Project Status (e.g., new, ongoing, expansion, new phase with brief description):

Please provide the following information regarding the location of the project, including the name of the District(s) or Agency which has jurisdiction over the project area. If the proposal is for a non-structural program, please state the District(s) or Agency where the program will be implemented.

Districts or Agencies (i.e., location corresponding to District or Agency service areas):

Description of Proposed Location:

Latitude (if available):

Longitude (if available):

2.0 Project/Program Description

Please provide a general description of the proposed project or program, including an assessment of the potential impacts and benefits of implementing the project or program. This section should provide information regarding the project concept, general project information, and readiness to proceed.

If applicable, please list the existing water conveyance infrastructure associated with the proposed project or program:

____
____
____
____
____

Source of assumed increased supply or demand reduction (check all that apply):

☐ Surface Water (Supply Management)
☐ Groundwater Recharge (Storage/Banking)
☐ Conveyance/Delivery Efficiency
☐ Groundwater (Treatment)
☐ Conservation/Water Use Efficiency
☐ Conjunctive-Use Management
☐ Transfer/Exchange
☐ Other (describe): _____

If applicable, please list any available documents which contain information specific to the proposed project or program (include conceptual plans, permits, drawings, and any technical documents):

____
____
____
____

For projects or programs ready for construction or implementation, briefly describe the readiness-to proceed:

____
____
____
____
____
____

Does the project have the potential to reduce dependence on water originating from the Sacramento-San Joaquin River Delta?

☐ Yes ☐ No ☐ Not Sure

Does the project address any known environmental justice issues?

☐ Yes ☐ No ☐ Not Sure

Is the project located within or adjacent to an *economically-disadvantaged community* (DAC)?

☐ Yes ☐ No ☐ Not Sure

Does the project include DAC participation, or involvement from the DAC Representative or Work Group?

☐ Yes ☐ No ☐ Not Sure

If yes, please identify the group, organization, or requested services of the DAC Representative or Work Group:

____
____
____
____

Please describe any benefits that the proposed project or program may have towards preparing the region for the presumed effects of climate change, see Section 13.0 of the 2014 IRWM Plan:

____
____
____
____
____

3.0 Proposal Impacts and Benefits to Region

Please provide an estimate (quantitative and/or qualitative) of specific impacts or benefits realized by implementation of the proposed project or program. There does not necessarily have to be a model or study verifying these estimates, however, the applicant should be prepared to justify any of the identified impacts or benefits to the IRWM Group.

Total Project Area (acres) ____________

Annual Yield (AF) ____________

Annual Demand Reduction (AF) ____________

Rehabilitated Land (acres) ____________

Primary benefits/impacts anticipated during specific water-year types (check all that apply):

☐ Median/Average Year ☐ Dry Year (Drought) ☐ Wet Year

Primary benefits/impacts anticipated during specific season (check all that apply):

☐ Summer (Jun – Aug) ☐ Fall (Sept – Nov)

☐ Winter (Dec – Feb) ☐ Spring (Mar – May)

APPROX. TOTAL COST ____________

Annual O&M or Mgmt. Costs ____________

Life of Project/Program (years) ______

Please provide a preliminary description of a schedule for project/program implementation:

____

____

____

____

____

PROPOSED START DATE ____________

4.0 IRWM Plan Measurable Objectives

Please indicate below whether the proposed project or program meets any of the Poso Creek IRWM Plan 'Measurable Objectives', as stated in Section 4.0 of the Plan. Where necessary/appropriate, please provide a brief explanation of how the proposal meets the objective(s).

	Objective	Met (check)	Comments/Description
A	Increase reliability of surface water supplies delivered to region.		
B	Identify water conveyance improvements, direct recharge, and in-lieu service area expansion.		
C	Increase absorptive capacity within the region.		
D	Promote regional conjunctive water-use.		
E	Support groundwater monitoring activities.		
F	Maintain and improve quality of water supply.		
G	Enhance region-wide flood control measures.		
H	Promote environmental conservation and support wildlife habitat enhancement.		
I	Promote environmental conservation and support wildlife habitat enhancement.		
J	Implement region-wide water management actions.		

