

3 Work Plan

3.0 Introduction and Background

The Poso Creek IRWM Plan Region relies on its water supplies to support the economies of its urban and agricultural communities and to maintain its environmental resources. Since the agricultural uses of the six districts (in the RWMG) equate to approximately 96-percent of the applied water in the region, the six districts came together to form the IRWM Plan with a shared interest in addressing the projected loss of approximately 14 percent, or 104,000 acre-feet, of their average annual diversion of surface water (740,000 acre-feet). The average annual diversion of 740,000 acre-feet was described in the Poso Creek IRWM Plan and includes supplies delivered to the Southern San Joaquin Municipal Utility District and the six districts of the RWMG.

The projected loss of surface supplies to the Region is attributable to four issues:

1. Reduced reliability of SWP deliveries south of the Delta due to court-ordered constraints on pumping.
2. Changing timing of CVP deliveries due to in-stream flow needs required by the San Joaquin River Settlement; in 2012, the delivery of Recirculation Water that requires it is recovered south of the Delta.
3. Changes in timing of the Kern River flows due to safety-of-dam issues at Lake Isabella that affect storage of Kern River water.
4. Expiring long-term contracts between agricultural districts and the City of Bakersfield for delivery of Kern River water.

These issues were the impetus for the formation of the Poso Creek RWMG and the common driver for the districts to collectively discuss water management and consider regional assets, challenges and operations. The integration of community and environmental water users' needs into the Poso Creek IRWM Plan process has occurred due to the shared interest in managing the common groundwater resource and managing the surface supplies available to replenish the groundwater. The role of the IRWM process in assuring sustainable water for all users in the region is discussed on the following sections.

3.0.1 *History of Poso Creek Regional Water Management Group*

Pursuant to IRWM guidelines promulgated in 2005, the Poso Creek RWMG developed and ultimately adopted the Poso Creek Integrated Regional Water Management Plan (IRWM

Plan) in July 2007. The RWMG comprised six agricultural water districts and one resource conservation district at the time of plan adoption:

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

Since Plan adoption, the RWMG has continued to meet regularly to implement the IRWM Plan and to address the Proposition 84 changes to plan standards. The RWMG maintains a regular meeting schedule and has financed an annual budget that allows for six to ten public meetings per year, depending on the level of activity needed. The regular meetings have allowed for specific Plan activities to be accomplished, including adoption of a Governance MOU, addition of a voting DAC Representative Position, and consistency for communication with representatives from neighboring IRWMP regions.

3.0.1.1 Purpose

The stated IRWM Plan purpose is “... to provide a framework for – (1) coordinating groundwater and surface water resource management activities [through] a cohesive set of regional water management objectives, and (2) implementing the actions necessary to meet those objectives.” The Poso Creek IRWM Plan emphasizes planning strategies to resolve the region’s water supply challenges and immediately upon Plan adoption began implementing the Plan through local, federal, and state funding opportunities.

3.0.1.2 Implementation

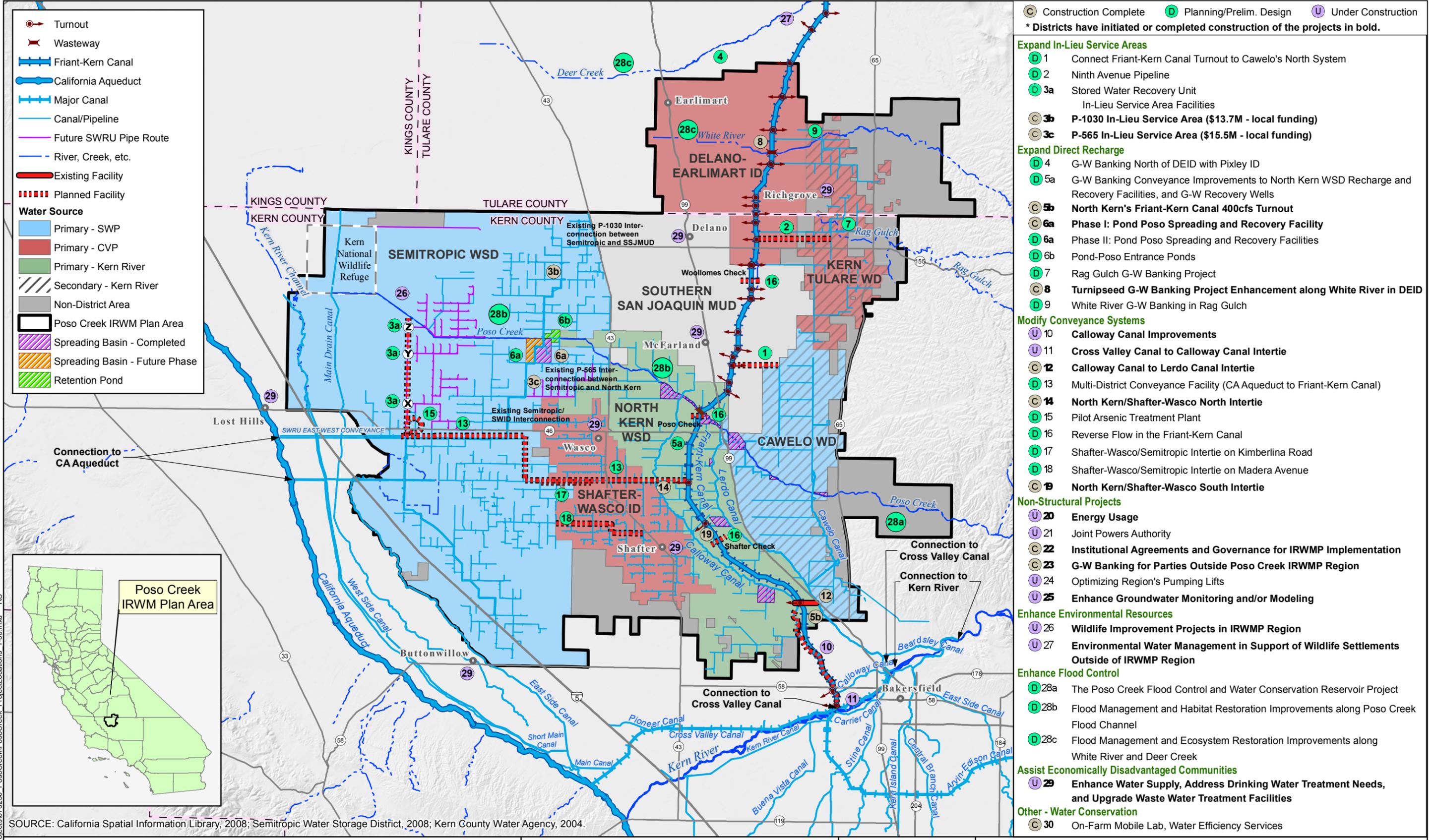
The working relationships established between the Poso Creek RWMG and stakeholders is strongly enhanced by continuing regular meetings to implement IRWM Plan as the various interests have worked together to manage surface water and groundwater resources of the Region. Since Plan adoption in 2007, several U.S. Bureau of Reclamation funding opportunities were available that funded the advancement of both non-structural and structural water conveyance projects to accelerate the transition from *individual* water district management to *regional* management. Several recently constructed Interties now connect neighboring water district facilities. These regional projects have been implemented by multiple districts to enhance the ability to match timing of water deliveries with demands to more effectively use and store (absorb) surface water supplies delivered into the Region.

Individual communities have also successfully obtained State and Federal funding to construct wastewater treatment, install water metering, and improve and protect drinking water quality. In 2011, the IRWM Plan provided a basis for a successful application for an IRWM funding pursuant to Proposition 84, Round 1 Implementation. The Round 1 Proposal included eight projects that benefit both small communities and agricultural water users, plus enhance the environmental component of a recently constructed direct spreading facility.

3.0.1.3 Accomplishments through Local and Grant Funding

The Poso Creek RWMG develops an annual budget for core activities and coordination with neighboring IRWMPs and for special tasks, such as development of the RWMG Governance MOU. The RWMG has also funded the development of materials to submit to the DWR for the Regional Acceptance Process, Special Planning Studies for development of a Rural Water Supply Program, Reclamation System Optimization Review, local funding for Poso Banking CEQA/NEPA, and other items. Following the Plan adoption, a System Optimization Review for Poso Region was conducted from October 2008 to September 2010, which utilized \$300,000 in federal funds provided by Reclamation.

The Poso Creek IRWM Plan identified 29 regional projects to consider for implementation, and recently added No. 30 as shown on Figure 1. The Poso Creek RWMG remains focused on implementing regional projects ahead of individual district projects. Figure 2 identifies projects recently constructed or under construction; the status of each Project is indicated on the map views.



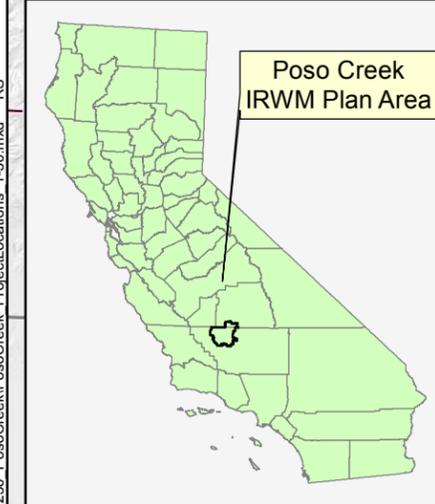
Legend

- Turnout
- Wasteway
- Friant-Kern Canal
- California Aqueduct
- Major Canal
- Canal/Pipeline
- Future SWRU Pipe Route
- River, Creek, etc.
- Existing Facility
- Planned Facility

Water Source

- Primary - SWP
- Primary - CVP
- Primary - Kern River
- Secondary - Kern River
- Non-District Area
- Poso Creek IRWM Plan Area
- Spreading Basin - Completed
- Spreading Basin - Future Phase
- Retention Pond

- C** Construction Complete
 - D** Planning/Prelim. Design
 - U** Under Construction
- * Districts have initiated or completed construction of the projects in bold.**
- Expand In-Lieu Service Areas**
- D 1** Connect Friant-Kern Canal Turnout to Cawelo's North System
 - D 2** Ninth Avenue Pipeline
 - D 3a** Stored Water Recovery Unit In-Lieu Service Area Facilities
 - C 3b** P-1030 In-Lieu Service Area (\$13.7M - local funding)
 - C 3c** P-565 In-Lieu Service Area (\$15.5M - local funding)
- Expand Direct Recharge**
- D 4** G-W Banking North of DEID with Pixley ID
 - D 5a** G-W Banking Conveyance Improvements to North Kern WSD Recharge and Recovery Facilities, and G-W Recovery Wells
 - C 5b** North Kern's Friant-Kern Canal 400cfs Turnout
 - C 6a** Phase I: Pond Poso Spreading and Recovery Facility
 - D 6a** Phase II: Pond Poso Spreading and Recovery Facilities
 - D 6b** Pond-Poso Entrance Ponds
 - D 7** Rag Gulch G-W Banking Project
 - C 8** Turnipseed G-W Banking Project Enhancement along White River in DEID
 - D 9** White River G-W Banking in Rag Gulch
- Modify Conveyance Systems**
- U 10** Calloway Canal Improvements
 - U 11** Cross Valley Canal to Calloway Canal Intertie
 - C 12** Calloway Canal to Lerdo Canal Intertie
 - D 13** Multi-District Conveyance Facility (CA Aqueduct to Friant-Kern Canal)
 - C 14** North Kern/Shafter-Wasco North Intertie
 - D 15** Pilot Arsenic Treatment Plant
 - D 16** Reverse Flow in the Friant-Kern Canal
 - D 17** Shafter-Wasco/Semitropic Intertie on Kimberlina Road
 - D 18** Shafter-Wasco/Semitropic Intertie on Madera Avenue
 - C 19** North Kern/Shafter-Wasco South Intertie
- Non-Structural Projects**
- U 20** Energy Usage
 - U 21** Joint Powers Authority
 - C 22** Institutional Agreements and Governance for IRWMP Implementation
 - C 23** G-W Banking for Parties Outside Poso Creek IRWMP Region
 - U 24** Optimizing Region's Pumping Lifts
 - U 25** Enhance Groundwater Monitoring and/or Modeling
- Enhance Environmental Resources**
- U 26** Wildlife Improvement Projects in IRWMP Region
 - U 27** Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region
- Enhance Flood Control**
- D 28a** The Poso Creek Flood Control and Water Conservation Reservoir Project
 - D 28b** Flood Management and Habitat Restoration Improvements along Poso Creek Flood Channel
 - D 28c** Flood Management and Ecosystem Restoration Improvements along White River and Deer Creek
- Assist Economically Disadvantaged Communities**
- U 29** Enhance Water Supply, Address Drinking Water Treatment Needs, and Upgrade Waste Water Treatment Facilities
- Other - Water Conservation**
- C 30** On-Farm Mobile Lab, Water Efficiency Services



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

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Miles

Poso Creek IRWM Plan Update and Improvement Proposal

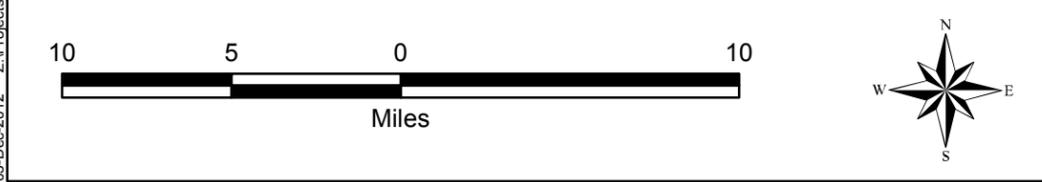
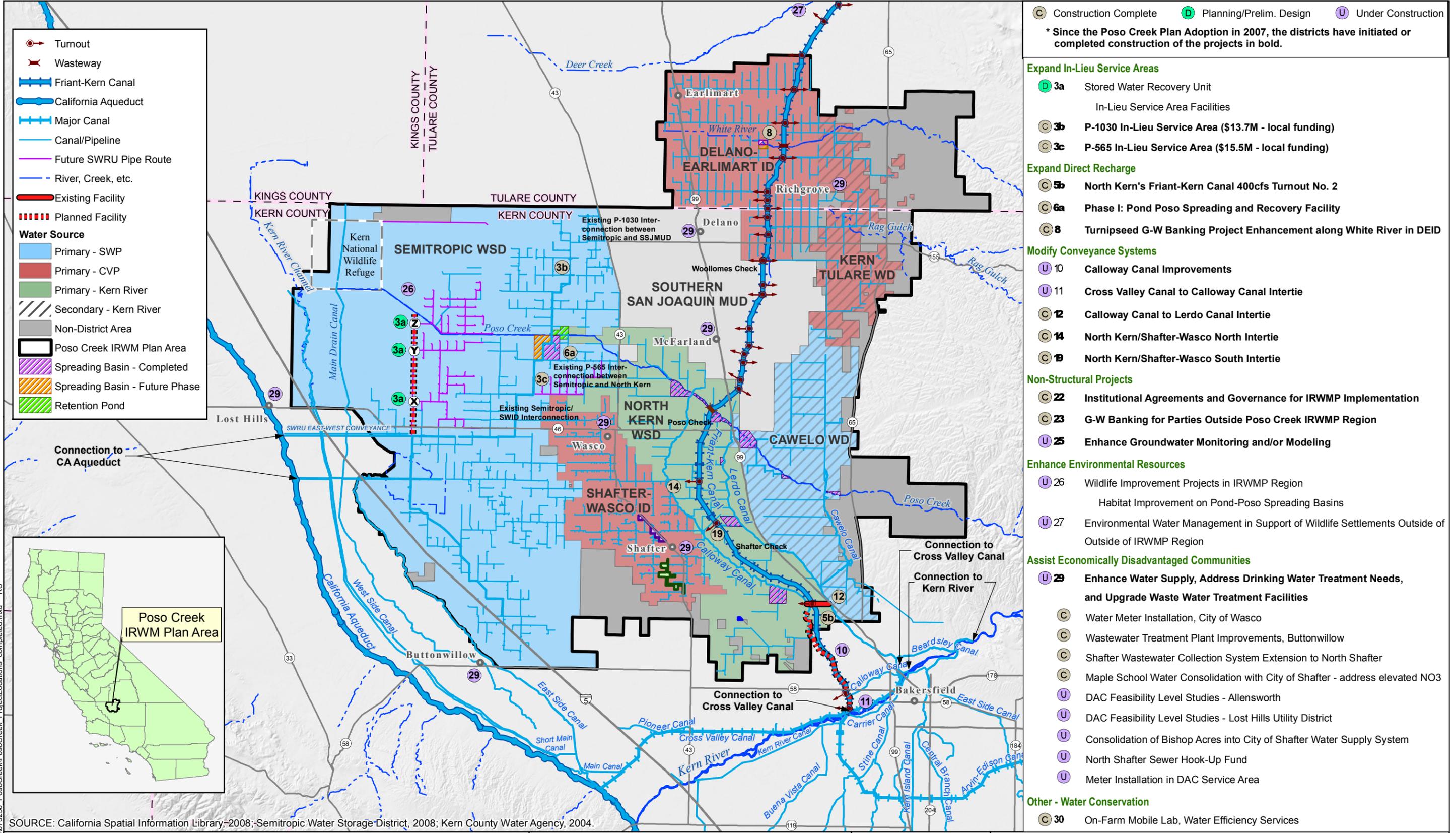
Poso Creek IRWMP

PROJECT LOCATIONS AND STATUS OF COMPLETION

DECEMBER 2012

FIGURE 1

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03-Dec-2012 Z:\Projects\073230_PosoCreek\PosoCreek_ProjectLocations_completed.mxd RS

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

Since the Plan was adopted, the Poso Creek RWMG has locally funded the following accomplishments that help to align the Plan with the sixteen standards per Proposition 84:

- Signed Governance MOU and cost sharing agreement
- Incorporated DAC, flood control, and wildlife enhancement projects
- Elected voting member, DAC Representative to RWMG
- Developed DAC projects with assistance from incorporated cities, districts, and Self-Help Enterprises
- Participated in coordination meetings with neighboring IRWMs in Tulare Basin
- Provided representation on 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 25 years
- Expanded in-lieu service areas in Semitropic WSD with \$29M local funding

The RWMG has implemented non-structural and structural project components of the Plan through several funding opportunities. The projects were funded by a combination of local cost share and award funds. The grant awarded funds are shown in (\$). Since most of the federal funded projects require a 50-percent cost match, the list represents a significant commitment by the local interests to advance water management measures in the Poso Creek IRWM Region:

- System Optimization Review for Poso Creek IRWM Plan (\$300,000)
- Conservation Improvements for Return of Banked Water, Semitropic WSD (\$300,000)
- North Intertie between North Kern WSD and Shafter-Wasco ID (\$300,000)
- South Intertie between North Kern WSD and Shafter-Wasco ID (\$300,000)
- Turnout No. 2 for North Kern WSD (\$300,000)
- Turnipseed GW Banking Project Enhancement along White River in DEID (\$1.55M)
- Pond-Poso Spreading and Recovery Facility, Semitropic WSD (\$2.2M ARRA)
- Calloway Canal to Lerdo Canal Intertie, North Kern WSD (\$5.0M ARRA)

- Groundwater Bank Improvements in Northwestern Kern County, Semitropic WSD (\$917,000)
- Bay-Delta Agricultural Water Conservation and Efficiency Project; Water Use Efficiency and Energy Improvement for Semitropic WSD Growers (\$711,000)

Projects completed by DAC communities, cities, and towns within the Region include:

- Water Meter Installation, City of Wasco
- Wastewater Treatment Plant Improvements, Buttonwillow (\$2,766,812 in SCWG, USDA & Buttonwillow CWD funds), completed in 2010
- Shafter Wastewater Collection System extension to North Shafter
- Maple School Water Consolidation with City of Shafter to address elevated nitrate levels

Regional conveyance, environmental, water conservation, and DAC community Projects funded by Proposition 84 Implementation include Eight Projects (with a total value of \$8.25M); eligible grant start date was August 16th, 2011:

- Cross Valley Canal to Calloway Canal Intertie, North Kern WSD
- Habitat Improvement on Pond-Poso Spreading Basins
- On-Farm Mobile Lab, Water Use Efficiency Services
- DAC Fund for Feasibility-Level Studies – Allensworth
- DAC Fund for Feasibility-Level Studies – Lost Hills Utility District
- Consolidation of Bishop Acres into City of Shafter Water Supply System
- North Shafter Sewer Hook-Up Fund
- Meter Installation in DAC Service Area

Additional, recent Projects for which individual districts within the RWMG have applied for grant funding include:

- Semitropic - WaterSMART 2013 project to improve recovery capacity at the Pond-Poso Spreading and Recovery Facility; submitted for two levels of funding: (1) \$300,000 and (2) \$1.5M with solar power component
- North Kern - WaterSMART 2013 project to line a portion of the Calloway Canal (\$300,000)

- North Kern and Cawelo - Bay-Delta Water Use Efficiency proposal to line a portion of Calloway Canal (\$1M); secured in 2012. Several more lining grant proposals are awaiting award in 2013
- Semitropic - Bay-Delta Agricultural Water Use Efficiency proposal for improved return capacity of Pond-Poso Canal to enhance return of stored water to Growers and Banking Partners during dry periods (\$300,000)
- Semitropic and North Kern - DWR Ag WUE Grants for updating Agricultural Water Management Plans, a demonstratoin proeject for meter testing, and implementation funding for Canal Lining

In developing the proposed projects for Implementation, Round 2, the Poso Creek IRWM RWMG considered a regional water conveyance project with a purpose to help manage San Joaquin River Settlement, Recirculation Water, which is a challenging and important water issue for the three CVP Contractors of the RWMG. The remaining five projects are regional programs to help with water use efficiency or projects to address DAC drinking water needs.

1. Madera Avenue Intertie
2. Lost Hills New Well and Tank Replacement
3. Allensworth Tank Replacement and SCADA Upgrade
4. Groundwater Well Destruction Program
5. On-Farm Mobile Lab for Water Use Efficiency in Support of Nutrient Management
6. South Shafter Sewer – Planning and Design

In order to understand the vision and purpose of the Round 2 Projecss selected for implementation, it is useful to reflect on the planning and implementation efforts the Poso Creek RWMG has in place and to recognize the commitment the individual water mangers, Stakeholders, and Board of Directors, have to implementing a *regional* water Plan. The Poso Creek RWMG remains focused on improvements to the region’s assets that can help solve the challenges faced by all water users in the region. The Poso Creek IRWM Plan 8-page Brochure describing the Plan and the 12-page Poso Creek IRWM Plan – Summary of Findings & Conclusions and Plan Implementation is included below. The Poso Creek IRWM Plan’s Appendix C – Description of the San Joaquin River Settlement is included later in the Proposal, as Appendix 7.1-1 as background information. Constraint to water supply imposed by this settlement is the key regional water issue this Proposal is intended to help resolve. To help increase oparational flexibility, thus stretch available supply, this proposal will provide west to east conveyance as a mechanism for CVP Contractors to recover and deliver San Joaquin River Recirculation Water to CVP districts.

POSO CREEK

Integrated Regional Water Management Plan



—ADOPTED JULY 2007—

Poso Creek IRWMP Regional Water Management Group, Study Area, and Region

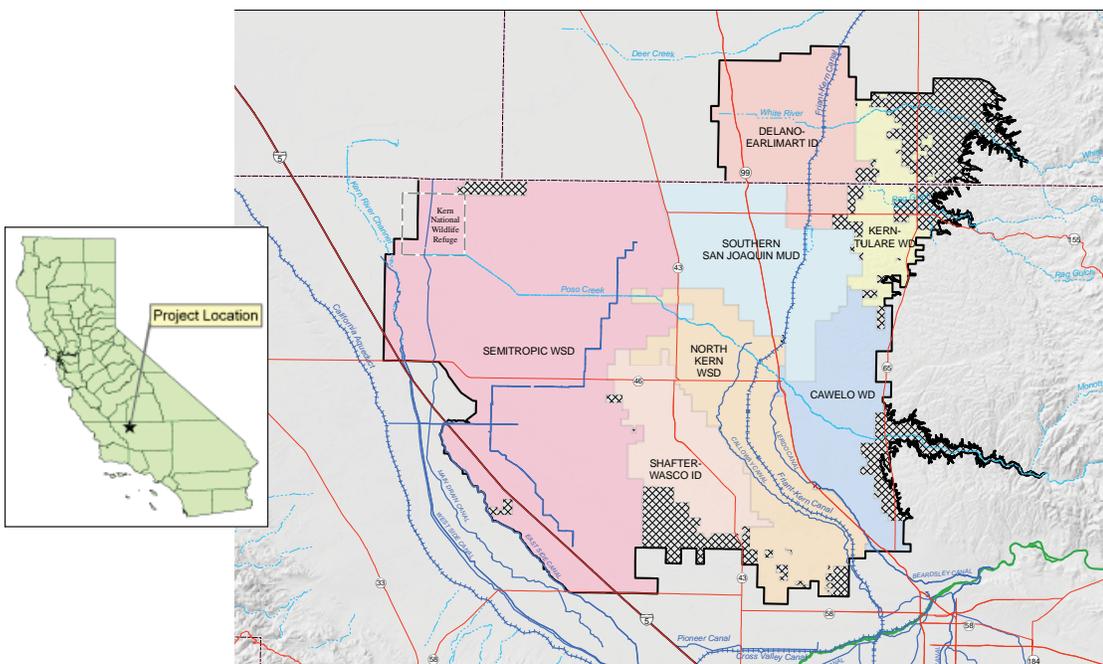
The Poso Creek Regional Water Management Group (RWMG) comprises six agricultural districts and one resource conservation district listed below.

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

The RWMG adopted the Poso Creek Integrated Regional Water Management Plan (Poso Creek IRWMP) in July 2007.

These districts overlie the groundwater basin in the Tulare Lake Basin Hydrologic area located in the northerly portion of Kern County and southerly portion of Tulare County. The Poso Creek IRWMP Region (Region) is a fertile agricultural area with a current annual gross value of agricultural commodities estimated at \$2 billion. The rich soils, climate, and irrigation water make it possible to grow predominately high-value, permanent crops. The largest value commodities – almonds, grapes, citrus, pistachios, and vegetables – are sold worldwide.

The Poso Creek IRWMP emphasizes resolving the Region's short-term and long-term water supply challenges through an integrated water resource planning approach. The Poso Creek IRWMP includes development of regional water management strategies to address the Region's needs and the framework for prioritizing and implementing them. The focus of the RWMG is to improve water supplies throughout the Study Area.



Notes:

1. The boundary of the RMG and Region encompasses all of the area within the districts; however, to the extent that the NWKRC boundary includes area outside of the districts, the NWKRC boundary lines are not included.
2. For the purpose of evaluating water supplies, demands, and operations, Southern San Joaquin Municipal Utility District (SSJMUD) was included with the RMG districts. This larger grouping is referred to throughout the IRWMP as the Study Area.

Poso Creek IRWMP Region's Assets

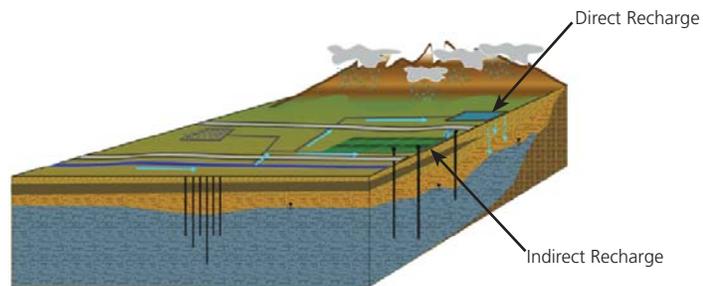
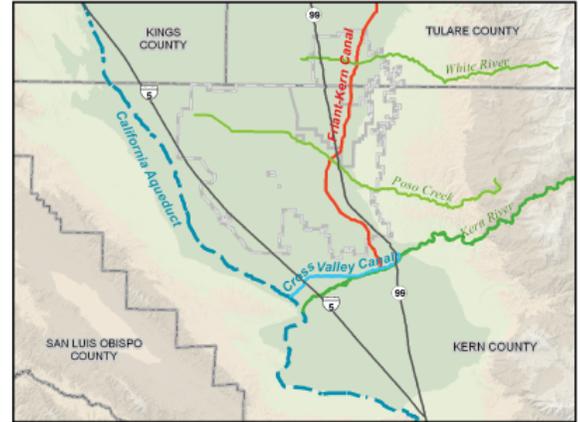
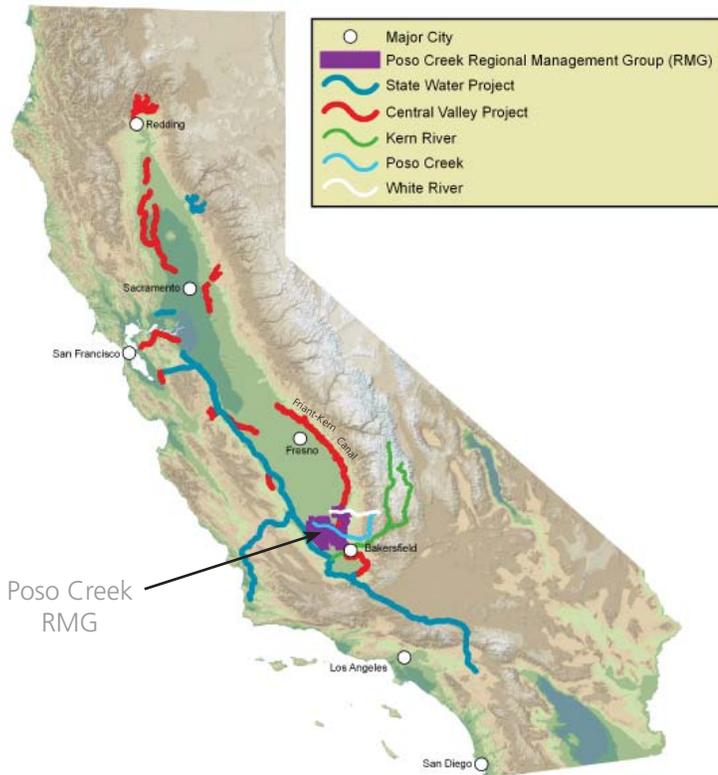
The RWMG and stakeholders (listed on the last page of this brochure) share a common interest in managing the surface water and groundwater resources of the Region. They have operated segments of the groundwater basin conjunctively with available surface supplies for decades. The managed resources include water supplies from:

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

The Region is located at the crossroads of the California Aqueduct, Friant-Kern Canal, and the Kern River. Thus, the potential for increased conjunctive use of surface water and groundwater supplies is a valuable asset to the Region.

Since California typically experiences either wet or dry years, the groundwater basin acts as a large regulating reservoir. The existing conjunctive use operation can be expanded by adding interconnections and promoting water supply exchanges between districts that allow for more flexibility in the Region's water supply. The Region's assets of federal, state, and local water supplies, dewatered groundwater storage, and significant irrigation demand make it an ideal location to regulate surface supplies conjunctively to the benefit of the agricultural based economy and the *economically-disadvantaged communities* of the Region and the state of California.

Water Supply, Conveyance, and Groundwater Storage



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

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

Challenges to the Region

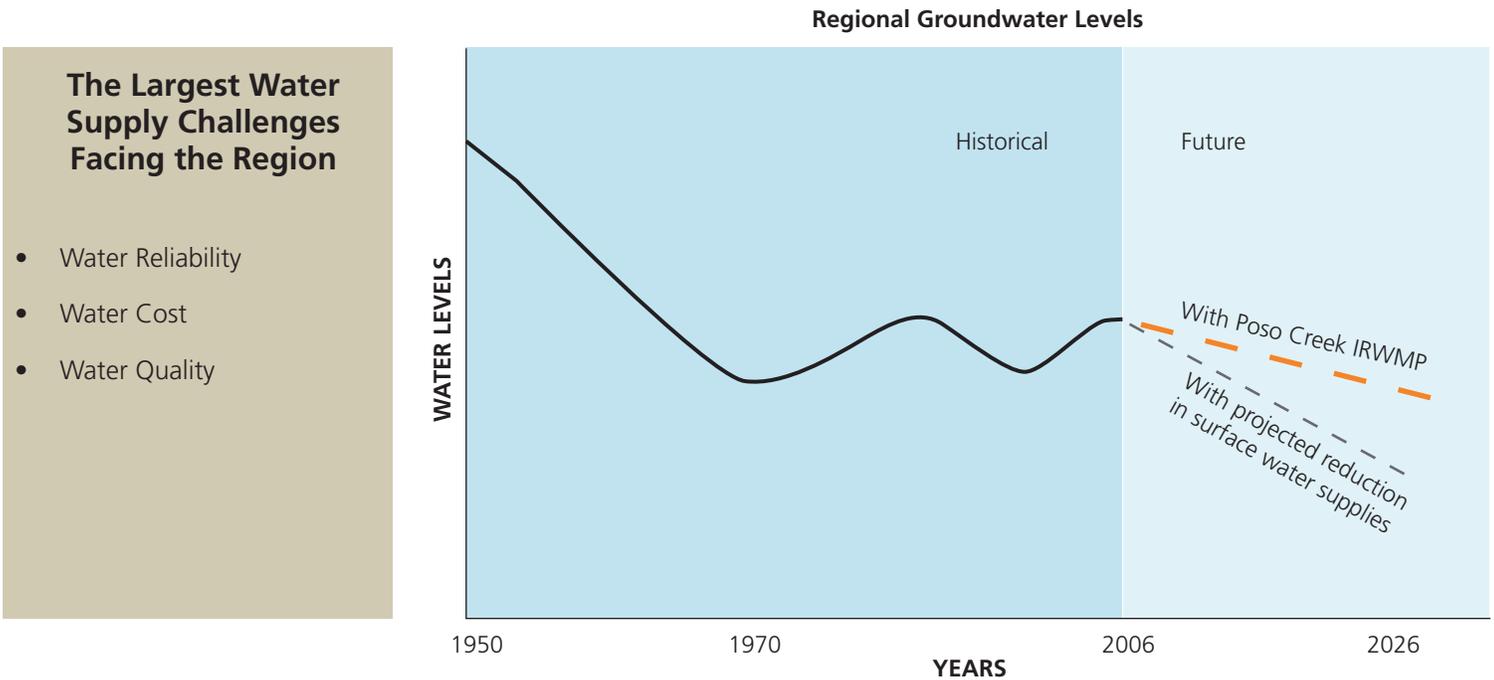
The accumulated effect of surface water supplies is reflected in the Region’s groundwater levels. As shown in the figure below, surface water supplies to the Region have generally stabilized groundwater levels since 1970. This relatively balanced condition would continue if deliveries of surface water supplies were to remain the same as recent historical amounts. However, the Region’s deliveries of surface water supplies are projected to decrease due to increased urbanization and environmental uses throughout the state.

Also shown illustratively in the figure are the effects of the projected reduction in deliveries of surface water supplies on regional groundwater levels. As pressure on surface supplies increases, it is apparent that the Region must make additional

use of its groundwater basin to regulate and absorb the available wet-year supplies. This increased conjunctive use operation will help maintain water reliability within the Region.

Since the Region produces crops for both local and world markets, to maintain its competitive role in the market place, the water supply must remain economical. Increased conjunctive use operations will help to maintain or enhance groundwater levels that support economically viable groundwater pumping lifts.

Groundwater quality in the Region is currently very good. Water banking and exchange activities will require water quality management and treatment to maintain that water quality.



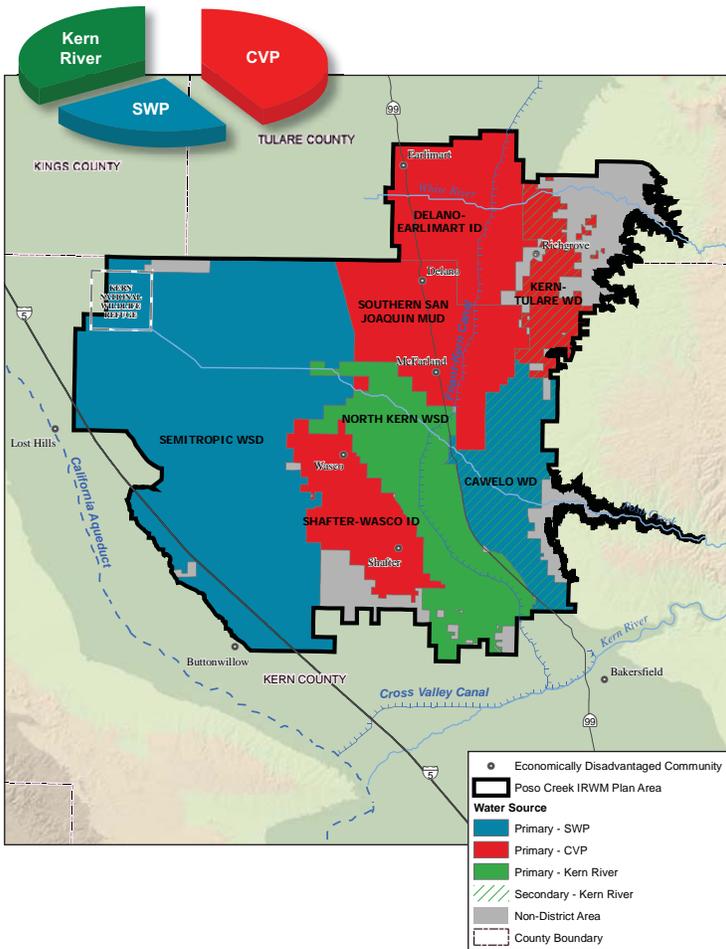
Regional Cooperation Will Provide A Solution

The sources of surface water supplies of the Region's individual districts' are shown on the map below. With the expected loss of historical surface water supply reliability, the Region must absorb wet-year water supplies in order to maintain a reliable and economical water supply. Wet-year water is available on short notice and not always at times when the water can be delivered for an irrigation demand. Therefore, it is important that the Region increase its ability to absorb surface water when available.

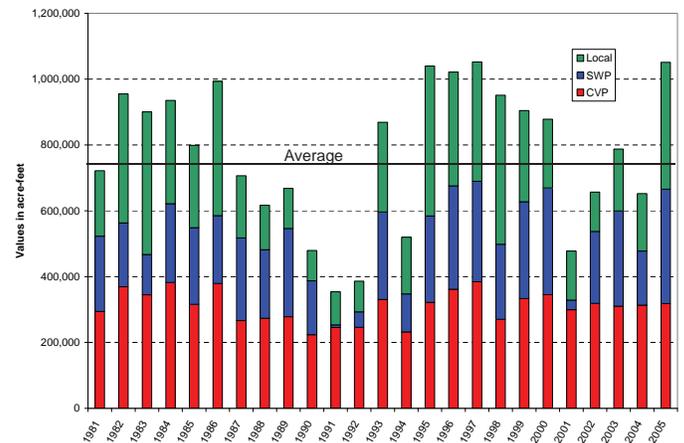
Because water is available to the Region from a number of sources which have differing hydrologic timing, integration of these various water supplies, combined with conjunctive

use of the groundwater basin, provides the Region with an opportunity to mitigate the projected loss to its water supplies.

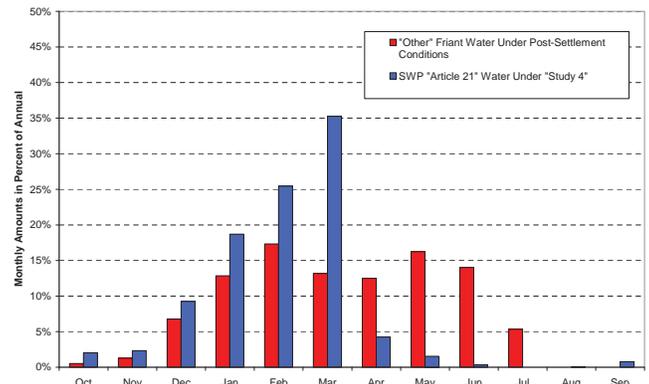
Regional cooperation will provide solutions for individual district needs by increasing operational flexibility. This can be accomplished by enhancing the existing conveyance systems within districts and establishing interconnections between districts. These conveyance enhancements will foster additional water delivery capability within the Region.



Historical Surface Water Supplies delivered to Poso Creek IRWMP Region during 1981-2005



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



Planning Objectives, Strategies and Water Management Measures

The RMG intends to implement non-structural and structural water resource management measures that support the Region's Planning Objectives and consider the State of California's state-wide priorities and the California Water Plan Update 2005 Resource Management Strategies.

The seven Planning Objectives which were identified for the Region are listed below. The more detailed operational objectives developed by the RMG during the plan formulation are included in Table ES-1 of the Plan.

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

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

As Projects are implemented to meet the highest priorities for the Region, secondary benefits that each project may provide will be integrated into the *regional* solution. These benefits may include, flood control, ecosystem restoration, environmental and habitat protection and improvement, reduction in use of power and energy, water quality improvements, subsidence mitigation, and many others.

The RWMG, with input from the stakeholders, has considered all of the Water Management Strategies listed in Table 2–Water Management Strategies of the IRWM Grant Program Guidelines. Most of these water management strategies are already practiced in this Region to some extent, as discussed in Chapter 6 of this Plan. Due to the overwhelming need to address water supply issues within the Region, the RMG prioritized water management strategies into the following two groups;

Highest Priority Strategies Considered for Project Implementation

- Groundwater management
- Water supply reliability
- Conjunctive management of surface water and groundwater
- Water transfers and exchanges
- Water quality protection and improvement

Strategies Considered for Project Integration¹

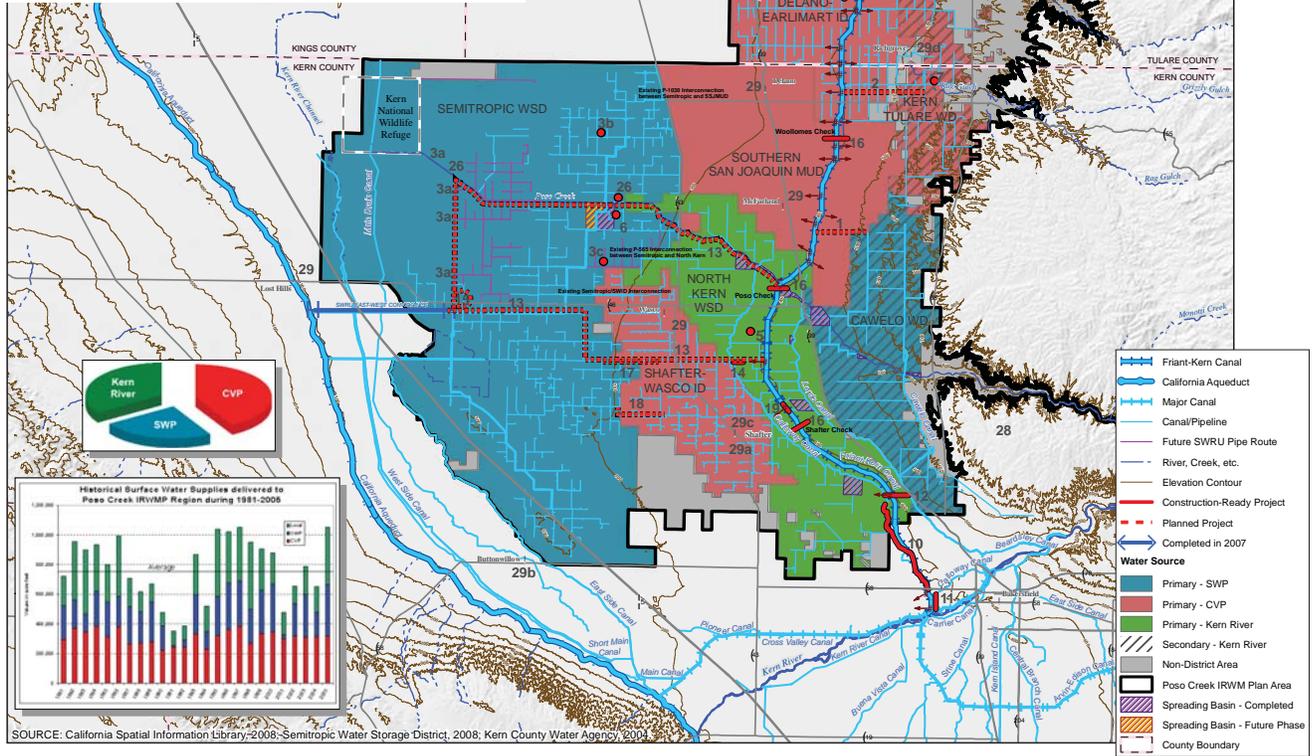
- Ecosystem restoration
- Environmental and habitat protection and improvement
- Flood management
- Imported water
- Land use planning
- NPS pollution control
- Recreation and public access
- Storm water capture and management
- Surface storage
- Water conservation
- Water recycling
- Water and wastewater treatment
- Watershed planning
- Wetlands enhancement and creation

The RWMG formulated and prioritized projects to implement, consisting of the non-structural and structural water management measures listed on the opposite page. Locations of the proposed structural measures are shown on the map. The projects that are proposed for near-term funding proposals are highlighted. Implementation of these projects will occur in phases as funding opportunities are secured to match local contributions.

¹ Due to the location of the Region, desalination is the only water management strategy not under consideration for the Region.

Water Supply Enhancement Project for the Poso Creek IRWM Plan Region

While the estimated capital cost to implement all of the proposed water management measures is on the order of \$300 million (at 2009 price levels), it is noted that the costs and the benefits realized for each component are not strictly additive and that significant benefits can be achieved with initial expenditures which are much less than this total amount.