Measurable Objectives (continued):

		Met (check)	Comments/Description
K	Maintain compliance with State and Federal planning requirements.		
L	Maintain coordination between Poso Creek RWMG, stakeholders, and state/local agencies.		
M	Identify demand reduction measures.		

The Poso Creek IRWM Group has defined the following Region Goals 1 through 7, as set forth in Section 4.4 of the 2014 IRWM Plan:

Primary Goals

Maintain and Enhance Water Supply Reliability	**1**
Improve Operational Efficiency and Flexibility	**2**
Reduce Water Demand	**3**
Protect Quality of Water Supply	**4**
Maintain Economic Viability of Water Use in Region	**5**

Secondary Goals

Practice Regional Resource Stewardship and Environmental Awareness	**6**
Improve Flood Management	**7**

Please briefly describe which of these Regional Goals would be met by the proposed project or program:

____

____

____

____

____

APPENDIX H

**Poso Creek Integrated Regional Water Management (IRWM) Group
Public Involvement Plan (PIP)**

Poso Creek IRWM Plan

Public Involvement Plan (PIP)

Supplement to the 2007 Poso Creek Integrated Regional Water Management Plan

- September 2013 -

Table of Contents

PREFACE AND PURPOSE

This document outlines the Public Involvement Plan (PIP) approach used for Stakeholder Involvement and interregional Coordination for the Poso Creek Integrated Regional Management Plan (IRWM Plan). The IRWM Plan for the Poso Creek Region was first adopted in 2007. It was prepared by local interests who received grant funding through a California Department of Water Resources (DWR) Proposition 50 Planning Grant. The initial IRWM Plan was completed pursuant to a grant contract and Memorandum of Understanding (MOU) allowing time to establish mutual understandings among the Poso Creek Region IRWM participants and established the Regional Water Management Group (RWMG). Following the initial IRWM Plan development, the RWMG initiated implementation which included development of a Governance MOU designating roles for implementing the IRWM Plan over time and established the decision making process. The Governance MOU contains the signatures of eligible agencies and organizations who serve as the Poso IRWM Plan "Regional Water Management Group" members. The RWMG is responsible for periodically updating the IRWM Plan.

The purpose of this PIP is to identify and document how participation and information sharing occurs throughout this IRWM Plan process. Implementation of the PIP documents the IRWM Plan's efforts to meet DWR outreach requirements and promote agency, stakeholder, and disadvantaged community (DAC) involvement in this IRWM Plan. This PIP continues the successful IRWM process initiated by the RWMG that involved Stakeholder and DAC interests in the IRWM Plan development and includes these entities in the implementation activity. The PIP describes the timing and nature of communications that occur among the parties involved in the IRWM Plan process. The PIP is not intended to prescribe new protocol for the entities, i.e. the PIP does not establish communication guidelines for the RWMG. Rather the PIP describes the kinds and timing of communication used to facilitate both public involvement and coordination among the Poso IRWM Plan participants, among neighboring IRWMPs within the Tulare Basin Funding Regions, and among the IRWM state program. The PIP discusses:

- Scheduled meetings and public forums and the nature of materials used;
- RWMG response procedure to requests for information;
- Schedule of communications;
- Responsible entities for providing and circulating information; and
- Documentation of meetings and other communications.

In order to provide consistent and effective communication over time in the face of changing conditions, implantation of the PIP's Communication and Outreach Plan identifies the procedures used to manage communication for the IRWM Plan. This Stakeholder Outreach Plan is an integral part of the overall IRWM Plan and is used as guidance for stakeholder engagement by the Poso Creek RWMG. The PIP identifies formal communication elements. Other communication channels exist on informal levels and enhance those discussed within this PIP. Informal communications will enhance communication and are not intended to be limited by this PIP.