STRUCTURAL PROJECTS (LOCATIONS SHOWN ON MAP)

Expand In-Lieu Service Areas

- D 1 Connect Friant-Kern Canal Turnout to Cawelo's North System
- D 2 Ninth Avenue Pipeline
- S 3a Stored Water Recovery Unit*
In-Lieu Service Area Facilities
Well Field Recovery Facilities & HCP
- C 3b Expand P-1030 In-Lieu Service Area
- C 3c New P-565 In-Lieu Service Area

Expand Direct Recharge

- D 4 G-W Banking North of DEID with Pixley ID
- D 5 G-W Banking Conveyance Improvements to North Kern WSD Recharge and Recovery Facilities
- S 6 Pond Poso Spreading Grounds*
- D 7 Rag Gulch G-W Banking Project
- S 8 Turnipseed GW Banking Project Enhancement along White River in DEID*
- D 9 White River G-W Banking in Rag-Gulch

Modify Conveyance Systems

- S 10 Calloway Canal Improvements
- S 11 Calloway Canal to Cross Valley Canal Interconnection
- S 12 Calloway Canal to Lerdo Canal Interconnection*
- D 13 Multi-District Conveyance Facility
- S 14 North Interconnection between North Kern WSD/Shafter-Wasco*
- D 15 Pilot Arsenic Treatment Plant

- P = In Progress C = Construction Complete
- D = Planning/Preliminary Design S = Shovel-Ready for Construction

NON-STRUCTURAL PROJECTS (SOME LOCATIONS NOT SHOWN ON MAP)

- P 20 Energy Usage
 - P 21 Joint Powers Authority
 - P 22 Institutional Agreements and Governance for IRWMP* Implementation
 - P 23 GW Banking for Parties Outside of Poso Creek IRWMP Region*
 - P 24 Optimizing Region's Pumping Lifts
 - P 25 Enhance Groundwater Monitoring and/or Modeling*
- #### ENHANCE ENVIRONMENTAL RESOURCES
- D 26 Wildlife Improvement Projects in IRWMP Region
 - D 27 Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region
- #### ENHANCE FLOOD CONTROL
- D 28 The Poso Creek Flood Control and Water Conservation Reservoir Project
- #### ASSIST ECONOMICALLY DISADVANTAGED COMMUNITIES
- D 29 Enhance Water Supply, address Drinking Water Treatment Needs, and upgrade Waste Water Treatment Facilities*



POSO CREEK IRWMP

Management Group

Your interest in the Region's water resources and views on how they should be managed are important to the RWMG and stakeholders. We welcome your input, reviews, and comments on the Poso Creek IRWMP. The RWMG will continue to meet monthly as part of implementing the plan. RWMG public meetings are typically held at 12 pm on the first Tuesday of each month at the Semitropic Water Storage District offices. You may also participate in the meetings by conference call.

Please contact Mr. Paul Oshel, District Engineer for Semitropic Water Storage District, at (661) 758-5113, for information or to answer questions on behalf of the following seven entities:



Wilmar L. Boschman
General Manager
Semitropic Water Storage District



Steven C. Dalke
General Manager
Kern-Tulare Water District



David R. Ansolabehere
General Manager
Cawelo Water District



Dana S. Munn
Engineer-Manager
North Kern Water Storage District



Dale R. Brogan
General Manager
Delano-Earlimart Irrigation District



Brian Hockett
District Manager
North West Kern Resource Conservation District (NWKRCDD)



Jerry L. Ezell
General Manager
Shafter-Wasco Irrigation District

Regional Water Management Group

- 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

Stakeholders and Plan Participants

- Buena Vista Water Storage District
- Lost Hills Water District
- Rosedale-Rio Bravo Water Storage District
- Semitropic Wildlife Improvement District
- Southern San Joaquin Municipal Utility District

- Kern County Water Agency
- Friant Water Users Authority
- Kern County Board of Supervisors
- City of Buttonwillow
- City of Delano
- City of McFarland
- City of Shafter
- City of Wasco
- Lost Hills Utility District
- Kern National Wildlife Refuge
- Paramount Farms

State and Federal Agencies

- California Department of Fish and Game
- California Department of Water Resources
- U.S. Bureau of Reclamation

Stakeholders and Participants added following the Plan adoption July, 2007

- California Water Institute, CSU Fresno
- Community Water Center
- R.L. Schafer and Associates
- Self-Help Enterprises
- Sequoia River Lands
- Tulare Basin Wildlife Partners

Legislative Contacts

- Congressman Kevin McCarthy
- Congressman Jim Costa
- Congressman Devin Nunes
- Senator Dean Florez
- Senator Roy Ashburn
- Assembly Member Danny Gilmore
- Assembly Member Jean Fuller

Prepared by:



Funding assistance for the Poso Creek Integrated Regional Water Management Plan was provided by the California Department of Water Resources through a Proposition 50 planning grant.

* Project 3 will receive Federal planning money in 2010. Projects 6, 8, 12, and 14 all received Federal funding for construction in 2009. Project 22 received Federal planning money in 2008. Federal funds were provided to projects 29, 23, and 25 in 2009.

POSO CREEK

IRWM Plan – Summary of Findings & Conclusions
and Plan Implementation



—ADOPTED JULY 2007—

Summary of Findings and Conclusions

Based on Poso Creek Integrated Regional Water Management (IRWM) Plan as Adopted July 2007

Findings and conclusions resulting from the Proposition 50 funded planning effort that were summarized in the Adopted Plan are repeated herein. Since plan adoption, court-ordered actions have further constrained the State Water Project (SWP) supplies.

Where applicable, and unless noted otherwise, projected water supplies are based on CalSim II – Study 4 for the SWP, and post-San Joaquin River Settlement conditions for the Friant Division of the Central Valley Project (CVP). While averages have been cited for the purpose of assessing the long-term water supply implications, it must be recognized that water demands occur in every year and these averages reflect water occurring in the wetter years and are not a true measure of water supply reliability.

1. Conjunctive-use projects developed on a district-by-district basis to acquire and import surface water supplies to mitigate declining groundwater levels in the Region were generally complete by the mid to late 1970s (with some completed much earlier). In the subsequent 25 to 30 years, groundwater levels have been relatively "stable" over the Region, going up during wet periods and down during dry periods.
2. Water demands in the Region over the next 20 to 30 years are expected to be comparable to the last 25 years, inasmuch as irrigated acreage has been relatively "stable" and that, in general, as urban demand increases, the agricultural demand will decrease (assuming that it is irrigated agricultural land that is urbanized, which has been the trend to date), with no significant net change in demand.
3. Surface water has been a significant part of the Region's water supply, averaging about ¾ million acre-feet annually over last 25 years. The historical average use of local surface water supplies (primarily Kern River and Poso Creek) has amounted to about one-third of the total surface water supplies of the Region, with imported supplies making up the remaining two-thirds. There are three principal sources of surface water, which are listed following, along with the approximate contribution of each to the total for the Region:

» Local (Kern River and Poso Creek)	34%
» Central Valley Project	42%
» State Water Project	24%
4. The projected long-term average annual availability of surface water supplies to the Region is on the order of 0.7 million acre-feet, which is less than the 0.75 million acre-feet which was historically diverted for use within the Region. (This estimate is based on availability at the source of supply; does not reflect consideration of any conveyance or absorptive capability limitations; is based on the minimum "share" of unregulated SWP and CVP supplies; and does not include third-party banking.)
5. It is projected that each of the three principal sources of surface water will be reduced in the future relative to the last 25 years. Accordingly, the reduction in water supply reliability is the number one water resource management issue for the Region. The

total reduction in diversion and use of these sources of supply was estimated to be on the order of 100,000 acre-feet, with about one-third of the reduction attributable to each source of supply.

- » Kern River - The reliability of the Kern River supplies that have been used in the Region in the past is threatened, owing to the expiration of several long-term contracts in 2011, as well as ongoing litigation.
 - » State Water Project - 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 .
 - » Central Valley Project - 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, which centered on restoration of the San Joaquin River below Friant Dam.
6. The total irrigated acreage in the Region has remained fairly stable over the last 25 years, ranging from 340,000 to 375,000 acres, with an average of about 350,000 acres. These lands rely on the conjunctive use of surface water and groundwater, either directly or indirectly. To the extent that surface water supplies are short, groundwater is used to satisfy irrigation water requirements, inasmuch as these lands largely overlie useable groundwater.
 7. The acreage planted to permanent crops has been increasing, with over 60 percent presently planted to nuts, grapes, and citrus. Twenty-five years ago, permanent plantings amounted to about 40 percent of the irrigated acreage. Presently, it is estimated that the Region produces at least \$2 billion annually in agricultural commodities.
 8. Presently, about 120,000 people reside within the Region and rely exclusively on pumped groundwater for their water needs. These are primarily located within the communities of Delano, Wasco, Shafter, McFarland, Earlimart, Richgrove, and Lost Hills, which are economically-disadvantaged based on 2000 census tract data compared to the threshold for disadvantaged communities . The population approximately doubled between 1990 and 2006, which implies an average growth rate of about 5 percent per year.
 9. The projected 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.
 10. With relatively "stable" water levels over the last 25 years; with the demand for water projected to remain about the same; and with less surface water projected for the future; groundwater levels will decline, with a corresponding increase in the use of power and energy resources, creating both an environmental and economic burden.
 11. With a common groundwater basin shared by all uses within the Region, any decline in water levels will be felt by all uses, i.e., there will be an adverse economic effect on both irrigated agriculture and the already economically-disadvantaged communities that rely on groundwater in whole or in part. By the same token, anything that is done to

mitigate declines in water levels, such as projects identified in this Plan, will benefit all uses.

12. The operations of each district within the Poso Creek Regional Water Management Group (RWMG) reflect, to a large extent, conjunctive-use operations as an individual district. There is the potential to increase the use of available surface water supplies within the Region, and thereby enhance conjunctive-use operations, by coordinating the use of each district's water and water management assets within the Region.
13. Access to local, state, and federal water supplies and conveyance facilities, which is provided by combining the assets of the districts within the Region, creates both the flexibility and the opportunity for regional water management that can realize water supply accomplishments that individual districts cannot. The key to unlocking this potential is conveyance between districts within the Region.
14. The ability to move water between districts within the Region is presently limited both physically and institutionally. Accordingly, both structural and non-structural measures were identified to address this observation.
15. Non-structural measures that have "risen to the top" include:
 - » An organizational structure and environmental compliance framework that allows for exchange, transfer, and banking approvals to be in place to take advantage of unregulated and unscheduled water supplies that are available from time to time, often on short notice.
 - » The necessary approvals to move water from different sources around within the Region as required to maximize the utility of the Region's assets and thereby maximize water supply and reliability to the Region.
 - » A means of maintaining equity as between districts within the Region, in terms of water and/or dollars.
16. Structural measures involving conveyance improvements include canals, pipelines, and pumping plants. (Implementation projects for near-term funding proposals are listed in Table ES-7 and shown on Figure ES-14.)
17. Water supply operations studies indicate that water will be available from time to time in excess of the absorptive capability of the contracting districts. This observation creates both the potential and the need to regulate these supplies within the remaining absorptive capability of other districts in the Region. Most of this need is projected to involve CVP-Friant supplies
18. Most of the opportunities to increase the absorption of surface water supplies rest with the unscheduled supplies; SWP Article 21 water and CVP-Friant Other water. However, competition for these supplies can be expected to increase in the future as other areas of the state address similar water supply reliability issues. While the minimum "share" of these supplies can be estimated, the amount that may be available beyond the minimum is unknown, and could be significant. The average annual minimum share of these unscheduled supplies is estimated at about 35,000 acre-feet, consisting of about one-third SWP water and two-thirds CVP water.

19. The projected average annual system-wide availability of Other Friant water is about 195,000 acre-feet, and the minimum share of this supply that would be available to contracting districts within the Region is estimated at about 23,000 acre-feet. However, it is reasonable to assume that there will not be any measurable capacity to wheel this water during the months of May through August. Under this assumption, the 23,000 acre-feet at Friant Dam could be reduced to about 15,000 acre-feet canal-side, i.e., about one-third of this supply occurs after April on average, when available capacity in the Friant-Kern Canal would be a constraint.
20. The projected average annual system-wide availability of Article 21 water is about 262,000 acre-feet, and the minimum share of this supply that would be available to contracting districts within the Region is estimated at about 12,000 acre-feet (based on CalSim II Study 4 for 2005 conditions).
21. When considered on a district-by-district basis, it is projected that, on average over the long term, about 21,000 acre-feet of CVP-Friant water will be in excess of the absorptive capability of the contracting districts within the Region. It is further estimated that about two-thirds of this amount could be absorbed within the Region with the appropriate agreements and institutional and regulatory approvals, with about one-half going directly to an irrigation demand and the remainder to spreading.
22. Strategies to mitigate projected reductions in the Region's surface water supplies include the following:
 - » Maximize use of available surface water supplies through the use of existing absorptive capability by coordinating mismatches between supply and demand within the Region, i.e., matching supply that exceeds demand in one district with demand that exceeds supply in another district. This applies to both irrigation absorptive capability as well as spreading absorptive capability.
 - » Evaluate feasibility of developing additional absorptive capability if the available surface water supplies cannot be substantially regulated through the use of existing absorptive capacity.
 - » Consider development of third-party water-banking arrangements that bring more water into the Region than the Region is obligated to return (such as is the case with an unbalanced banking program) and/or bring dollars into the Region that can be used to help purchase waters of opportunity.
 - » Support improving water supply reliability from the Delta.
 - » Support implementation of the water management goal of the San Joaquin River Settlement.
 - » Support the restoration of lost capacity in the Friant-Kern Canal as well as expanded capacity, in order to maximize the use of contract supplies.
23. Experience has shown that water conveyance and distribution facilities, in addition to the purposes for which they were designed, have been used in ways that were not contemplated when they were designed and constructed. In other words, the accomplishments or benefits have typically far exceeded that which was originally

estimated. While we are used to seeing a contingency applied to project costs, experience suggests that it may be appropriate to apply a contingency to benefits as well.

24. Due to the overwhelming need to address water supply issues within the Region, the RWMG prioritized water management strategies into two groups; (1) highest priority strategies considered for implementation; and (2) strategies considered for project integration. As Projects are implemented to meet the highest priorities for the Region, secondary benefits that each project may provide will be integrated into the regional solution. These benefits may include, flood control, ecosystem restoration, environmental and habitat protection and improvement, reduction in use of power and energy, water quality improvements, subsidence mitigation, and many others.
25. Individual water agencies have been encouraged and incentivized (through eligibility requirements for grant funds) to work together to address water resource management issues on a regional level. In order for this to be effective, some of the institutional and regulatory constraints that have acted as disincentives to working together and realizing truly regional water resource management must be addressed.
26. While the estimated capital cost to implement all of the proposed water management measures is on the order of \$250 million (at 2007 price levels), it is noted that the costs are not strictly additive and that significant benefits can be achieved with initial expenditures which are far less than this total amount. (The estimated cost to implement projects proposed for the near-term funding opportunities is \$65 million, as shown in Table ES-7.)
27. In addition to local monies, financing of non-structural as well as structural measures is expected to include grants, loans, and possibly revenue from development of third-party banking programs.
28. Most of the proposed non-structural and structural projects identified in the planning process are ready for implementation and some are even under construction. Therefore, most of the proposed structural projects were categorized as Tier 1 projects, which means they are ready for implementation and contain phases that can be completed within three years.
29. The RWMG has worked very effectively together during the IRWMP process over the last two years and has already realized benefits from that process. Owing to this experience, the manageable size of the RWMG, and their common goals, they are well positioned to continue with project implementation.

Poso Creek IRWM Plan Implementation

The Plan

The Poso Creek IRWM Plan Regional Water Management Group was formed in March 2005. The RWMG adopted the IRWM Plan in July 2007, which functions as a living document. Since adoption, several stakeholders have been involved in updating the Plan, including: Self-Help Enterprises, Community Water Center, Sequoia River Lands Trust, Tulare Basin Wildlife Partners, and California Water Institute (CWI), CSU Fresno.

The RWMG meets the first Tuesday of each month at the Semitropic WSD office. Presently the RWMG is implementing Water Management Strategies identified during the Plan development. The status of Plan’s Water Management Measures and Projects are listed herein (A U.S. Bureau of Reclamation-funded Water 2025 System Optimization Review will refine the operations study and provide a detailed evaluation of the projects in the Plan).

Status of Water Management Measures and Plan Projects

Expanding In-Lieu Service Areas

- D** **No. 1 – Connect Friant-Kern Canal Turnout to Cawelo’s North System and No. 2 – Ninth Avenue Pipeline;** being evaluated by the individual water districts.
- S** **No. 3a – Stored Water Recovery Unit;** is being constructed in phases under a design/build contract. System X is ready for construction (\$35M); System Y (\$10.2M) and System Z (\$17.9M) are in need of design.
- C** **No. 3b – Expand P-1030 In-Lieu Service Area;** construction completed (\$5M) with interconnection to SSJMUD operational.
- C** **No. 3c – New P-565 In-Lieu Service Area;** construction completed (\$15M) with interconnection to NKWSD operational.

Direct Recharge

- D** **No. 4 – GW Banking North of DEID with Pixely ID;** will be evaluated within a separate Reclamation-funded System Optimization Review received by Pixely ID.
- D** **No. 5 – GW Banking Conveyance Improvements to North Kern WSD Recharge and Recovery Facilities;** re-evaluated by the Poso Creek IRWM RWMG and ranked as a high priority project (estimated cost \$17.5M).
- S** **No. 6 – Pond Poso Spreading Grounds, Retention Ponds, and Conveyance Enhancements;** Phase I constructed in 2007 (\$3.2M); Phase II ready for construction (\$8M).
- S** **No. 8 – Turnipseed GW Banking Project Enhancement along White River in DEID;** Phase I is under construction (\$1M); Phase II is ready for construction (\$19M).
- D** Both **No. 7 – Rag Gulch G-W Banking Project** and **No. 9 – White River G-W Banking in Rag Gulch** were considered, evaluated, and found not cost effective at this time.

Modify Conveyance Systems

Projects 10 through 19 will be evaluated for the amount of water they are capable of managing and their cost/benefits refined as part of the Reclamation funded Water 2025 System Optimization Review.

- S** **No. 10 – Calloway Canal Improvements;** CEQA is complete, district owns right-of-way, design is 85% complete (Calloway Canal Lining and Reverse Flow Pump Stations cost estimated \$29M).

C	= Construction Complete
S	= Shovel-Ready for Construction
P	= In Progress
D	= Planning/Preliminary Design

-  **No. 11 – Calloway Canal to Cross Valley Canal Interconnection;** district has agreements on right-of-way, design is 75% complete (Construction cost estimate \$11.3M for Canal Alternative; \$17.3M for Pipeline Alternative).
-  **No. 12 – Calloway Canal to Lerdo Canal Interconnection;** district owns right-of-way, design is in progress (\$21.8M estimate for 500 cfs capacity).
-  **No. 13 – Multi-District Conveyance Facility;** this large conveyance project being considered for funding by Reclamation to support the SJR Settlement Water Management Goal (\$55M to \$85M, depending on how components overlap with other projects).
-  **No. 14 – North Interconnection between NKWSD/Shafter-Wasco;** Districts applied for “Water for America” funds to construct project (under construction, \$1.2M).
-  **No. 15 – Pilot Arsenic Treatment Plant;** Semitropic is evaluating under the SWRU (estimated ≈\$20M).
-  **No. 16 – Reverse Flow in the Friant-Kern Canal;** considered in Federal Legislation along with capacity improvements to the Friant-Kern Canal to alleviate constraints (≈\$3M).
-  **No. 17 – Shafter-Wasco/Semitropic Interconnection on Kimberlina Road;** considered in district planning for flexibility in operations, not identified for any specific funding sources (conceptual design complete, \$12.2M).
-  **No. 18 – Shafter-Wasco/Semitropic Interconnection on Madera Avenue;** considered in district planning for flexibility in operations, not identified for any specific funding sources (concept design complete, \$4.8M).
-  **No. 19 – South Interconnection between NKWSD/Shafter-Wasco;** Districts applied for “Water for America” funds to construct project (ready for construction, \$0.6M).

Non-Structural Projects

-  **No. 20 – Energy Usage;** Solar power is being tested and considered by districts and DACs in the region.
-  **No. 21 – Joint Powers Authority;** Poso Creek IRWM RWMG joined the Tulare Basin JPA for the Tulare Basin and may consider other governance agreements, as needed, for Regional projects that overlap multiple districts or planning areas.
-  **No. 22 – Institutional Agreements and Governance for IRWMP Implementation;** The RWMG adopted an MOU for governance in March 2009; RWMG is coordinating with a larger SJV Planning Group through the JPA for the Tulare Basin Water Entities; the RWMG is implementing “Non-Structural” water management measures; the RWMG is coordinating with the DACs and the Kern IRWMP.
-  **No. 23 – GW Banking for Parties Outside of Poso Creek IRWMP Region;** Semitropic has formed a JPA with Rosamond. NKWSD and Semitropic continue to implement and explore additional agreements for outside banking interests. Districts in Southern California are expressing interest in banking supplies south of the Delta. Reclamation has expressed an interest in GW Banking in Semitropic to increase CVP reliability.

	= Construction Complete
	= Shovel-Ready for Construction
	= In Progress
	= Planning/Preliminary Design

P No. 24 – Optimizing Region’s Pumping Lifts; presently, districts implement individual programs to minimize energy costs.

P No. 25 – Enhance Groundwater Monitoring and/or Modeling; several RWMG districts were successful under the recent DWR Local GW Assistance grant program. Semitropic and NKWSD have led the GW monitoring and modeling within the Plan Area. Semitropic is in the process of updating their groundwater model for Reclamation to use in evaluating the SWRU. A regional effort may be useful to coordinate with the larger planning area, especially considering the Delta pumping restrictions and the SJR Settlement. This may be considered in the Kern IRWMP and Tulare Basin JPA level of planning.

Enhance Environmental Resources

D No. 26 – Wildlife Improvement Projects in IRWMP Region; Semitropic Wildlife Improvement District is working with the Tulare Basin Wildlife Partners to improve water conveyance facilities in the Kern National Wildlife Refuge area that will add flexibility for delivery of supply. The team has obtained a seed grant to move the concept design for the West-East Pintail Slough canal towards a construction ready design. This water conveyance enhancement is being evaluated with other concepts to increase the ability for the KNWR, private farms, and duck clubs to match water deliveries with demand at differing times of the year.

D No. 27 - Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region; RWMG CVP Contractors will be part of Reclamation’s effort to implement the SJR Water Management Goal to restore SJR Habitat flows. The location of the RWMG is well positioned to help off-set reduced pumping south of the Delta by use of GW Banking to help regulate surface supplies. Opportunities exist to mitigate the projected loss to the Region’s water supply for DACs who share the local GW supply, environmental, urban, and agriculture water needs.

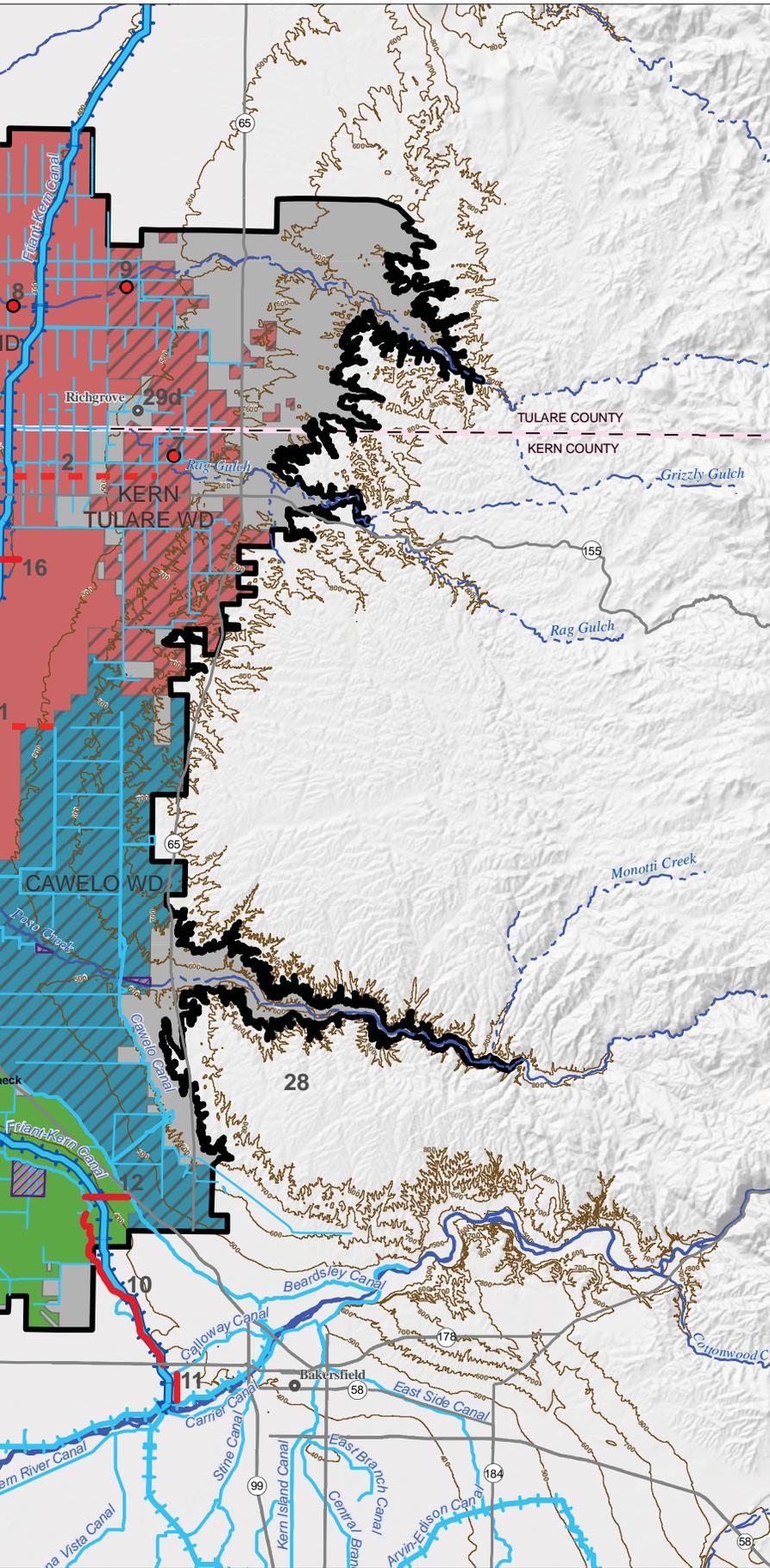
Enhance Flood Control

D No. 28 - The Poso Creek Flood Control and Water Conservation Reservoir Project; this project was added to the Poso Creek IRWMP in May of 2008 and has potential to fit into the Prop 84 and 1E funding opportunities. The COE’s evaluation of this project is coordinated with R. L. Schafer and Associates.

Assist Economically Disadvantaged Communities

D No. 29 - Enhance Water Supply, address Drinking Water Treatment Needs, and upgrade Waste Water Treatment Facilities; progress was made following Plan adoption to include projects for DACs within the Poso Creek IRWMP Area. David Warner of Self-help Enterprises provided the RWMG with an organized assessment of DAC needs for the Poso Creek Planning Area and for all of Kern County. The RWMG has coordinated with the “North County” group of cities within the Kern IRWMP to help integrate the water related projects of the communities. The RWMG expects that the Disadvantaged Communities will continue to be assisted by Self Help Enterprises and other planning groups within the Region. Since July 2008, Self-Help has successfully helped two of the communities within the Poso Creek Plan Area secure funding (\$2M each) for a waster water treatment facilities. Communities are looking to find funding to make their projects construction ready or whole and the RWMG will recommend a design fund as part of an implementation grant application to meet their collective needs.

	= Construction Complete
	= Shovel-Ready for Construction
	= In Progress
	= Planning/Preliminary Design



PROJECTS SUMMARY (LOCATIONS SHOWN ON MAP)

- P = In Progress ● S = Shovel-Ready for Construction
- D = Planning/Preliminary Design ● C = Construction Complete

Expand In-Lieu Service Areas

- D 1 Connect Friant-Kern Canal Turnout to Cawelo's North System
- D 2 Ninth Avenue Pipeline
- S 3a Stored Water Recovery Unit
- C 3b Expand P-1030 In-Lieu Service Area
- C 3c New P-565 In-Lieu Service Area

Expand Direct Recharge

- D 4 G-W Banking North of DEID with Pixley ID
- D 5 G-W Banking Conveyance Improvements to North Kern WSD Recharge and Recovery Facilities
- S 6 Pond Poso Spreading Grounds
- D 7 Rag Gulch G-W Banking Project
- S 8 Turnipseed GW Banking Project Enhancement along White River in DEID
- D 9 White River G-W Banking in Rag-Gulch

Modify Conveyance Systems

- S 10 Calloway Canal Improvements
- S 11 Calloway Canal to Cross Valley Canal Interconnection
- S 12 Calloway Canal to Lerdo Canal Interconnection
- D 13 Multi-District Conveyance Facility
- S 14 North Interconnection between North Kern WSD/Shafter-Wasco
- D 15 Pilot Arsenic Treatment Plant
- D 16 Reverse Flow in the Friant-Kern Canal
- D 17 Shafter-Wasco/Semitropic Interconnection on Kimberlina Road
- D 18 Shafter-Wasco/Semitropic Interconnection on Madera Avenue
- S 19 South Interconnection between North Kern WSD/Shafter-Wasco

**NON-STRUCTURAL PROJECTS
(SOME LOCATIONS NOT SHOWN ON MAP)**

- P 20 Energy Usage
- P 21 Joint Powers Authority
- P 22 Institutional Agreements and Governance for IRWMP Implementation
- P 23 GW Banking for Parties Outside of Poso Creek IRWMP Region
- P 24 Optimizing Region's Pumping Lifts
- P 25 Enhance Groundwater Monitoring and/or Modeling

ENHANCE ENVIRONMENTAL RESOURCES

- D 26 Wildlife Improvement Projects in IRWMP Region
- D 27 Environmental Water Management in Support of Wildlife Settlements Outside of IRWMP Region

ENHANCE FLOOD CONTROL

- D 28 The Poso Creek Flood Control and Water Conservation Reservoir Project

ASSIST ECONOMICALLY DISADVANTAGED COMMUNITIES

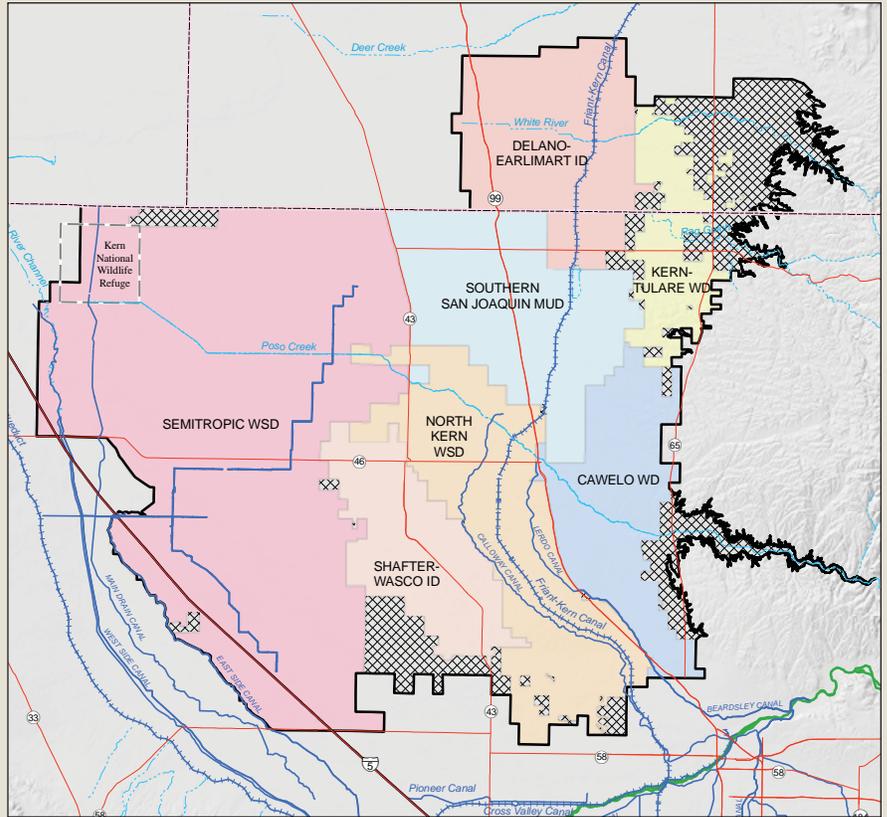
- D 29 Enhance Water Supply, address Drinking Water Treatment Needs, and upgrade Waste Water Treatment Facilities



POSO CREEK IRWMP

Management Group

Your interest in the Region's water resources and views on how they should be managed are important to the RWMG and stakeholders. We welcome your input, reviews, and comments on the Poso Creek IRWM Plan. The RWMG continues to meet monthly to implement the plan. The RWMG public meetings are typically held at 12 pm on the first Tuesday of each month at the Semitropic Water Storage District office. You may also participate in the meetings by conference call.



Please contact Mr. Paul Oshel, District Engineer for Semitropic Water Storage District, at (661) 758-5113, for information or to answer questions on behalf of the following seven entities:



Wilmar L. Boschman
General Manager
Semitropic Water Storage District



Dana S. Munn
Engineer-Manager
North Kern Water Storage District



David R. Ansolabehere
General Manager
Cawelo Water District



Brian Hockett
District Manager
North West Kern Resource Conservation District (NWKRC)



Dale R. Brogan
General Manager
Delano-Earlimart Irrigation District



Jerry L. Ezell
General Manager
Shafter-Wasco Irrigation District



Steven C. Dalke
General Manager
Kern-Tulare Water District

3.0.2 Proposed Work

Detailed work plans have been prepared for each of the six projects included in this Proposal and are presented below.

This proposal addresses the Primary and secondary objectives of the Poso Creek IRWM Plan by providing integration of regional water conveyance systems with addition of the Madera Avenue Intertie. The Madera Avenue Intertie Project (No. 1) provides needed west to east conveyance for the delivery of San Joaquin River Recirculation Water. Other Projects in this application, support regional water use conservation and a regional well destruction program, and addresses several critical drinking water and water quality problems faced by DACs. The benefits of all projects are discussed in Attachment 8 of this application.

The intertie will help reduce the Region's short-term and long-term water supply shortage through improved supply management and greater water supply reliability. Specifically, the Intertie will add west to east conveyance capacity that allows CVP Contractors a mechanism for delivery of San Joaquin River – Recirculation Water from the California Aqueduct, wheeled through Semitropic to Shafter-Wasco ID and the Friant-Kern Canal, thus reaching CVP service areas. The Intertie will improve water supply reliability; provide drought protection and provide a secondary benefit: water quantity and quality improvement for water users who rely on the common groundwater basin. The regional conveyance intertie will increase conveyance capacity between existing banking and exchange facilities allowing enhancements to conjunctive management of water within the Region and expand the opportunity for delivery of water to Central Valley Project Contractors.

The projects to directly benefit DAC areas will provide new water well production capacity, reduce arsenic in the source water, and replace two water storage tanks, all of which will increase water supply reliability and quality for two DACs. The program to destroy unused groundwater well will minimize spread of contaminants such as arsenic and nitrate. On-farm water use efficiency services will improve irrigation efficiency, reduce energy use, and support improved nutrient management practices. Providing the planning and design for expanding wastewater collection and upgrading water supplies in several DACs will address public health and environmental justice issues.

3.0.2.1 Goals and Objectives

The goal of this application is to leverage the investment of the region in the projects of this Proposal with the assistance of state funding to help meet the objectives set forth in the adopted IRWM Plan. The Proposal will meet the primary goals and objective of the Poso Creek IRWM Plan and two secondary goals.

Primary Goals and Objectives

- Enhance water supply reliability
- Conserve groundwater and surface water supplies
- Reduce groundwater pumping lifts
- Provide drought preparedness.

Secondary Goals and Objectives

- Enhance wildlife habitat
- Assist DACs in protecting drinking water supplies through improvements to drinking water and wastewater facilities

This application contains six projects that meet the Poso Creek IRWMP goals and objectives through specific measures:

1. Improve *regional water supply reliability* by completing an intertie that allows Recirculation Water to be returned to CVP Contractors to enhance *wildlife habitat* (San Joaquin River Fisheries) in areas outside the Poso Creek IRWM region;
2. Conserve *groundwater* through support of the mobile irrigation laboratory, on-farm irrigation system evaluations;
3. Protect *groundwater quality* by implementing groundwater well destruction;
4. Implement *critical drinking water quality protection for DACs* by constructing a new well and replacing storage tanks; and
5. Develop *DAC projects* by completing planning and design of a needed sewer system.

In accordance with the MOU governing the RWMG and the IRWM Plan, the RWMG and stakeholders developed a number of potential projects based on identified DAC needs and priorities. The Proposal includes Project 1 addresses water supply reliability, the highest priority issue in the Region. Projects 2, 3, 4, 5, and, 6, were identified by the RWMG to address issues identified in the Poso Creek Region other than regional water supply reliability. All Projects were developed during the monthly meetings in collaboration between the RWMG and representatives from stakeholders and DAC communities. The Proposed Projects meet multiple objectives of the IRWM Plan as shown:

Exhibit 3.0-1

Poso Creek IRWMP Objectives Addressed By Proposed Projects

Project No. and Title		Poso Creek IRWMP Objectives					Flood Control
		Water Supply Reliability	Ground-water Levels	Ground-water Quality	Water Supply Costs	Environmental Resources	
1	Madera Avenue Intertie	✓	✓	✓	✓		
2	Lost Hills New Well and Tank Replacement	✓		✓	✓		
3	Allensworth Tank Replacement and SCADA Upgrade	✓		✓	✓		
4	Groundwater Well Destruction Program	✓	✓	✓	✓	✓	
5	On-Farm Mobile Lab for Water Use Efficiency in Support of Nutrient Management	✓		✓	✓	✓	
6	South Shafter Sewer – Planning and Design	✓		✓		✓	

3.0.2.2 Purpose and Need

The purpose of the lead project within this Implementation Grant Proposal is to improve the *regional* management of environmental water by constructing a needed Intertie for west to east conveyance capacity that will allow delivery of San Joaquin River – Recirculation Water to CVP Contractors, thus meeting the highest priority need of the region. This project will help implement the San Joaquin River Settlement and reduce regional conflicts over available supplies.

The purpose of the other five projects within the Implementation Proposal is to meet critical drinking water needs of DACs, improve regional water use efficiency, and provide protection of water quality within the region.

The Poso Creek IRWM Implementation Grant Proposal includes a regional intertie (Project 1) that will increase west to east conveyance capacity from the CA Aqueduct through Semitropic WSD to federal CVP Contractors by average annual quantity of 10,000 acre-feet/year to 20,000 acre-feet/year, providing a mechanism to recover and return San Joaquin River – Recirculation Water to CVP Contractors, improve the capacity for conjunctive water management, and provide drought protection for the Poso Creek IRWM Region. The Intertie

will increase the flexibility in timing of SWP and CVP Delta deliveries decrease the competition for pumping water south of the Sacramento-San Joaquin Delta during droughts and other critical outages, provide a mechanism for CVP Contractors to recapture and return San Joaquin River – Recirculation Water, provide some interregional wet-period water management, and support water banking for third-parties in Southern California.

Project 2 will provide a DAC community with a new well that provides necessary capacity and is screened to protect from arsenic. Project 3 would replace an existing tank used for drinking water, peaking and fire supply, as well as upgrade a SCADA system that would allow for service from a remote, inaccessible, and difficult to reach location, plus provide a more reliable and less expensive operation of the DAC drinking water supply. Project 4 establishes a fund to properly destroy abandoned groundwater wells to protect groundwater quality, with a focus on areas near DAC’s source of drinking water. Project 5 provides on-farm water use efficiency services through support of North West Kern Recourses Conservation District On-Farm Mobile Lab Services that support and enhance nutrient management in the region. Project 6 addresses a critical water quality need of DAC areas near Smith Corner, one of six small communities south of the City of Shafter. Project 6 involves the planning and design of a wastewater collection system and trunk line that will connect Smith Corner residents, who currently rely on septic systems (which have been identified as a source of groundwater contamination), to the City of Shafter/North of the River regional wastewater system.

3.0.2.3 Project List

List of individual project titles:

1. Madera Avenue Intertie
2. Lost Hills New Well and Tank Replacement*
3. Allensworth Tank Replacement and SCADA Upgrade*
4. Groundwater Well Destruction Program*
5. On-Farm Mobile Lab for Water Use Efficiency in Support of Nutrient Management
6. South Shafter Sewer – Planning and Design*

*Addresses a critical water supply or water quality issue for a DAC

Project List			
Poso Creek IRWM Implementation Grant, Proposition 84, Round 2			
Project		Total Project Cost	Local Sponsor
1	Madera Avenue Intertie	\$10,498,755	Semitropic WSD, Shafter-Wasco ID, Delano-Earlimart ID, and Kern-Tulare WD
2	Lost Hills New Well and Tank Replacement	\$2,451,610	Lost Hills Utility District
3	Allensworth Tank Replacement and SCADA Upgrade	\$356,500	Allensworth Community Services District
4	Groundwater Well Destruction Program	\$73,500	Poso Creek RWMG
5	On-Farm Mobile Lab for Water Use Efficiency in Support of Nutrient Management	\$206,500	North West Kern Resource Conservation District
6	South Shafter Sewer - Planning and Design	\$356,000	Kern County Engineering and Services Group
Proposal Total		\$13,942,865	Poso Creek RWMG

Exhibit 3.0-2
Summary of Proposed Projects

Project No., Title, and IMPLEMENTING AGENCY	Project Abstract	Project Status
<p>Project 1:</p> <p><i>Madera Avenue Intertie</i></p> <p>Semitropic WSD</p> <p>Shafter-Wasco ID</p> <p>Kern-Tulare WD</p> <p>Delano-Earlimart ID</p>	<p><u>PV Costs:</u> \$25,125,254</p> <p><u>PV Benefits:</u> \$39,708,000</p> <p><u>B/C Ratio:</u> 1.58</p> <p><u>Yield:</u> 10,000 acre-feet per year</p> <p>The Intertie will increase west to east conveyance capacity from the CA Aqueduct through Semitropic WSD to federal CVP Contractors by average annual 10,000AFY to 20,000 AFY, providing a mechanism to recover and return San Joaquin River – Recirculation Water to CVP Contractors, improve the capacity for conjunctive water management, and provide drought protection for the Poso Creek IRWM Region.</p> <p>Benefits: Added flexibility in managing environmental water and surface water supplies, more reliable, dry-year supply and drought protection, reduced risk of water quality degradation, avoided water costs, and increased jobs.</p>	<p>Design completed at the 10-percent level; CEQA project description complete. (Ready to implement and construct upon one year of receiving grant award). Multiple districts in support of Intertie.</p>

Project No., Title, and IMPLEMENTING AGENCY	Project Abstract	Project Status
<p>Project 2:</p> <p><i>Lost Hills New Well and Tank Replacement</i></p> <p>Lost Hills Utility District</p>	<p><u>PV Costs:</u> \$2,046,702</p> <p><u>PV Benefits:</u> \$516,204</p> <p><u>B/C Ratio:</u> 0.25</p> <p><u>Yield:</u> N/A</p> <p>The Lost Hills New Well and Tank Replacement project will provide funding to address a critical water supply need in a DAC, the community of Lost Hills. The Lost Hills New Well and Tank Replacement project consist of making improvements to LHUD's existing water distribution system including (1) constructing a new production well and (2) replacing a deteriorating water tank with a new water storage tank. The Project will help LHUD address water quality issues related to high Arsenic levels and provide reliability in terms of water capacity to meet existing and projected water demands within LHUD's service area</p> <p><u>Benefits:</u> Safe Drinking Water Supply for DAC; grant funding allows water rates to remain reasonable and affordable.</p>	<p>Design completed at the 30-percent level; Project can be in construction within 6 to 12 months of receiving award notification; CEQA to be completed.</p>
<p>Project 3:</p> <p><i>Allensworth Tank Replacement and SCADA Upgrade</i></p> <p>Allensworth Community Services District</p>	<p><u>Costs:</u> \$356,000</p> <p><u>PV Benefits:</u> Not Calculated</p> <p>The Allensworth Tank Replacement and SCADA Upgrade project will provide funding to address a critical water supply need in a DAC. The Project consists of making improvements to ACSD's existing water system including (1) replacing an existing water tank and (2) upgrade of an automated control system (called Supervisory Control and Data Acquisition or SCADA) to increase operational reliability and water quality to a small DAC.</p> <p><u>Benefits:</u> Provides the following direct physical benefits: a New storage tank (leading to improved reliability) and an operational SCADA system (leading to more efficient operations and better water quality). As a result the DAC community served by the ACSD would benefit from lower operational costs, increased emergency supply capacity, and improved water quality due to lower Arsenic levels.</p>	<p>Due to funding constraints, ACSD would start this project once an agreement is signed with DWR.</p>

Project No., Title, and IMPLEMENTING AGENCY	Project Abstract	Project Status
<p>Project 4: <i>Groundwater Well Destruction Program</i></p> <p>Semitropic WSD (collaboration with cities and districts serving DACs)</p>	<p><u>Cost:</u> \$73,500</p> <p><u>PV Benefit:</u> Not Calculated</p> <p>This Project would address critical water supply needs in Disadvantaged Communities (DACs) by providing funding for this Project identifying unused wells and partially funding their destruction.</p> <p><u>Benefits:</u> Protects ground water quality used as DAC source, reduces medical health costs; and increases property values.</p>	<p>Poso Creek RWMG will coordinate with Self-Help Enterprises to select wells with priority given to location nearest DAC water supply wells.</p> <p>Properties have been canvassed to identify unused wells and a list has been created by Kern County Environmental Health Department. Destruction procedures are in place. Exempt from CEQA.</p>
<p>Project 5: <i>On-Farm Mobile Lab, Water Use Efficiency Services</i></p> <p>NWKRC</p>	<p><u>Cost:</u> \$206,500</p> <p><u>PV Benefit:</u> Not Calculated</p> <p>This Project would increase Mobile Lab services to an estimated 12,000 acres of irrigated farmland primarily within the North West Kern Resource Conservation District. The Mobile Lab provides specific on-site evaluation of irrigation system performance that would enable the water user to improve water application efficiency and achieve optimum application scheduling.</p> <p><u>Benefits:</u> Improved water management, increased water use efficiency and energy savings, and reduced leaching of salts and nutrients to groundwater – improving groundwater quality.</p>	<p>This Project would expand an already existing program; accordingly, it could be implemented upon receipt of additional funding. Exempt from CEQA.</p>
<p>Project 6: <i>South Shafter Sewer-Planning and Design</i></p> <p>COUNTY OF KERN</p>	<p><u>Cost:</u> \$356,000</p> <p><u>PV Benefit:</u> Not Calculated</p> <p>The South Shafter Sewer – Planning and Design Project is designed to provide funding to address a critical sewage treatment need for a disadvantaged community (DAC) in the South Shafter area. This Project would provide for planning and design of a wastewater collection system and trunk line that will connect Smith Corner, to the City of Shafter/North of the River regional wastewater system. The residents of this community currently rely on septic systems, most of which are quite old, with failing leach fields that have been identified as a source of groundwater contamination.</p> <p><u>Benefits:</u> Improves water quality to DAC area, provide DAC with opportunity to advance sewer project.</p>	<p>Preliminary engineering has been completed. Planning and Design is exempt from CEQA. Project is to complete CEQA necessary for advancement.</p>

3.0.2.4 Integrated Elements of Projects

The Madera Avenue Intertie project is one of a number of high-priority Projects in the Poso Creek IRWM Plan that will allow SWP and CVP Contractors more flexibility in managing supplies that have been reduced by a number of regulatory actions including the San Joaquin River Settlement and loss of reliability of SWP deliveries due to Sacramento-San Joaquin Delta issues. The Poso Creek IRWM Plan identified the need to support water management for issues outside of the IRWM Region. The Madera Avenue Intertie project specifically helps to implement Project No. 27 - Environmental Water Management in Support of Wildlife Settlements Outside of the IRWM Region of the Plan.

In general, the Poso Creek IRWM Plan identified non-structural and structural projects that focus on providing benefit towards meeting the Region's highest priority; increasing water supply reliability to the Region. Several high-priority projects identified in the Poso Creek IRWM Plan, which are not part of this grant application, have been constructed since the Poso Creek Plan adoption in July of 2007. Conveyance facilities that link North Kern's Calloway Canal to the North and South mainline systems in Shafter-Wasco ID are completed and operational; both the North (Poso Plan Project No. 14) and South Interties between North Kern WSD and Shafter-Wasco ID (Poso Plan Project No. 19) received funding from Reclamation's WaterSMART program. Both interties were used in 2012 to convey water to Shafter-Wasco ID and provide a mechanism to complete water exchanges among the Poso Creek IRWM RWMG CVP Contractors. The proposed Madera Avenue Intertie project adds an important west to east conveyance capacity from Semitropic to enhance exchange capacity, and provides a mechanism to complete agreements by adding west to east capacity for the participants within Poso Creek IRWM Plan Region. Adding this structural component is a key component to allow implementation of regional exchange agreements that are now possible since the Poso Creek IRWM Plan's districts have completed the necessary CEQA and NEPA documents to allow for immediate operational use of facilities identified in the environmental documents.

Increased funding for the On-Farm Mobile Lab (Project 5) has been identified and vetted during the regular implementation meetings of the Poso Creek IRWM Plan. This Project was recommended as a regional Project that supports water use efficiency throughout the Region. During the past year, the Poso RWMG has identified the need to secure supplemental matching funds to ensure the On-Farm Mobile Lab services can be augmented to continue to provide a service in the Region. This non-structural Project has a direct benefit of identifying on-farm methods to improve efficient use of water supply; it also provides support for efficient use of nutrients. This project integrates with all other proposed projects because improved irrigation efficiency enhances flexibility for delivery of surface supplies, makes proposed improvements more effective and thereby reduces both the dependence on surface water importation and energy costs. Finally, reducing deep percolation by increasing irrigation distribution efficiency is a demonstrated, effective method to reduce NO₃ movement from the root zone to the groundwater, thus enhancing supplies for DACs.

Funding is also being proposed for identifying and properly destroying up to 15-wells that have no remaining useful purpose and that have a potential to contribute to DAC water quality problems if not properly destroyed.

Several DAC Projects are proposed for implementation. The DAC projects are a component of the Poso Creek IRWM Plan (Plan), specifically Project 29 of the Plan, to Assist Disadvantaged Communities to Enhance Water Supply, Drinking Water Treatment, and Waste Water Treatment Facilities. Specifically, Project 2 will allow Lost Hills Utility District, a small water supply system serving a DAC in the Poso Creek Region, to better utilize its ground water supply and meet water quality objectives necessary to protect the health of its citizens. Under funding provided by the Round 1 Implementation Grant, LHUD is completing a Water Master Plan. This Project would use the results of that work to provide benefit towards meeting one of the Region's highest priorities; providing an affordable water supply to users within the Region.

Similarly, Allensworth (ACSD) cannot afford to advance their Project (Project 3) without grant funding. Project 3 will allow this DAC to better utilize its ground water supply and meet water quality objectives necessary to protect the health of its citizens. Under funding provided by the Round 1 Implementation Grant, ACSD is completing a feasibility study evaluating the use of well modifications to improve water quality. Under additional Proposition 84 funding provided by the Department of Public Health, a broader Feasibility Study is being conducted to analyze and recommend the best long-term solution to Allensworth's Arsenic problem.

Finally Project 6 will benefit a small DAC, Smith Corner, by funding the planning and design of a wastewater collection system that will allow this DAC to discontinue use of septic systems and connect to an existing sewer treatment facility. This Project provides benefit towards meeting one of the Region's highest priorities; protecting groundwater quality within the region. In addition, the planning and design of the Smith Corner system could be expanded in the future to serve the five other small DAC communities nearby. All of the DAC projects will meet the IRWM Plan objective of assisting economically disadvantaged communities.

3.0.2.5 Regional Map

Detailed regional maps that show the location of activities and Poso Creek facilities of the project(s), the water resources (groundwater or surface water) that will be affected, DACs within the region are included in the Brochures inserted in this Section 3.0. All surface water delivered into the Region from the California Aqueduct, Friant-Kern Canal, or delivered in a conveyance facility between and within districts is metered. Agreements are based on quantity of use and will be reported and utilized for payment of wheeling water through a district or use of a neighboring district's facility. Proposed monitoring locations for the Madera Avenue Intertie are shown on drawings included as part of the Project description. A

Project Map showing the location of the six Proposed Projects for Implementation, Round 2 Proposal is included

3.0.2.6 Completed Work

A description of the work that has been completed or is expected to be completed prior to the grant award date is included in the Work Plans for each individual project proposed. For all proposed projects, the Project Sponsors are ready to implement their projects upon notice of an award and most will start construction within 6 to 12 months following an award.

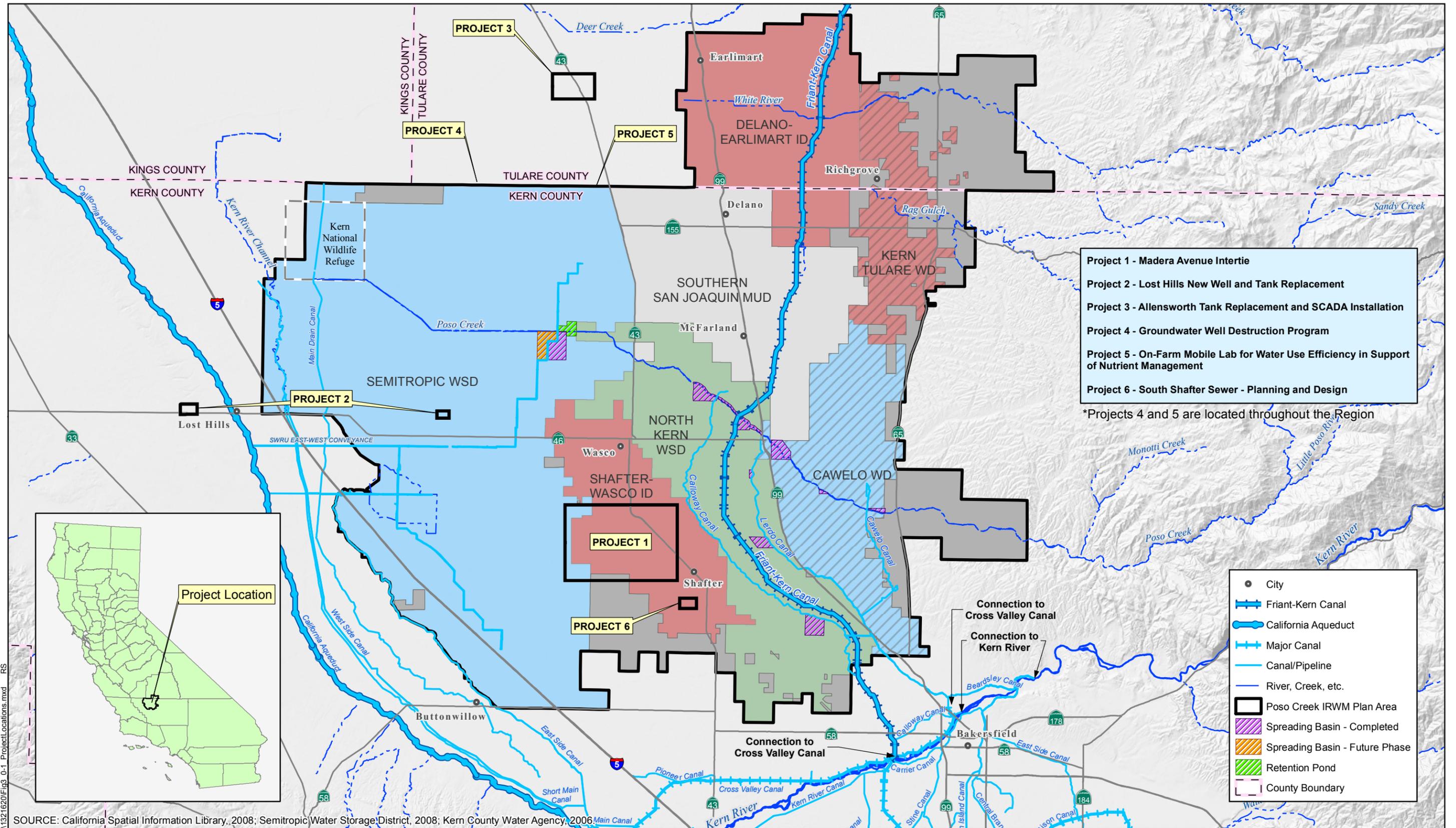
Semitropic will apply for approval of a Labor Compliance program in April, 2013. Since the construction of all projects is to be on previously disturbed or presently cultivated lands, and none of the construction project footprints are in known sensitive environmental areas, the necessary CEQA compliance will begin at the time of award notice and is expected to not take very long to complete. The two DAC projects (2 and 3) that are to help resolve critical drinking water needs received some funding in Round 1 to advance the projects. In short, any critical path components have been identified and will be considered by the Poso Creek RWMG and Project Sponsors to be completed as soon as possible following an award notice. It was recognized the Poso Creek RWMG will accelerate the Labor Compliance Plan for Semitropic who will serve as the Grantee.

3.0.2.7 Existing Data and Studies

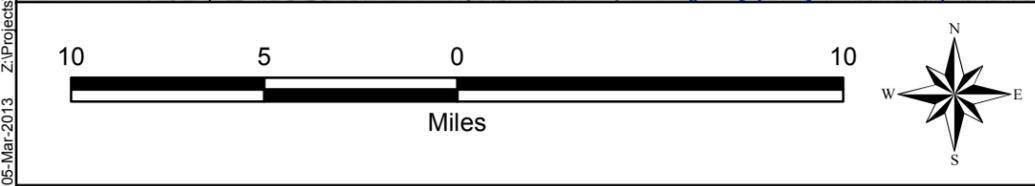
A description of the work that has been completed or is expected to be completed prior to the grant award date is contained in the Project Descriptions. The urgent need to be able to convey San Joaquin River – Recirculation Water was identified in past studies and has now occurred for the first time as a result of SWP operations in 2012. The proposed Intertie will help with management of a key environmental water component for the State of CA. The Poso Creek RWMG is aware of on-going Agriculture Waiver issues for water quality and obligations for reporting groundwater levels to CASGEM.

3.0.2.8 Project Timing and Phasing

The proposed project can each provide a benefit to the region independent of the other projects proposed. Project 1 of the Proposal is part of a multi-year effort to transform the individual district conveyance assets and operations into *regional* conveyance facilities capable of meeting the needs of neighboring districts, help resolve regional water issues, and be of value to the State of California in managing water for Agriculture, environment, and urban uses. The overall schedule of projects completed in the Poso Creek IRWM Region since Plan adoption is shown in Section 4.0 of this Application.



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



Poso Creek IRWMP Implementation Grant Proposal
 Poso Creek IRWMP Region



PROJECT LOCATIONS
 MARCH 2013
 FIGURE 3.0-1

05-Mar-2013 Z:\Projects\13271620\Fig3_0-1_ProjectLocations.mxd RS

3.1 Project 1 – Madera Avenue Intertie

3.1.1 Introduction

The Madera Avenue Intertie project (Project) is a 50-cfs pumping plant combined with a pipeline connection to accommodate conveyance of water west to east from Semitropic WSD to the Shafter-Wasco ID service area and to the Friant-Kern Canal, shown on Figure 3.1-1 in section 3.1.1.5. The primary benefit of this Project is to add up to 30,000 acre-feet/year of conveyance capacity from Semitropic facilities to deliver water to Shafter-Wasco ID to allow return of environmental water in a dry and/or typical water year to benefit Federal CVP Water Contractors, Shafter-Wasco ID, Delano Earlimart ID, and Kern-Tulare WD. The federal water districts are obligated to meet environmental water management goals for the San Joaquin River Settlement, and assist Kern-Tulare WD with deliveries of CVP-Delta supplies south of the Sacramento-San Joaquin Delta. The Madera Avenue Intertie adds critically needed conveyance capacity for the region in the west to east direction; the Intertie allows for water supplies delivered via the California Aqueduct to be wheeled through Semitropic facilities and delivered to CVP contractors.

The four neighboring water districts will contribute local cost share funding to construct the Project facilities. The proposed facilities are located within Semitropic and Shafter-Wasco ID service area boundaries. Semitropic WSD will serve as the lead district for constructing the Project and serve as the Grantee for implementing the Proposal contract with DWR. The Poso Creek IRWM Plan has recently completed several regional projects to add absorptive capacity in North Kern WSD, Cawelo WD, and Semitropic WSD benefiting the all districts within the region; this Project is the next regional water conveyance component to construct within the Poso Creek IRWM Region to continue the successful transformation of *individual* district water management to a *regional* water management. In support of regional water management, the Poso Creek RWMG has recently completed CEQA and NEPA environmental documents that allow the districts to bank, transfer, and exchange water supplies over the next 25 years and to utilize facilities identified in the environmental documents for water management agreements once they are constructed. As projects are completed, they are immediately put into *regional* operations to assist the region in managing the timing of surface supply deliveries that are affected by environmental constraints outside of the Poso Region. In addition to the primary function to add west to east conveyance capacity, the Madera Avenue Intertie will add gravity deliveries (east to west) to increase flexibility to absorb CVP water supplies delivered from the Friant-Kern Canal through Shafer-Wasco ID to Semitropic WSD.

3.1.1.1 Goals and Objectives

The Project accomplishes multiple water management goals and objectives of the Poso IRWM Plan, the Southern San Joaquin Valley, and of the State of California. The primary purpose of this Project is to add up to 50-cfs (100 acre-feet per day) conveyance capacity in the west to east direction by pumping water from Semitropic WSD to Shafter-Wasco ID and to the Friant-Kern Canal. The project will have the capability to delivery water over a 10-month period and up to 30,000 acre-feet per year (3,000 acre-feet per month or 100 acre-feet per day) in the west to east conveyance direction that will facilitate return of “Recirculation Water” to CVP Contractors. Recirculation Water is water released for environmental needs of the San Joaquin River that is conveyed through and south of the San Joaquin-Sacramento River Delta (Delta). The Intertie will also provide a reliable, firm supply in dry and typical years as drought protection for CVP-Friant and CVP-Delta districts that deliver the water using Semitropic WSD facilities. Delano-Earlimart ID and Shafter-Wasco ID are CVP-Friant contractors and Kern-Tulare WD receives CVP-Delta supplies. The 50-cfs return conveyance capacity will allow completion of exchanges that involve conveyance of water to Shafter-Wasco ID and to the Friant-Kern Canal during dry and typical water years.

The primary goal of the Project is to enable CVP Contractors to complete delivery of water that is now being delivered to Semitropic WSD from the CA Aqueduct, which is water that needs a mechanism or facility to wheel the water through Semitropic into Shafter-Wasco. This project will provide Friant Contractors a mechanism for implementing the San Joaquin River Settlement, Water Management Goal for recovery of fisheries in the San Joaquin River. The return of Friant Contractor water delivered to the San Joaquin River for environmental uses and conveyed south of the Sacramento-San Joaquin Delta is referred to as “Recirculation Water” and is part of the water management goals of the San Joaquin River Settlement. Exhibit 3.1-1 below presents a selection of the Poso IRWM Plan Objectives, and how the Project Goals and Objectives coincide with them:

Exhibit 3.1-1

IRWM Plan Objectives	Project 1 Goals and Objectives
<p><u>Primary:</u> Enhance Water Supply Reliability of Surface Supplies</p>	<p>Project 1 enhances water reliability since it provides 50-cfs return conveyance capacity to enable return of up to 30,000 acre-feet per year of CVP water to return to neighboring CVP partner districts for meeting the Water Management Goal of the San Joaquin River Settlement and Restoration.</p>
<p><u>Secondary:</u> Provide a mechanism for Environmental Water Management outside of the Region; Provides Drought Protection for the Region</p>	<p>Increases operational flexibility by 50-cfs and allows for delivery and wheeling of water to help accomplish San Joaquin River, Environmental Water Management goals and provide drought protection.</p> <p>The Project will enhance Water Supply Reliability by delivering an average annual 10,000 to 20,000 acre-feet per year of water conveyed from west to east from Semitropic to Shafter-Wasco ID and to the Friant-Kern Canal. Project 1 accomplishes the increase through a conveyance system modification by connecting CVP districts that need to receive supply in a dry and typical water year by a different route than past delivery using the Friant-Kern Canal. For the purpose of the benefit analysis, the lower, conservative average annual amount of 10,000 acre-feet per year was used; the Poso Creek RWMG expects the use to be much greater based on discussions related to future operations.</p>

IRWM Plan Objectives	Project 1 Goals and Objectives
Region; Provides Drought Protection for the Region	The Project will enhance Water Supply Reliability by delivering an average annual 10,000 to 20,000 acre-feet per year of water conveyed from west to east from Semitropic to Shafter-Wasco ID and to the Friant-Kern Canal. Project 1 accomplishes the increase through a conveyance system modification by connecting CVP districts that need to receive supply in a dry and typical water year by a different route than past delivery using the Friant-Kern Canal. For the purpose of the benefit analysis, the lower, conservative average annual amount of 10,000 acre-feet per year was used; the Poso Creek RWMG expects the use to be much greater based on discussions related to future operations.
Maintain groundwater levels at economically viable pumping lifts	Project 1 increases conveyance capacity connecting supply with in-lieu and direct recharge activities. As available supplies are connected to more service areas for in-lieu banking and direct recharge is available for surface supply, less water is pumped from the shared groundwater basin. This results in a slowing, or reversal, of groundwater level decline.
Protect the quality of groundwater and enhance where practical	Declining water levels leads to certain water quality degradation such as higher TDS and arsenic. The Project would help avoid the need for costly water treatment.
Maintain water supply costs at a level commensurate with the continued viability of the agricultural economy which has developed in the area	Ability to move water from the Semitropic Water Storage District to Shafter-Wasco ID and to the Friant-Kern Canal enhances the CVP Contractors ability to manage "Recirculation Water", which is surface supplies involved with the San Joaquin River Settlement. Implementing the Water Management Goals for the San Joaquin River Restoration will require water to be recaptured south of the San Joaquin-Sacramento Delta and returned to the Friant Contractors. The management of the Recirculation Water will cost more energy to deliver; therefore, a grant supplementing this facility will help maintain local water supply costs at viable levels for local businesses.

3.1.1.2 Purpose and Need

Semitropic Water Storage District, Shafter-Wasco Irrigation District, Kern-Tulare Water District, and Delano Earlimart Irrigation District are proposing to construct a 50-cfs water conveyance intertie, identified as the Madera Avenue Intertie, and are requesting a grant through the Poso Creek IRWM Plan to assist with funding. The location of the facilities to be constructed will be within Semitropic and Shafter-Wasco's district boundaries; however the direct beneficiaries will be Semitropic, Shafter-Wasco, Kern-Tulare, Delano-Earlimart, and the region's groundwater basin. In this regard, the sponsoring districts (Semitropic, Shafter-Wasco, Kern-Tulare, and Delano-Earlimart) will share the costs under a cost sharing agreement. The Project is intended to serve several purposes, which include the following:

- Provide west to east conveyance capacity, up to 50-cfs, 100 acre-feet per day and up to 30,000 acre-feet of dry-year or typical year yield, for conveying, CVP or SWP water through Semitropic to a CVP Contractor's District, specifically, into Shafter-Wasco ID from Semitropic or to other CVP Contractors via delivery to the Friant-Kern Canal;
- Provide a means for delivering previously banked Delano-Earlimart ID, Shafter-Wasco ID, and Kern-Tulare WD CVP water stored in Semitropic, into Shafter-Wasco ID or to the Friant-Kern Canal for exchange of Shafter-Wasco ID's contract supply or another

CVP Contractor's supply that can be delivered to Delano-Earlimart ID and Kern-Tulare WD upstream of Shafter-Wasco ID' intake from the Friant-Kern Canal;

- Provide drought protection for the established economy within the Poso Creek Region; and
- Increase operational flexibility to absorb wet-period supply and to enhance environmental water management for environmental resources outside of the Poso Creek IRWM Region.

Beneficiaries include SWP and CVP Contractors, including Poso Creek IRWM Plan RWMG members, specifically, Semitropic WSD, Shafter-Wasco ID, Kern-Tulare Water District, Delano-Earlimart ID, and the Disadvantaged Communities within the Region who rely on groundwater for their drinking water supply. The surrounding communities and the other members of the Poso Creek RWMG, North Kern WSD and Cawelo WD, all rely on the common groundwater basin, therefore, any conveyance facility improvements that allow more flexibility of surface water delivery enhances the reliability of the basin's water supply. These entities are neighboring districts that share the common groundwater basin with environmental and urban uses.

The Project is intended to serve several purposes; however, one of the most significant is the greatly enhanced ability to complete exchange arrangements and enhance banking programs to replace loss of water supplies, with the overarching goal of improving the water supply reliability to the Poso Creek IRWM Plan region. The Project sponsors are trying to mitigate any impacts due to the uncertainty of future water supplies to deal with the following:

- Reduced reliability of water exported from the Sacramento-San Joaquin Bay/Delta as a result of environmental and regulatory impacts;
- Reduced availability and changes in timing of CVP water supplies from the Friant-Kern Canal due to the settlement on the San Joaquin River;
- Changes in timing of Kern River water supplies due to safety-of-dam issues at Lake Isabella; and
- Expiring long-term contracts between agricultural districts and the City of Bakersfield for delivery of Kern River water.

The Project sponsors have managed water conjunctively for many years; however, the physical capacity to convey water west to east across the Poso Creek IRWM Region is limited. While the Madera Avenue Intertie focus is on return of environmental water, the potential benefits are much broader. The recently adopted IRWM identified interconnections between neighboring water districts as a key element for regulating water supplies available to the Region to mitigate losses in water supply reliability, which includes the three principal sources of surface water in the Region --- local Kern River water and imported CVP and California State Water Project water. Semitropic's capability to deliver water to Shafter-

Wasco, with Shafter-Wasco and other project sponsors returning a like amount of its contract supply is a key means of returning water and thereby completing the water supply regulation which is needed within the region.

3.1.1.3 Project Abstract

The Madera Avenue Intertie (Project) will provide up to 50-cfs of west to east conveyance capacity; add 100 acre-feet per day of return conveyance capacity; and add up to 30,000 acre-feet of dry-year and typical year yield for neighboring water districts. The primary purpose is to return “Recirculation Water” to CVP Contractors in the Poso Creek IRWM Region by wheeling the water through Semitropic. The Project will add flexibility in managing surface supplies utilizing Semitropic’s existing conveyance facilities and provides a means to complete exchanges with neighboring water districts. More importantly the project will help neighboring water districts greatly enhance their ability to complete exchange arrangements and enhance banking programs to replace loss of water supplies, with the overarching goal of improving the water supply reliability to the Poso Creek IRWM Plan region. The project sponsors are trying to mitigate any impacts due to the uncertainty of future water supplies to deal with the following:

- Reduced reliability of water exported from the Sacramento-San Joaquin Bay/Delta as a result of environmental and regulatory impacts;
- Reduced availability and changes in timing of CVP water supplies from the Friant-Kern Canal due to the settlement on the San Joaquin River;
- Changes in timing of Kern River water supplies due to safety-of-dam issues at Lake Isabella; and
- Expiring long-term contracts between agricultural districts and the City of Bakersfield for delivery of Kern River water.

The Project, which is expected to start construction in 2014, specifically adds return conveyance capacity from Semitropic for CVP contractors to implement Water Management Goals established under the San Joaquin River Settlement and provides synergy with the recently completed non-structural water management measures implemented since adoption of the Poso Creek IRWM Plan (agreements for banking and exchanges among the Poso Creek IRWMP districts), and several structural improvements between SWP, CVP, and Kern River contractor districts.

The Project, designed at a preliminary 10-percent design level, can move quickly into construction since the Project is a fairly straightforward design of a pumping plant and pipeline.

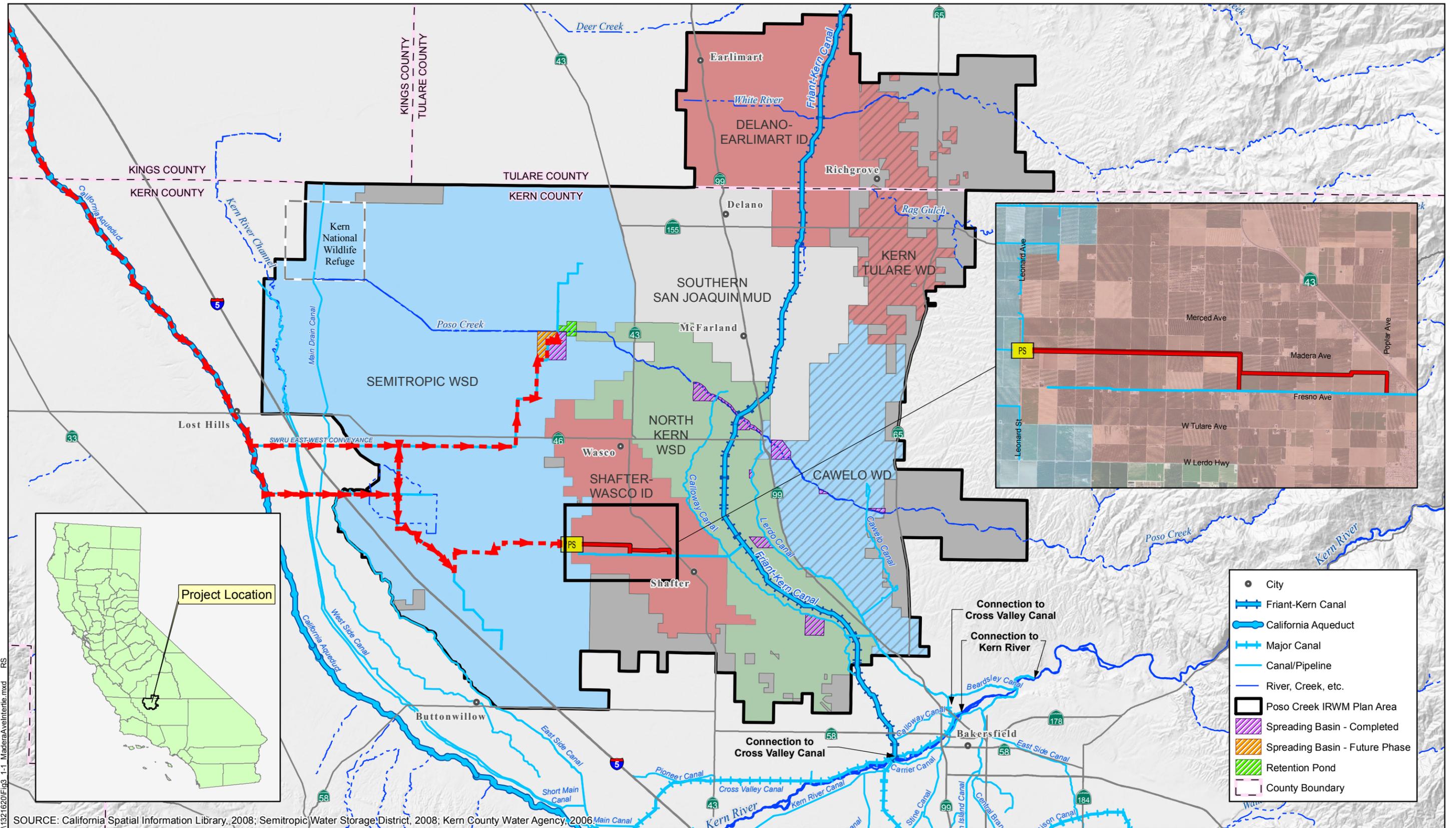
3.1.1.4 Integrated Elements of Project

The Madera Avenue Intertie project is one of a number of high-priority Projects in the Poso Creek IRWM Plan that will allow SWP and CVP Contractors more flexibility in managing supplies that have been reduced by a number of regulatory actions including the San Joaquin River Settlement and loss of reliability from the Sacramento-San Joaquin Delta issues. The Poso Creek IRWM Plan identified the need to support water management for issues outside of the IRWM Region. The Madera Avenue Intertie project specifically helps to implement **Project No. 27 - Environmental Water Management in Support of Wildlife Settlements Outside of the IRWM Region of the Plan.**

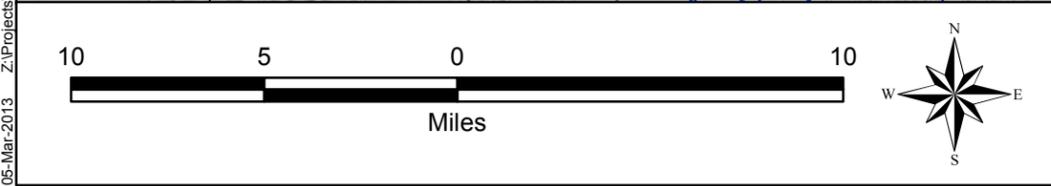
In general, the Poso Creek Plan identified non-structural and structural projects that focus on providing benefit towards meeting the Region's highest priority; increasing water supply reliability to the Region. Several high-priority projects identified in the Poso Creek IRWM Plan, which are not part of this grant application, have been constructed since the Poso Creek Plan adoption in July of 2007. Conveyance facilities that link North Kern's Calloway Canal to the North and South mainline systems in Shafter-Wasco ID are completed and operational; both the North (Poso Plan Project No. 14) and South Interconnections between North Kern WSD and Shafter-Wasco ID (Poso Plan Project No. 19) received funding from Reclamation's WaterSMART program. Both interconnections were used in 2012 to convey water to Shafter-Wasco ID and provide a mechanism to complete water exchanges among the Poso Creek IRWM RWMG. The proposed Madera Avenue Intertie project adds an important west to east conveyance capacity from Semitropic to enhance exchange capacity, and provides a mechanism to complete agreements by adding west to east capacity for the participants within Poso Creek IRWM Plan Region. Adding this structural component is a key component to allow implementation of regional exchange agreements that are now possible since the Poso Creek IRWM Plan's districts have completed the necessary CEQA and NEPA documents to allow for immediate operational use of facilities identified in the environmental documents.

3.1.1.5 Regional Project Map

The Madera Avenue Intertie project is a regional conveyance connection, shown on Figure 3.1-1. The Project connects Semitropic's Lateral B-230 (part of Semitropic's B-230 System) to Shafter-Wasco ID's mainline of their South System, Lateral 137.2. The intertie will allow for delivery of SWP, CVP-Delta, or CVP-Friant water supplies between Semitropic and Shafter-Wasco ID and will also allow delivery to the Friant-Kern Canal to integrate the water supplies into a demand pool of CVP Contractors. The Project connects regional conveyance facilities with the banking facilities within Semitropic. Water delivered through or banked in Semitropic can be conveyed to lands served by the South System in Shafter-Wasco ID and to the Friant-Kern Canal, allowing water to be delivered to CVP Contractors and to complete banking and exchanges within the Region.



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



Poso Creek IRWMP Implementation Grant Proposal
 Poso Creek IRWMP Region



MADERA AVENUE INTERTIE PROJECT 1 LOCATION
 MARCH 2013
 FIGURE 3.1-1

05-Mar-2013 Z:\Projects\13271620\Fig3_1-1_MaderaAveIntertie.mxd RS

3.1.1.6 Completed Work

Since adoption of the Poso Creek Plan, the Madera Avenue Intertie project has been discussed by the Poso Creek Plan Regional Water Management Group (RWMG) as a key component for increasing the west to east conveyance capacity from Semitropic's facilities to the neighboring districts within the Region. From October 2012 through March 2013, a preliminary design and cost estimate was prepared at the 10-percent design level. This proposal includes an assessment of costs and benefits for the Project based on this preliminary engineering.

Work that is expected to be completed prior to the grant award date (October 2013) will include submitting an application to DIR to obtain certification of a Labor Compliance Program for Semitropic. The funding partners will work on an operations agreement for use of the Intertie. The environmental work, including an environmental assessment (Initial Study under CEQA), acquisition of the necessary project rights-of-way, and final engineering will commence once an award for the Grant agreement has been made. Once grant funding is secured, the design will be finalized for contracting.

An agreement with the participating Districts for use of the Project for banking and exchanges, construction cost sharing, and operation of the Project will be formally adopted prior to the start of construction. The Poso Creek IRWM MOU has provisions for cost sharing of projects and several of the districts within the Poso Creek RWMG have jointly constructed projects.

Semitropic WSD, Shafter-Wasco ID, Kern-Tulare WD, and Delano Earlimart ID are currently engaged and have scheduled discussions regarding the terms of use agreement outside of the regularly-scheduled Poso Creek IRWM Plan meetings.

Engineering plans resulting from the design work that has been completed to date are included as Appendix 3.1-1 to this section of Attachment 3.

3.1.1.7 Existing Data and Studies

Summaries of the following technical studies are included in Section 7 Technical Justification of Projects, for the Madera Avenue Intertie project.

“Shafter-Wasco Irrigation District, System Optimization Review and Improvements”, 2009, a specific component of the System Optimization Review for the Poso Creek IRWM Plan Area.

“Plan of Action for Poso Creek Plan Region”, System Optimization Review for the Poso Creek IRWM Plan Area, conducted from October 2008 through September 2010 (funded by a Reclamation WaterSMART grant).

3.1.1.8 Project Map

Figure 3.1-1 includes a site map showing the Project's geographical location and the surrounding work boundaries.

3.1.1.9 Project Timing and Phasing

This project is not part of a multi-phased project; it is a standalone project and is fully functional without implementation of subsequent projects. The majority of the work would commence once notice is received of a Grant award. The proposed schedule for implementation of the Project is included in Attachment 5, which matches with the project budget which is presented in Attachment 4. The Project will be constructed over a 1 to 1.5-year period.

Implementing Agency and Management of Project

The proposed Project will be implemented by Semitropic WSD in cooperation with Shafter-Wasco ID, Kern-Tulare WD, and Delano-Earlimart ID (Project sponsors). Paul Oshel, District Engineer for Semitropic WSD, is the representative for the Applicant and will provide overall Project Management. Mr. Oshel will work closely with the other Project sponsors and will work closely on the technical design and construction of the project components. Semitropic WSD has an engineering services contract in place with GEI Consultants, Inc. (GEI), an engineering consulting firm who will provide design, construction management, administrative, and reporting assistance as requested. In this regard, Semitropic operates with a minimal professional staff and has maintained a long-standing relationship with the consultant, who is both familiar with District facilities and operations. The sequencing of work is addressed in Attachment 5, which presents and discusses the Project Schedule. The status and construction progress of the Project will be reported to the Poso Creek Plan RWMG. As described in Attachment 6, a written Monitoring and Reporting Plan will be developed and be the basis for documenting construction and operations that meet project objectives. As part of the reporting, the quantities of water conveyed through the Intertie will be measured and reported to Reclamation as part of agreements to convey CVP water.

3.1.2 Proposed Work

Several tasks have been defined to complete the work and are organized to track with the Project Budget and Schedule. The sequencing of the work is addressed in the Project Schedule. Below is a description of the tasks that are part of the Work Plan.

3.1.2.1 Direct Project Administration Category (a)

Task 1 –Project Administration

With regards to project administration, work will include coordination of all project activities including budget, schedule, communication, and grant and cost-share administration (preparation of invoices and maintenance of financial records). Work related to grant administration will include: review and execution of DWR Grant Contract; attending Grant kick-off meeting with DWR personnel; coordination of field visits with DWR personnel; preparation of invoices and maintenance of financial records; preparation of requests for Grant modifications (if any); and preparation of Grant deliverables as required.

As part of the Grant’s administration, activities will include coordination of projects for local sponsors. Activities will include: coordinating the preparation of a Sub-grantee agreement to be executed between the grant recipient and the local sponsors; hosting a workshop with local sponsors to discuss grant requirements and establish the lines of communication and coordination through the grant process; coordinating preparation and submittal of all required reporting, including monitoring discussed in Attachment 6 of this application, with local sponsors; coordination of preparation of reimbursement requests and grant modifications with the local sponsors as required; and coordinating other grant activities with local sponsors.

It is expected that a formal sub-grantee agreement between the recipient and the local sponsors will be executed setting forth requirements for grant compliance. Coordination between the grant recipient and the local sponsors will be achieved by conducting a formal workshop to kick-off the grant and subsequent formal meetings, email and telephone communication etc. It is noted that the participants of the Poso Creek Integrated Regional Water Management Group meets regularly and some time will be set aside at these meetings to coordinate any grant activities.

With regards to project financing, activities will include coordinating the development of a funding agreement for execution between funding partners.

This work will be initiated when a notice of a Grant award is received.

Deliverables: (1) Preparation of invoices and grant modifications; (2) grant administration; and (3) preparation of other deliverables as required.

Task 2 – Labor Compliance Program

A third-party consultant will be retained to develop and implement a Labor Compliance Program (LCP). The LCP will follow the rules of the California Department of Industrial Relations (DIR). The LCP will enforce the prevailing wage requirements as stipulated in the Labor Code Section 1771.5. The goal of the LCP will be to accomplish the following: inform

contractors about their prevailing wage obligations; monitor compliance by obtaining and reviewing certified payroll records throughout the construction of the project; investigate complaints and other suspected violations; and take appropriate actions when violations are found. Monthly reports will be prepared which will document compliance throughout construction of the project. An LCP will be developed and implemented prior to commencing construction.

This work will be initiated prior to commencing with construction.

Deliverables: (1) Submit application to Department of Industrial Relations for approval of LCP; and (2) development and implementation of an LCP.

Task 3 – Reporting

Work under this task will include preparing and submitting all reports as required as part of the Monitoring and Reporting Plan. Based on inspection of a template of the DWR Grant Agreement it is expected that the following reports will be prepared and submitted: Quarterly Progress Reports; Project Completion Reports; Grant Completion Report; and Project Performance Reports. Below is a description of each report.

Quarterly Progress Reports will be prepared and will provide a brief description of the work performed, description of project activities, milestones achieved, any accomplishments and any problems encountered in the performance of the work during the reporting period. Construction and operational monitoring described in Attachment 6 to this application will be included in the quarterly reports. Activities will also include coordinating the preparation and submission of the Quarterly Progress Reports with the local sponsors.

A Project Completion Report will be prepared after completion of the project and will include a description of actual work done, any changes or amendments to the project, and a final schedule showing actual progress versus planned progress, and will include all project deliverables as attachments (if any). Construction and operational monitoring described in Attachment 6 to this application will be included in the Project Completion Report. Activities will also include coordination with local sponsors for the preparation and submission of the Project Completion Reports for all projects.

A Grant Completion Report will be submitted after all projects (including those of the local sponsors) have been completed. The Grant Completion Report will include a description of the reimbursement status, a brief description of each project completed, and how those projects will further the goals of the IRWM Plan and identify any changes to the IRWM Plan, as a result of project implementation. Construction and operational monitoring described in Attachment 6 to this application will be included in the Grant Completion Report.

A Project Performance Report for each project will be prepared and submitted after the first operational year of a project has elapsed and annually for a total of 10 years after. Operational monitoring described in Attachment 6 to this application will be the basis for the Project Performance Report. Activities will include coordination with local sponsors for the preparation and submission of the Project Performance Report for all projects.

In addition, the Project will comply with any other reporting requirements specified in the Grant Agreement. This task will be implemented once an award is made and a Grant Agreement has been executed.

This work, including development of a Monitoring and Reporting Plan, will be initiated when a notice of a Grant award is received.

Deliverables: Submission of quarterly progress reports, project completion reports, grant completion reports and project performance reports as specified in the Grant Agreement.

3.1.2.2 Land Purchase/Easement Category (b)

Land Purchase/Easement

The proposed Project will be constructed on private property. In this regard, it will be necessary to acquire the necessary easements (permanent and temporary easements for construction of the pipeline) and fee parcel (for construction of the pumping plant) prior to construction of the project. All the necessary project rights-of-way will be obtained by following the standard practice for easement acquisition which includes the following process: conduct field work to determine the best site layout and location for facilities (this work has already been completed); order litigation guarantees from a title company to confirm ownership of the rights-of-way parcels; initiate contact and maintain communication with the affected landowners; prepare legal descriptions and plats which include a written description and a drawing (plat) which show the proposed easement layout; and engage a certified agricultural appraiser to prepare appraisals of the fair market value of the easements.

Once the plats and legal descriptions have been prepared and the appraisals have been finalized, Legal Counsel will prepare the final offer package to send to the affected landowners. Their work will include: preparation of the offer letters for just compensation for the purchase of the project easements; preparation of the easement deed; and compilation and transmittal of the final package which includes the offer letter, easement deed, appraisal and legal plat and description.

Once the final packages have been transmitted to the affected landowners, the final process will include securing signatures for the easement deed and filing the document with the County recorder's office.

Prior to construction of the Project, a certified agricultural appraiser will visit the project site to document the pre-project field conditions. This will assist the appraiser in preparing any crop damage assessments which will be prepared after construction has been completed. Payment for any crop damages will be made to the affected landowners after the construction work has been completed.

The acquisition of easements has not been initiated. It is expected that if successful in obtaining grant funding, the process will be initiated and will be completed prior to construction commencing.

It is anticipated that the project easements will be acquired through the conventional right-of-way acquisition process, and it is not expected that easements will be acquired by eminent domain actions.

Deliverables: Obtain easements necessary for construction of the project.

3.1.2.3 Planning/Design/Engineering/Environmental Documentation Category (c)

Task 4 – Assessment and Evaluation

Starting in 2006, as part of the Poso Creek IRWM Plan development, the Districts investigated the feasibility of potential interties between Semitropic WSD and Shafter-Wasco ID. In 2007, a preliminary conceptual design was provided for the Poso Creek IRWM Plan for intertying between neighboring water districts at four separate locations. From October 2008 through September of 2010, the Poso Creek RWMG completed a System Optimization Review (SOR) covering the water conveyance facilities and operations of the Poso Region; the SOR was partially funded by the US Bureau of Reclamation, WaterSMART Program. As part of the overall regional SOR, the task was to conduct a focused System Optimization Review of the Shafter-Wasco ID conveyance system. Based on these evaluations and work completed in the System Optimization Review of Shafter-Wasco ID's distribution system, the Madera Avenue Intertie project was the recommended project to improve Shafter-Wasco IDs South System and the Kimberlina Avenue Intertie was recommended on the North Distribution System. As part of the SOR, the Poso Creek RWMG was able to evaluate and recommend a sequence in completing the structural improvements; several conveyance projects have been completed ahead of the Madera Avenue Intertie that will allow the benefits of the added conveyance to be readily realized once completed. In addition to the structural improvements, the SOR allowed for the completion of non-structural project; the development of two environmental documents covering operations in the Region for banking, transfers, and exchanges of water among the six Poso Creek RWMG members. An Initial Study under CEQA was completed in November, 2010 and an Environmental Assessment under NEPA was signed by Reclamation in May, 2012. The two environmental documents allow use of each of the conveyance improvements in the Poso Region once constructed under separate environmental compliance for the construction of each project.

Future work under this task will include (1) developing an Operator's Agreement between project sponsors for joint use and operation of the project facilities; and (2) preparation of a maintenance and operation manual for the facility.

This work will be initiated when a notice of a Grant award is received.

Deliverables: (1) Operator's Agreement; and (2) Maintenance and Operation Manual.

Task 5 – Final Design

A preliminary design has been completed at the 10-percent design level. Work that was performed as part of the preliminary design included performing a preliminary hydraulic analysis that analyzed the pipeline for maximum steady-state flows and maximum and minimum system pressures; determined the pipeline diameter and hydraulic gradient for the proposed pipe alignment and determined the pumping plant capacity and size. As part of the preliminary design, major facilities, including the pumping plant and pipeline alignment were located. A copy of the 10-percent level design drawings are included in Appendix 3.1-1. Work under this task will include preparing the final design of the project at the 100-percent design level. Work under this task will be accomplished by completing the following subtasks:

- Subtask 5-1 – Final Hydraulic Analysis
- Subtask 5-2 – Geotechnical Investigation
- Subtask 5-3 – Surveying and Aerial Mapping
- Subtask 5-4 – Utility Verification
- Subtask 5-5 – Final Design
- Subtask 5-6 – Construction Cost Estimates
- Subtask 5-7 – Preparation of Plans and Specs

The subtasks described below have not been completed. It is expected that this work will be completed in parallel with other critical tasks. The subtasks are described in more detail below.

Subtask 5-1 – Final Hydraulic Analysis – A preliminary hydraulic analysis has been prepared as part of early work performed. Further work will include finalizing the hydraulic analysis evaluation to confirm system efficiency. Activities will include performing a transient analysis and making a recommendation for surge mitigation measures. The proposed project will tie-in to several existing systems that are in operation and it will be important to evaluate surge protection measures to ensure system efficiency at all tie-in locations.