DWR has expanded the IRWM Plan standards since adoption of the 2007 Poso Creek IRWM Plan. A revision of the IRWM plan is needed to address these expanded standards and to meet the contractual obligations of several of the Poso Creek RWMG members. DWR has listed 16 "Plan Standards" that must be addressed in developing or updating an IRWM Plan. Two of these standards Stakeholder Involvement and Coordination, are directly addressed by this document. The specific Standards are contained in the November 2012 IRWM Grant Program Guidelines available at: http://www.water.ca.gov/irwm/grants/.

The IRWM Plan guidelines state "the intent of the Stakeholder Involvement Standard is to ensure the RWMGs give the opportunity to all stakeholders to actively participate in the IRWM decision making process on an on-going basis." To assure that the intent is met, the guidelines list a number to topics that must be addressed:

- Process used to Identify Stakeholders
- Involvement of Disadvantaged Communities
- Use of Technology and Information Access
- Decision Making Process
    - The groups or committees involved
    - The constitution of those groups
    - The opportunities to contribute to those groups or the decision making process
- Stakeholder Involvement

The intent of the Coordination Standard is to ensure the following items:

- Coordination of activities with local agencies and stakeholders to avoid conflict within the region and to best utilize resources,
- Planning efforts and coordinating with RWMGs in adjacent Regions, and
- State, federal, and local agency resources and roles are taken into account in the implementation of their plans and projects.

The DWR Standards provide direction for three topics:

- Coordination of activities within an IRWM Region,
- Identification and coordination with neighboring IRWM Regions, and
- Coordination with agencies.

While the guidelines do not require a Public Involvement Plan, development of a PIP is a method to assure that elements of the Stakeholder Involvement and Coordination requirements are met. In addition, it is useful for documenting this activity to meet the DWR's plan requirements.

PARTICIPANT ROLES AND RESPONSIBILITIES

This section describes the organization, roles and responsibilities, communication, and established relationships among of the participating entities involved in the Poso Creek IRWM Plan. The participating entities include the Poso RWMG, Semitropic Water Storage District (WSD) as the Lead Agency, the DAC Representative, the DAC Working Group, and Interested Stakeholders.

1. The **Regional Water Management Group (RWMG)** is responsible for the IRWM Plan development and implementation. According to DWR, a RWMG must meet the definition per CWC §10539 which states,

> *RWMG means a group in which three or more local agencies, at least two of which have statutory authority over water resources or water management, as well as those persons who may be necessary for the development and implementation of a plan that meets the requirements of the CWC §10540 and §10541, participate by means of a joint powers agreement, Memorandum of Understanding (MOU), or other written agreement, as appropriate, that is approved by the governing bodies of those local agencies.*

In the Poso Creek IRWM Region, the RWMG members must be either local agency as required by the CWC or an IRS defined 501 (c) 3 non-profit organizations. The RWMG members are signatories to the Governance MOU and will consider adopting the 2014 IRWM Plan. The RWMG comprises:

- Semitropic Water Storage District
- Cawelo Water District
- Delano-Earlimart Irrigation District
- Kern-Tulare Water District
- North Kern Water Storage District
- North West Kern Resource Conservation District
- Shafter-Wasco Irrigation District
- DAC Representative

The RWMG member agencies and/or organizations' roles and responsibilities include:

- Execute and maintain Governance MOU
- Maintain, update, and adopt the IRWM Plan
- Designate a Chairman as representative with clear authority to represent agency/organization
- Attend public meetings/workshops
- Submit planning/implementation projects/programs for IRWM Plan and grant funding
- Compile and as necessary, submit data on planning/implementation projects/programs

The RWMG holds a public meeting on the first Tuesday of the month, as necessary. A list of RWMG representatives is shown in Appendix A.

Semitropic Water Storage District (Semitropic) acts as the **Lead Agency** that manages the IRWM Plan, submittal of the grant applications on behalf of the Region, and acts as a liaison with DWR. Specifically, the roles and responsibilities of the Lead Agency are:

- Review and approval of IRWM Plan
- Coordinate re-adoption of IRWM Plan as needed
- Execute MOU
- Act as Lead Agency for Region
- Communicate decision on IRWM activities with RWMG
- Authorize grant applications
- Enter into agreements with DWR on behalf of RWMG
- Approve implementation agreements
- Approve funding for IRWM planning
- Approve contracts with consultant(s)

Semitropic hosts a public meeting of the RWMG on the first Tuesday of the month, as necessary; occasionally, the public meeting may be held at one of the other RWMG member locations to accommodate members of the RWMG, IRWM Plan participants, and the public.