Subtask 5-2 – Geotechnical Investigation - A geotechnical investigation will be made along the pipeline alignment and at the pumping plant site. The geotechnical investigation will include drilling exploratory borings, analyzing the borings cuttings, and the preparation of an engineering report that will provide:

- Description of the geologic setting
- Soils profile and subsurface conditions
- Groundwater conditions
- Structural design parameters including allowable soil bearing pressures, soil foundation, lateral soil pressures and seismic criteria
- Engineering conclusions and recommendations

The geotechnical report will evaluate existing subsurface conditions and provide parameters necessary for final design.

Subtask 5-3 – Surveying and Aerial Mapping – Surveying to establish the horizontal and vertical control of the project will be completed for use for project facility design and construction. The surveying work will include pipeline alignment to confirm hydraulic gradients. Permanent survey monuments (if they don't already exist) will be installed to provide vertical and horizontal control for design and construction. An aerial flight of project locations (including alignments) to produce digital photographic and digital topography mapping will be ordered. The survey will be based on the datum that is currently being relied on.

Subtask 5-4 – Utility Verification – This subtask will include coordination with utility companies impacted by the project. All utility companies will be contacted to obtain current information on the type and location of their facilities. The location (vertical and horizontal location), type, and size of the utility will be verified. This information will be incorporated into the design drawings.

Subtask 5-5 – Final Design – This subtask will consist of the layout and design of the project elements in the form of drawings and technical specifications at the 100-percent level. Drawings will be prepared showing construction limits, survey control points, borrow and staging areas, environmental protection requirements, construction access roads/limits of work area, and site restoration requirements. Also, drawings will be prepared showing site excavation and grading requirements, pipeline installation requirements, structural work, civil work, mechanical work, and electrical work. The resulting drawings will be incorporated into the bidding documents.

Subtask 5-6 – Construction Cost Estimates – A preliminary engineer's estimate has been prepared based on the completion of the 10-percent level design. A more refined engineer's

estimate will be prepared based on more details when the final design has been completed. The more refined engineer's cost estimate will be prepared for construction of the project elements, as well as for evaluation of construction bids. The cost estimate will be a budget level estimate, and construction contingencies and escalations appropriate to this level of estimate. Quantity takeoffs will be prepared in support of the cost estimate. The quantity takeoffs will also be used in developing the bid schedule.

Subtask 5-7 – Preparation of Bid Documents - Contract documents will be prepared in anticipation for procuring a construction contract. The contract documents are expected to include front-end specifications; a defined scope of work; construction bid schedule; measurement and payment provisions; drawings; technical specifications and special provisions as necessary, including environmental and permitting requirements. Existing Specifications will be used and be modified to reflect the requirements specific to this project.

Work under this task will commence once notice of a Grant award has been received.

Deliverables: Completion of project plans and specifications at the final level (100% level).

Task 6 – Environmental Documentation

Pursuant to the California Environmental Quality Act (CEQA), it is anticipated that an Initial Study will be prepared for construction of the project which will evaluate the project's potential for significant effects on the environment. It is anticipated that the Initial Study will indicate that the Project environmental compliance can be met through the preparation and filing of a Negative Declaration. The Poso Creek RWMG has recently completed CEQA and NEPA environmental documents that allow the districts to bank, transfer, and exchange water supplies over the next 25 years and to utilize facilities for water management agreements once they are constructed. In this regard, an environmental document for operation of the Project is already in place. The following subtasks will be performed as part of this task.

Subtask 6-1 – Project Description – Develop a project description to support the CEQA evaluation and prepare a preliminary assessment of necessary field evaluations including biological and archeological evaluations.

Subtask 6-2 – Perform Technical Studies – Biological and archeological evaluations will be performed to comply with accepted environmental review standards and support environmental compliance and regulatory permitting requirements.

Subtask 6-3 – Environmental Impact Analysis – An Initial Study/Negative Declaration will be prepared to satisfy the requirements of CEQA. As part of this process, activities will include preparing and distributing a Notice of Preparation (NOP); hosting public scoping

meetings; preparing recommendation for consideration by the Board of Directors; providing technical support at the District's Board meeting to consider adoption of the Negative Declaration; and filing the Notice of Determination of the Negative Declaration once adopted. If the Initial Study concludes that there are potentially significant impacts that cannot be mitigated, an Environmental Impact Report (EIR) would be prepared.

The CEQA Initial Study work has not been completed. Work under this task will commence once notice of a Grant award has been received. Any mitigation requirements will be incorporated into the Monitoring and Reporting Plan and results included in Quarterly Progress Reports and Project Completion Reports.

Deliverables: (1) Prepare an Initial Study/Negative Declaration; and (2) file the Notice of Determination.

Task 7 – Permitting

It is anticipated that no regulatory permits will be required, inasmuch as the work will be performed within private property in already disturbed farm land. In this regard, only permits related to construction will be required and application will be made for these permits prior to construction commencing. A summary of permit compliance activities will be included in the Monitoring and Reporting Plan

County Road Encroachment Permit – Application will be made to the Kern County Roads Department to obtain an encroachment permit for crossing County roads. Work will include submitting an encroachment permit application and initiating contact with the County Roads Department to ensure timely processing of the application.

National Pollutant Discharge Elimination System (NPDES) Permit – Application will be made to the State Water Resource Control Board for an NPDES permit related to storm water discharges from construction activities (such as clearing, grading, excavating, and stockpiling). A Notice of Intent (NOI) will be submitted certifying that all permit's eligibility conditions have been met. As part of the preparation of an NOI, a State Water Pollution Prevention Plan (SWPPP) will be developed and implemented during construction of the Project. The SWPPP will spell out Best Management Practices to prevent waste and pollutants into surface water and underground water sources. This permit will be obtained immediately prior to construction.

PM-10 Dust Control Permit – Application will be made to the San Joaquin Valley Air Pollution Control Board for a PM-10 Dust Management Plan permit. This permit will require that a dust control management plan be prepared and implemented during construction to prevent air pollution.

Bids for construction will be solicited through the competitive bidding process on the basis of final plans and specifications. The standard specifications include language relating to the

contractor obtaining permits and approvals prior to construction. In particular, the standard language in the specifications states “The Contractor is an independent contractor and shall, at his sole cost and expense, comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the work, obtain all necessary permits and licenses therefor...” Compliance with any requirements will be monitored and results included in the Monitoring and Reporting Plan and reported through Quarterly Progress Reports and Project Completion Reports.

Finally, it is noted that the agricultural districts are not subject to the County’s jurisdiction with regard to building and grading permits.

Deliverables: Obtain all permits prior to construction.

3.1.2.4 Construction/Implementation Category (d)

Task 8 – Construction Contracting

A Contract for construction of the Project will be competitively bid; accordingly, the work will include publish notice soliciting bids; conduct job-site tour for prospective bidders; respond to contractors’ questions; issue addenda to specifications if required; open and evaluate bids, including costs, required bonds, suppliers and subcontractors, and checking bidder’s references and experience successfully executing this type of work; award of contract; and issuance of the Notice to Proceed. This task will be implemented once the project has been designed at the 100-percent design level and the Contract bidding documents have been completed as part of Task 5-Final Design.

Deliverables: (1) Advertise for bids; (2) conduct pre-bid meeting; (3) award the contract; and (4) issue the Notice to Proceed.

Task 9 – Construction

Activities under this task include construction of all project work. Below is a description of all subtasks.

Subtask 9-1 – Mobilization and Site Preparation:

Mobilization – Work will consist of the mobilization of the contractor's forces and equipment necessary for performing the work required under the contract. Mobilization activities will include transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the contractor's operations at the site; and securing all bonding.

Site Preparation – Work will include surveying the limits of the work area and clearing and grubbing the work area prior to construction work commencing.

Subtask 9-2 – Project Construction: Work under this task would include all activities necessary for construction of the project to be performed by a qualified Contractor. The process for selecting a contractor is described in Task 8 above. Activities will include procurement of all materials/equipment; site preparation; potholing pipeline alignment to identify existing utilities; coordination of subcontractors; and construction of all contract work.

The work will include construction of the Madera Avenue Intertie Pipeline and Madera Avenue Intertie Pumping Plant. Both components are described in detail below.

The construction components to be completed for the Madera Avenue Intertie Pipeline include: furnishing, installing, and testing 30” PVC pipe; furnishing and installing all appurtenances for pipeline alignment, including butterfly valves, air valves, and color-coded marker post installations; and completing all pipeline tie-ins.

The construction components to be completed for the Madera Avenue Intertie Pumping Plant include: furnishing, installing and testing closed-suction vertical turbine pumps; furnishing and installing steel manifold piping with appurtenant pump suction and discharge branch piping and associated valves and couplings; constructing reinforced concrete meter vaults (at two locations), including furnishing and installing bi-directional ultrasonic flowmeters; constructing fabricated steel standpipes at two locations; constructing air chambers at two locations; performing embankment construction, including site excavation and grading, gravel surfacing, chain-link fence and steel drive gates; and completing electrical work. Work will also include installation of a PH adjustment facility which includes installation of static mixer assemblies, sample/sump drain lines, chemical conduits, eyewash assembly/supply line, temporary containment area, and tank tie-downs.

Subtask 9-3 – Performance Testing and Demobilization: Testing and Commissioning - Work under this task will include all labor, material, and equipment to field start-up and test the project facilities. Part of the work under this task will include energizing the pumping plant and testing the pump and motor units to confirm that the pumps are operating at the designed pump curves. Part of the performance testing would also include testing the pressurized pipeline to determine if there are any leaks in the system and to verify that the flowmeters are working properly.

Demobilization - Activities include transportation of personnel, equipment, and supplies; disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

This work will be initiated when the work in Task 8-Construction Contracting has been completed.

Deliverables: (1) Construct all project work.

3.1.2.5 Environmental Compliance/Mitigation/Enhancement Category (e)

Task 10 – Environmental Compliance

With respect to environmental compliance, it is expected that the Initial Study/Negative Declaration will confirm that the project will not have a negative impacts on the environment. In this regard, it is expected that work under this task will be limited to retaining a certified biologist to conduct a pre-construction biological survey prior to construction commencing to confirm that no environmentally sensitive species are present at the project site at the time of construction. Accordingly, under this task, a pre-construction biological survey will be coordinated and monitoring will be provided (if required) during construction. The results of mitigation monitoring will be included in the Monitoring and Reporting Plan and reported through Quarterly Progress Reports and Project Completion Reports. Monitoring data will be developed in a manner to be consistent in form to any relevant State databases.

Deliverables: (1) Conduct pre-construction biological field surveys and report; and (2) report on biological monitoring (if necessary) during construction.

3.1.2.6 Construction Administration Category (f)

Task 11 – Construction Administration and Management

This task includes both field inspection and Contract administration where the latter includes the following activities: attend weekly construction meetings; process technical submittals; process Requests for Information (RFI's); review contractor schedule and cash flows; process contract change order requests; evaluate and process claims; prepare the monthly progress estimate; maintain as-built drawings and photographic records; and contract close-out.

With respect to field inspection, activities include inspection of materials and quality of work for conformance with the plans and Specifications including the following: verification of depth and invert elevations of facilities to be constructed; record quantities of materials received or used during specified periods; maintenance of daily logs of construction and inspection activities, including photographs; and coordination of concrete and earthwork testing in support of construction.

This work will be initiated when the work in Task 8 - Construction Contracting has been completed.

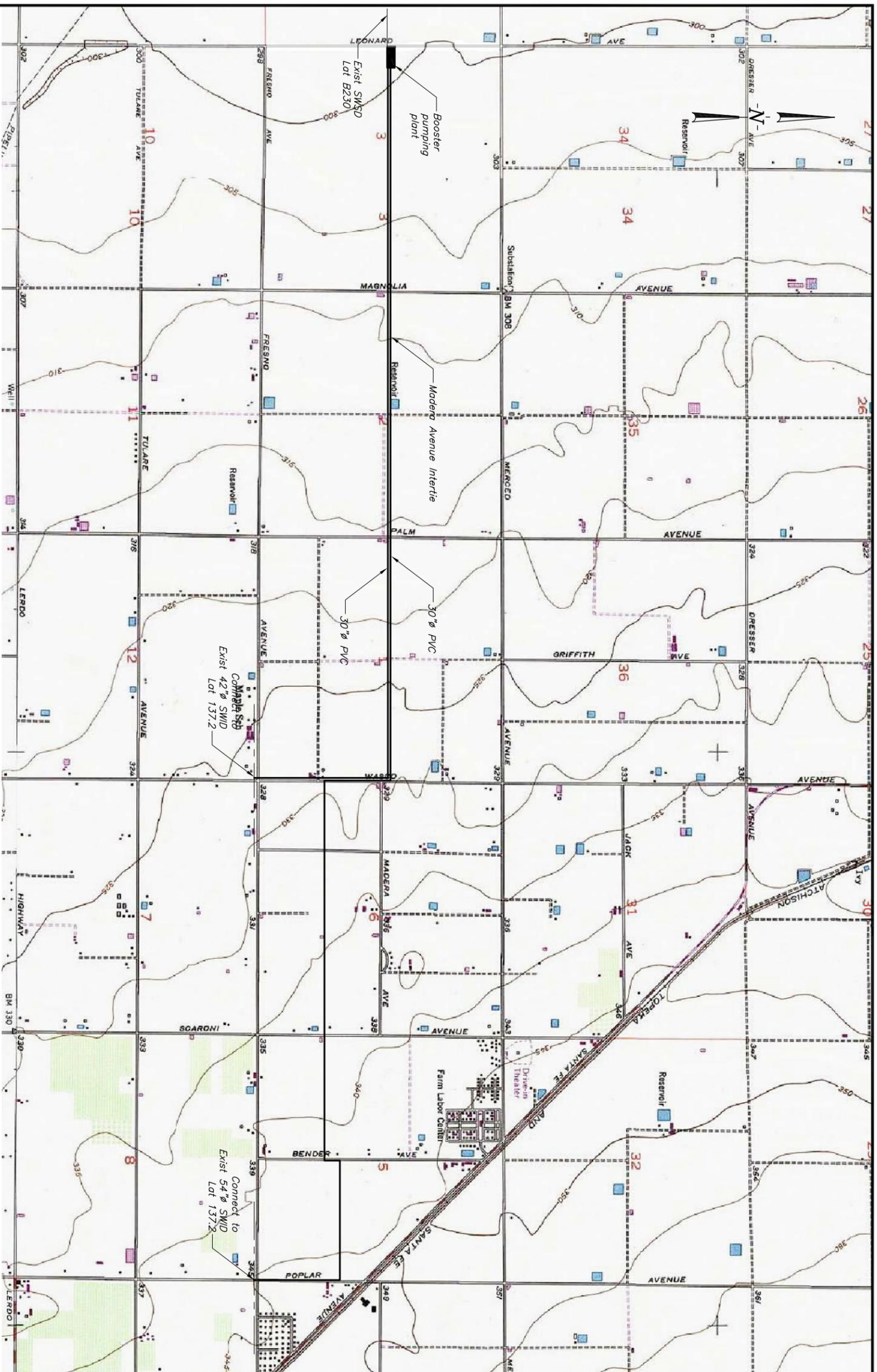
Deliverables: (1) Filing of the Notice of Completion; and (2) preparation of the “As-Built” plans.

3.1.3 Appendices

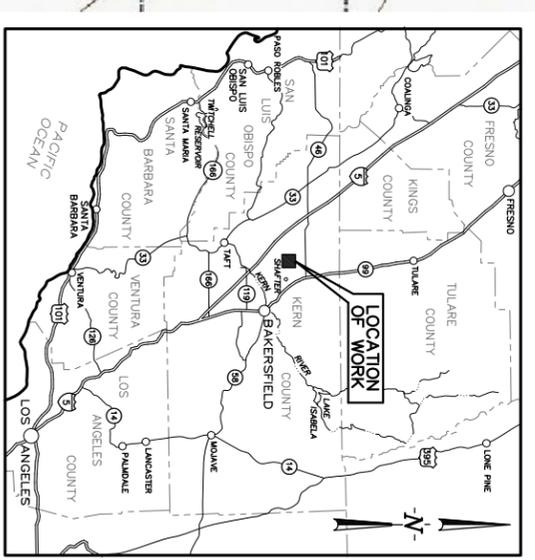
Appendices for this Project 1 Work Plan include:

- Appendix 3.1-1 – 10-Percent Level Design Plans
- Appendix 3.1-2 – Preliminary Engineering/ Evaluation Memo
- Appendix 3.1-3 – Plan of Action for Poso Creek Plan Region
- Appendix 3.1-4 – Shafter-Wasco Irrigation District, System Optimization Review & Improvements

The Data Management and Monitoring Deliverables are discussed in Attachment 6 of the application.



LOCATION OF WORK
No scale



VICINITY MAP
No scale

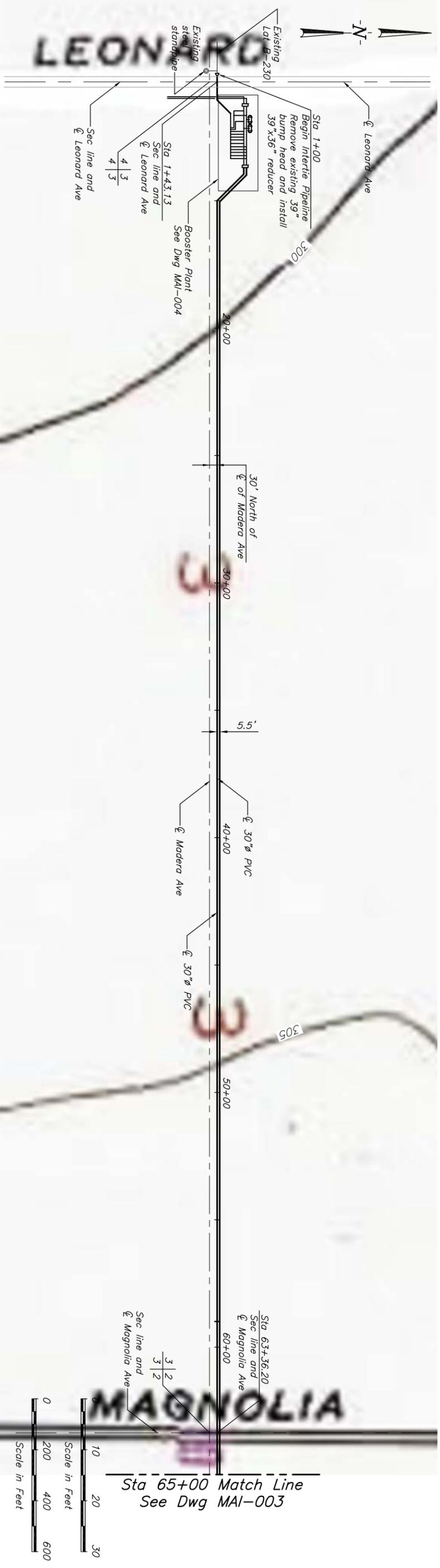
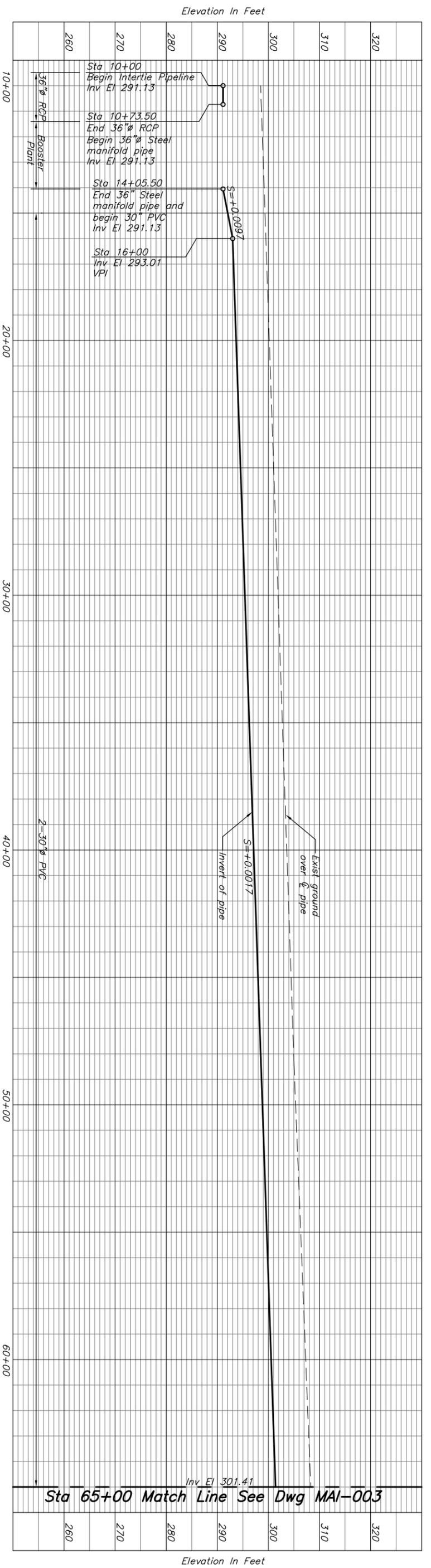
SHEET NO	DWG NO	DRAWING TITLE
1	MAI-001	Location of Work and List of Drawings
2	MAI-002	Plan and Profile - Sheet 1 of 6
3	MAI-003	Plan and Profile - Sheet 2 of 6
4	MAI-004	Plan and Profile - Sheet 3 of 6
5	MAI-005	Plan and Profile - Sheet 4 of 6
6	MAI-006	Plan and Profile - Sheet 5 of 6
7	MAI-007	Plan and Profile - Sheet 6 of 6
8	MAI-008	Booster Pumping Plant - General Plan
9	MAI-009	Booster Pumping Plant - Typical Can Pump Installation Details
10	MAI-010	Meter Vault - Sheet 1 of 2
11	MAI-011	Meter Vault - Sheet 2 of 2
12	MAI-012	Typical Pipe Trench Sections
13	MAI-013	Steel Pipe Specials and Fittings
14	MAI-014	Air Valves and Manholes
15	MAI-015	Thrust Blocks for Reducers and Bends
16	MAI-016	Thrust Blocks for Horizontal and Vertical Bends - PVC Pipe
17	MAI-017	Typical Welded Steel Standpipe
18	MAI-018	Typical Air Chamber
19	MAI-019	General Structural Notes
20	MAI-020	Typical Structural Details - Sheet 1 of 4
21	MAI-021	Typical Structural Details - Sheet 2 of 4
22	MAI-022	Typical Structural Details - Sheet 3 of 4
23	MAI-023	Typical Structural Details - Sheet 4 of 4
24	MAI-024	Miscellaneous Manifold Details
25	MAI-025	Concrete Foundation
26	MAI-026	Adjustable Flange Support and Pipe Support Details
27	MAI-027	Chain Link Fence Details

SEMITROPIC WATER STORAGE DISTRICT
KERN COUNTY, CALIFORNIA
GEI CONSULTANTS, INC.
BAKERSFIELD, CALIFORNIA



MADERA AVENUE INTERTIE
LOCATION OF WORK AND LIST OF DRAWINGS

DATE
March 2013
DRAWING NUMBER
MAI-001



Sta 65+00 Match Line
See Dwg MAI-003

Sta 65+00 Match Line See Dwg MAI-003

SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA
G&E CONSULTANTS, INC.
BAKERSFIELD, CALIFORNIA

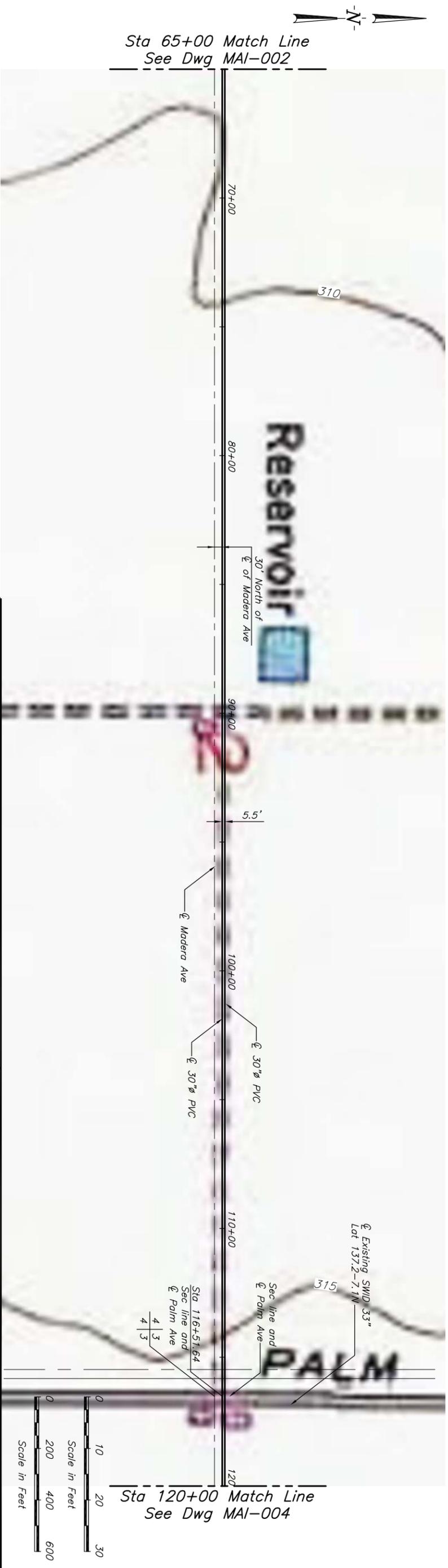
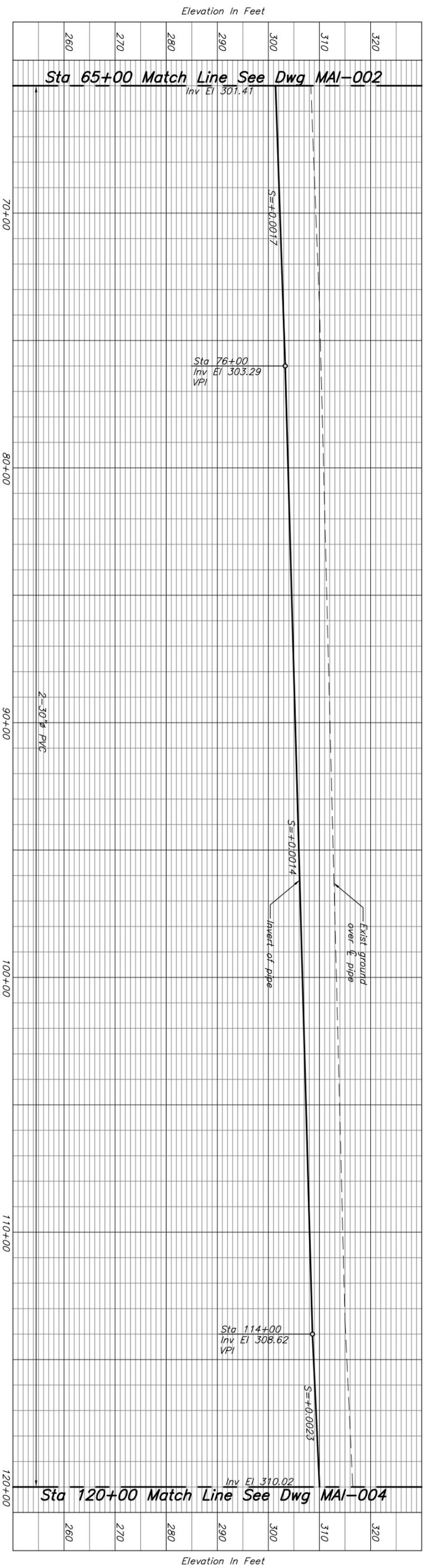


MADERA AVENUE INTERTIE

PLAN AND PROFILE
SHEET 1 OF 6

DATE
March 2013

DRAWING NUMBER
MAI-002



SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

G&E CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA

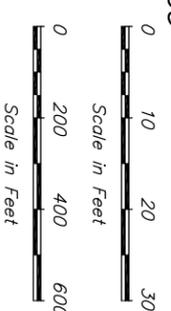
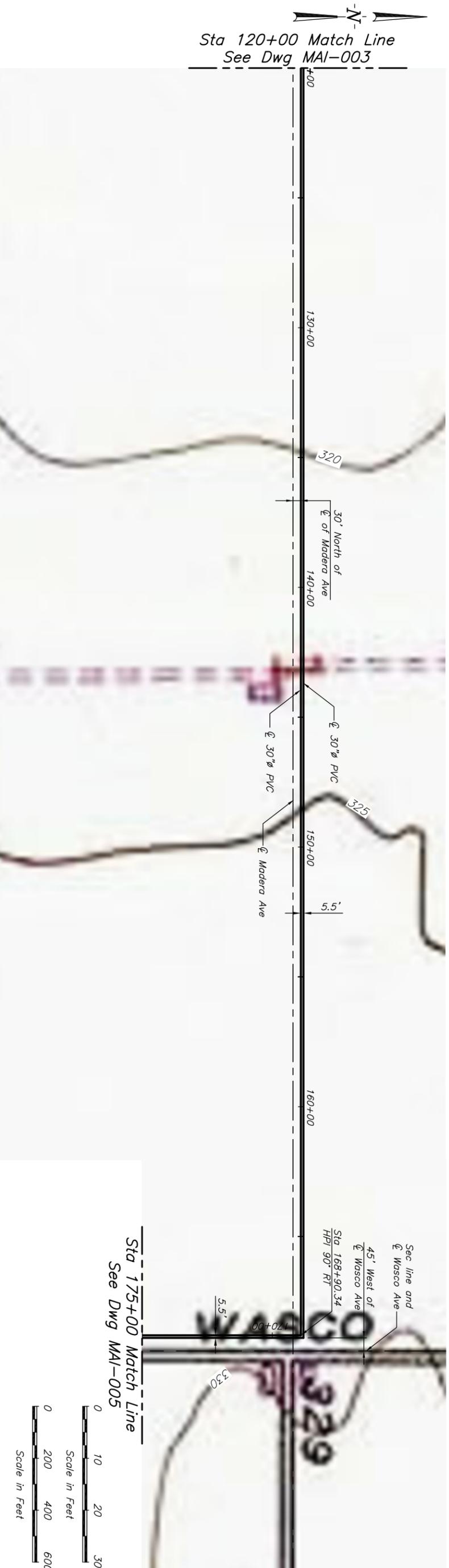
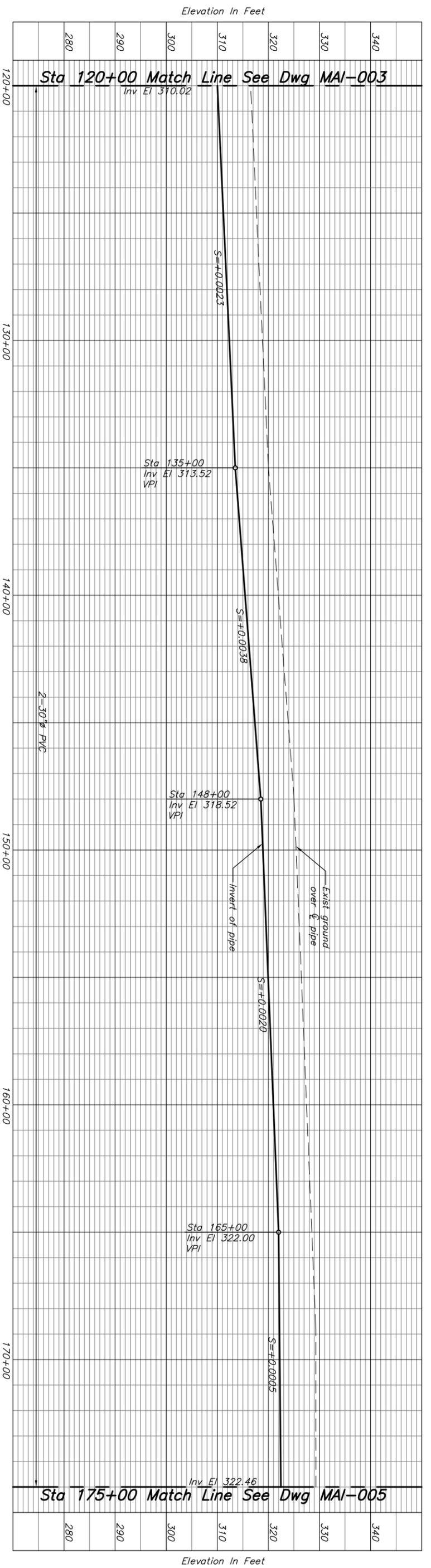


MADERA AVENUE INTERTIE

PLAN AND PROFILE
SHEET 2 OF 6

DATE
March 2013

DRAWING NUMBER
MAI-003

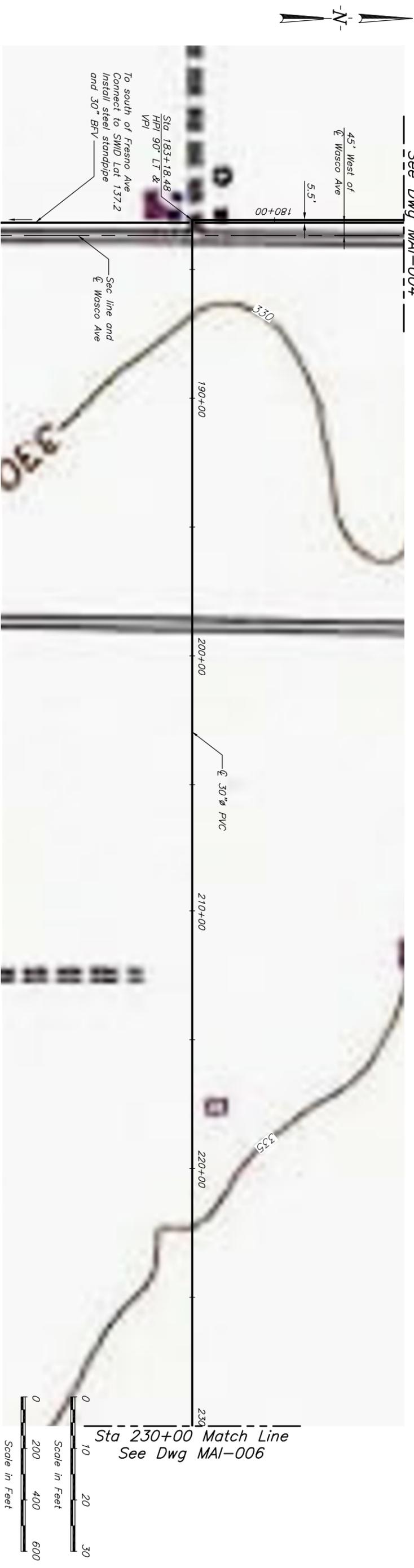
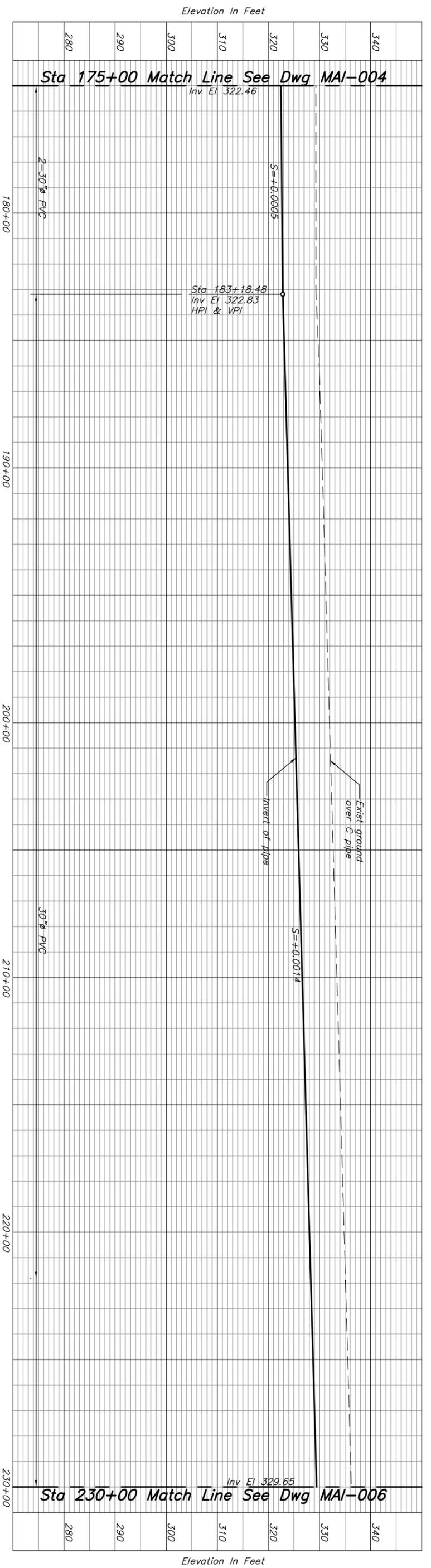


SEMITROPIC WATER STORAGE DISTRICT
 KERN COUNTY, CALIFORNIA
 GEI CONSULTANTS, INC.
 BAKERSFIELD, CALIFORNIA



MADERA AVENUE INTERTIE
 PLAN AND PROFILE
 SHEET 3 OF 6

DATE
 March 2013
 DRAWING NUMBER
 MAI-004



SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

G&E CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA

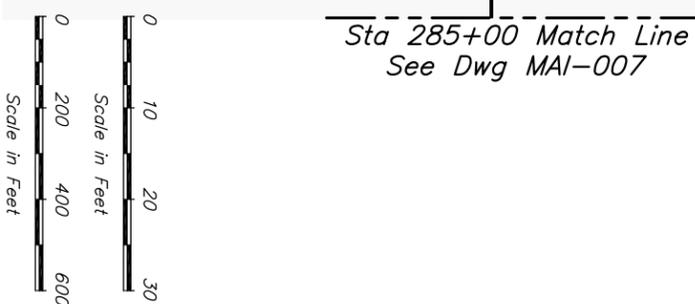
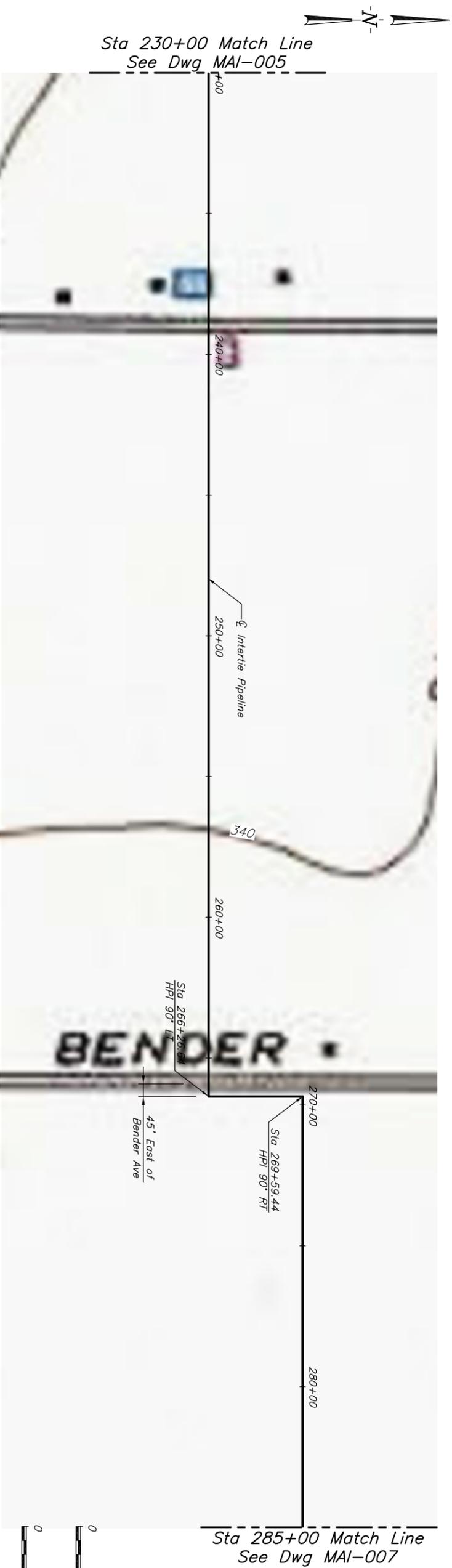
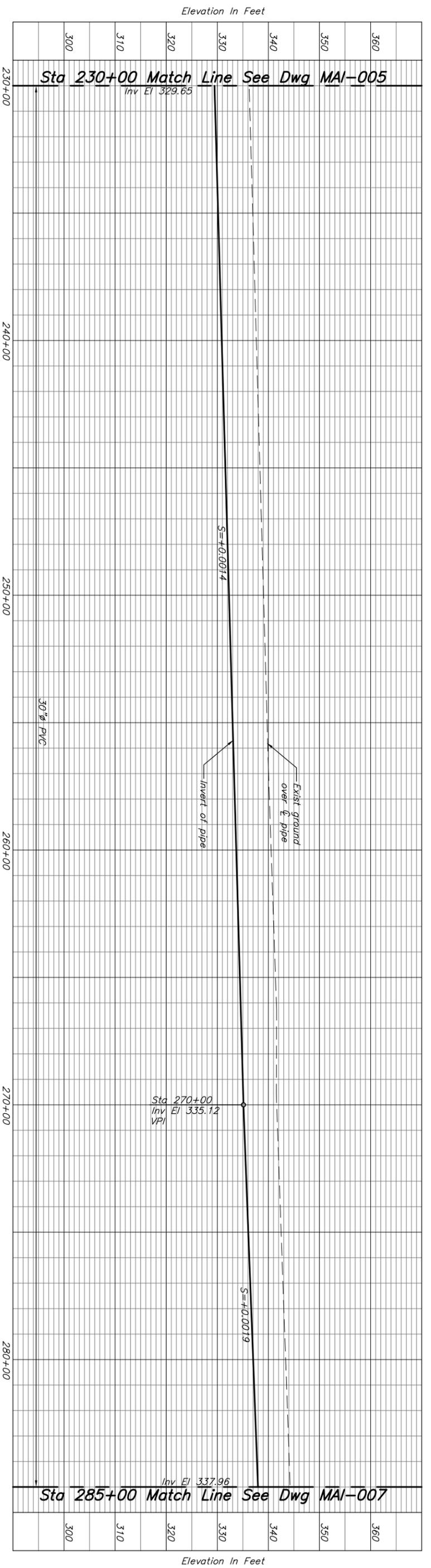


MADERA AVENUE INTERTIE

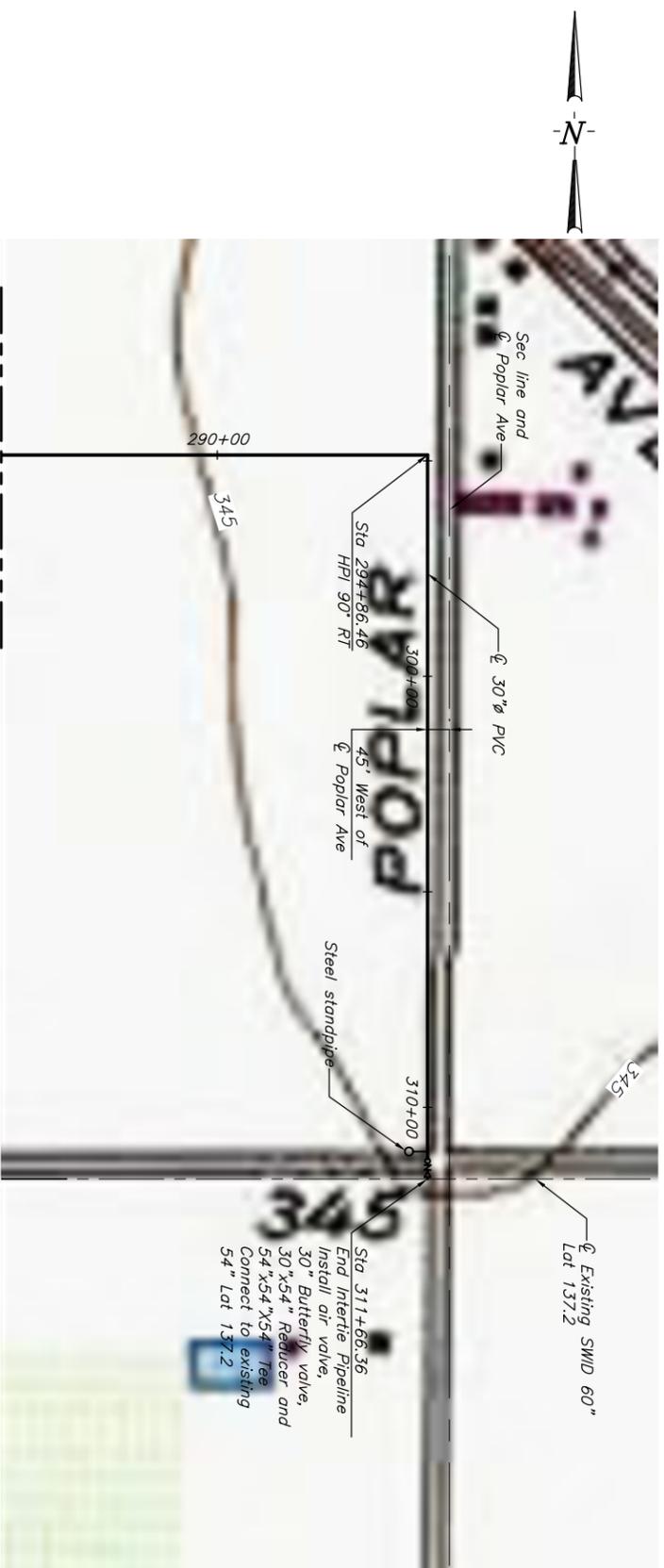
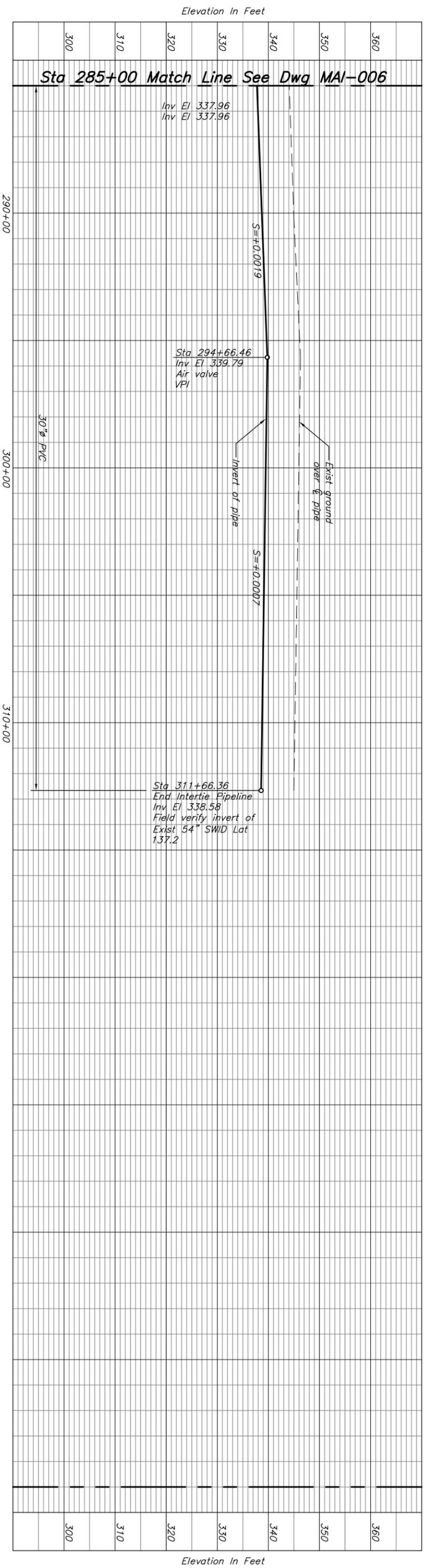
PLAN AND PROFILE
SHEET 4 OF 6

DATE
March 2013

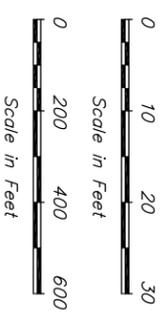
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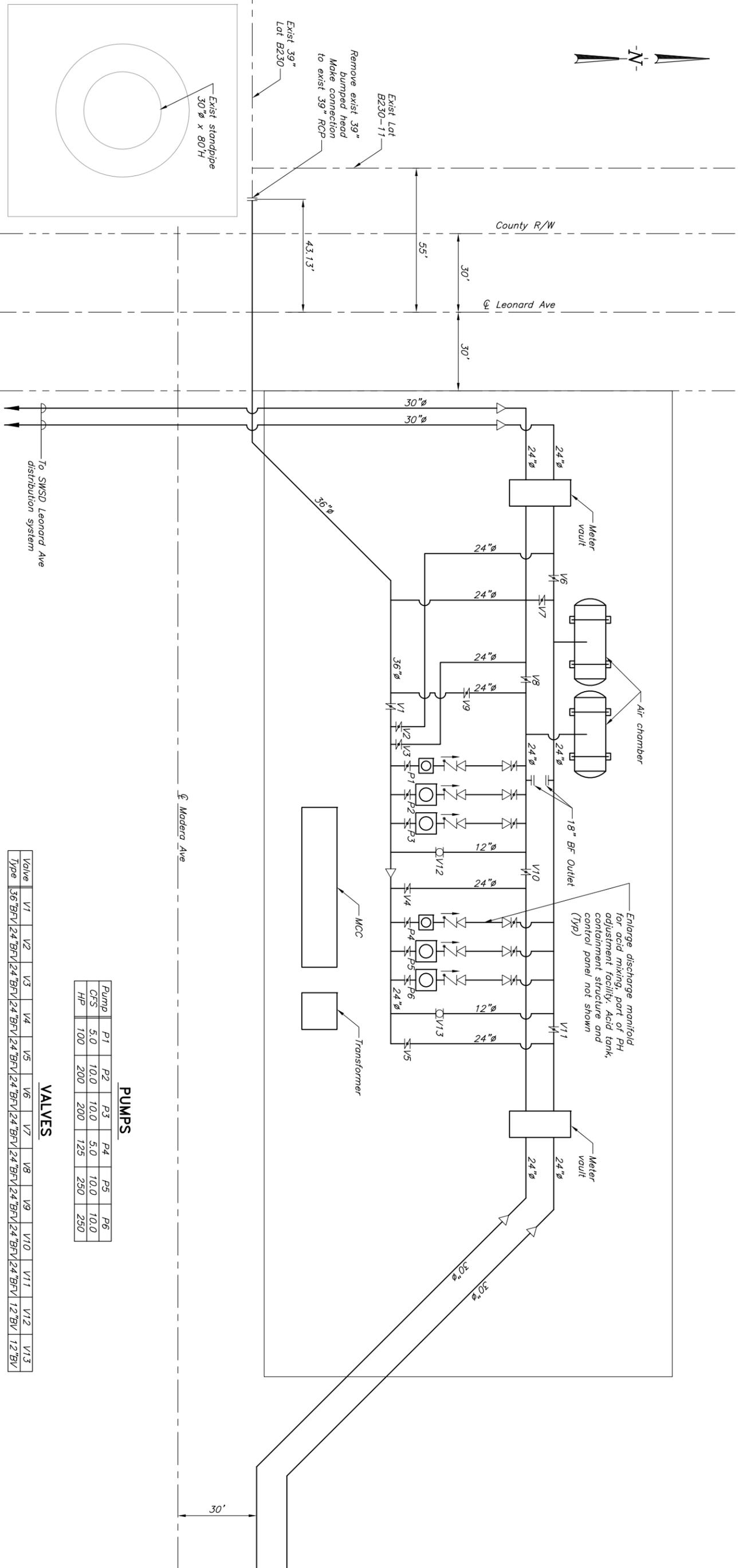
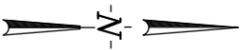
SEMITROPIC WATER STORAGE DISTRICT KERN COUNTY, CALIFORNIA	 G&E CONSULTANTS, INC. BAKERSFIELD, CALIFORNIA	MADERA AVENUE INTERTIE	DATE
			March 2013
PLAN AND PROFILE SHEET 5 OF 6		DRAWING NUMBER MAI-006	DATE
			March 2013



Sta 285+00 Match Line
See Dwg MAI-006



SEMITROPIC WATER STORAGE DISTRICT KERN COUNTY, CALIFORNIA	 G&E Consultants Bookman-Edmonston Division	MADERA AVENUE INTERTIE	DATE March 2013



PUMPS

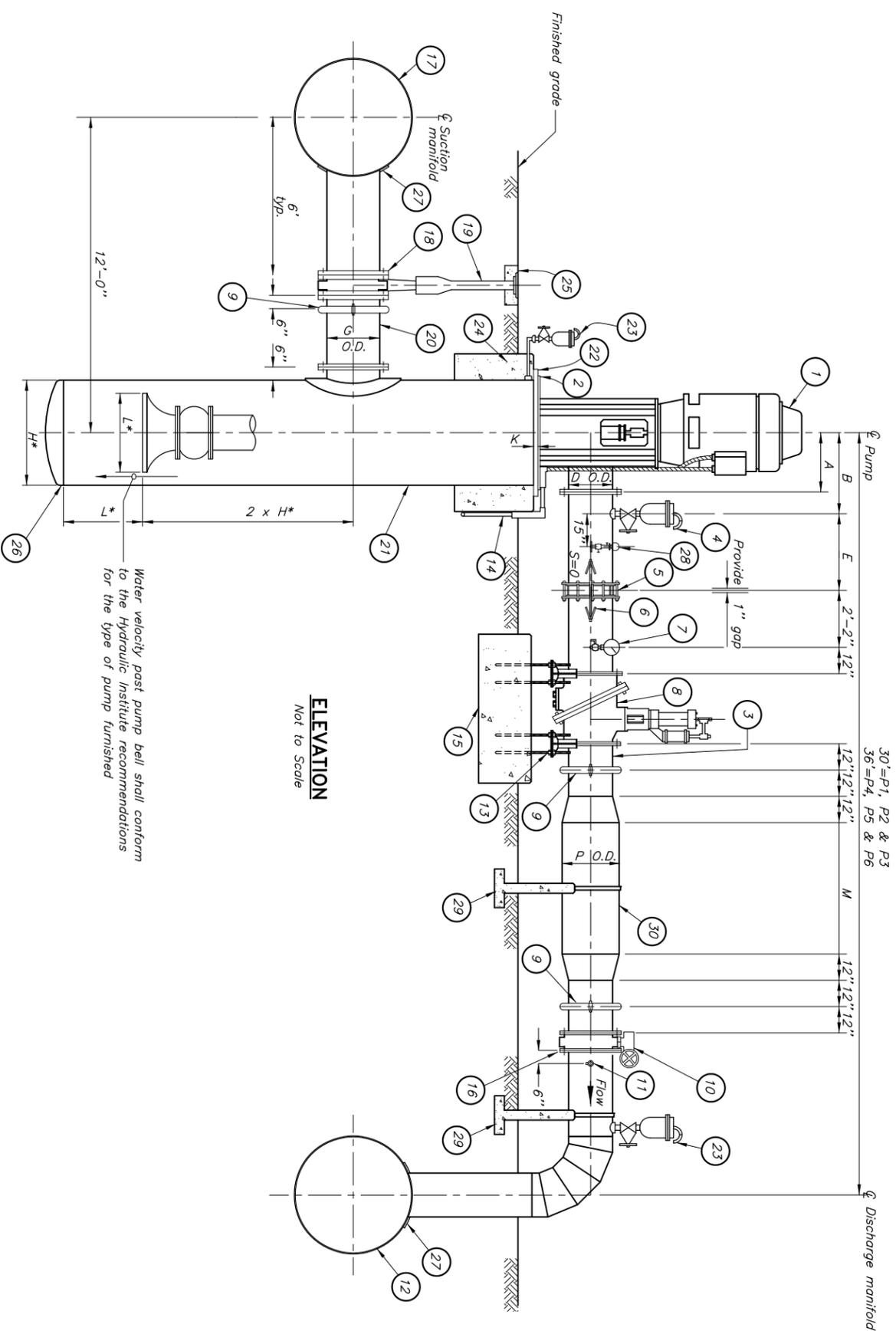
Pump	P1	P2	P3	P4	P5	P6
CFS	5.0	10.0	10.0	5.0	10.0	10.0
HP	100	200	200	125	250	250

VALVES

Valve	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13
Type	36" BFTV	24" BFTV	12" BV	12" BV									

Notes: See Dwg MAI-009 for typical can pump installation details.

SEMITROPIC WATER STORAGE DISTRICT KERN COUNTY, CALIFORNIA		MADERA AVENUE INTERTIE		DATE March 2013
GEI CONSULTANTS, INC. BAKERSFIELD, CALIFORNIA		 GEI Consultants Bookman-Edmonston Division		BOOSTER PUMPING PLANT SCHEMATIC GENERAL PLAN



ELEVATION
Not to Scale

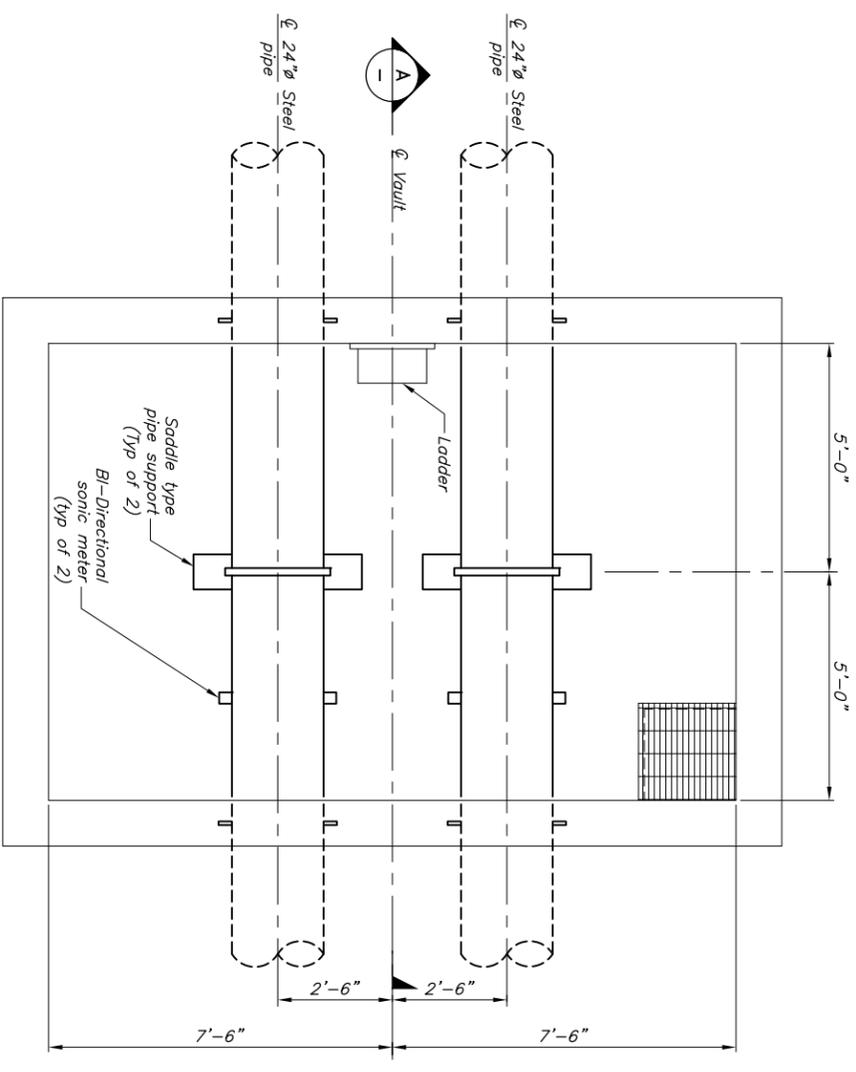
ITEM NUMBER	DESCRIPTION
1	Pump, motor, and fabricated, flanged discharge head with bolts, nuts & gaskets
2	Pump base plate with attaching bolts
3	Pump discharge pipe, 0.250" wall steel pipe
4	3" Air and vacuum valve assembly
5	Sleeve-type coupling - 7" middle ring, 2 tie bolts required per coupling
6	Coupling harness
7	Pressure gauge, mounted on side of pipe
8	Tilting disc check valve with oil controlled dashpot, class 125
9	Victaulic coupling
10	Flanged butterfly valve - AWWA class 150B - manual handwheel operator
11	3/4" Hose faucet outlet, Dwg. MAI-017 (on unit #1 only)
12	Steel discharge manifold
13	Adjustable flange supports
14	Conduits to MCC
15	Reinforced concrete foundation
16	Insulated flange connection
17	Steel suction manifold
18	Flanged butterfly valve - AWWA class 150 B with Buried operator
19	Valve box
20	Steel manifold piping - 0.250" wall min.
21	Steel suction barrel - 0.250" wall min. To be supplied by pump manufacturer
22	Suction barrel base plate
23	2" Air release valve assembly
24	Reinforced concrete foundation
25	18" sq. x 6" Concrete support pad
26	Dished and flanged head, ASME code, 100% C.R. - 0.250 wall thickness
27	Provide outlet reinforcement per AWWA M-11, design pres. = 100psi
28	Pressure switch, mounted on side of pipe, Dwg. P565-619
29	Reinforced concrete foundation
30	Inline static mixer

PUMP NO.	Q	A	B	D	P	E	G	H	K	L	M
1 & 4	5 CFS	*	2'-6"	12 3/4"	14"	3'-6"	14"	*	1 1/4"	*	72"
2, 3, 5 & 6	10 CFS	*	2'-9"	16"	20"	3'-3"	20"	*	2"	*	96"

* Dimensions per pump manufacturer

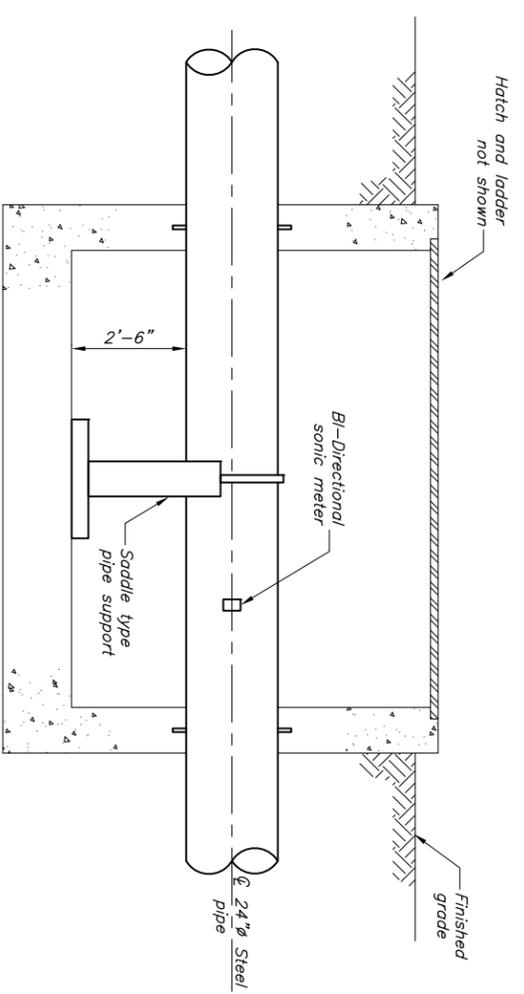
SEMITROPIC WATER STORAGE DISTRICT		MADERA AVENUE INTERTIE		DATE
KERN COUNTY, CALIFORNIA				March 2013
G&I CONSULTANTS, INC.		BOOSTER PUMPING PLANT		DRAWING NUMBER
BAKERSFIELD, CALIFORNIA		TYPICAL CAN PUMP INSTALLATION DETAILS		MAI-009





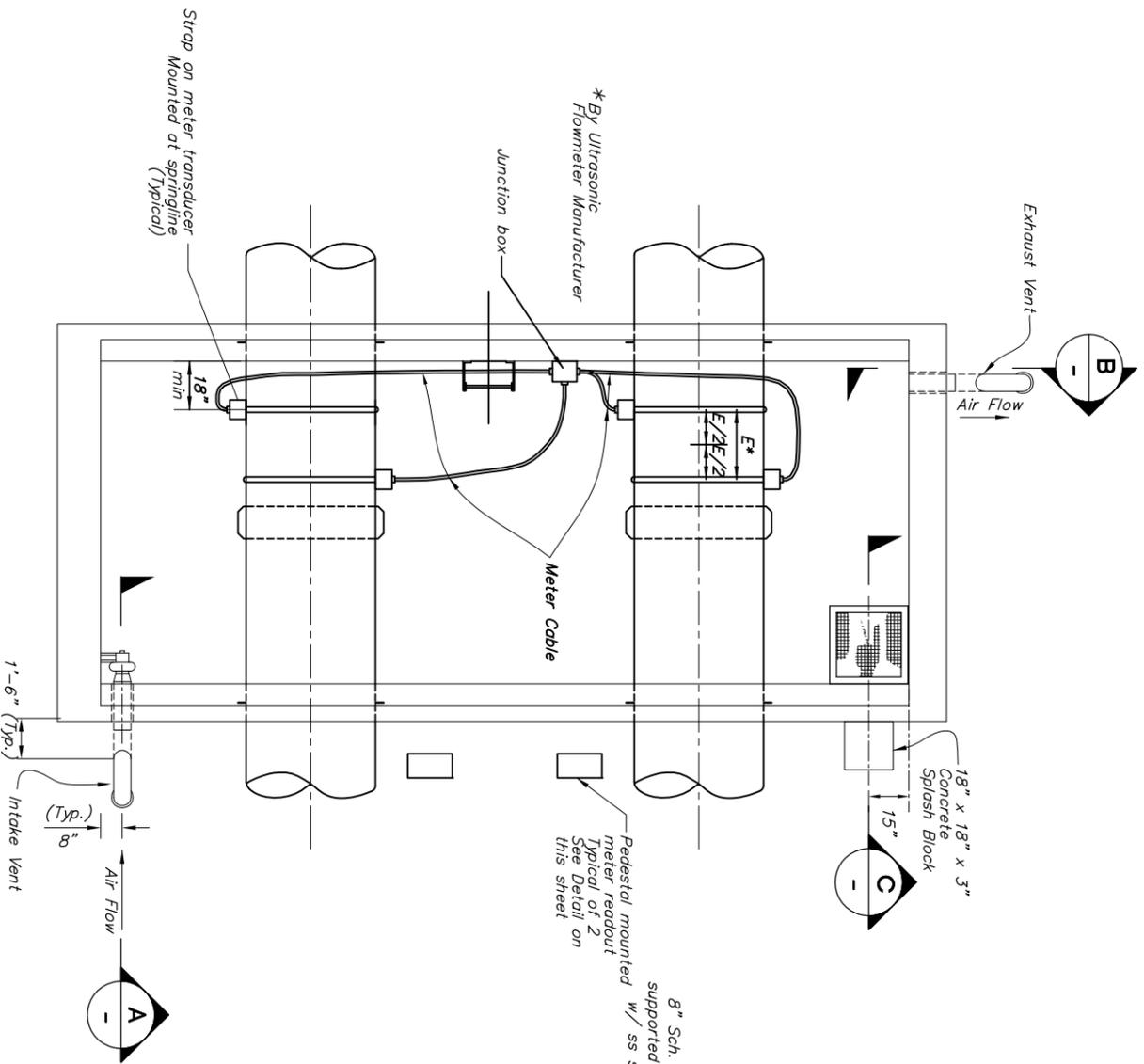
P L A N
SCALE: 1/2"=1'-0"

Notes:
1. See Dwg MAI-011 for ventilation and miscellaneous details.

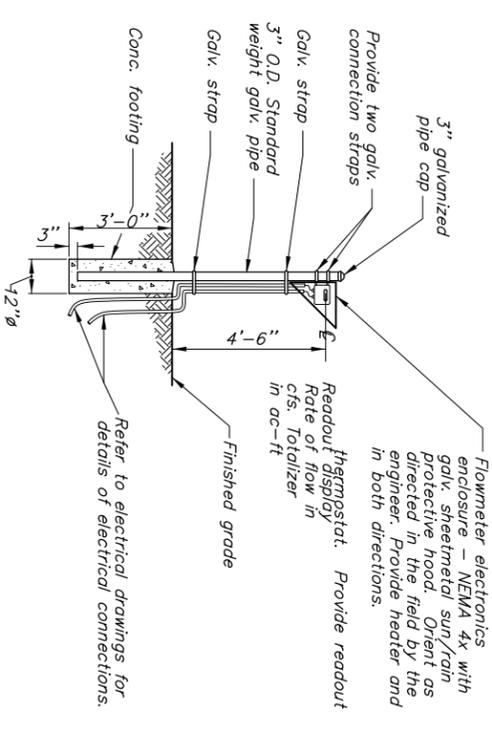
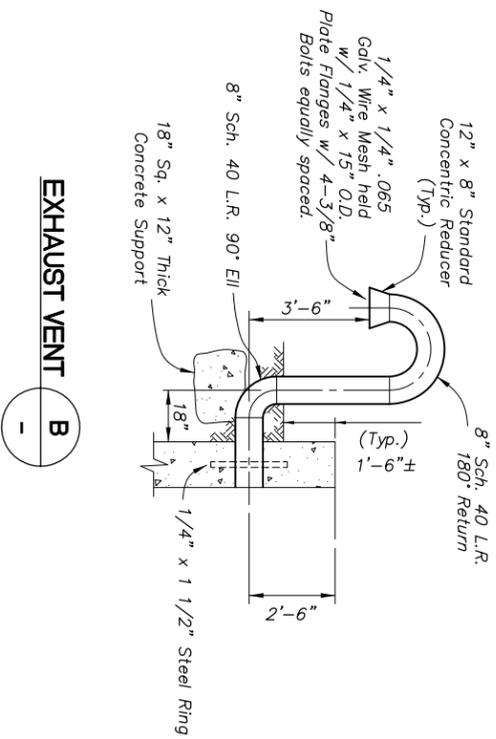
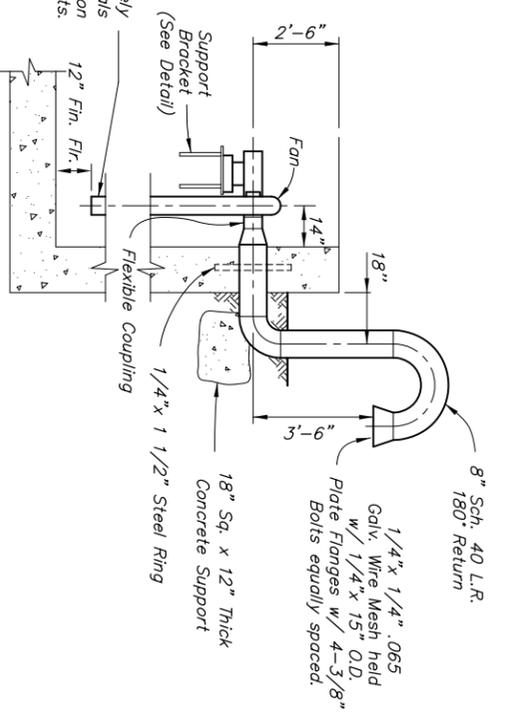


SECTION A
SCALE: 1/2"=1'-0"

SEMITROPIC WATER STORAGE DISTRICT		MADERA AVENUE INTERTIE	
KERN COUNTY, CALIFORNIA		DATE March 2013	
G&E CONSULTANTS, INC. BAKERFIELD, CALIFORNIA		DRAWING NUMBER MAI-010	
G&E Consultants Bookman-Edmonston Division		METER VAULT SHEET 1 OF 2	

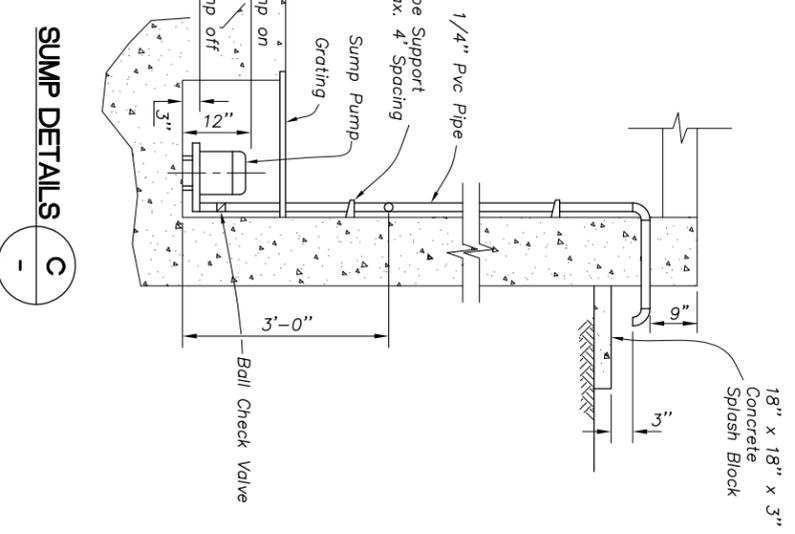


8" Sch. 40, or duct adequately supported w/ ss straps and ss expansion anchor bolts.



Note: Location of meter readout shall be as directed by engineer in field.

- NOTES:**
- Distance based on flowmeter manufacturers specifications pending Engineer approval.
 - Install per flowmeter manufacturers specifications pending Engineer approval.



FAN SUPPORT BRACKET

SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

GEI CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA

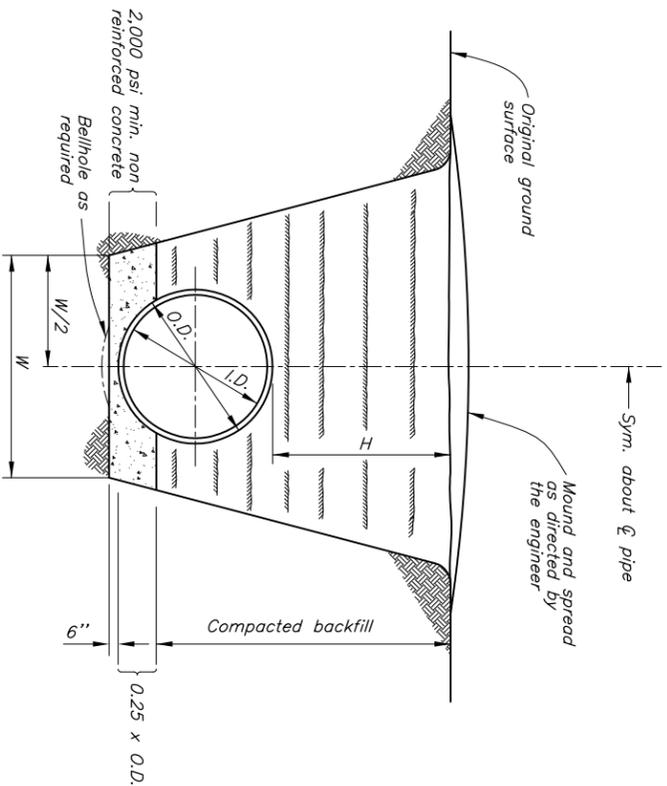


MADERA AVENUE INTERTIE

METER VAULT
SHEET 2 OF 2

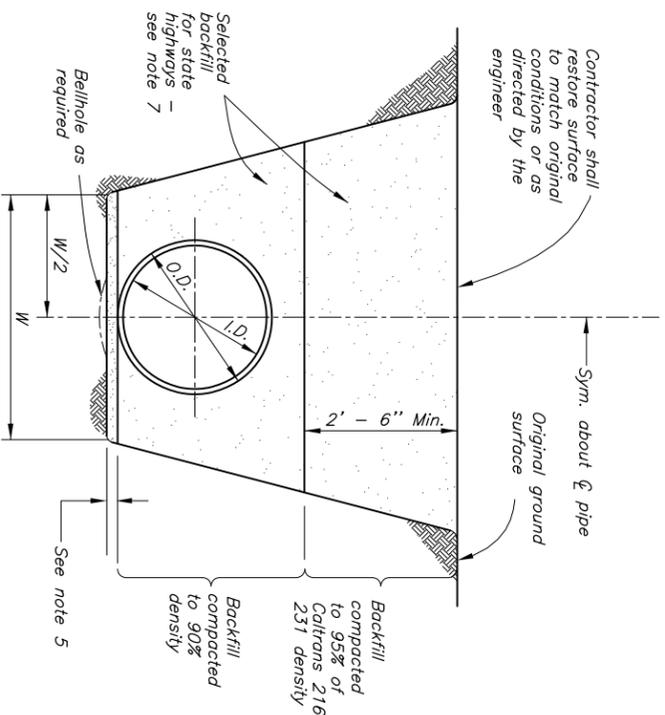
DATE
March 2013

DRAWING NUMBER
MAI-011

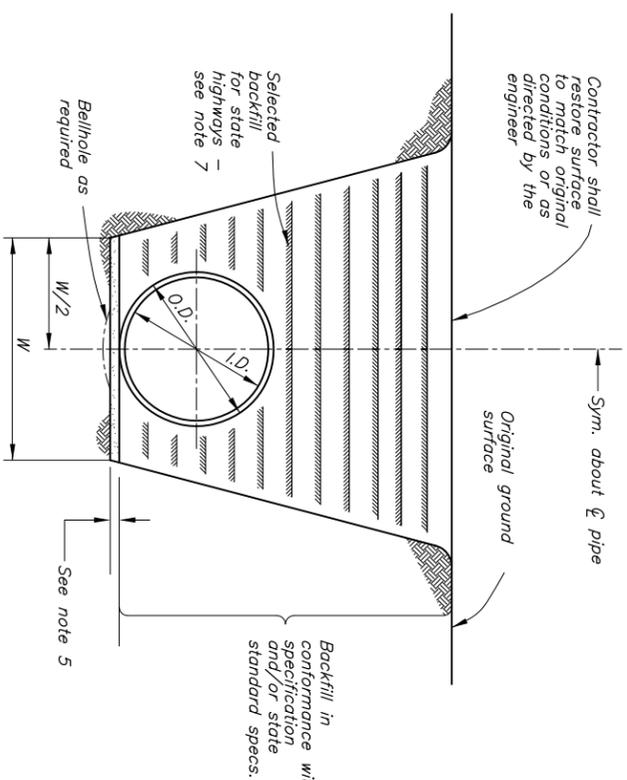


**SPECIAL TRENCH SECTION
REINFORCED CONCRETE PIPE – ALL SIZES
WHEN H IS GREATER THAN 10 FEET**

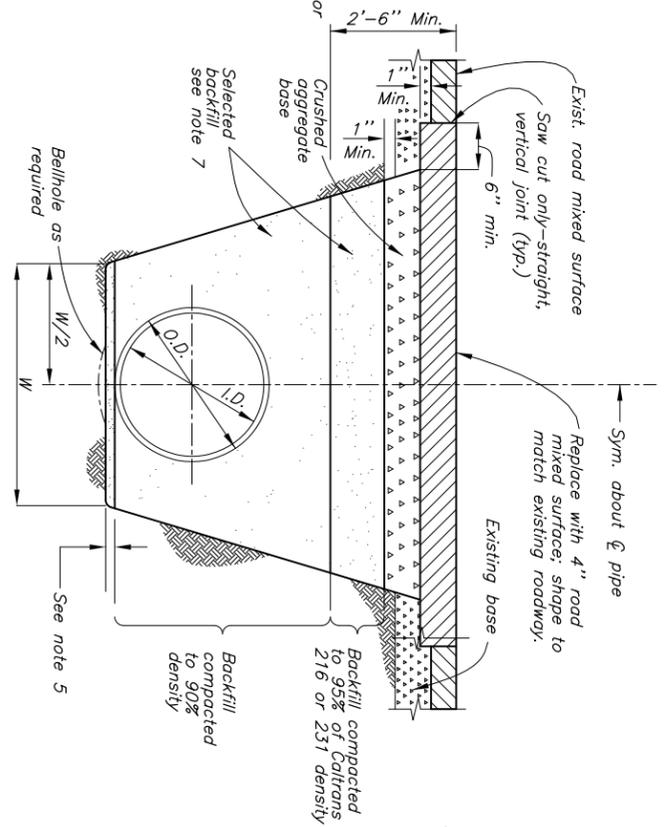
See plan and profile drawings for location and station limits



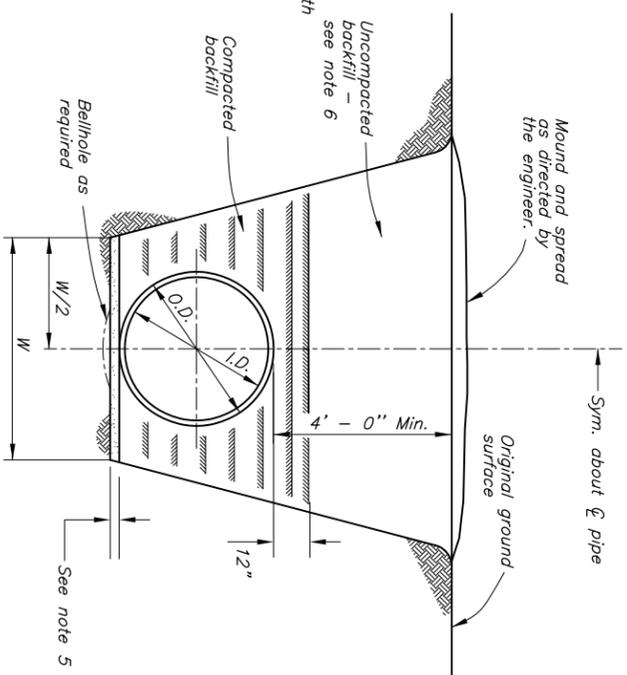
**ALL TYPES AND SIZES OF PIPE
IN UNPAVED COUNTY ROAD R/W**



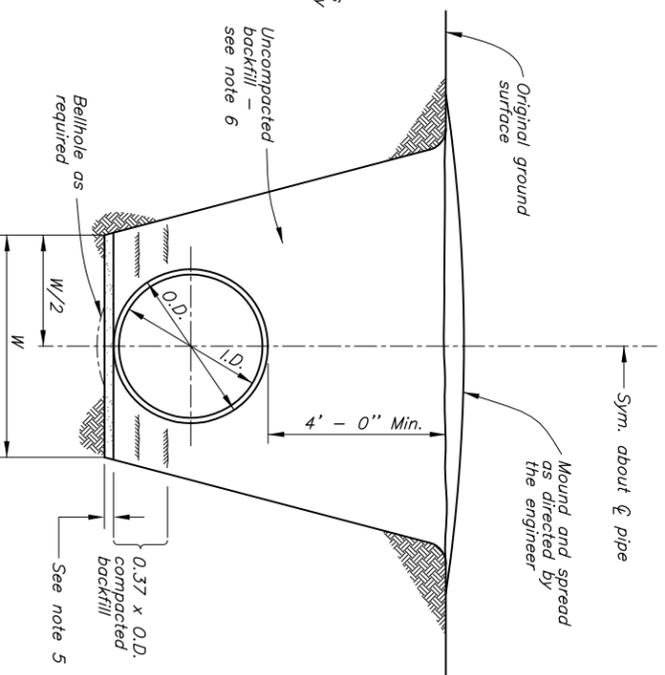
**ALL STEEL PIPES, ALL SIZES RCP
WATERWAY CROSSINGS, ALL STATE R/W,
AND ALL PVC TURNOUT PIPING**



**ALL TYPES AND SIZES OF PIPE
IN PAVED ROADWAYS**



PVC DISTRIBUTION LATERAL PIPING



REINFORCED CONCRETE PIPE – 27" AND LARGER

General Notes:

1. Where pipe trench crosses county road, special backfill conditions are required. See specifications and details on this drawing.
2. Trench bottom or bedding for all pipe shall be graded to provide uniform support for the entire length of the pipe except at bellholes.
3. Bellholes for pipe shall have a clearance of 3" between the bottom of the bellhole and the exterior of the pipe barrel, but in no case shall bellholes be smaller than required to facilitate placing of the pipe or proper joining of the pipe.
4. Compacted backfill shall be compacted to a degree at least equivalent to the existing degree of compacting of adjacent in-place earth materials against which such compacted backfill is to be placed, or to a minimum of the laboratory standard maximum ASTM D698 density, whichever is greater. For definition of compacted backfill and of maximum density, see specifications.
5. Minimum 3-inch deep layer of scarified material when in hard material. In unsuitable material, overexcavate as directed by the engineer (6" min.) and replace with compacted backfill.
6. When pipeline is in and parallel to farm roads, all uncompacted backfill shall be wheel rolled using a grader or similar equipment. Existing surfacing on farm roads that is disturbed or destroyed during performance of the contract work shall be replaced in kind.
7. All selected backfill is to be in conformance with state standard specifications.
8. W = pipe O.D. + 24" min.
9. All trench sections shall comply with CAL-OSHA requirements.
10. Single pipe trench shown, double pipe trench similar.

SEMITROPIC WATER STORAGE DISTRICT
KERN COUNTY, CALIFORNIA

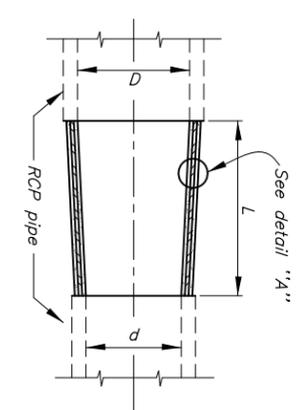
G&E CONSULTANTS, INC.
BAKERSFIELD, CALIFORNIA



MADERA AVENUE INTERTIE

TYPICAL PIPE TRENCH SECTIONS

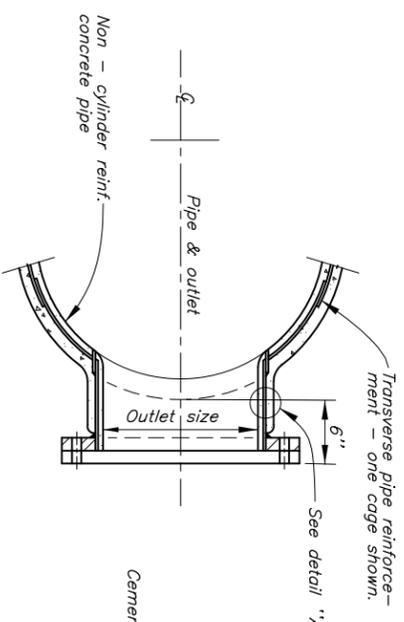
DATE
March 2013
DRAWING NUMBER
MAL-012



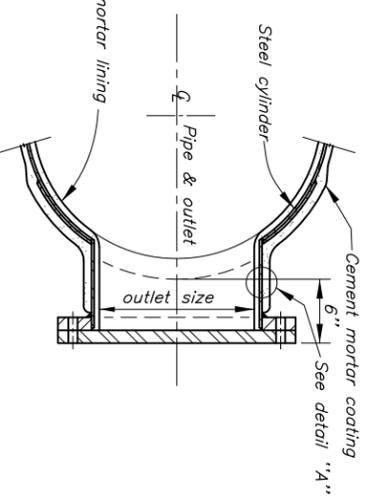
Note:
Thrust block not shown,

MINIMUM LENGTH OF REDUCERS AND INCREASERS

D - d Inches	L Inches	D - d Inches	L Inches
2	12	7	21
3	12	8	24
4	12	9	27
5	15	10	30
6	18	54	72



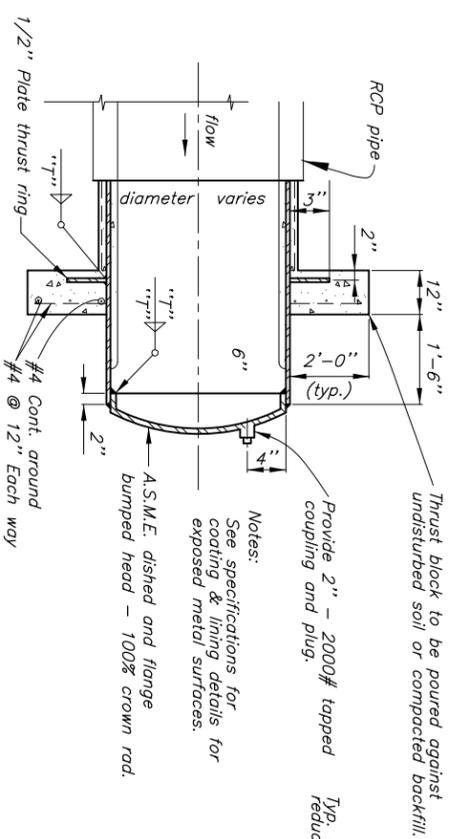
TYPICAL FLANGED TEE IN NON-CYLINDER R.C.P.



TYPICAL FLANGED TEE IN STEEL PLATE FITTING

- FLANGED TEE NOTES:**
1. Alternate details may be submitted to the engineer for approval.
 2. All flanges are to be A.W.W.A. class "D".
 3. See specifications for coating details for exposed metal surfaces.

- GENERAL NOTES:**
1. The finished I.D. of all steel plate fittings is to be the same as that of adjacent lateral pipe.
 2. Details shown hereon are "not to scale".