2. **Interregional Coordination** occurs through engaged interaction of the RWMG with other representatives of adjacent IRWM Regions who meet on the first Monday of the Month in order to understand the specific water resources needs and priorities of the overall Funding Area Region, explore common Resource Management Strategies, and consider regional programs. A list of IRWM and other regional planning activities in the Tulare Basin Funding Area is shown in Appendix B.

3. **DAC Representation** is provided by an elected DAC Representative. The DAC Representative has a vote on the RWMG and coordinates with key DAC stakeholders who guide identification and development of DAC water related projects for inclusion on the IRWM Plan and grant proposals.

4. **Interested Stakeholders** provide valuable input into the planning process and inform the RWMG of potential project opportunities. In specific, the roles and responsibilities of the Interested Stakeholders are:

- Provide input into development of IRWM Plan
- Attend public meetings/ workshops
- Comment on Draft Sections of the Plan
- Provide letters of support for the Plan and Projects

Stakeholders are informed of the monthly RWMG meetings. A list of current Stakeholders in provided in Appendix C.

APPROACH TO THE PUBIC INVOLVEMENT PLAN

This PIP includes communication and involvement with two groups of interests:

- Stakeholder interests within the Poso Creek IRWM Region, and
- Agency and other interests both within and outside the IRWM from adjacent Regions.

Differentiating between communication and involvement approaches for these two groups in the standards is in many ways an artificial construct; they are not mutually exclusive. However the DWR guidelines do contain two distinct sets of standards. Therefore this PIP discusses a series of approaches, some focusing on stakeholders within the Poso Creek Region and some focusing on coordination with interests and will generally use DWR terminology.

The discussion below will first focus on involvement of Stakeholder interests, specifically:

- Process used to identify and involve stakeholders
- The role of disadvantaged communities
- Use of technology and information access in communication
- Stakeholder role in the RWMG decision making process
- Stakeholder involvement in development of the IRWM Plan update

These topics comprise the first element of the coordination Standard:

- Coordination of activities within an IRWM Region.

The last two sections of the Approach discussion will address the second and third elements of the Coordination standard:

- Identification and coordination with neighboring IRWM Regions, and
- Coordination with agencies.

Process used to identify and involve stakeholders

The RWMG developed an initial list and maintains an existing list of all relevant agencies and interest groups, including those statutorily required stakeholders (Appendices A, B and C). The list is augmented through formal and informal communications with stakeholders already on the list and through outreach communications. Communications include word of mouth, e-mail communication, requests for involvement through organizations such as Self Help Enterprises, and Pubic Announcements.

The stakeholder outreach list informs the public and maintains a link for a consistent outreach process. It also serves as a tool moving forward into other media.

Stakeholders receive updates on the project and plan milestones, funding information, and other appropriate and relevant information. The stakeholder list was built from a considered list:

- Wholesale and retail water purveyors
- Wastewater agencies
- Flood control agencies
- Municipal and county governments and special districts
- Electrical corporations
- Native American tribes (None are within this IRWM Area)
- Self-supplied water users
- Environmental stewardship organizations
- Community organizations
- Industry organizations
- State, federal, and regional agencies or universities
- Disadvantaged community members
- Any other interested group appropriate to the region.

The stakeholder list is updated throughout the process and is open to new participants.

Role of disadvantaged communities

The IRWM Plan relies on the DAC Representative of the RWMG to coordinate community needs; the DAC Representative coordinates the smaller disadvantaged community needs through Self Help Enterprises. This process incorporates the wealth of local knowledge, input, and priorities of the DACs in the region to identify the needs, priorities, actionable water management strategies, and potentially fundable projects. Other DAC representatives are encouraged to participate in the monthly RWMG meetings. However, the participation by the DAC Representative and by the key stakeholder, Self Help Enterprises, has led to a reliable and effective process to identify and address DAC water related needs.

The RWMG encourages identification of relevant Resource Management Strategies determined by the DAC representatives and development of projects specifically to benefit DACs. The Poso Creek RWMG continues to support the advancement of DAC projects within and in some cases, just outside the Region's boundaries. The RWMG is open to address any technical barriers to communication so as to assure the DAC issues are identified and defined in the IRWM update. A list of Disadvantaged Communities that have participated and in many cases benefitted from the Poso Creek IRWM process in provided as Appendix D.

Use of technology and information access in communication

Methods of communication – The RWMG relies on communication systems that are commonly utilized in the Region:

E-Mail - Each stakeholder is encouraged to provide an e-mail address. An E-mail list is used to circulate all notices and other relevant information including alerting entities to meetings, meeting changes, alerting entities to key documents that have been posted on the Poso IRWM website (http://semitropic.com/PubsArchive.htm). General questions and answers from the public are directed to the appropriate RWMG representative for information on the IRWM Plan.

Conference calls - Conference calls or other means are used for communication with entities such as DWR or to provide remote access to public meetings.

Website - The existing website is to be restructured to accommodate the IRWM Plan update and implementation process; once restructured, it will be enhance existing communication.

Published notices - In addition to e-mail and web postings, the RWMG publishes notices to advise the public of certain formal actions such as the Notice of Intent to update the IRWM Plan.

Formal Communication - RWMG will use formal communications for certain items:

Notice of Intent – An example of a formal "Notice of Intent" (NOI) is an NOI to update the Poso Creek IRWM Plan. The NOI is publically noticed in media publications in the County. The NOI is posted on the Poso Creek IRWM website and websites of RWMG members to provide widespread notice. In addition, the NOI is circulated to the Stakeholder list by e-mail.

Public Meeting Notices – Hearings, such as, for adoption of the revised Plan and certain meetings are publically noticed to allow for public and stakeholder input. Routine meeting Notices are posted on the Poso Creek IRWM website (Address here) for public access.

RWMG Meeting Notices – RWMG meetings are held the first Tuesday of the month. Reminder notices are generated and sent out by email to the RWMG in advance of the actual meeting. The stakeholder list is copied on RWMG meeting notices to ensure the all interested parties are kept abreast of the progression on the Plan. Meeting Notices, Agendas and Meeting Minutes are posted on the Poso Creek IRWM website (Address here) for public access.

Informal communications - Informal communications occur during the IRWM Plan activities, update, and implementation. This informal process may consist of e-mail, conversations or phone calls and serve to supplement and expand communications. Informal communication is not intended to replace formal communications.

Stakeholder role in the RWMG decision making process

Individual stakeholders and stakeholder organizations are critical to informing the IRWM process and supporting the RWMG in their development, update, and implementation of the Poso Creek IRWM Plan. Stakeholders provide input on matters pertaining to development, updating, and implementation of the IRWM Plan. In RWMG meetings, stakeholders may participate on discussion of agenda items and may provide comment on other matters on the agenda.

In particular, Stakeholders are expected to participate in development of regional Objectives and Resource Management Strategies. Stakeholders nominate projects for inclusion in the IRWM Plan through a district sponsor, the DAC Representative, and/or through a DAC Working Group that includes Self-Help Enterprises. DWR guidelines allow those stakeholder organizations, such as public agencies, to sponsor projects that address Plan objectives and with the concurrence of the RWMG.

Stakeholder involvement in the IRWM Plan

Stakeholder involvement in development, updating, and implementing the IRWM Plan is encouraged and supported in a number of ways, including:

RWMG Meeting Protocol

- Meeting agendas are prepared and distributed prior to the meeting.
- Meetings are coordinated by and facilitated by the RWMG Chairman and/or its designee.
- Meetings operate according to a set of ground rules.
- Progress toward completing work plan tasks is assured by adherence to time frames identified on meeting agendas.
- Meeting materials are coordinated and distributed ahead of the meeting time.
- Public comments are scheduled at the beginning of meetings.