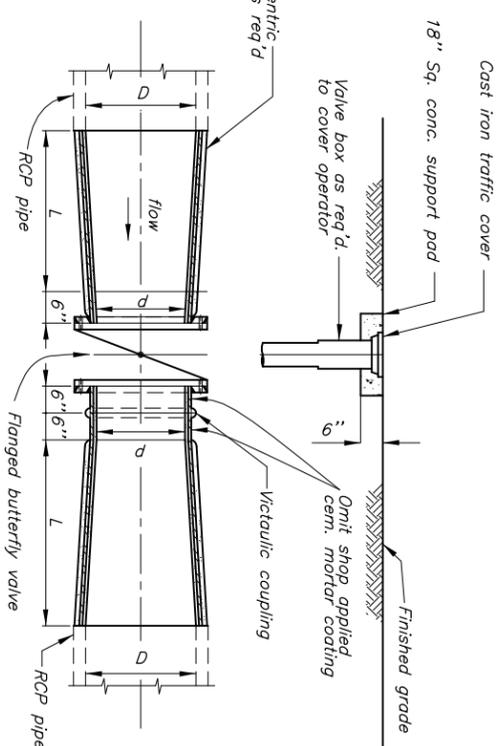


END OF LINE BUMPED HEAD

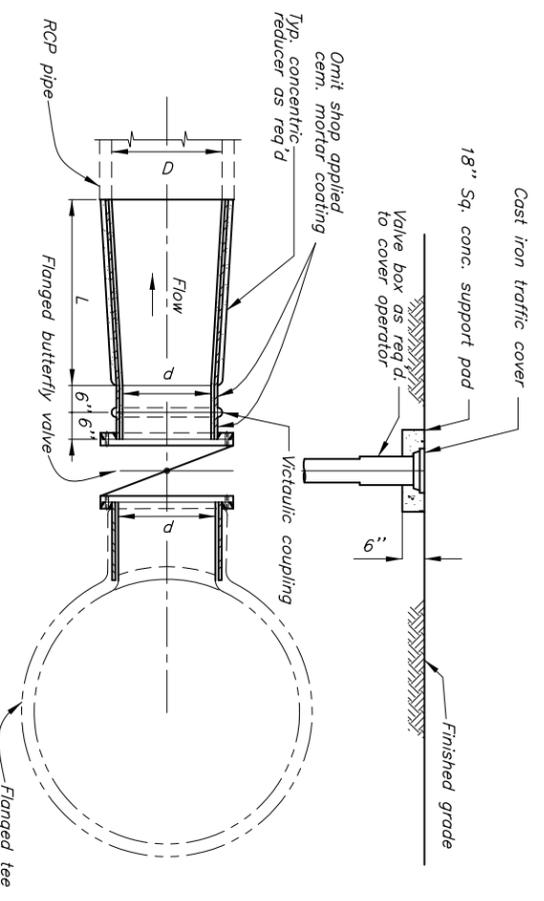
TABLE 1

Minimum thickness "t" of steel plate cylinder for tee outlets, spools, elbows and reducers. (Use larger diameter of reducer)

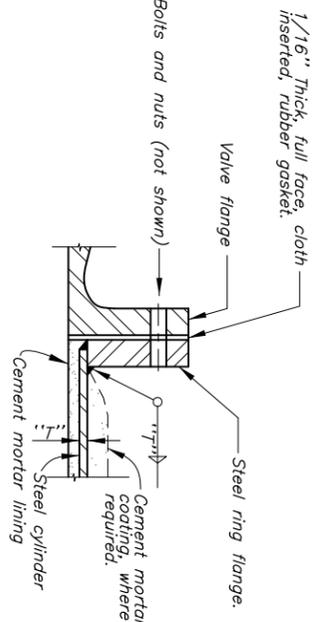
Diameters	Min. "t"
6" Thru 15"	10 Gage
18" Thru 24"	3/16"
27" Thru 42"	1/4"
45" Thru 51"	5/16"



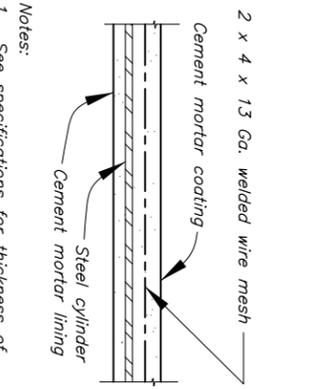
TYPICAL BURIED LINE VALVE INSTALLATION



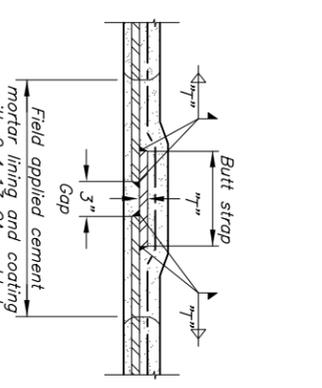
TYPICAL BURIED VALVE INSTALLATION AT TEE



TYPICAL FLANGED VALVE CONNECTION



DETAIL "A"



TYPICAL BUTT STRAP CONNECTION

BURIED VALVE NOTES:

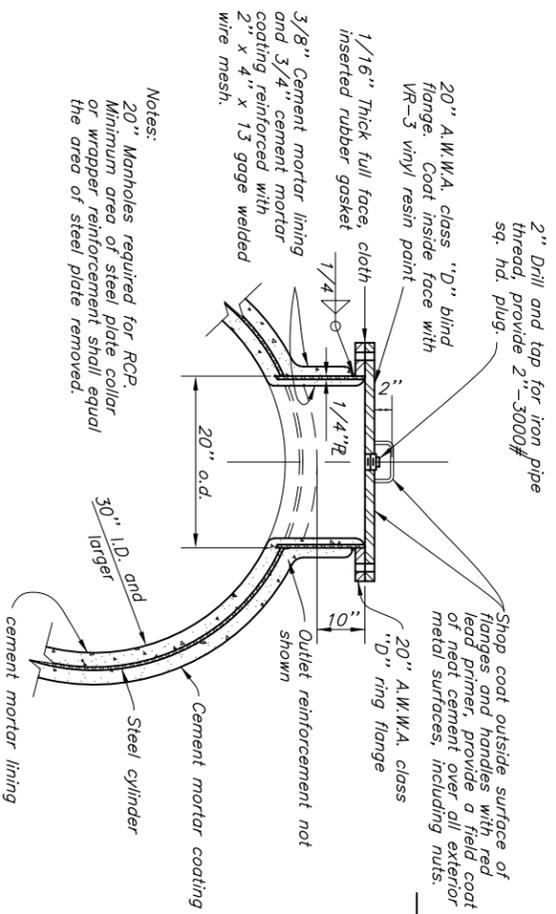
1. See specification for coating details for exposed metal surfaces.
2. Provide concrete valve support pad for each buried valve.
3. Thrust blocks not shown.

SEMITROPIC WATER STORAGE DISTRICT
KERN COUNTY, CALIFORNIA
GEI CONSULTANTS, INC.
BAKERSFIELD, CALIFORNIA

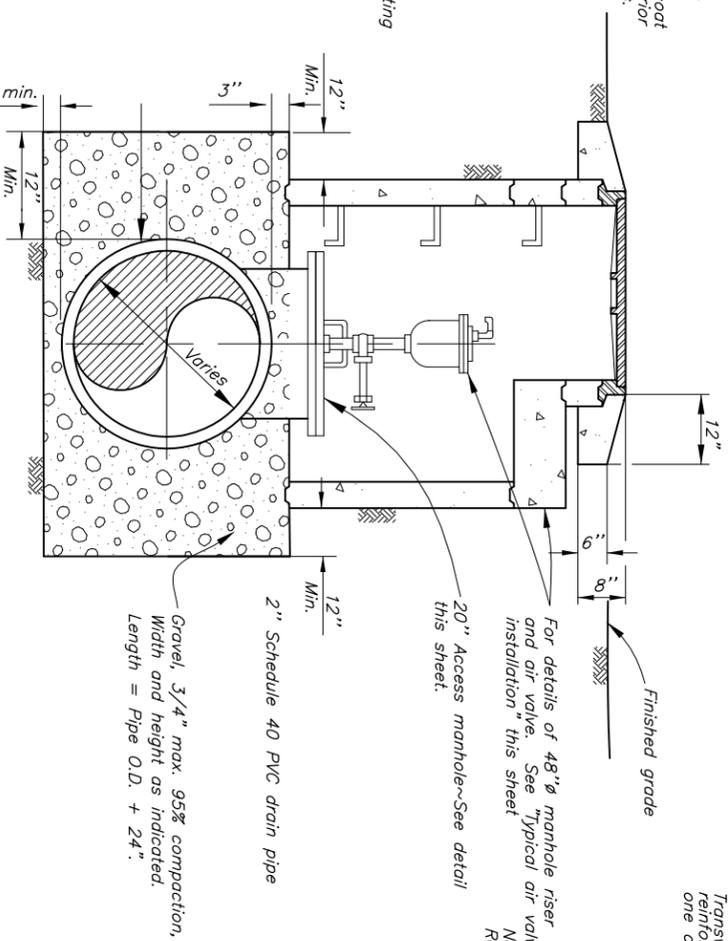


MADERA AVENUE INTERTIE
STEEL PIPE SPECIALS AND FITTINGS

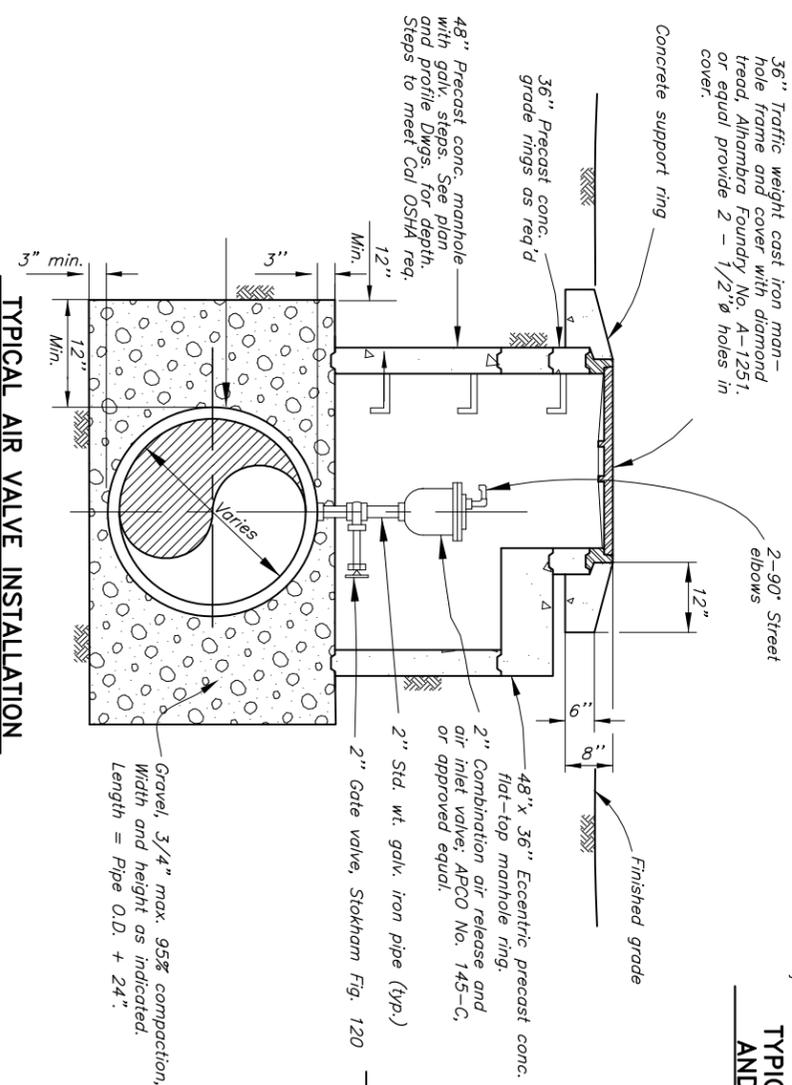
DATE
March 2013
DRAWING NUMBER
MAI-013



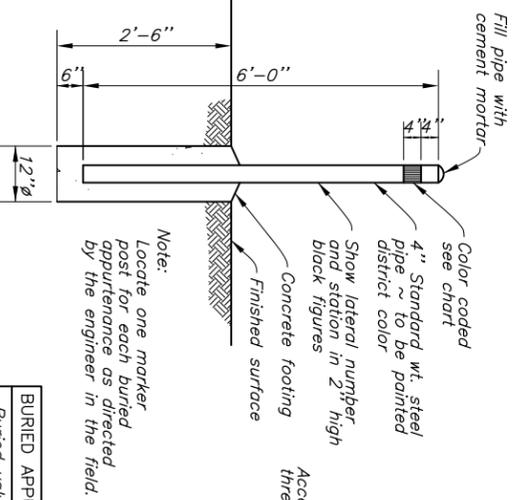
TYPICAL 20" ACCESS MANHOLE



TYPICAL COMBINATION MANHOLE AND AIR VALVE INSTALLATION



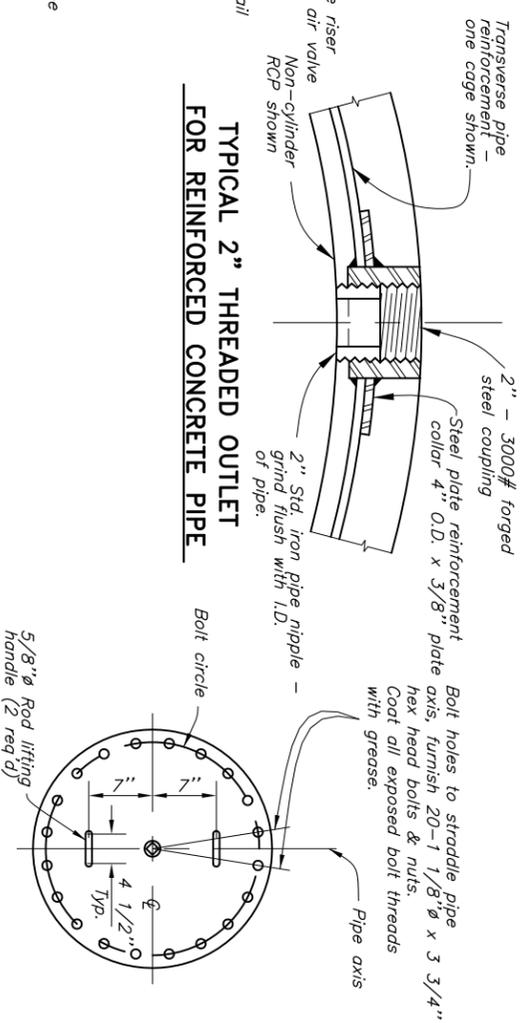
TYPICAL AIR VALVE INSTALLATION



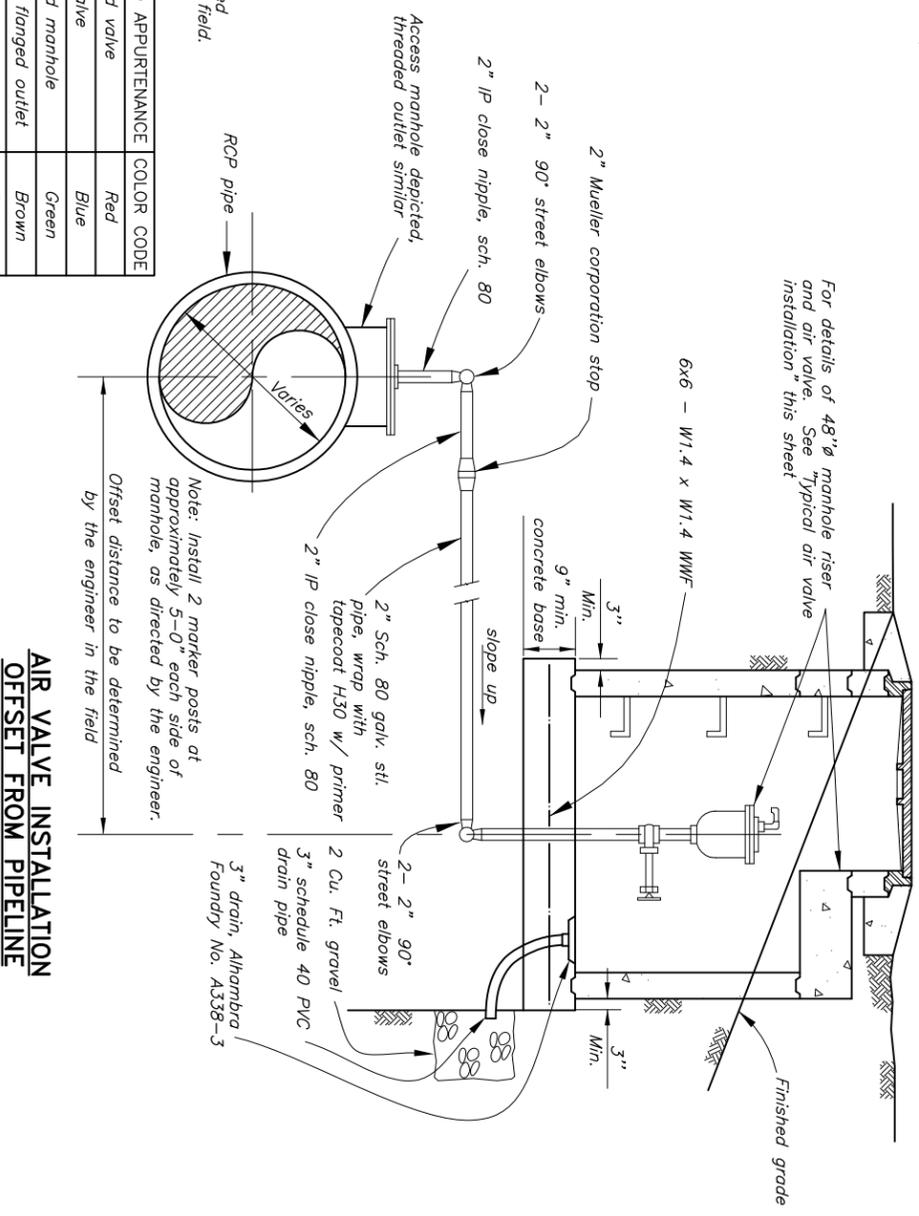
TYPICAL MARKER POST

BURIED APPURTENANCE	COLOR CODE
Buried valve	Red
Air valve	Blue
Buried manhole	Green
Blind flanged outlet	Brown
Bumped head	Pink

TYPICAL 2" THREADED OUTLET FOR REINFORCED CONCRETE PIPE



BLIND FLANGE PLAN



AIR VALVE INSTALLATION OFFSET FROM PIPELINE

SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

GEI CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA



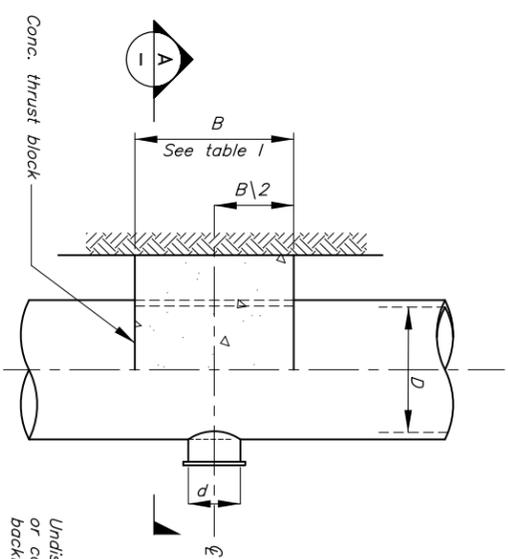
MADERA AVENUE INTERTIE

AIR VALVES AND MANHOLES

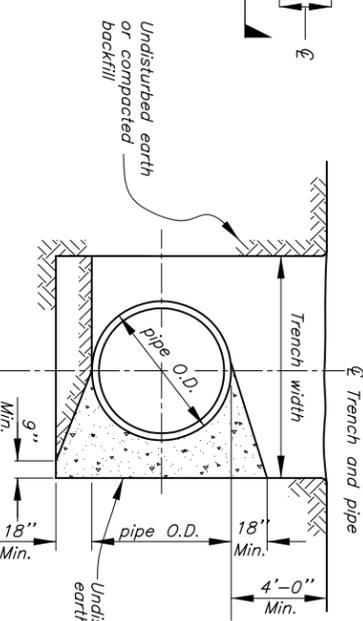
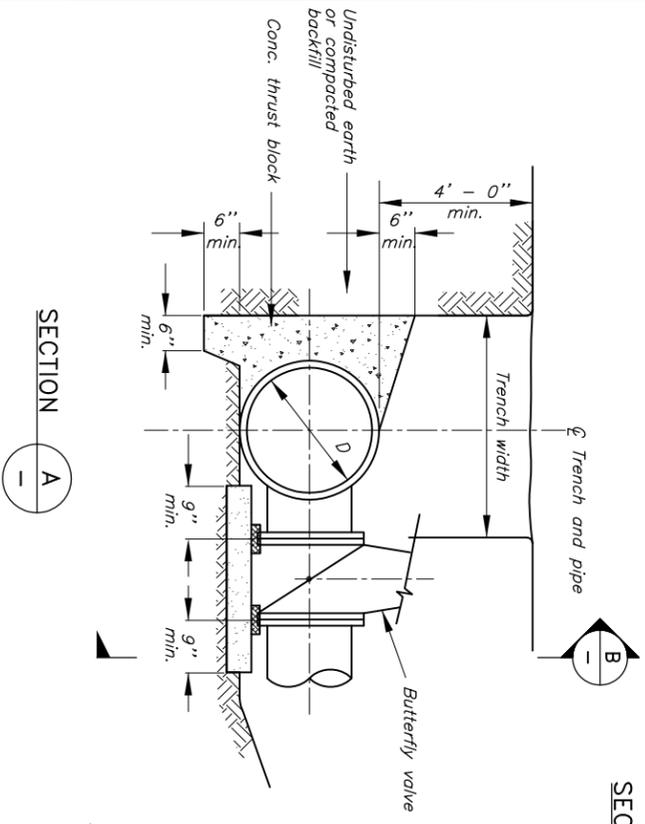
DATE
March 2013

DRAWING NUMBER
MAI-014

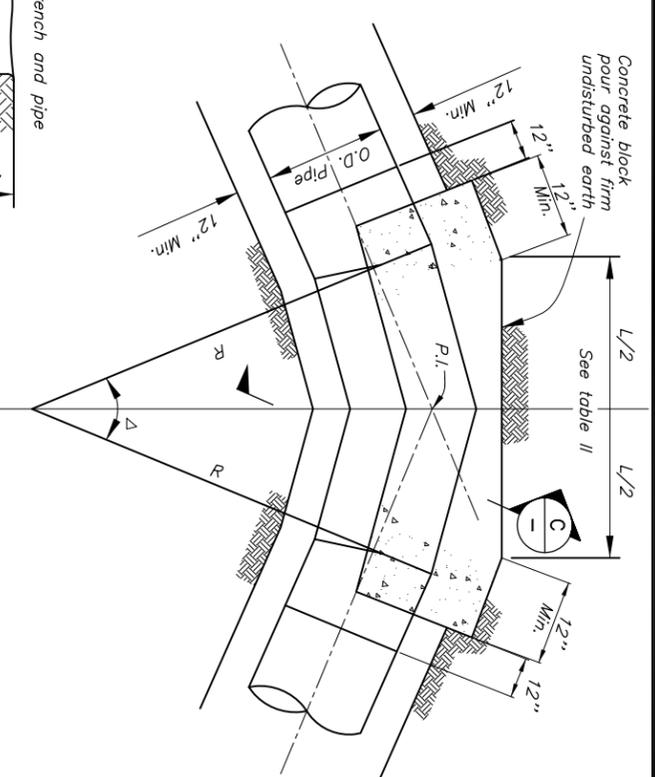
- Notes:
1. Refer to General Notes, and minimum trench width requirements.
 2. For line valves, thrust block shown for reducers shall be provided both upstream and downstream.
 3. Thrust blocks are required for blind flanged outlets.
 4. Thrust blocks are to be used for all pipe head classes.



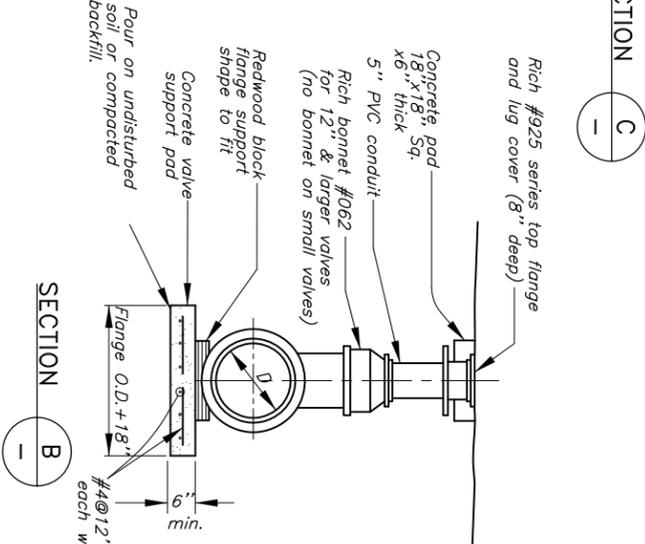
PLAN - BLOCKING FOR FLANGED OUTLETS



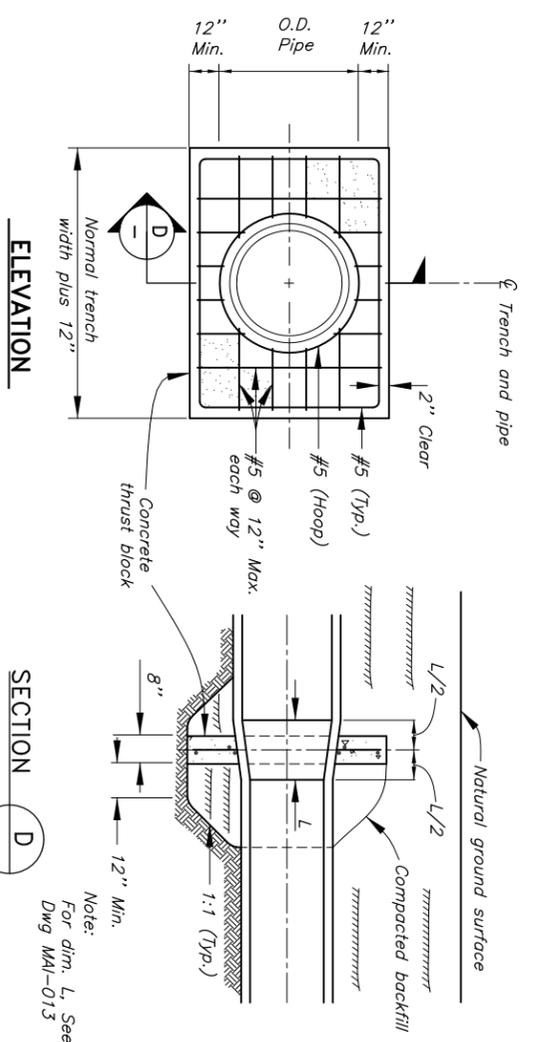
SECTION C



PLAN - HORIZONTAL THRUST BLOCKS



SECTION B



BLOCKING FOR REDUCERS

TABLE I
LENGTH OF THRUST BLOCK FOR FLANGED OUTLETS

D	15"	18"	20"	21"	24"	27"	30"	33"	39"	42"	45"	48"	51"	60"	66"	69"	72"	78"
6 & 8"	1'-6"	1'-6"	1'-6"	1'-6"	1'-3"	1'-3"	N/R											
10 & 12"	3'-3"	3'-3"	3'-3"	3'-3"	2'-9"	2'-6"	2'-3"	2'-0"	1'-9"	1'-9"	1'-6"	1'-6"	N/R	N/R	N/R	N/R	N/R	N/R
14 & 15"	5'-6"	4'-9"	4'-9"	4'-0"	3'-9"	3'-6"	3'-3"	3'-0"	2'-6"	2'-6"	2'-6"	2'-3"	2'-3"	2'-0"	2'-0"	1'-6"	1'-6"	1'-6"
16 & 18"	6'-6"	6'-3"	6'-3"	6'-3"	5'-9"	4'-9"	4'-9"	4'-6"	4'-3"	3'-6"	3'-3"	3'-3"	3'-0"	3'-0"	2'-9"	2'-9"	2'-6"	2'-6"
20"	7'-3"	7'-0"	6'-3"	6'-0"	6'-3"	6'-0"	5'-6"	5'-3"	4'-6"	4'-3"	4'-0"	4'-0"	3'-9"	3'-9"	3'-6"	3'-6"	3'-6"	3'-6"
24"	9'-0"	8'-3"	8'-3"	8'-3"	7'-9"	7'-3"	7'-3"	6'-9"	6'-3"	5'-9"	5'-6"	5'-6"	5'-3"	5'-3"	5'-3"	5'-0"	5'-0"	5'-0"
30"	9'-0"	8'-9"	8'-9"	8'-9"	8'-9"	8'-9"	8'-9"	8'-9"	8'-9"	8'-9"	8'-6"	8'-6"	8'-6"	8'-6"	8'-3"	8'-3"	8'-0"	8'-0"

NOTE: N/R indicates not required

TABLE II
LENGTH OF HORIZONTAL THRUST BLOCKS

D	15"	18"	20"	21"	24"	27"	30"	33"	39"	42"	45"	48"	51"	60"	66"	69"	72"	78"
22 1/2"	1'-0"	1'-0"	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"	2'-6"	2'-6"	2'-3"	2'-0"	1'-9"	1'-9"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
45"	1'-6"	2'-0"	2'-6"	3'-0"	3'-3"	3'-9"	4'-6"	5'-0"	6'-0"	7'-0"	7'-9"	8'-6"	9'-3"	11'-6"	12'-9"	13'-6"	14'-3"	15'-0"
90"	2'-9"	3'-6"	4'-6"	5'-6"	6'-0"	7'-0"	8'-3"	9'-9"	11'-0"	13'-0"	14'-6"	15'-9"	17'-0"	21'-0"	23'-9"	25'-0"	26'-6"	28'-0"

SEMITROPIC WATER STORAGE DISTRICT

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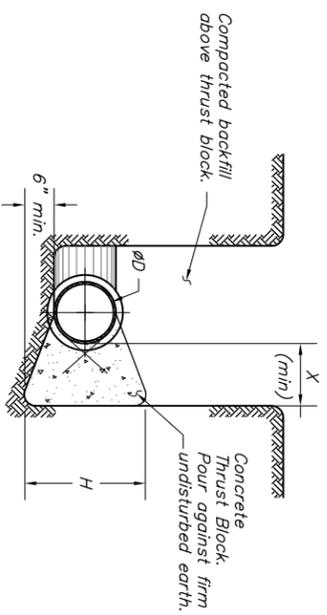


MADERA AVENUE INTERTIE

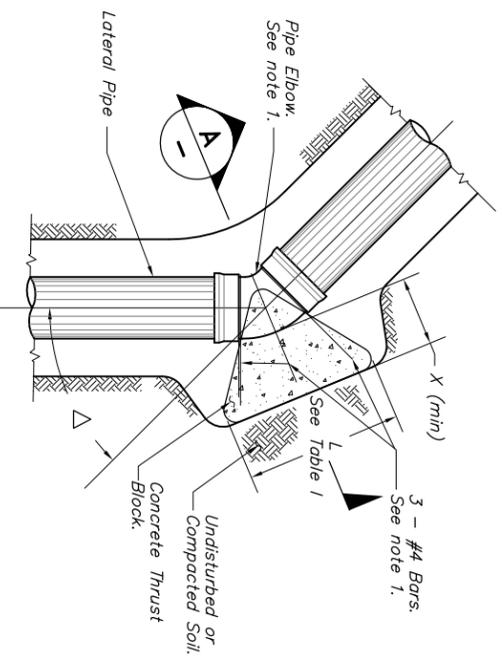
THRUST BLOCKS FOR REDUCERS AND BENDS

DATE
March 2013

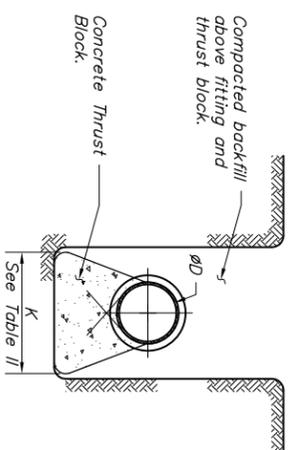
DRAWING NUMBER
MAI-015



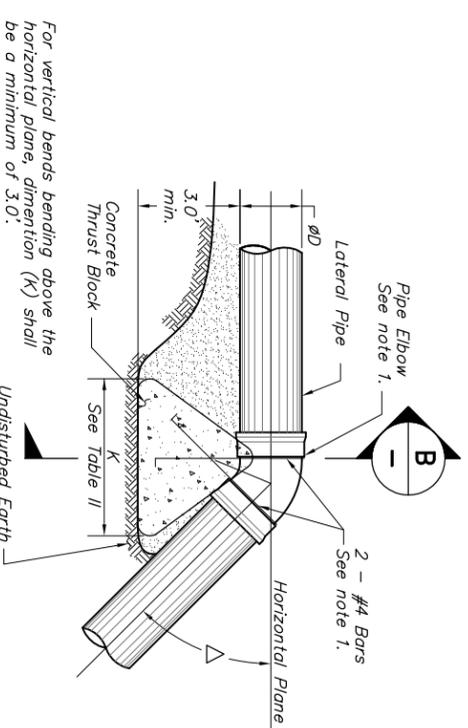
SECTION A



PLAN - HORIZONTAL THRUST BLOCK



SECTION B



ELEVATION - VERTICAL THRUST BLOCK

HORIZONTAL THRUST BLOCKS				FOR ΔEQUALS 90° OR LESS				FOR ΔEQUALS 45° OR LESS			
D (in.)	H (ft.)	L (ft.)	MIN. X (ft.)	APPROX. VOL. (Cu. Yds.)	D (in.)	H (ft.)	L (ft.)	MIN. X (ft.)	APPROX. VOL. (Cu. Yds.)		
12	3.0'	2.4	1	0.2	12	2.0'	2.0	1	0.1		
15	3.0'	4.2	1	0.3	15	2.0'	3.5	1	0.2		
18	3.0'	5.4	1.2	0.8	18	3.0'	2.9	1	0.4		
21	3.0'	9.5	2.8	1.2	21	3.0'	5.2	1	0.7		
24	3.5'	10.5	3.5		24	3.5'	6.0	1.5			
30	4.0'	12.5	4.0		30	4.0'	8.0	2.0			

TABLE I

D (in.)	VERTICAL THRUST BLOCKS			K DIMENSION (APPROX.) (ft.)		
	VOLUME (Cu. Yds.)	Δ < 8°	Δ < 12°	Δ < 6°	Δ < 12°	Δ < 23°
12	0.2	0.4	0.8	1.6	2.5	3.7
15	0.3	0.7	1.3	1.9	3.3	4.7
18	0.5	0.9	1.7	2.6	3.7	5.3
21	0.8	1.6	3.0	3.2	5.0	7.1
24				4.0	6.5	8.5
30				4.5	7.0	9.0

TABLE II

Notes:
1. Fitting and rebar to be field coated with a minimum of 1" cement mortar coating. Connection between fitting and pipe to remain clear of concrete and mortar. Alternate details may be submitted to the Engineer for approval.

SEMITROPIC WATER STORAGE DISTRICT

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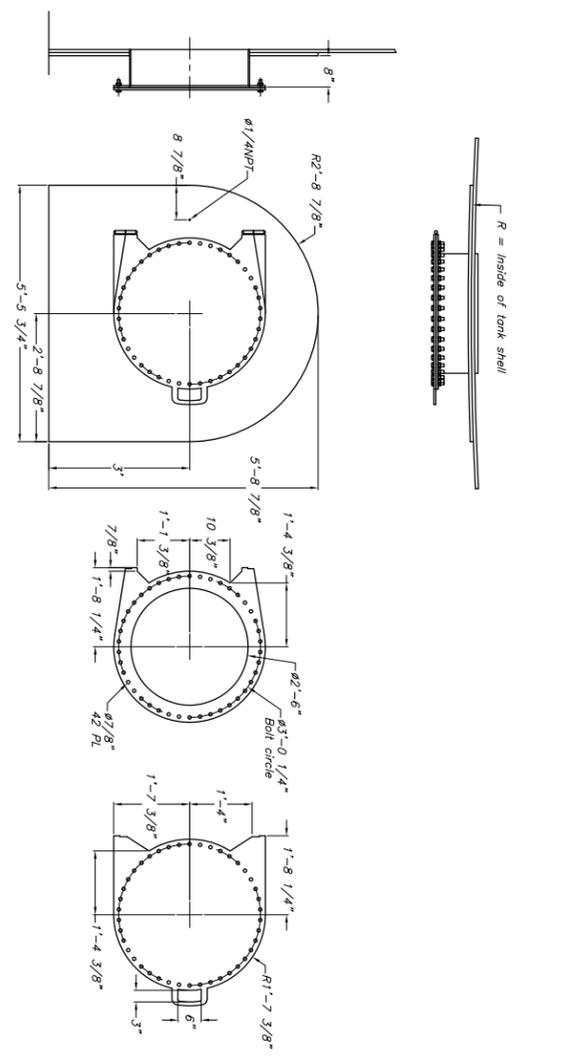
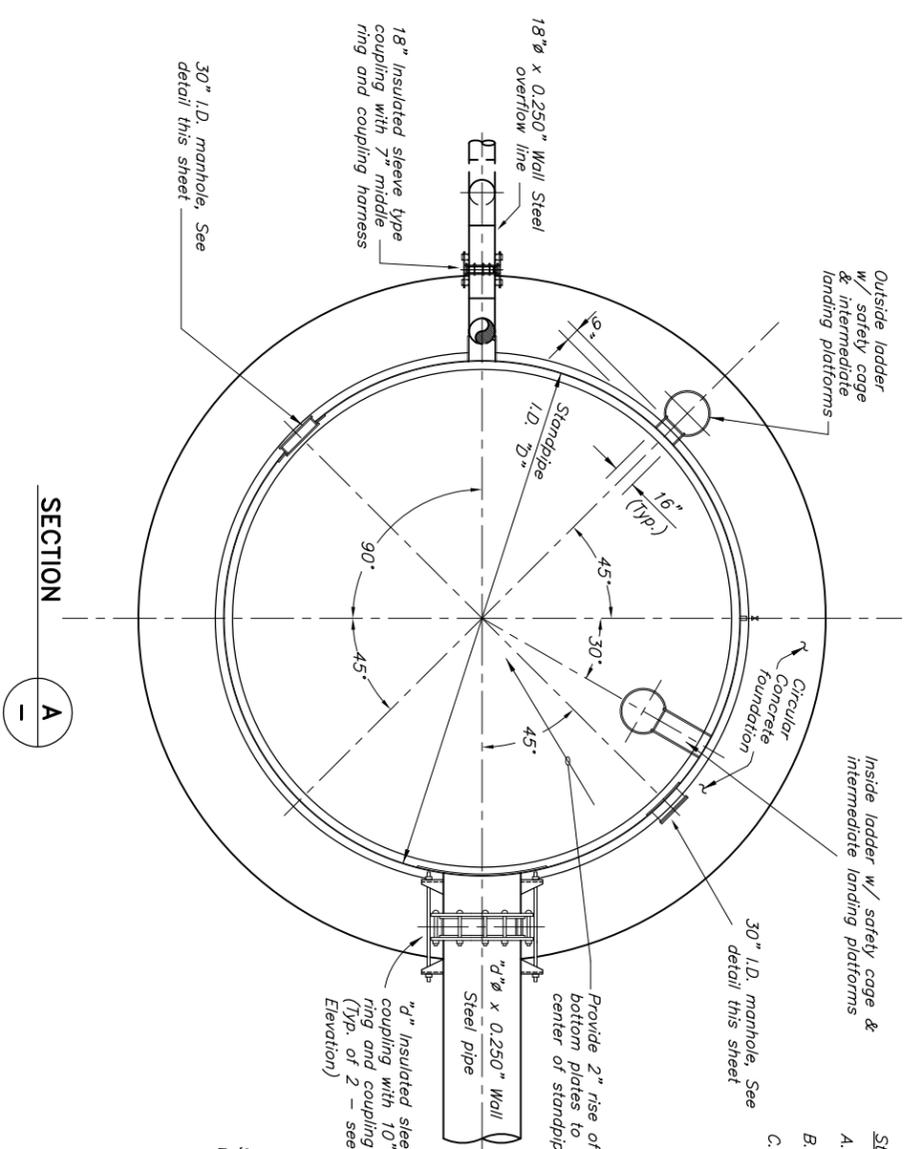


MADERA AVENUE INTERTIE

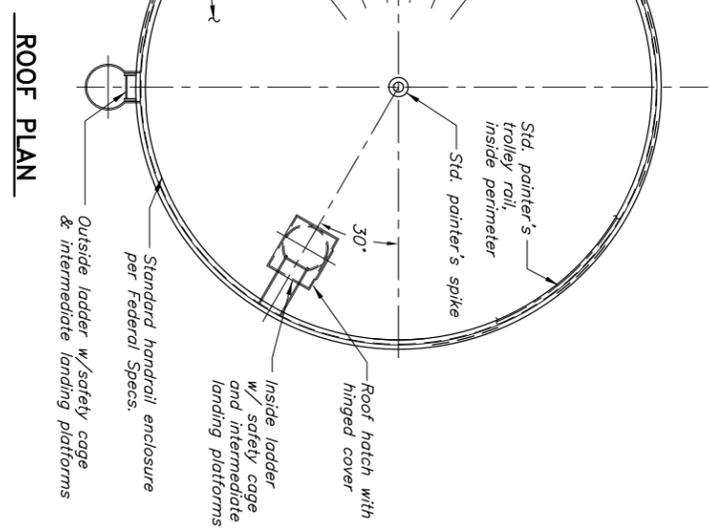
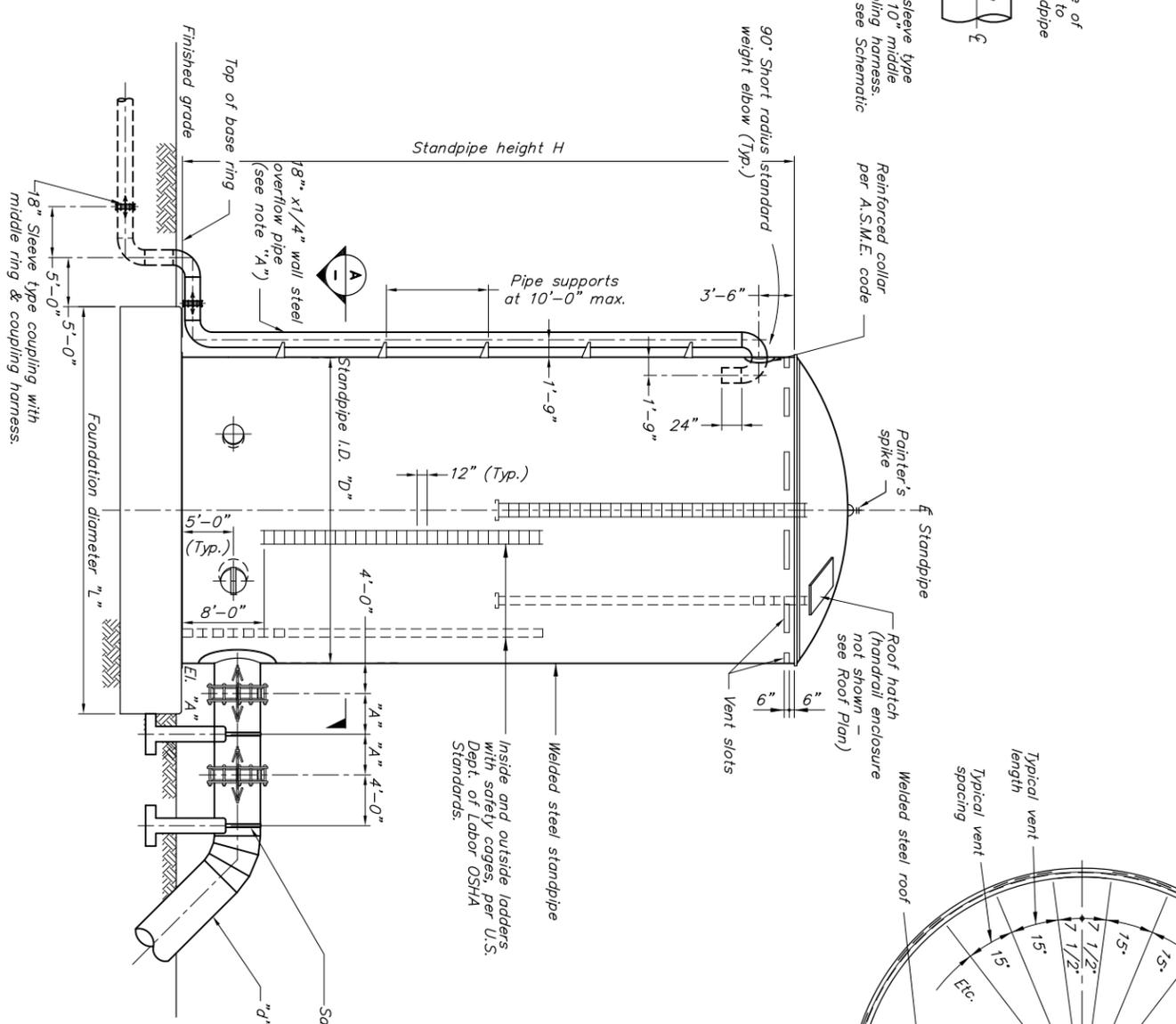
THRUST BLOCKS FOR HORIZONTAL AND VERTICAL BENDS - PVC PIPE

DATE
March 2013

DRAWING NUMBER
MAI-016



- Standpipe Notes:**
- A. For clarity, locations of overflow pipe and manholes have been rotated in Elevation.
 - B. Where base anchorage interferes, locate reinforcing collars inside standpipe shell.
 - C. Furnish one - 1/2" dia. outlet assembly for pressure transmitter, approximately 18-inches above base of standpipe, located as directed by the engineer. Outlet assembly to include extra heavy steel half coupling, and gate valve.