Stakeholder Involvement and Input with the RWMG to the IRWM Plan Process

- Clear and complete schedule
- Materials easily accessible and available on time
- Encourage Stakeholder input through review of interim work products and recommending actions and decisions to the RWMG.

Encourage broader dissemination of IRWM related materials - The RWMG encourages participants to utilize existing groups and communication systems to disseminate information about the IRWM plan, in part relying on groups that have dedicated involvement and similar concerns and/or issues as those addressed in the IRWM Plan.

External Communications - Public Inquiries - The public is encouraged to participate in the IRWM Plan development, update, and implementation. The NOI, as described above, is publically distributed and both RWMG meetings and each district's Board hearings on the Plan are publically noticed. In addition, all meeting information is posted on the website and available for public viewing and comments. Public comments are received via an e-mail address posted on the website and are answered by designated RWMG member or their authorized agents.

Identification and coordination with neighboring IRWM Regions

Regular meetings of regional water planning entities within the Tulare Lake Funding Area are held the first Monday of the month. The entities involved are listed in Appendix B. The meetings are hosted by the JPA for Tulare Lake Hydrologic Region Water-Related Entities. Each participating Region provides participation by District staff involved directly in the IRWM process.

Participating parties in the monthly meetings include representatives of the Kings River Conservation District, the Upper Kings IRWM, the Southern Sierra IRWM, the Kern County Water Agency, and the Kern IRWM. Meeting agendas are prepared by a consultant for the Tulare Lake Hydrologic Region Water-Related Entities.

Coordination with agencies

The RWMG continues to foster and build relationships with other planning groups within the Central Valley; coordinating efforts include:

1. Meeting regularly as a RWMG focused on the Poso Creek IRWM Plan Implementation provides other IRWM groups with a functional implementation group to communicate with for implementing water management strategies that are larger than one planning group, such as, managing flood water from rivers adjacent to the Friant-Kern Canal in the Tulare Basin. These regular implementation meeting notices are distributed to a large group of districts and stakeholders, and provide a designated time for the RWMG to listen to any interested parties.
2. Meeting regularly with neighboring established and developing IRWM groups within the Tulare Lake Hydrologic Region Water-Related Entities. Participating parties in the monthly meetings include representatives of the Kaweah Delta Water Conservation District, the Deer Creek and Tule River Authority Kings River Conservation District, the Upper Kings IRWM, the Southern Sierra IRWM, the Kern County Water Agency, and the Kern IRWM.
3. Supporting the efforts of the *Partnership for the San Joaquin Valley* to develop an Action Plan that is a framework for planning for an eight-county area of the Central Valley. (http://www.sjvpartnership.org/).
4. Encouraging the DACs and Cities within the Poso Creek Region who are within the "North Group" of the Kern IRWM to join the Kern IRWM process and help build working relationships between the Kern IRWM and the Poso Creek IRWM Plan implementation groups.
5. Offering in-kind services and participating as a Stakeholder in the Kern IRWM process. Participating in the "Round Table of Regions" conference calls and IRWM coordination meetings.
6. Participating in semi-annual Tulare Lake Basin Working Group meeting that are led by Carole Combs, Executive Director, Tulare Basin Wildlife Partners and working with the TBWP to develop and implement wildlife projects in the Poso Creek Region.
7. Attending Reclamation's Mid-Pacific Conference and presenting Plan materials at meetings with Reclamation planning staff.
8. Attending CA Irrigation Institute Annual Meeting and presenting projects.

9. Presenting Plan information at technical conferences, such as, the United States Committee on Irrigation and Drainage.

The RWMG will continue to engage all water planning agencies with in the region through these efforts. In addition the RWMG will expand its coordination efforts through discussions with agencies responsible for Land Use Planning within the Region as the part of the Poso IRWM Plan.