MANHOLE DETAILS

SCHEMATIC ELEVATION

SEMITROPIC WATER STORAGE DISTRICT
KERN COUNTY, CALIFORNIA

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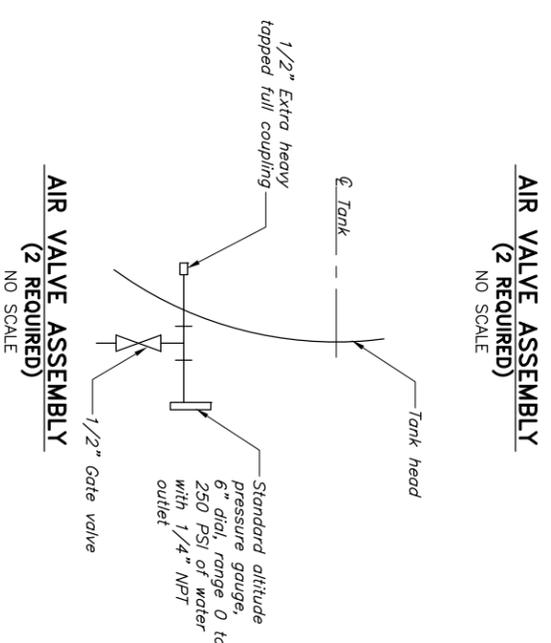
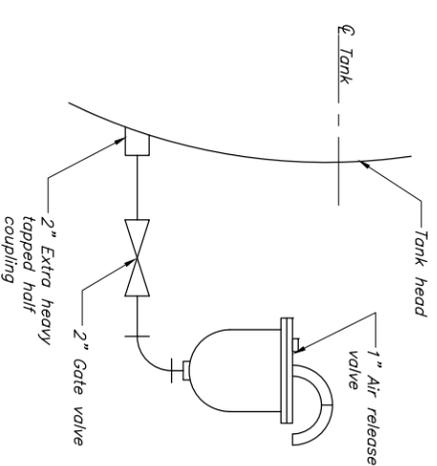
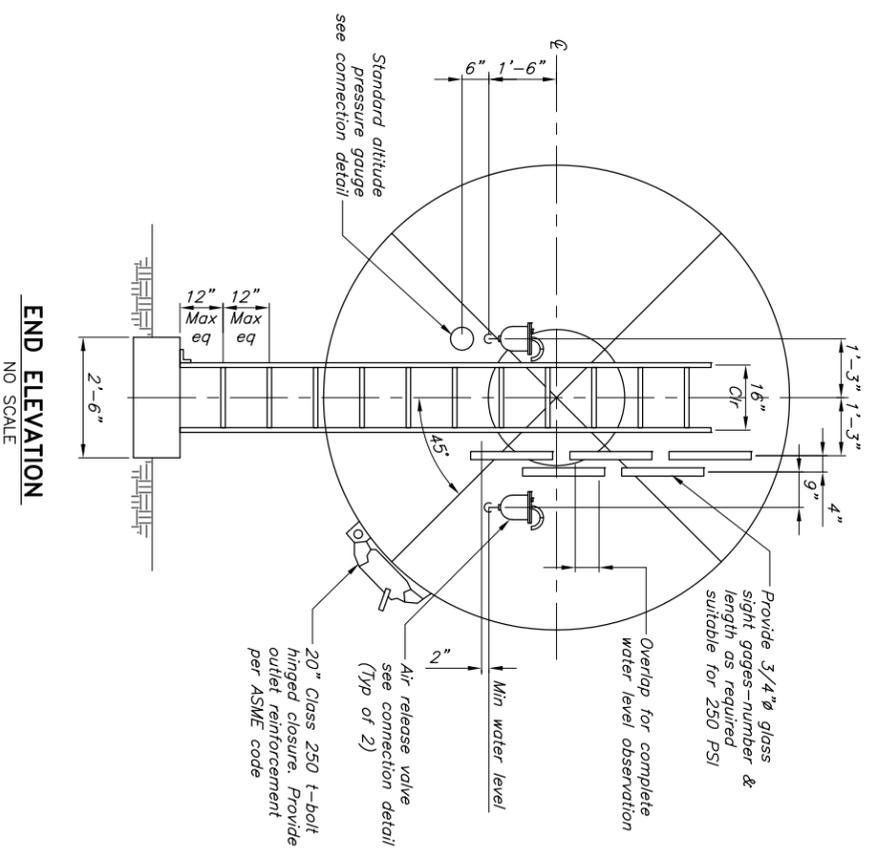
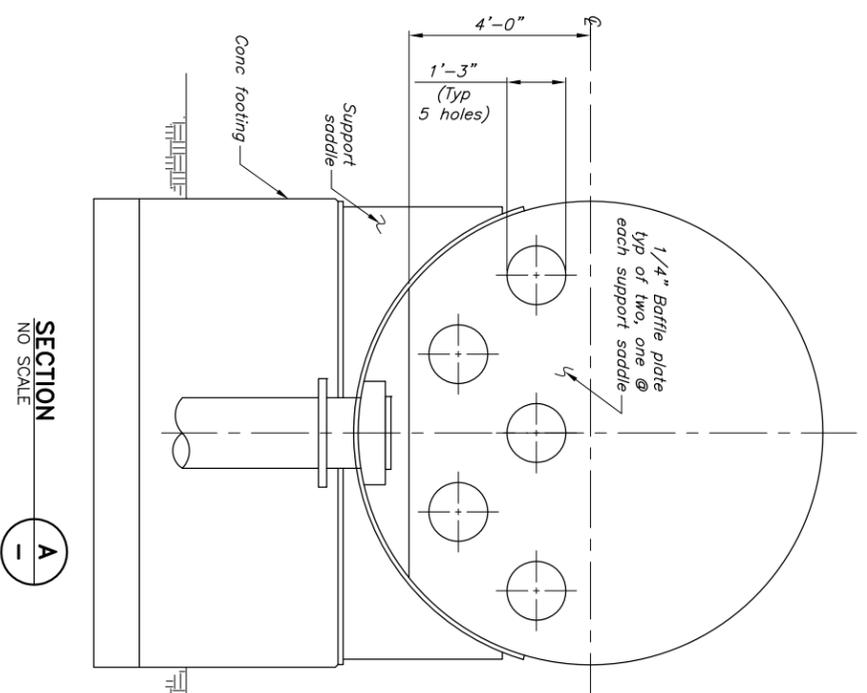
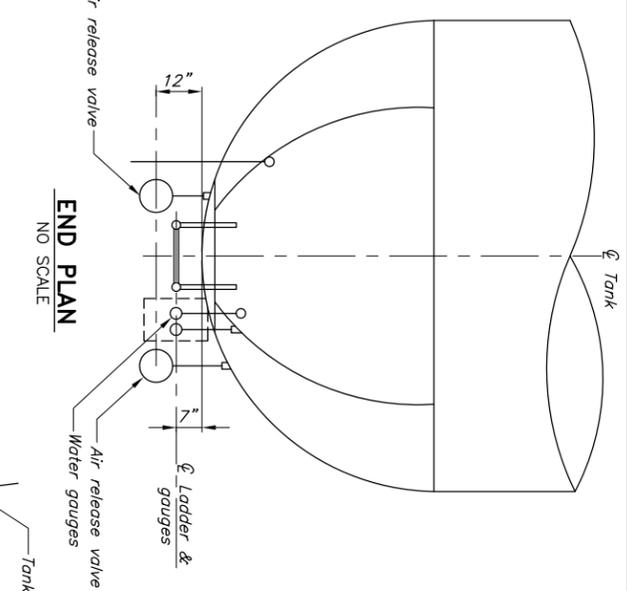
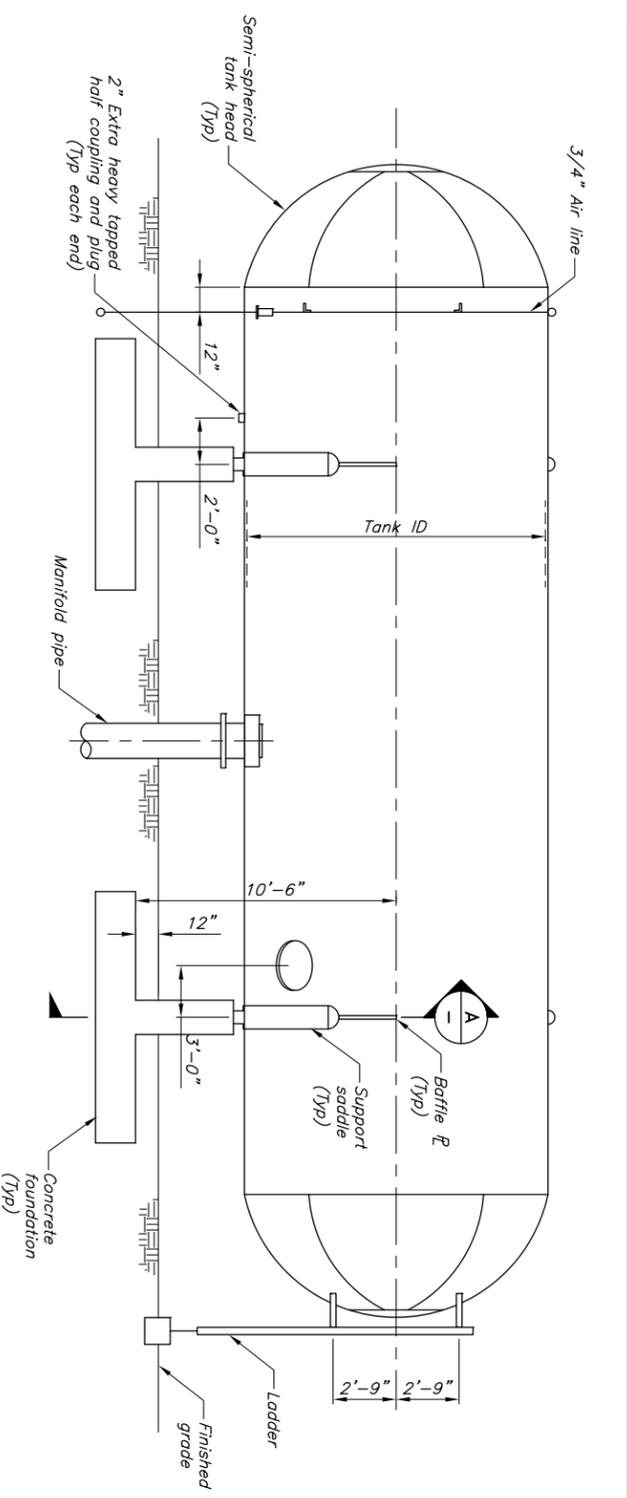


MADERA AVENUE INTERTIE

TYPICAL WELDED STEEL STANDPIPE

DATE
March 2013

DRAWING NUMBER
MAI-017



SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

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BAKERSFIELD, CALIFORNIA



MADERA AVENUE INTERTIE

TYPICAL AIR CHAMBER

DATE

March 2013

DRAWING NUMBER

MAI-018

GENERAL NOTES:

1. These notes are general and apply to the entire project except where specifically indicated otherwise.
2. Structural dimensions controlled by or related to mechanical equipment, including anchorage and recesses for such equipment not shown on the structural drawings, shall be coordinated by the contractor prior to construction. Anchor bolt sizes and placement, recesses, and embeds required by mechanical and electrical equipment shall be verified with the equipment manufacturer.
3. Structural drawings shall be used in conjunction with civil, mechanical, electrical drawings and with shop drawings provided by the equipment manufacturers.
4. Structures have been designed for operational loads on the completed structures. During construction the structures shall be protected by bracing and bracing whenever excessive construction loads may occur. Overstressing of any structural element is prohibited.
5. Unless otherwise indicated, finished grade is shown thus  on all structural drawings indicating ground surface, top of concrete slab, or top of AC pavement. For details of finished surfaces see civil drawings.
6. Design is in accordance with the 2006 International Building Code and the 2007 California Building Code except where other applicable codes or the following notes are more restrictive.
7. Loadings:
 - Elevated Slab/Walkway Live Load – 100 psf + Equipment Load
 - Additional Dead and Live Loads per 2006 IBC
 - Wind – Per 2006 IBC
 - Seismic per 2006 IBC – applied to above ground structures only
 - Lateral Soil Pressures per geotechnical report
8. Construction joints for structures shall be located as indicated on the drawings or approved by the engineer. All construction joints in members in contact with water shall have a 6-inch flatstrip waterstop unless otherwise indicated. In addition, joints in slabs covered with water shall have a 6-inch flatstrip waterstop and a seditant groove. Maximum spacing between construction joints shall be 40 ft.

STRUCTURAL STEEL NOTES:

1. All structural steel conform to the requirements of the AISC "Manual of Steel Construction, Allowable Stress Design, 9th Edition."
2. All welding shall be by the shielded arc method and shall conform to the AWS Code for Arc and Gas Welding in Building Construction. Qualifications of welders shall be in accordance with the Specifications for Standard Qualification Procedures of the AWS
3. All structural steel shall be hot-dip galvanized after fabrication unless otherwise noted.

CONCRETE NOTES:

1. All structural concrete shall develop a minimum compressive strength of 4000 P.S.I. at 28 days, unless otherwise noted.
2. All reinforcing steel shall be deformed bars conforming to the requirements of ASTM A-615, Grade 60, unless otherwise noted.
3. All detailing, fabrication, and placing of reinforcing steel shall be in accordance with ACI-315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures", latest edition.
4. The first and last bars in slabs and walls, stirrups in beams, and ties in columns shall start and end a maximum of one half of the adjacent bar spacing or 3-inches, whichever is less, from the start or end of the member.
5. All construction joints shall be rough and thoroughly cleaned for bond prior to placing concrete.
6. Tolerances for placing reinforcing steel shall be: ± 3/8 inch for members ≤ 8 inches thick. ± 1/2 inch for members > 8 inches thick.
7. Dowels, piping, waterstops, and other embeds shall be held securely in place while the concrete is being poured.
8. All gROUT shall be non-shrink, unless otherwise noted.
9. Bar supports, spacers, and other accessories are not shown on the design drawings.
10. Metal clips or supports shall not be placed in contact with the forms or subgrade. Concrete blocks or dabbies shall be in sufficient numbers to support the bars on the subgrade without settlement. In no case shall such support be continuous.
11. Unless otherwise indicated, the following shall be used in addition to the normal accessories used to hold reinforcing bars firmly in position:
 - A. In slabs #5 riser bars @ 36" O.C.. Max. to support reinforcing bars.
 - B. In walls with 2 curtains #3 U or Z shape spacers @ 6"-0" O.C. Max each way.
12. Dowels shall be set and wired or otherwise held in place prior to placing the concrete. Dowels shall not be inserted into freshly placed concrete.
13. A minimum clear distance of 2 inches shall be maintained between the reinforcing steel and all pipes, pipe flanges, or other metal parts embedded in the concrete.
14. All items embedded in the concrete shall be spaced at no less than 4 times the outside dimension of the largest item. The outside dimension shall not exceed one third the concrete member thickness.
15. Unless otherwise shown on the drawings, concrete cover for reinforcing bars shall be as follows:
 - Concrete placed against earth....."3"
 - For surfaces in contact with water or weather and formed surfaces in contact with earth....."2"
 - For concrete not exposed to weather or contact with water or earth....."2"
16. Unless otherwise noted, where a single layer of reinforcing steel is shown in a wall or slab the reinforcing shall be centered.
17. Slab thickness called out on the drawings are minimums. Where slabs have a sloping surface the slab bottom may be flat or it may be sloped to maintain a constant thickness, reinforcing steel in slabs with sloping surfaces shall be placed at the required distances from the slab surfaces.

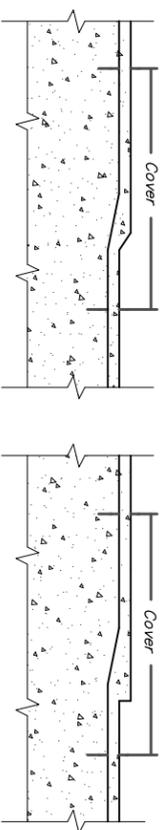
TYPICAL DETAIL NOTES:

1. Details on drawings CT2010-17 through CT2010-20 are typical details. These details are to be used when referred to or when no other more restrictive or different details are shown on the drawings.

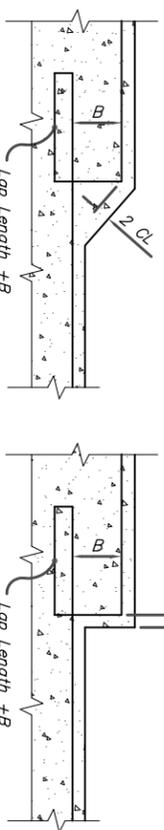
SPECIAL INSPECTION NOTES:

1. Unless otherwise noted the following items require special inspections:
 - Concrete reinforcement placement
 - Shop welding if not done in a UBC approved shop.
 - Field welding.
 - High strength bolted connections.
 - Installation of adhesive anchors.
 - Installation of cast-in-place anchor bolts.
2. Special inspection shall be provided per the 2006 IBC.

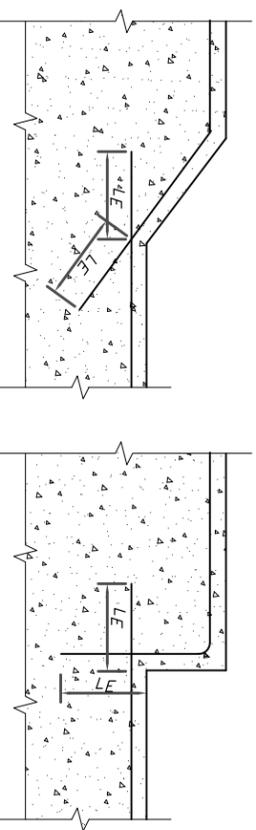
SEMITROPIC WATER STORAGE DISTRICT		 GEO Consultants Bookman-Edmonston Division	MADERA AVENUE INTERTIE	DATE
KERN COUNTY, CALIFORNIA			GENERAL STRUCTURAL NOTES	March 2013
GEO CONSULTANTS, INC. BAKERSFIELD, CALIFORNIA				DRAWING NUMBER MAI-019



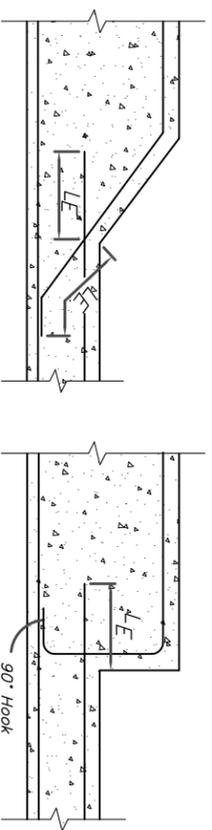
OFFSET LESS THAN 3"



OFFSET 3" TO 8"

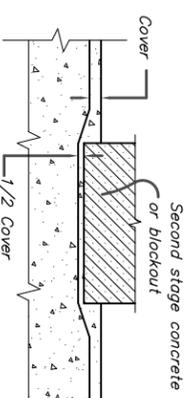


OFFSET GREATER THAN 8"

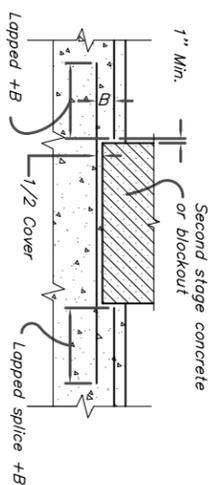


**OFFSET GREATER THAN 8"
RESTRICTED MEMBER THICKNESS**

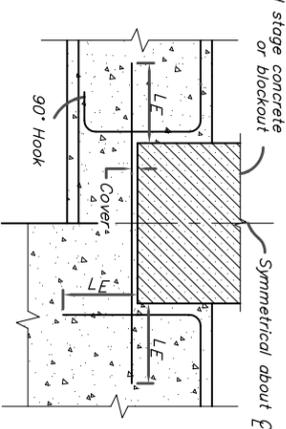
TYPICAL OFFSET DETAILS



RECESS LESS THAN 3" DEEP

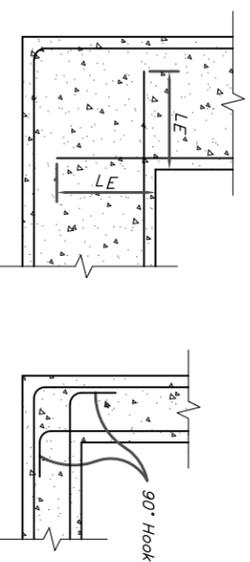


RECESS 3" TO 8" DEEP

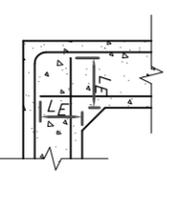


RECESS GREATER THAN 8"

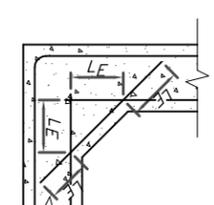
TYPICAL BLOCKOUT RECESS DETAILS



RESTRICTED MEMBER THICKNESS

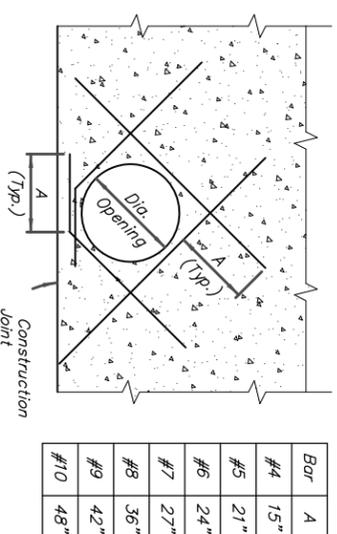


FILLET LESS THAN 1'-0"



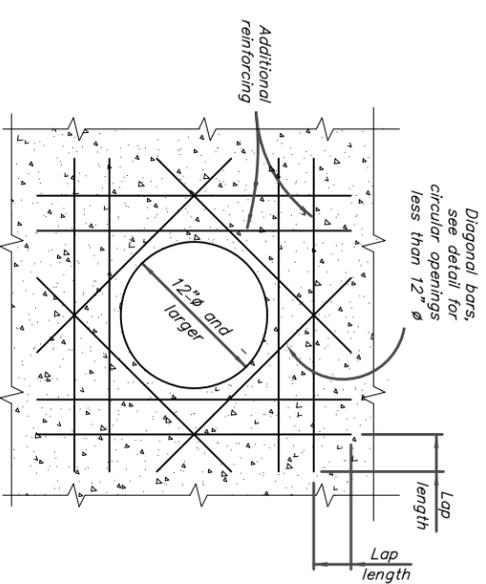
FILLET 1'-0" OR GREATER

TYPICAL CORNER DETAILS



Bar	A
#4	15"
#5	21"
#6	24"
#7	27"
#8	36"
#9	42"
#10	48"

**ADDITIONAL REINFORCING AT
CIRCULAR OPENINGS LESS THAN 12"**



**ADDITIONAL REINFORCING AT
CIRCULAR OPENINGS GREATER THAN 12"**

NOTES:
Lengths apply to grade 60 reinforcing only.

Place diagonal bars at centerline of wall where only one layer of reinforcing is provided and at each face where two layers of reinforcing are provided.

Diagonal bars shall match the size of the largest of the normal wall (slab) bars.

Bend diagonal bars as required at construction joints or other obstructions.

NOTES:

Cut normal reinforcing at opening.

Place additional vertical bars with an area of steel (As) equal to 1/2 the As of the vertical bars cut on each side of the opening. As of additional vertical bars equals As of vertical bars cut.

Place additional horizontal bars with an area of steel (As) equal to 1/2 the As of the horizontal bars cut on each side of the opening. As of additional horizontal bars equals As of horizontal bars cut.

Increase bar size as required to fit additional bars within a distance of 2 x wall (slab) thickness from the opening. Maintain a minimum of 2" clear between bars.

If a wall or slab intersects the wall with the opening within one wall thickness of the opening the additional bars may be omitted on that side.

NOTES:

For general notes see Dwg. No. CT2010-16.

For lap length and embedment lengths (Le) see drawing CT2010-18.

SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

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MADERA AVENUE INTERTIE

TYPICAL STRUCTURAL DETAILS

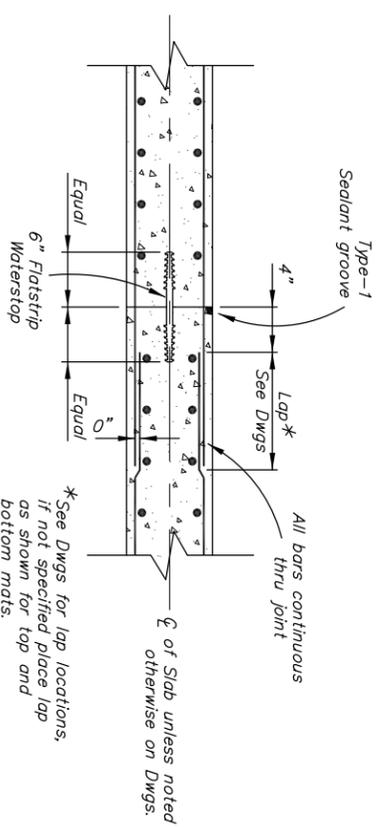
SHEET 1 OF 4

DATE

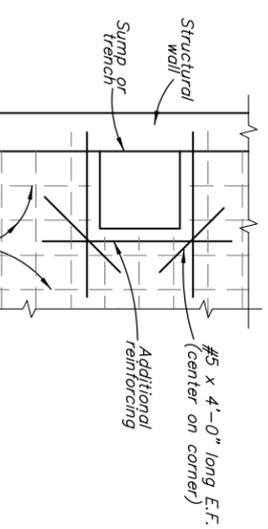
March 2013

DRAWING NUMBER

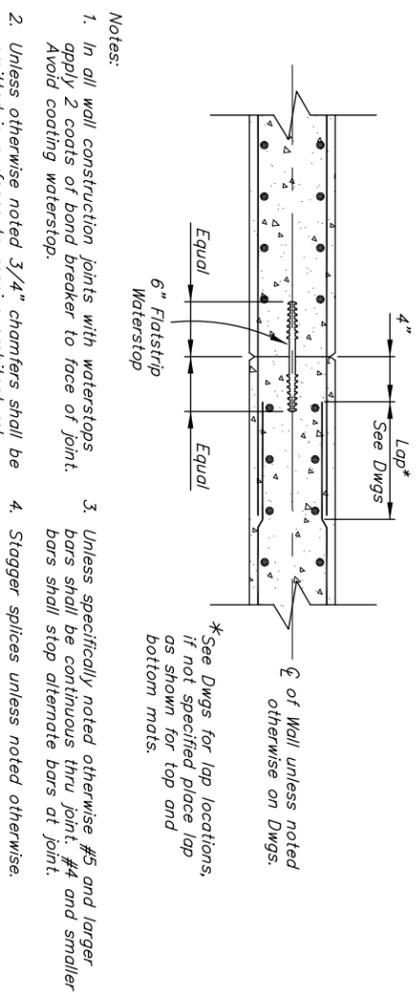
MAI-020



SLAB ON GRADE CONSTRUCTION JOINT

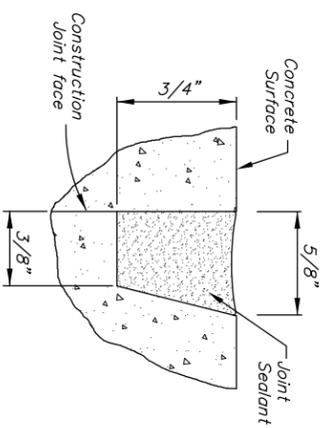


ELEVATION



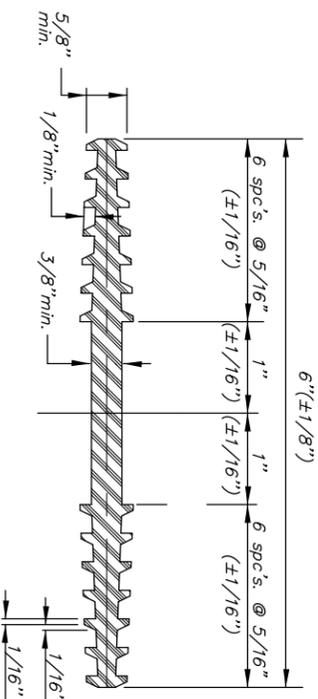
- Notes:
- In all wall construction joints with waterstops apply 2 coats of bond breaker to face of joint. Avoid coating waterstop.
 - Unless otherwise noted 3/4" chamfers shall be omitted in surfaces to receive architectural treatment.
 - Unless specifically noted otherwise #5 and larger bars shall be continuous thru joint. #4 and smaller bars shall stop alternate bars at joint.
 - Stagger splices unless noted otherwise.

VERTICAL WALL CONSTRUCTION JOINT

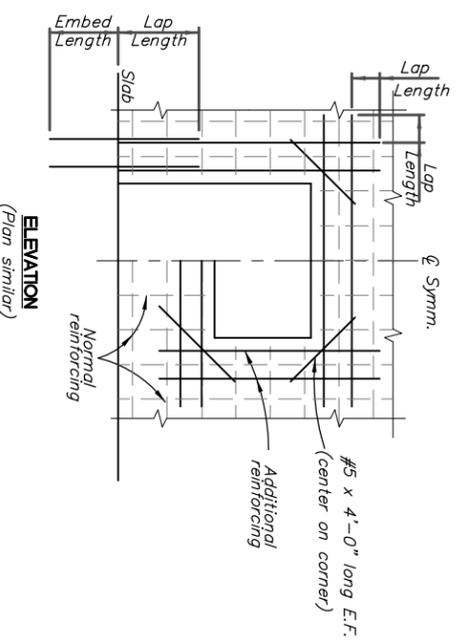


TYPE -1 SEALANT GROOVE

- Notes:
- All floor joints of hydraulic structures (members covered with water) shall have a sealant groove.
 - Where face of joint is to be coated with bond breaker avoid coating sealant groove.
 - Sandblasting required prior to application of primer.



6" FLATSTRIP WATERSTOP



- Notes:
- Cut normal reinforcing at opening.
 - Place additional vertical bars with an area of steel (As) equal to 1/2 the As of the vertical bars cut on each side of the opening. As of additional vertical bars equals As of vertical bars cut.
 - Place additional horizontal bars with an area of steel (As) equal to 1/2 the As of the horizontal bars cut on each side of the opening. As of additional horizontal bars equals As of horizontal bars cut.
 - Increase bar size as required to fit additional bars within a distance of 2 x wall (slab) thickness from the opening. Maintain a minimum of 2" clear between bars. If a wall or slab intersects the wall with the opening within one w/thickness of the opening the additional bars may be omitted on that side.

ADDITIONAL REINFORCING AT RECTANGULAR OPENINGS

Bar Size	Hook	*LENGTH	
		Lap (L)	Embedment (L _E)
#4	8"	18" (24")	14" (19")
#5	10"	23" (30")	18" (24")
#6	12"	28" (37")	22" (29")
#7	14"	33" (43")	25" (33")
#8	16"	See Table Below	See Table Below
#9	19"	See Table Below	See Table Below
#10	22"	See Table Below	See Table Below
#11	24"	See Table Below	See Table Below

Bar Size	*LENGTH		
	For 1" to < 2" Concrete Cover	For 2" to < 3" Concrete Cover	For 3" and Larger Concrete Cover
#8	62" (81")	62" (81")	37" (49")
#9	99" (129")	79" (103")	69" (90")
#10	125" (163")	100" (130")	88" (115")
#11	154" (201")	123" (160")	108" (141")
EMBEDMENT (L _E)			
#8	48" (63")	48" (63")	29" (38")
#9	77" (101")	61" (80")	54" (71")
#10	97" (127")	77" (101")	68" (89")
#11	119" (155")	95" (124")	84" (110")

- * Use length in parenthesis for wall horizontal rebars and slab bars with 12" or more of fresh concrete underneath.

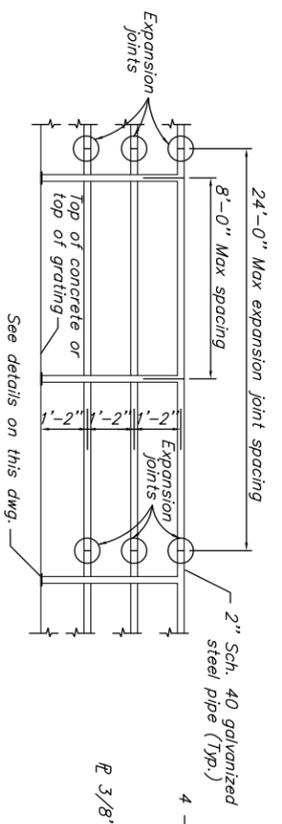
- Notes:
- Use lengths in these tables unless otherwise indicated on design drawings.
 - Tables are for concrete with a compressive strength f'c of 4,000 P.S.I. and grade 60 reinforcing steel (fy = 60,000 P.S.I.) only.
 - If reinforcing steel is epoxy coated multiply the lap and embedment lengths in the tables by 1.5.
 - To splice bars of different sizes use a lap length equal to the larger of the embedment length of the larger bar and the lap length of the smaller bar.
 - Splice bars larger than #11 with rebar couplers.
 - Extend dowel bars an embedment length into the second member or across the construction joint unless it is shown to splice with other bars or extend to the far face of the member and end with a standard hook.

STANDARD 90° HOOKS, EMBEDMENT LENGTHS AND LAP LENGTHS

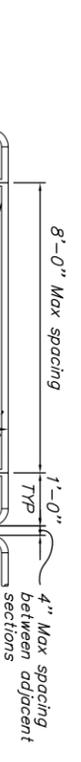
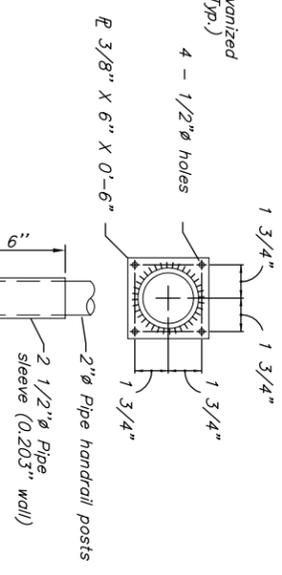
SEMITROPIC WATER STORAGE DISTRICT
KERN COUNTY, CALIFORNIA
G&E CONSULTANTS, INC.
BAKERSFIELD, CALIFORNIA



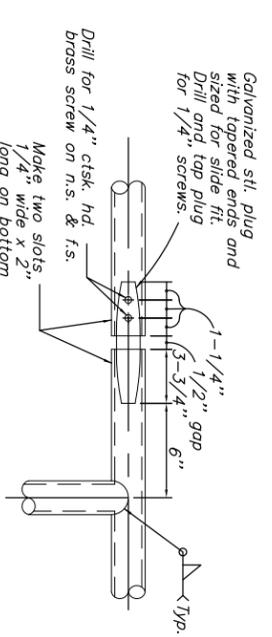
MADERA AVENUE INTERTIE
TYPICAL STRUCTURAL DETAILS
SHEET 2 OF 4
DATE: March 2013
DRAWING NUMBER: MAI-021



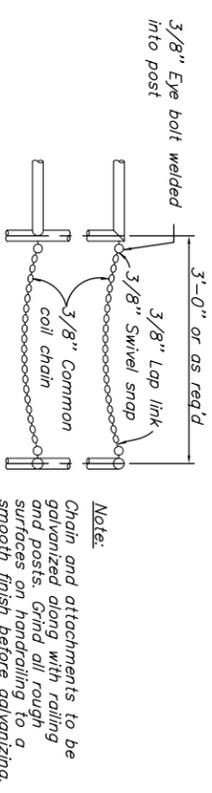
FIXED HANDRAIL



REMOVABLE HANDRAIL



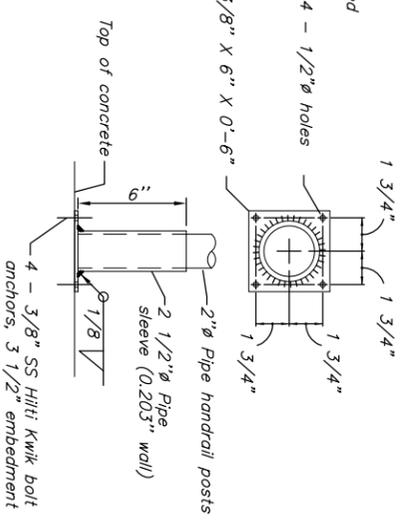
HANDRAIL EXPANSION JOINT DETAIL



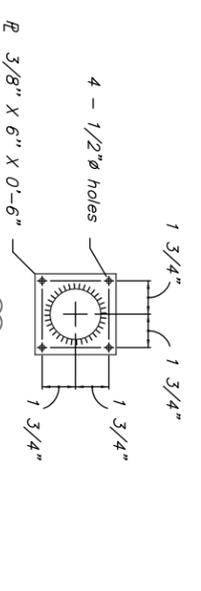
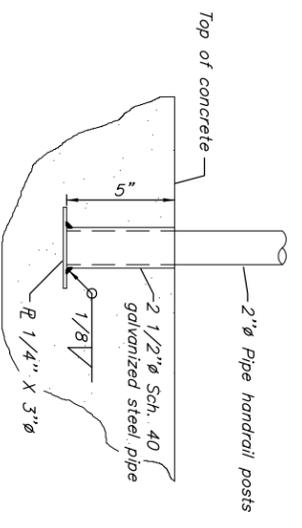
SAFETY CHAIN

Note:
Chain and attachments to be galvanized along with railing and posts. Grind all rough surfaces on handrailing to a smooth finish before galvanizing.

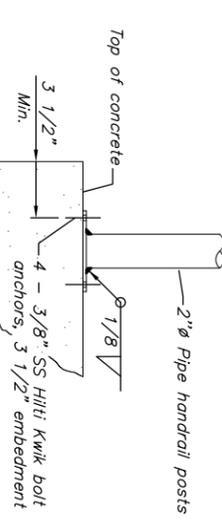
TOP MOUNTED PIPE SLEEVE DETAIL



EMBEDDED PIPE SLEEVE DETAIL

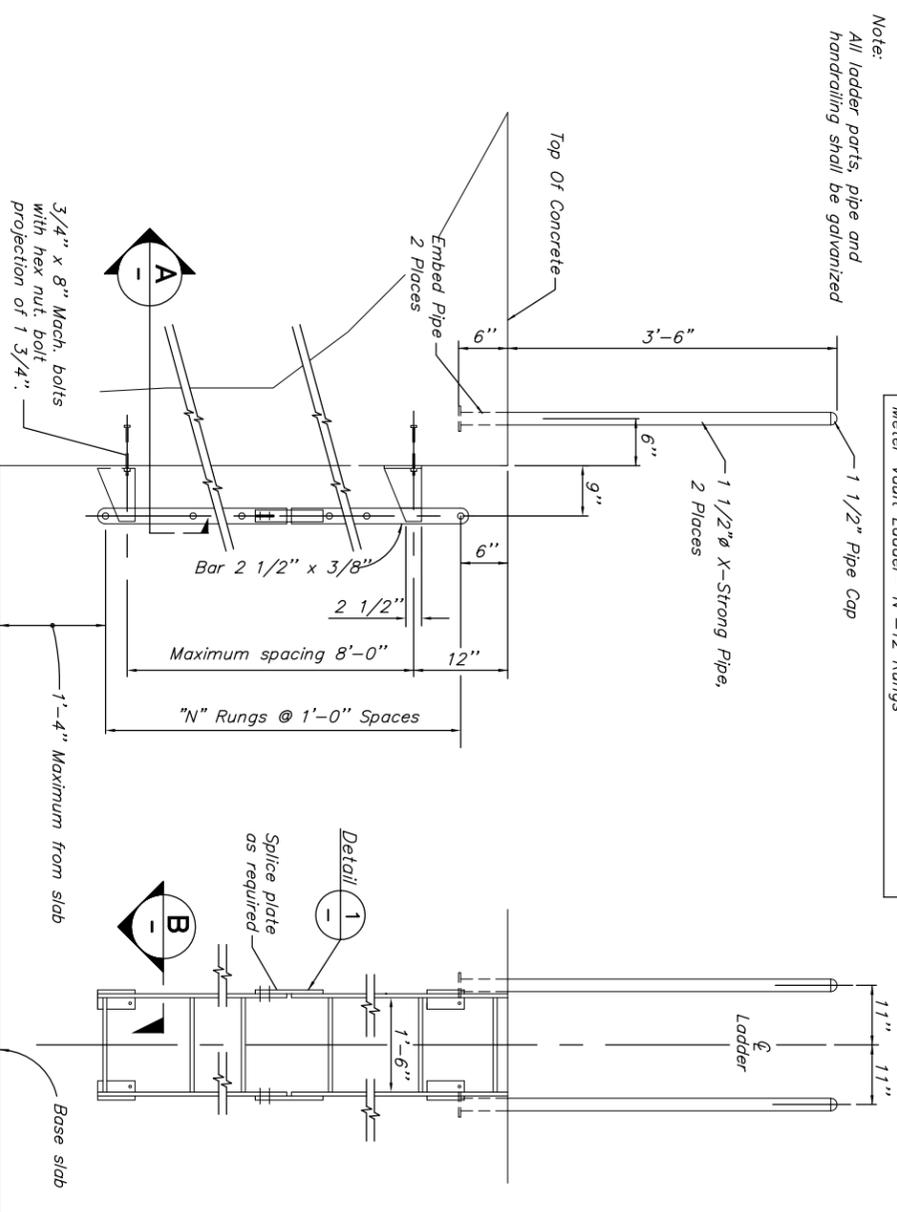


BASE PLATE DETAIL

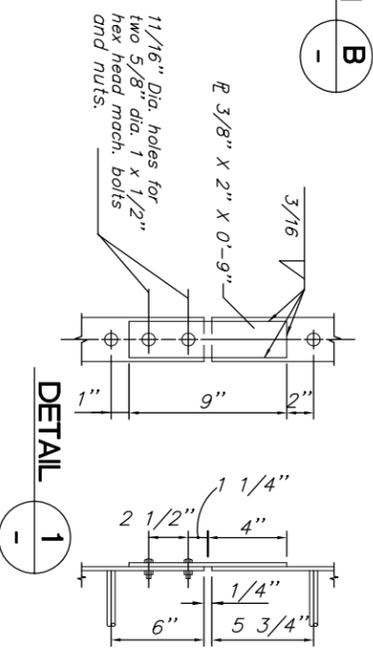
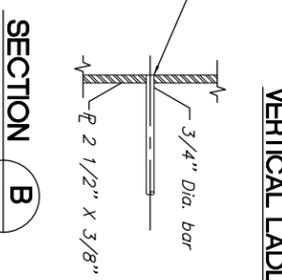
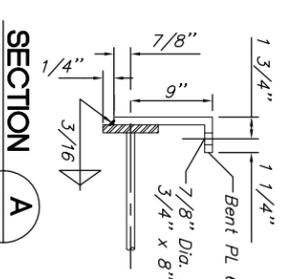


Note:
All ladder parts, pipe and handrailing shall be galvanized

Turnout Structure Ladder—"N"=18 Rungs (2) Required
Meter Vault Ladder—"N"=12 Rungs



VERTICAL LADDER



SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

G&I CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA

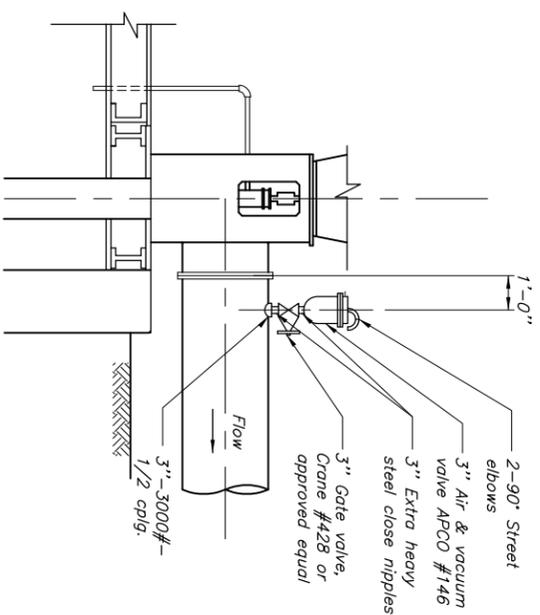


MADERA AVENUE INTERTIE

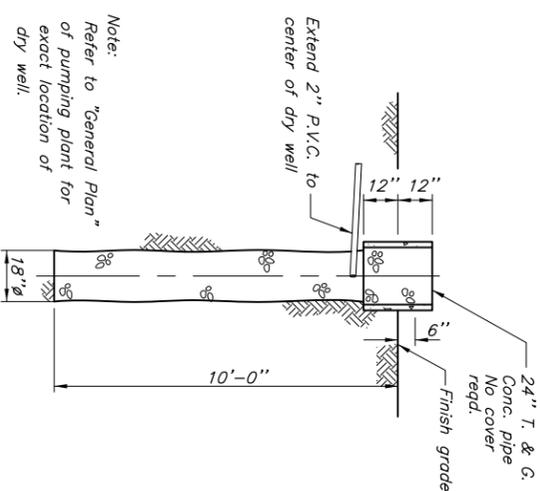
DATE
March 2013

TYPICAL STRUCTURAL DETAILS
SHEET 3 OF 4

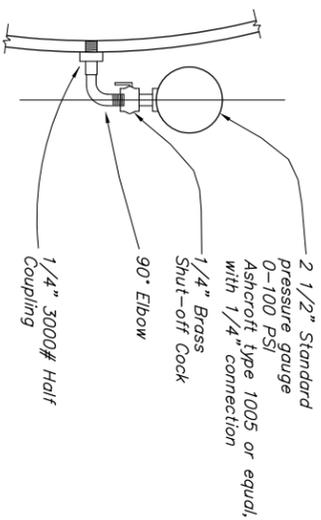
DRAWING NUMBER
MAI-022



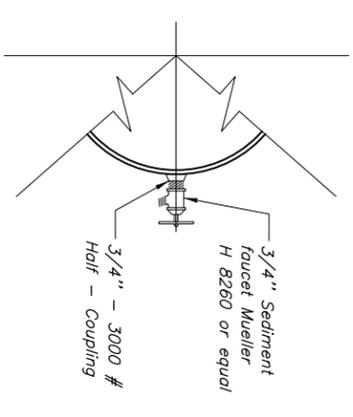
**AIR VALVE ASSEMBLY
OPEN SUMP PUMP INSTALLATION**
Scale: $3/8"=1'-0"$



TYPICAL DRY WELL
Scale: $3/8"=1'-0"$

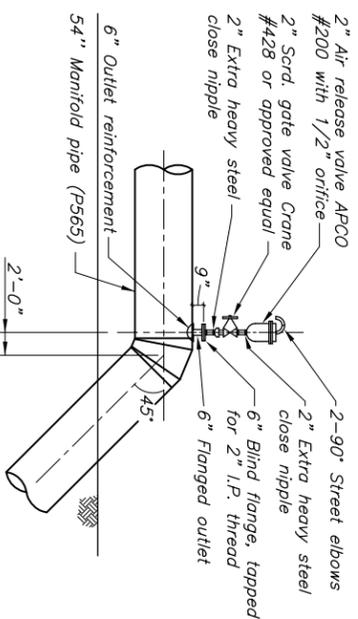


PRESSURE GAUGE DETAIL

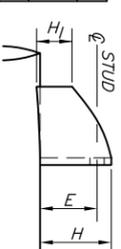
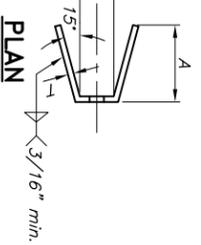
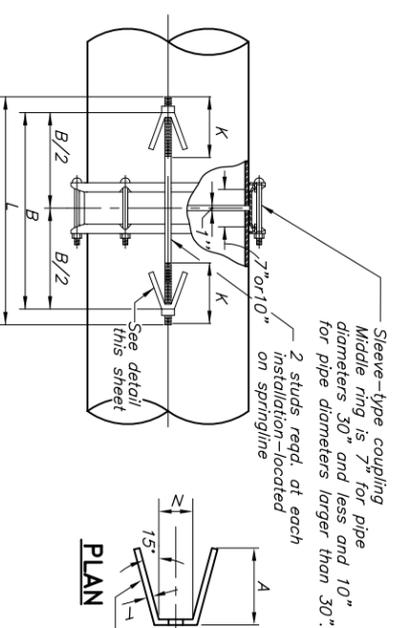


Note:
See Manifold Dwgs. for location

HOSE FAUCET OUTLET
Scale: $1"=1'-0"$



AIR VALVE ASSEMBLY DETAILS



JOINT HARNESS DIMENSIONS (IN INCHES)

PIPE SIZE	STUD D	A	B	T	H	E	H ₁	L	N	K
12	5/8	3	26	3/8	3 7/8	3	2	28 1/4	2	3 1/2
16	3/4	3 3/4	27 1/2	3/8	4 1/8	3 1/8	2	30	2	3 5/8
20	7/8	4 1/2	29	3/8	4 1/4	3 1/8	2	31 3/4	2	3 3/4
30	1	5 1/8	30 1/4	3/8	4 1/2	3 1/4	2	33 3/4	4	3 7/8
36	1 1/4	6 3/4	33 1/2	1/2	5	3 3/4	2 1/2	37	4	4 1/4
48	1 1/2	8 3/4	47 1/2	1/2	5 3/4	3 7/8	2 1/2	51 1/2	4	4 1/2
60	1 3/4	11 1/4	50 1/2	1/2	6 3/8	4 1/8	2 1/2	55	4	4 3/4