Communication Protocols

All IRWM Plan communications related to project-wide status is directed to Semitropic staff and in particular, the Poso RWMG Chairman, Paul Oshel, unless otherwise specified. Because of the broad scope of this project, only those individuals at the project management level are able to provide a comprehensive and accurate status update on the project as a whole. Project status updates will be disseminated periodically through e-mail, as needed, to all entities or sub-groups. All meeting agendas, materials, and action items will be posted on the IRWM website for public review.

Metrics

Appropriate metrics will be used to measure the Stakeholder involvement and communications to measure the success of this Public Involvement Plan. The metrics may include:

- Numbers of organizations or individuals involved (e.g. attending meetings)
- Range of interests shown by stakeholders
- Number of comments
- Scope of projects suggested to the RWMG
- Compliance with information/data requests
- Review of TMs, draft, and final drafts of plan according to schedule
- Agency participants provide current and accurate information about the Plan

The RWMG will consider a range of metrics for measuring the success of the overall IRWM planning process. A subset of those will be used by the RWMG to document success of the PIP.

Public Involvement Plan documentation

Written communications received or generated by the project will be retained and stored in the IRWM Plan records and key communications posted on the IRWM website. Documents that document decisions will be posted on the IRWM website, archived, and retained for historical purposes. The Public Involvement Plan will be included in the updated IRWM Plan.

Appendix A

Members of the RWMG

Paul M. Oshel
District Engineer
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)

Jerry L. Ezell
General Manager
Shafter-Wasco Irrigation District

Mike James – DAC Representative
Public Works Director
City of Shafter

Appendix B

IRWM Planning Activities within the Tulare Basin Funding Area

Westside Drainage – Functional equivalent IRWMP developed over 24 years with assistance from Reclamation, received $25M Implementation Grant

Upper Kings Basin – Prop-50/84 Compliant IRWMP developed over 14 years with assistance from DWR.

Kaweah Delta – Prop-50 Compliant IRWMP, Prop 84 update in progress, developed during the past 9 years.

Poso Creek – Prop-50 Compliant IRWMP, Prop 84 update in progress, developed during the past 9 years.

Tule River – Prop 84 Compliant IRWMP in development

South Sierra – Prop 84 Compliant IRWMP in development

Kern – Prop 84 Compliant IRWMP

A draft document was created for the JPA for Tulare Lake Hydrologic Region Water-Related Entities – IRWM Coordination Group

Appendix C

Initial List: Stakeholders, Plan Participants and Agencies

Stakeholders and Plan Participants

- Allensworth Community Services District
- Buena Vista Water Storage District
- California Water Institute, CSU Fresno
- City of Buttonwillow
- City of Delano
- City of McFarland
- City of Shafter
- City of Wasco
- Community Water Center
- Friant Water Users Authority
- Lost Hills Water District
- Kern County Water Agency
- Kern County Board of Supervisors
- Kern National Wildlife Refuge
- Lost Hills Utility District
- Paramount Farms
- R.L. Schafer and Associates
- Rosedale-Rio Bravo Water Storage District
- Semitropic Wildlife Improvement District
- Sequoia River Lands
- Southern San Joaquin Municipal Utility District
- Tulare Basin Wildlife Partners

State and Federal Agencies

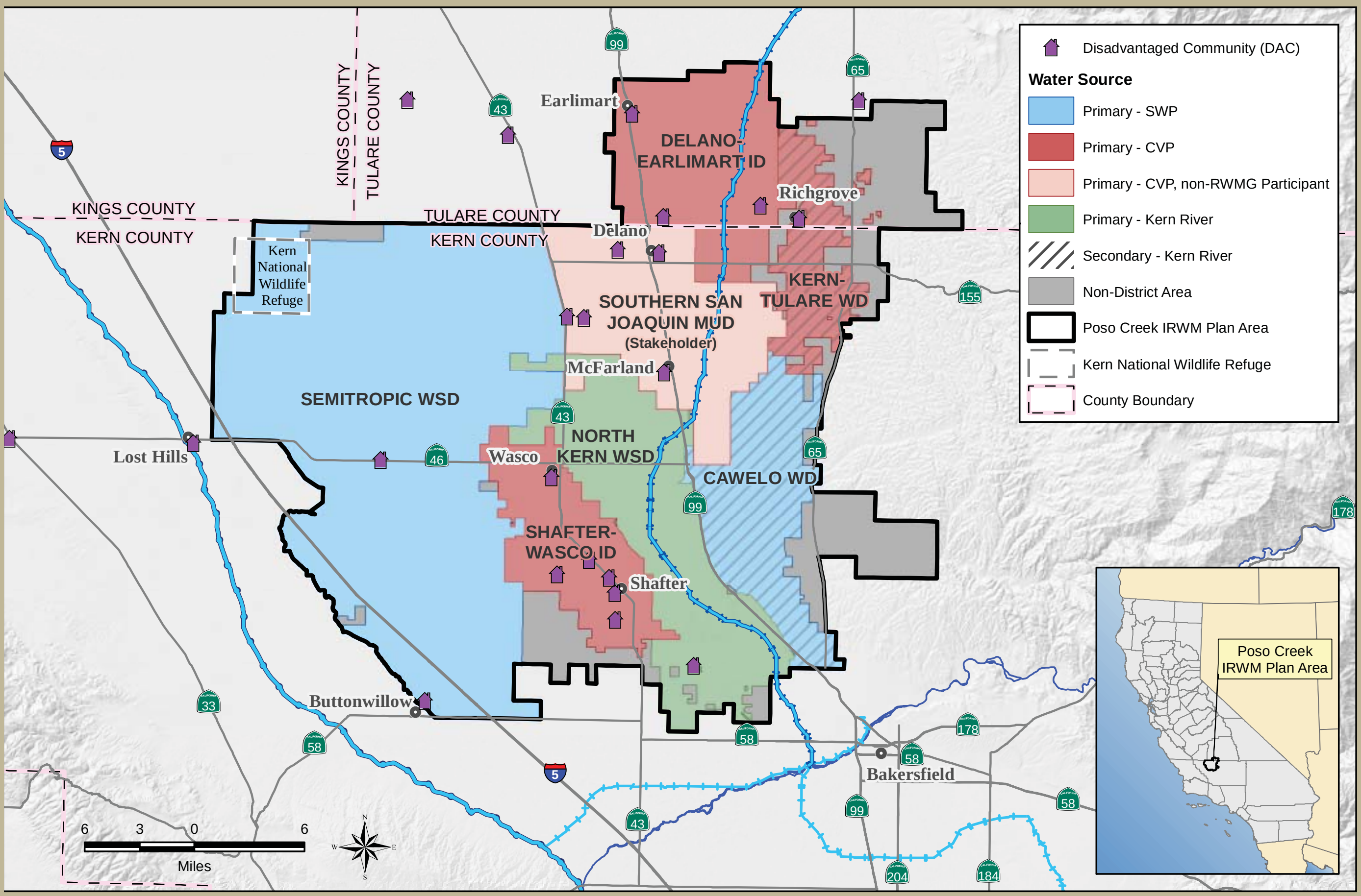
- California Department of Fish and Game
- California Department of Water Resources
- U.S. Bureau of Reclamation

Appendix D

DAC organizations/Communities that have participated and/or benefitted from the Poso Creek IRWM Process

- Allensworth
- City of Buttonwillow
- City of Delano
- City of McFarland
- City of Shafter
- City of Wasco
- Community Water Center
- Lost Hills Utility District
- Self-Help Enterprises

Water Districts within the Poso Creek Region



Please contact Mr. Paul Oshel, IRWM Chairperson, with the Semitropic Water Storage District (lead agency), at (661) 758-5113 for information or to answer questions on behalf of the following seven entities:

Jason Gianquinto
General Manager
Semitropic Water Storage District

Dale R. Brogan
General Manager
Delano-Earlimart Irrigation District

David R. Ansolabehere
General Manager
Cawelo Water District

Richard Diamond
General Manager
North Kern Water Storage District

Steven C. Dalke
General Manager
Kern-Tulare Water District

Dana S. Munn
General Manager
Shafter-Wasco Irrigation District

Brian Hockett
District Manager
North West Kern Resource Conservation District