HARNESS DETAIL
Not to Scale

SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

GEI CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA

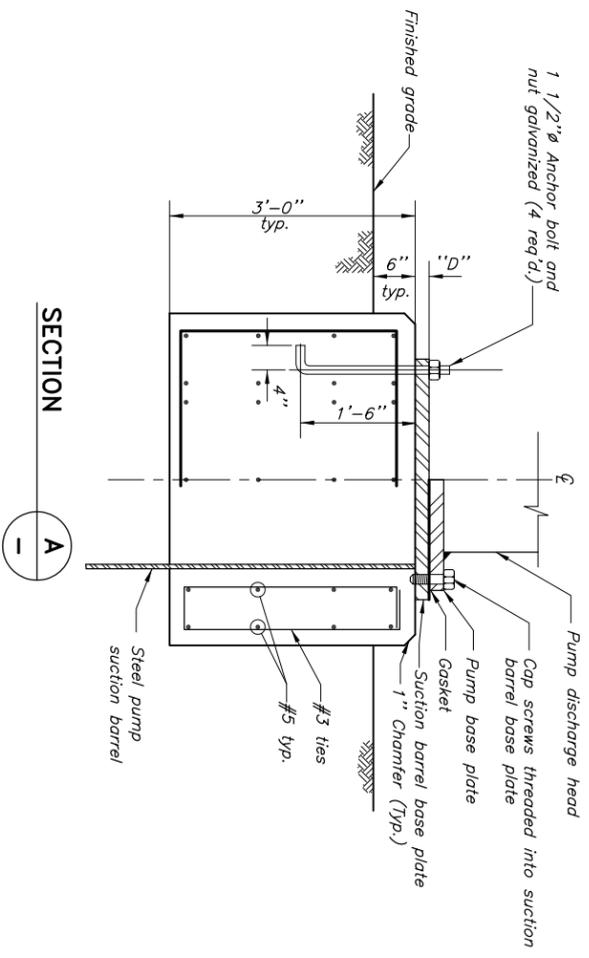
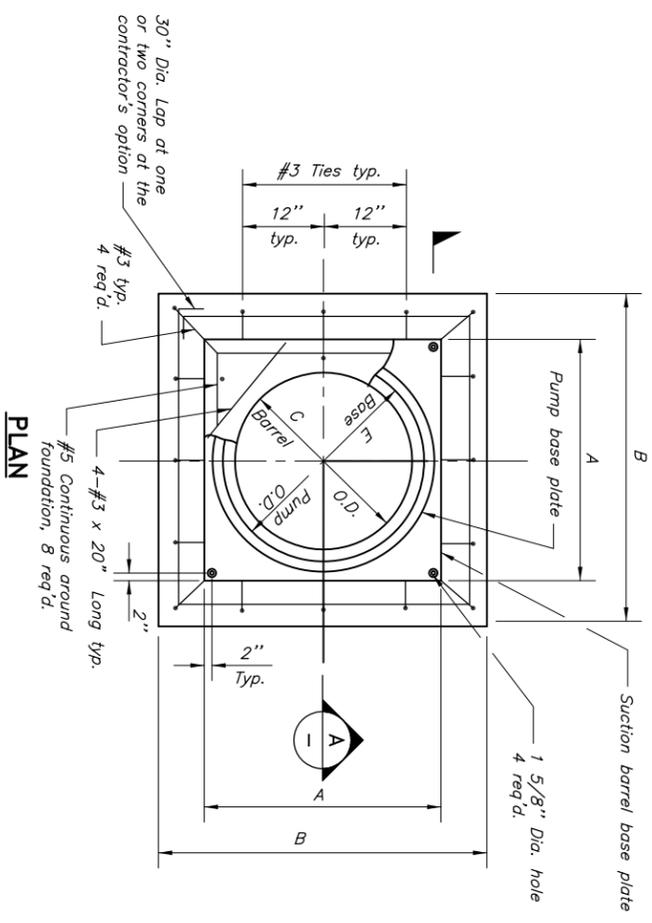


MADERA AVENUE INTERTIE

MISCELLANEOUS MANIFOLD DETAILS

DATE
March 2013

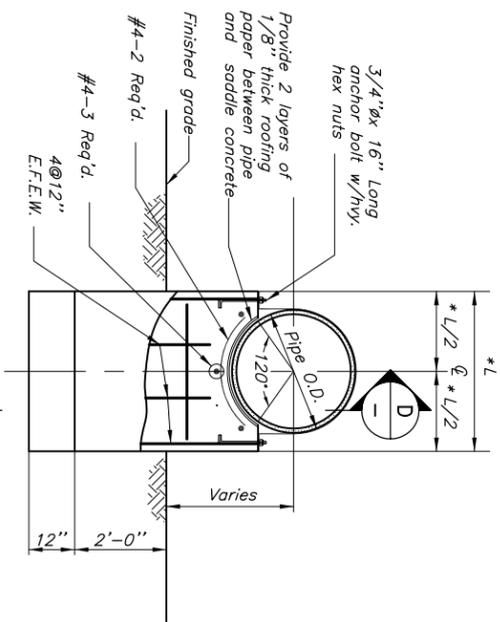
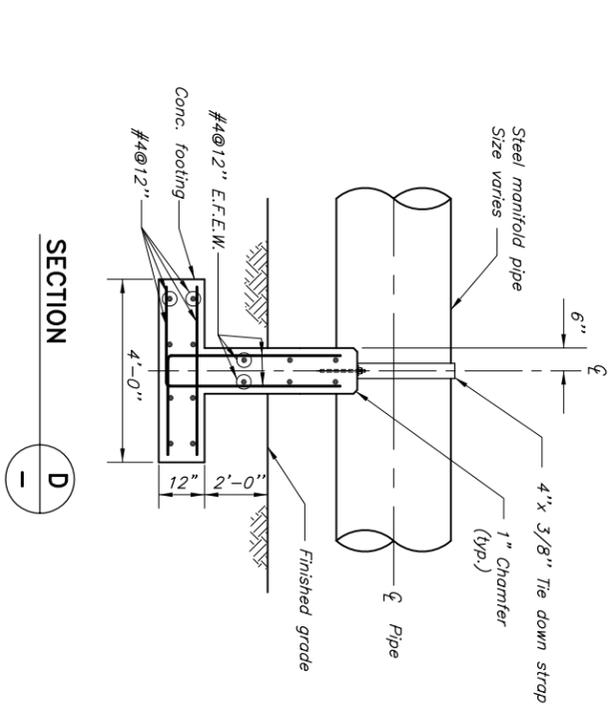
DRAWING NUMBER
MAI-024



Pump capacity	A	B	C	D	E
5 cfs	33"	5'-0"	*	1 1/4"	*
10 cfs	60"	7'-0"	*	2"	*

* Per pump manufacturer dimensions

CLOSED SUCTION PUMP FOUNDATION SLAB

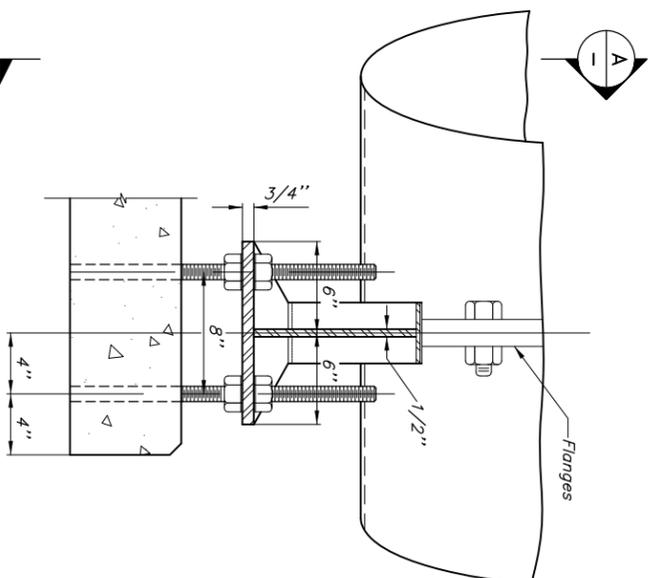


SADDLE TYPE PIPE SUPPORT

* L=Pipe O.D. + 12"

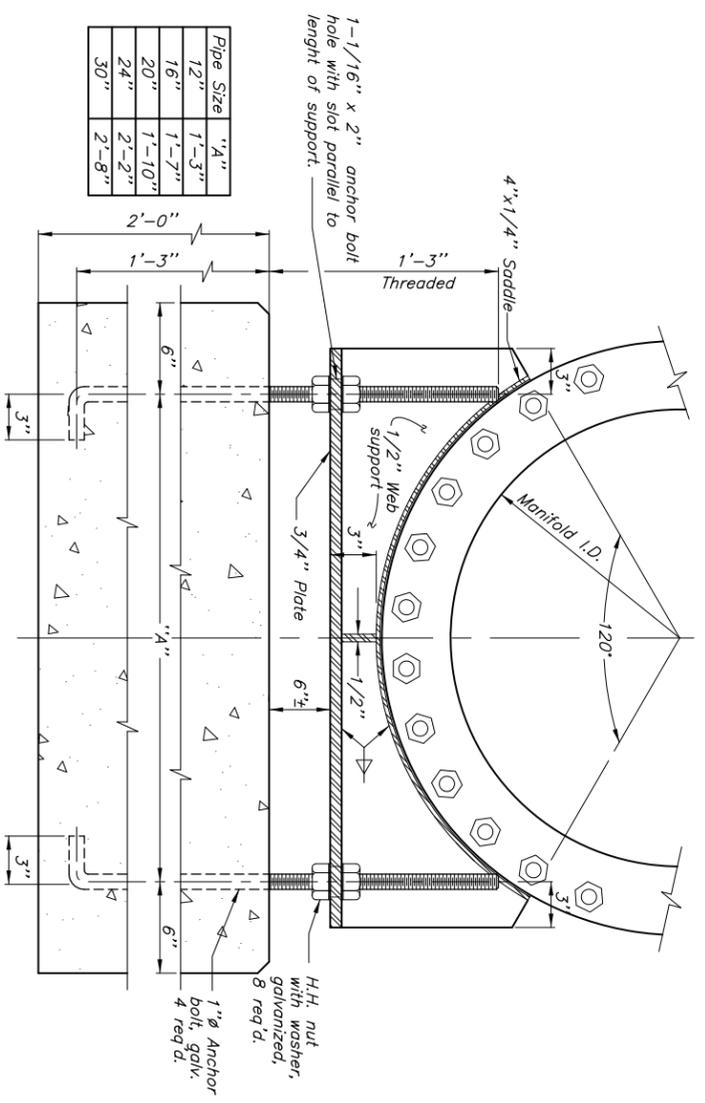
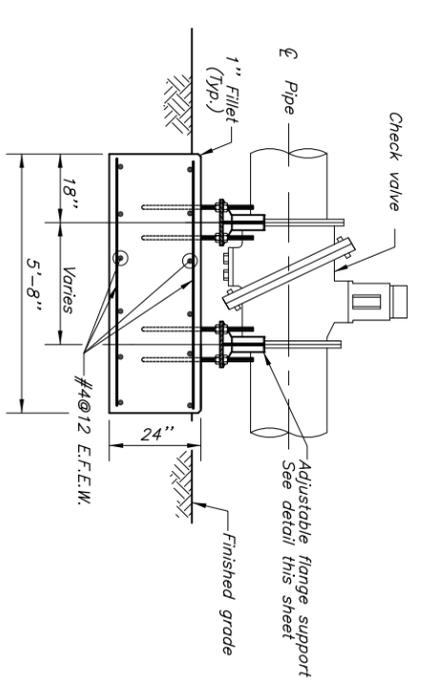
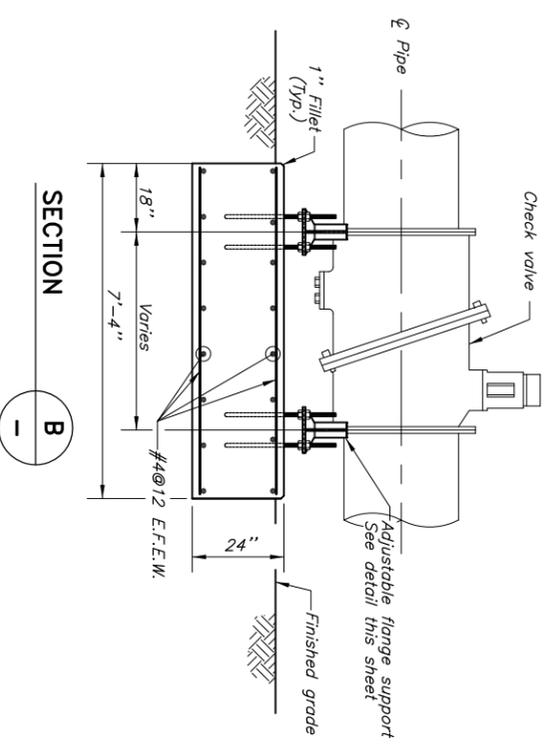
Notes:
1. For general structural notes, see Dwg. MAI-018.

SEMITROPIC WATER STORAGE DISTRICT		MADERA AVENUE INTERTIE	
KERN COUNTY, CALIFORNIA		DATE	
GEI CONSULTANTS, INC.		March 2013	
BAKERSFIELD, CALIFORNIA		DRAWING NUMBER	
GEI Consultants Bookman-Edmonston Division		MAI-025	
CONCRETE FOUNDATION			



DETAIL OF ADJUSTABLE FLANGE SUPPORT

Not to Scale



Pipe Size	"A"
12"	1'-3"
16"	1'-7"
20"	1'-10"
24"	2'-2"
30"	2'-8"

SECTION A
Not to Scale

SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

GEI CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA

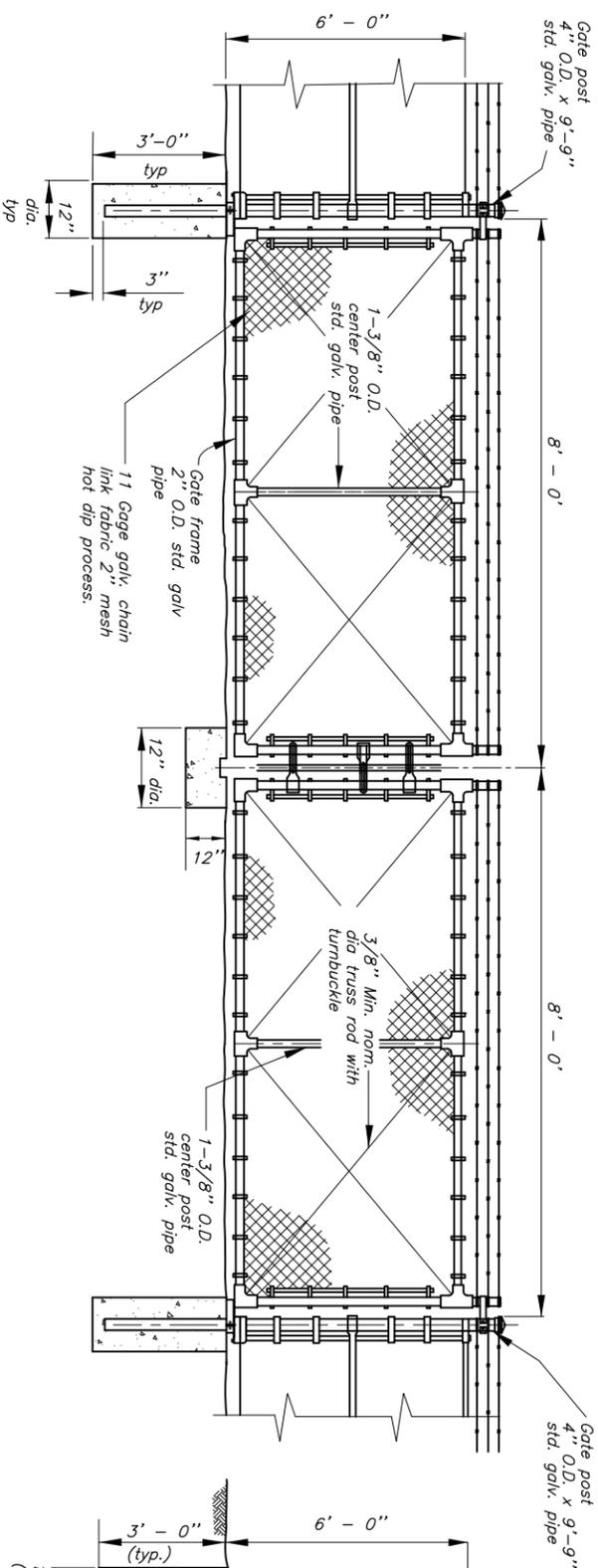


MADERA AVENUE INTERTIE

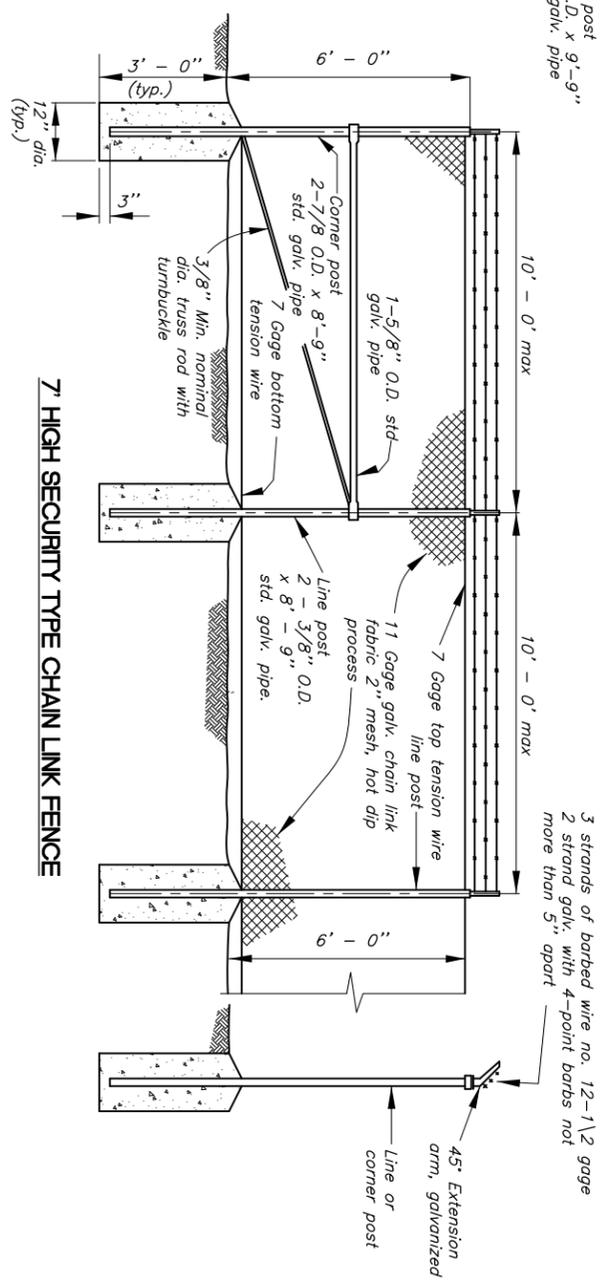
ADJUSTABLE FLANGE SUPPORT AND
PIPE SUPPORT DETAILS

DATE
March 2013

DRAWING NUMBER
MAI-026



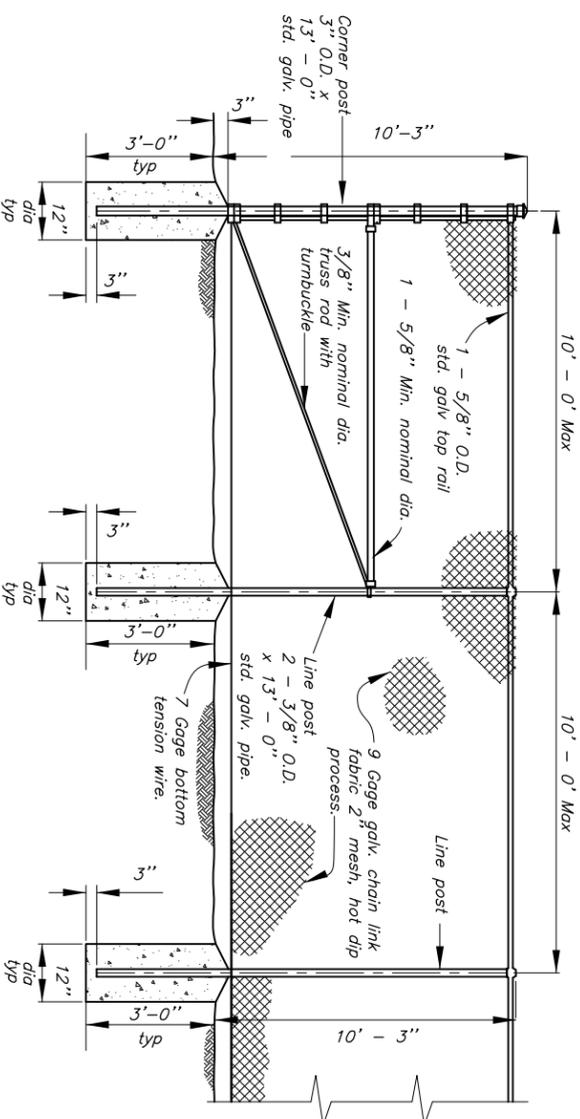
METAL FRAME DRIVE GATE



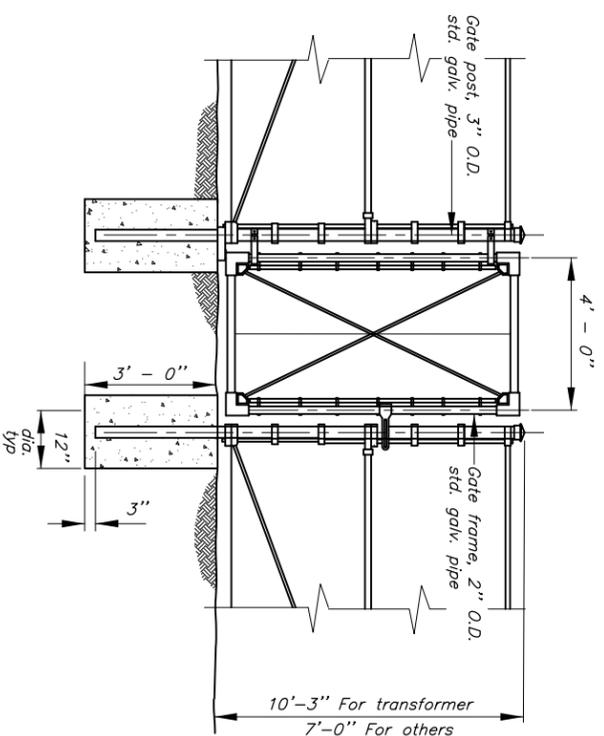
7' HIGH SECURITY TYPE CHAIN LINK FENCE

NOTES:

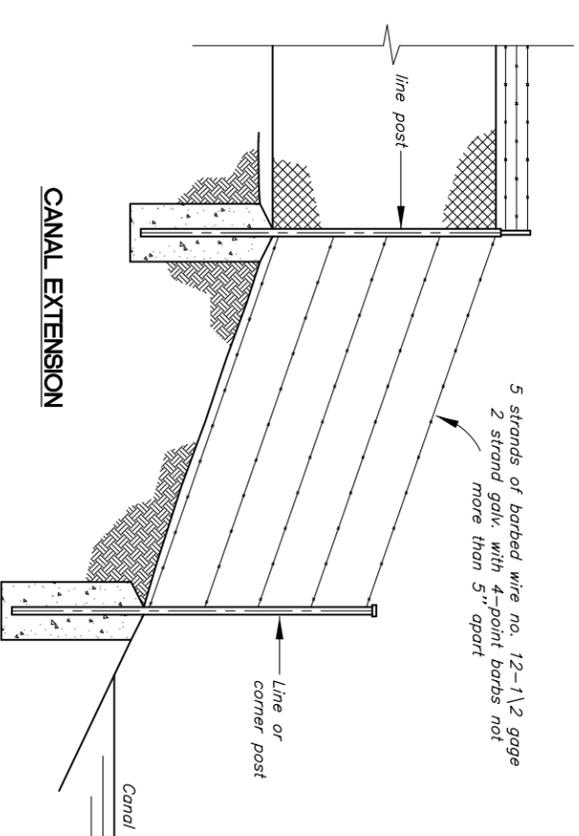
1. All pipe diameters shown are steel pipe sizes—standard weight.
2. Chain link fabric shall be attached to fence framework in accordance with the manufacturer's standard instructions.
3. Embankment at fence post location shall be thoroughly compacted prior to post installation.
4. All gates shall be equipped with gate fasteners suitable for locking with padlock.
5. Corner and end posts shall be braced in the direction of pull.
6. Alternate details may be submitted for approval.
7. All fencing shall be grounded in accordance with P. G. & E. standards.



10' HIGH CHAIN LINK FENCE FOR TRANSFORMER



METAL FRAME WALK GATE



CANAL EXTENSION

SEMITROPIC WATER STORAGE DISTRICT

KERN COUNTY, CALIFORNIA

GEI CONSULTANTS, INC.

BAKERSFIELD, CALIFORNIA



MADERA AVENUE INTERTIE

CHAIN LINK FENCE DETAILS

DATE
March 2013

DRAWING NUMBER
MAI-027

Memorandum

To: Files (129890) Attachment 3.1-2
From: Sam Schaefer
Re: Madera Avenue Intertie – Task Order 08-2012
Project Description, Preliminary Design and Hydraulic Analysis, and Benefits and Costs

In October, 2012, Semitropic Water Storage District, on behalf of the Madera Avenue Intertie project sponsors, authorized the following scope of work in support of developing the Madera Avenue Intertie Project under Task Order 08-2012. The location of each task deliverable in this Proposal is identified for each task as (location presented in Proposal). A map view of the project components that also displays the irrigation lands accessible in Shafter-Wasco Id is included in this Appendix as Figure 3.1-2.

SCOPE OF SERVICES

The scope of services includes the following tasks:

Task 1 – Project Description

- 1) Description of Project Components
- 2) Identification of lands accessible in Shafter-Wasco ID by Intertie (acres of service area)
- 3) Estimation of potential annual irrigation demands in Shafter-Wasco ID (accessible by Intertie)
- 4) Estimation of potential annual exchange capabilities (afforded by Intertie)

Deliverable: Project Description (Presented as Project 1 3.1 - Work Plan, 7.1 - Technical Justification, and 8.1 - Benefits)

Task 2 – Preliminary Design

- 1) Preliminary Alignment of Pipeline in Shafter-Wasco ID
- 2) Hydraulic Analysis (Note: Madera Avenue Intertie connects to the District's B-230 System. District has completed a hydraulic analysis of the facilities to serve the Semitropic lands and determined the available head at the tie-in to B-230 System. GEI to perform hydraulic analysis of Shafter-Wasco ID pipeline)
- 3) Preliminary design drawings

Deliverable: Grant Suitable Preliminary Design Package and Hydraulic Analysis Technical Memo (Design Drawings presented as Appendix 3.1-1)

Task 3 – Benefit and Cost Analysis

- 1) Development of Benefit Analysis
- 2) Engineer's Project Cost Estimates (Engineer's Estimate)

Deliverable: Quantification of Project Benefits and Engineer's Cost Estimate (Benefits presented in 3.1 – Benefits and Engineer's Cost Estimate presented in 4.1 – Project 1 Budget)

Madera Ave Intertie is a bi-directional 50-cfs connection between Semitropic WSD and Shafter-Wasco ID. The Madera Ave Pumping Plant allows for delivery West to East of up to 50 cfs (25 cfs in each of the 30-inch pipelines) through the intertie that connects into Shafter-Wasco ID's South Mainline distribution system at two locations: Wasco Ave and Poplar Ave. Once water is delivered to Shafter-Wasco ID's South Mainline, it can be distributed to lands in Shafter-Wasco's ID's Service Area by gravity or conveyed to the Friant-Kern Canal using the new Madera Ave Pumping Plant and the existing South Mainline conveyance pipeline in reverse mode. Water conveyed in the Intertie from East to West occurs by gravity.

PS Pump Station

Proposed Pipeline Alignment

Canal/Pipeline

River, Creek, etc.

City Limits

Water District Boundary

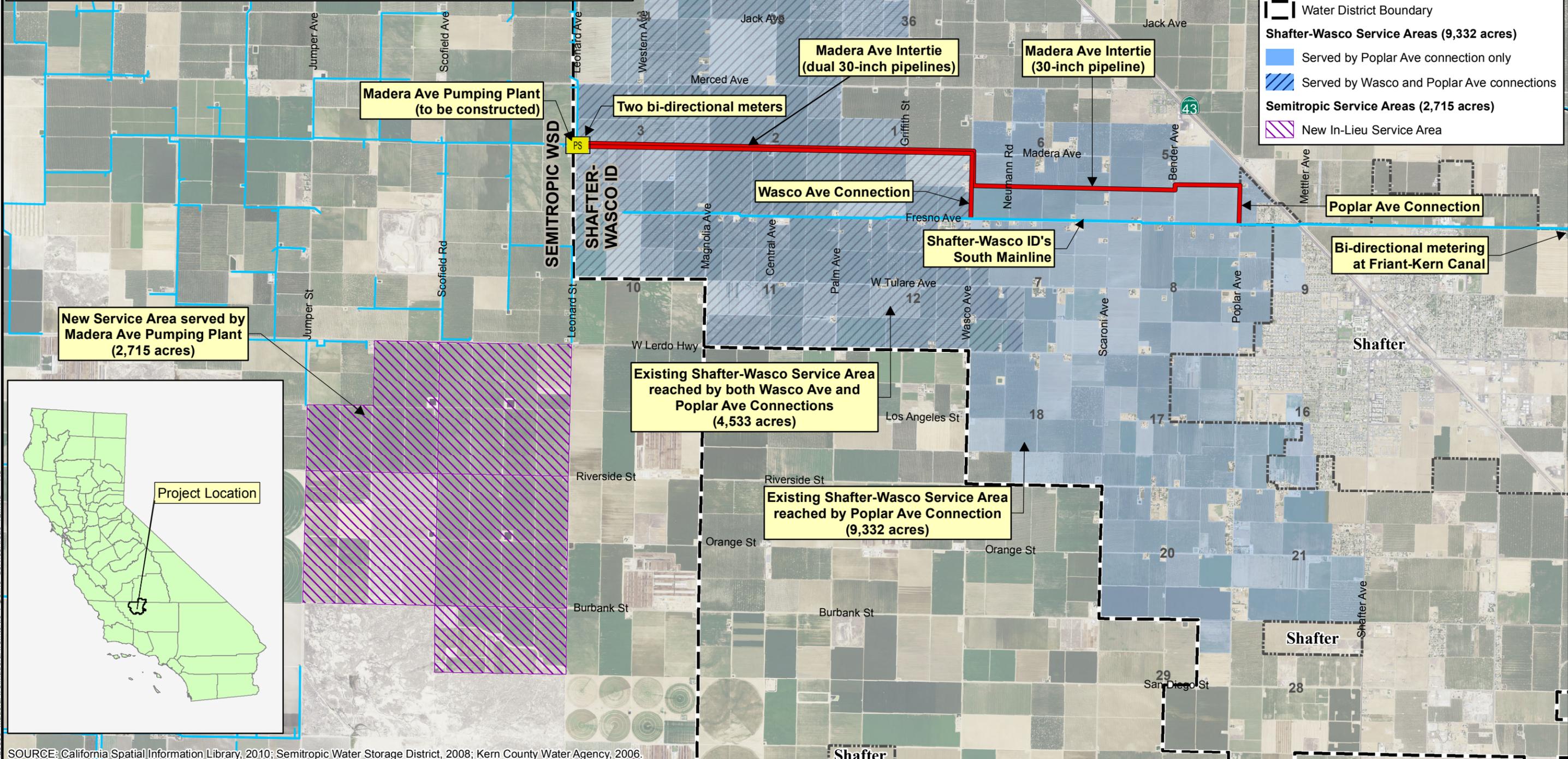
Shafter-Wasco Service Areas (9,332 acres)

Served by Poplar Ave connection only

Served by Wasco and Poplar Ave connections

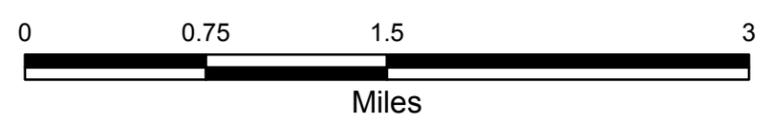
Semitropic Service Areas (2,715 acres)

New In-Lieu Service Area



SOURCE: California Spatial Information Library, 2010; Semitropic Water Storage District, 2008; Kern County Water Agency, 2006.

Z:\Projects\129890_MaderaAveIntertie_Pipeline_ServiceAreas_v2.mxd RS 27-Feb-2013



Poso Creek IRWMP Implementation Grant Proposal

Poso Creek IRWMP Region



MADERA AVENUE INTERTIE PROJECT LOCATION PUMPING PLANT AND PIPELINE ALIGNMENT

MARCH 2013

FIGURE 3.1-2

P L A N O F A C T I O N

Date: March 16, 2010

To: Paul Oshel, Chairman of the Poso Creek IRWMP Regional Water Management Group

From: Sam Schaefer

Subject: Plan of Action for Poso Creek Plan Region

Geotechnical
Environmental and
Water Resources
Engineering

The Poso Creek Regional Management Group (RMG) began implementing the Poso Creek IRWM Plan (Plan) immediately following the Plan adoption. The RMG received a System Optimization Review grant in the fall of 2008 that allowed them to continue to meet and focus on water management strategies to improve water supply reliability. The overall strategies for improving water supply reliability are collectively identified as the Water Supply Enhancement Project components, shown in Figure 7-1 and listed in Table 7-1.

The Plan of Action for implementation of the Plan includes non-structural and structural measures to be implemented in the near and long term as follows:

Non-structural measures

- Complete the CEQA/NEPA documents for banking and exchange among districts within the Region that will allow agreements to be made among districts.
- Continue scheduled meeting framework for coordinating conjunctive projects.
- Implement the Poso Plan MOU that contains a cost sharing mechanism for regional projects.
- Consider groundwater modeling and monitoring improvements, including improvements to allow internet access to reviewed data.
- Consider water banking arrangements for third-parties outside of Poso Plan Region; example is the Semitropic-Rosamond JPA.
- Complete environmental documents (CEQA/NEPA) for projects anticipated to receive state and/or federal funding.
- Consider funding sources for additional planning phases for the Poso Region.

Structural measures

Improvements to absorb CVP supplies delivered from the Friant-Kern Canal

- Complete the North Kern and Shafter-Wasco Interconnections, (North and South); Projects No. 14 and No. 19
- Complete the Calloway Canal to Lerdo Canal Interconnection; Project No. 12
- Construct a new 400 cfs turnout from the Friant-Kern Canal into North Kern; A component of Project No. 5
- Construct phases of DEID's Turnipseed Banking and Recovery Facilities; Project No. 8
- Construct phases of Pond-Poso Retention Pond and Recovery Facility; A component of Project No. 6 and No. 27
- Construct phases of Pond-Poso Spreading and Recovery facility; Project No 6

Improvements to enhance the return of stored water between districts

- Connect North Kern well capacity to distribution canals and to the Friant-Kern Canal; A component of Project No. 5
- Interconnections between Semitropic and North Kern.
 - Utilize Existing P-565 Interconnection
 - Pond-Poso Canal to the 9-26 Canal and Pipeline
- Interconnections between Semitropic and Shafter-Wasco.
 - Improve Existing Interconnection
 - Madera Ave. Interconnection; Project No. 18
 - Kimberlina Road Interconnection; Project No. 17

Improvements to regional conveyance facilities

- CVC and Calloway Canal Intertie; Project No. 11
- CA Aqueduct to Friant-Kern Canal Intertie; Project No. 13
- Reverse Flow in the Friant-Kern Canal; Project No. 16
[Consider North-South Conveyance alternatives to return CVP water other than the Friant-Kern Canal]

Other Projects

- Friant-Kern Canal Turnout to Cawelo's North System; Project No. 1
- Kern-Tulare WD Ninth Avenue Pipeline; No. 2
- SWRU In-Lieu and Well Field Recovery; No. 3
- Calloway Canal Improvements; No. 10
- Canal lining on Calloway Canal over poor quality groundwater; No. 10
- Arsenic Treatment for Return of Stored Water; No. 15
- Poso Creek Flood Control and Water Conservation Reservoir Project; No 28
- Assist DACs in Region with Water Supply; No 29

Construct Energy Projects

- Turbines in SWRU Pipeline
- Solar projects
- Pump Storage

Wildlife Improvement Projects

- West-East Pintail Slough (WEPS) connects Goose Lake Canal at the north side of the KNWR with the existing Pintail Slough and Alpaugh Canal providing flood protection and wildlife water supplies to the members of the Semitropic Wildlife Improvement District
- Adjustable weir on Poso Creek west of Pintail Slough
- Off-channel reservoir (SWRU well field reservoir)
- Interconnections between Goose Lake Canal and Semitropic (at 120-inch East-West Pipeline)
- Upland habitat improvements on completed spreading grounds

TECHNICAL MEMORANDUM

Date: November 12, 2009

To: Paul Oshel

From: Sam Shaefer and Terry Nguyen

Reviewed By: Dick Rhone

Subject: Shafter-Wasco Irrigation District, System Optimization Review & Improvements

Geotechnical
Environmental and
Water Resources
Engineering

Introduction

As part of an internal system optimization review for Shafter-Wasco Irrigation District (SWID), GEI Consultants, Bookman-Edmonston Division (GEI), met with SWID system operators to document their ideas on ways to improve the SWID system. This study aims to assess SWID's potential for water conservation opportunities and for improvements to their distribution facilities to maximize deliveries of available surface water.

Internally, SWID needs to address system modernization by adding isolation valves and replacing farm turnouts. The lack of isolation valves puts SWID and its users in a vulnerable position during times of maintenance or repairs. The old farm turnouts make delivery of water a time-consuming and hazardous task.

Also discussed were potential future projects that would interconnect SWID with its neighboring districts (Semitropic Water Storage District and North Kern Water Storage District) for the purpose of increasing water exchanges. The projects include the Kimberlina Road interconnection with Semitropic Water Storage District (Semitropic), the Madera Avenue interconnection with Semitropic, and the Multi-District Conveyance Facility. Previously in 2008, GEI completed an evaluation of the existing interconnection between SWID and Semitropic to identify any design modifications that would allow the interconnection to operate at a higher capacity. Those findings are summarized here and can be found in detail in the 2008 memorandum. Two other interconnection projects involving SWID, one of which is near completion, are the interconnections between SWID's north and south systems with North Kern Water Storage District (North Kern).

Each project is described and evaluated within this memorandum. Pertaining to the goals of this study, the ideas and suggestions of the SWID operators, along with the recommendations of GEI are presented herein.

Background

The SWID system is a gravity system which delivers water using two turnouts from the Friant-Kern Canal. Water from the turnouts flows west supplying SWID's distribution

systems called the “North” and “South” System (Figure 1). The northern turnout is the main line for the North System and the southern turnout is the main line for the South System. Each turnout has a practical capacity of approximately 200 cfs.

Operational Issues

Isolation Valves

A major issue with the SWID system is its lack of isolation valves along the pipeline main of its North and South Systems. Some of the existing valves on the main lines are worn-out and need to be replaced. Installation of additional isolation valves in strategic locations along the main line would minimize the number of users shut down during maintenance or repairs, allowing for a more reliable operation of the system. Ideal locations of new valves have yet to be determined. SWID would need to advise on new valve locations depending on known conditions and operational procedures of the pipeline. There are however, several valves along the main line of the North System that are known to be non-operational and need to be replaced.

Additional valves along certain laterals of the system would also help make the system more reliable. Existing valves are generally located at the beginning of each lateral. This allows for each lateral to be shut down independently of other laterals. However, some laterals can reach up to two miles in length; many laterals also have multiple sub-laterals. Maintenance or repairs along a lateral could potentially require shutting down the entire lateral. Again, SWID would need to advise as to where ideal locations for additional valves should be located.

Farm Turnouts

Modernizing existing farm turnouts such as those shown in Figure 2 would allow for a more efficient operation. Currently, once an order for any specific amount of water has been placed, the system operator must open the turnout valve then climb up a ladder to read the water meter at the top of the turnout riser located inside the standpipe (Figure 3). To discharge the correct amount of water the operator must read the meter then adjust the valve accordingly, this guess-and-check procedure of calibration requires several iterations of climbing up and down the ladder to read the meter and adjust the valve. New farm turnouts, as shown in Figure 4 and Figure 5, have the turnout riser and water meter located outside the standpipe. With this configuration the operator can easily adjust the valve while reading the meter, greatly reducing the amount of time it takes to calibrate the turnout; this configuration also eliminates the hazard of climbing up and down a ladder.

Old turnouts are slowly being phased out as the District began replacing and modernizing turnouts over the past three years starting in 2006. Turnouts that have priority for replacement are ones that are leaky due to worn-out valves and ones that have high standpipe heights. The cost of replacing the turnouts is about \$10-\$12K per turnout.

Findings and Recommendations for Modernization

With local funding, the District will continue to replace and modernize existing farm turnouts and add isolation valves. The District will evaluate Reclamation’s grant programs that pay up to 50-percent for water saving and system efficiency measures.

Evaluation of Existing and Future Conveyance Between Districts

Table 1 shows projects which are either existing, under construction, or proposed, that involve the interconnection of SWID with neighboring districts. Each project would allow for water exchanges between districts, increasing flexibility to SWID’s system.

Table 1

Project	Size	East-West Capacity (Gravity)	West-East Capacity (Pumping)	Project Status
SWID/Semitropic Existing Interconnection	36" Pipeline	>25 cfs	25 cfs	Existing
SWID/Semitropic Kimberlina Road Interconnection	60" Pipeline	75 cfs	75 cfs	Planning/Preliminary Design
SWID/Semitropic Madera Ave. Interconnection	36" Pipeline	50 cfs	50 cfs	Planning/Preliminary Design
Multi-District Conveyance Facility	84" Pipeline / New Canal	300 cfs	300 cfs	Planning/Preliminary Design
SWID/North Kern North Interconnection	60" Connection Facilities	100 cfs	75 cfs	Under Construction
SWID/North Kern South Interconnection	48" Pipeline	50 cfs	50 cfs	Ready for Construction

SWID/Semitropic Existing Interconnection

As mentioned earlier, the existing interconnection between SWID and Semitropic was previously evaluated in 2008 to identify any modifications that could be made to allow the Interconnection to operate at a higher capacity. Operation of the Interconnection in the west-to-east direction has proven to be challenging. The existing facilities consist of a pumping plant with a capacity of 625 horsepower and 25 cfs located at Semitropic’s Pond-Poso Canal, and approximately 3.5 miles of 36-inch diameter pipeline that runs east connecting the pumping plant to the end of SWID’s North System (See Figures 6 & 7).

As stated in the 1993 General Design Memorandum, operating parameters of and for the Interconnection in the west-to-east mode should be developed from exploratory operating experience after initiation of operations; for the operational conditions which result from introducing pumped Interconnection water (from the pumping plant located at the Pond

Poso Canal) into SWID's system with isolation valves No. 2 and No. 3 open and CVP water flowing from the Friant-Kern Canal could not be completely predictable.

Along with several minor design changes and additions to the facilities, it was concluded from the 2008 study that in order for the system to operate more smoothly, changes to the operation of the Interconnection would need to meet mutually acceptable criteria from both the SWID and Semitropic operators. Communication protocols for operation of the Interconnection should be put in place and followed by both districts. (Please see the 2008 Technical Memorandum for details regarding the existing SWID/Semitropic Interconnection.)

SWID/Semitropic Kimberlina Road Interconnection

Another interconnection project in consideration is the Kimberlina Road Interconnection between SWID and Semitropic (See Figures 6 & 8). This project would connect Semitropic's Lateral P-384 to SWID's North System main via a 60-inch intertie pipeline along Kimberlina Road. Unlike the existing intertie between Semitropic and SWID, which connects to the end of SWID's system, the intertie on Kimberlina Road would connect near the middle of SWID's North System, allowing for gravity flow to all the users downstream of the connection point.

In wet years, when there is excess non-project water available from the California Aqueduct through Semitropic's distribution system, this water can be used in-lieu of groundwater pumping by SWID growers. These facilities can also be used by Semitropic to receive water from east side sources, such as 215 Water from the Friant-Kern Canal or be used to convey Shafter-Wasco's high flow water into Semitropic's banking program. In dry years, these facilities will be used to return Shafter-Wasco's prior year banked water from Semitropic.

This project has only been conceptually designed and is one of the projects listed in the Poso Creek Integrated Regional Water Management Plan. It's estimated to cost \$12M with a design capacity of 75 cfs.

SWID/Semitropic Madera Avenue Interconnection

Another SWID/Semitropic project in consideration is the interconnection between the two districts on Madera Avenue (See Figures 6 & 8). This project is a 36-inch pipeline that would connect to the end of the 39-inch main transmission pipeline of Semitropic's Lateral B-230 to SWID's South System, a 33-inch pipeline located along Palm Avenue. This interconnection would operate in the same manner as the Kimberlina Road Interconnection. This project also has only been conceptually designed and is listed in the Poso Creek Integrated Regional Water Management Plan. Estimated at \$5M with a capacity of design capacity of 50cfs, this is SWID's preferred project as there is already an existing connection to Semitropic on SWID's North System.

Multi-District Conveyance Facility

The Multi-District Conveyance Facility Project involves facilities that would essentially connect the California Aqueduct and the Friant-Kern Canal (See Figure 9). The goal is to provide a transmission facility to make greater use of surplus water existing in either the State Water Project or the Central Valley Project. Although several alignments and alternatives have been studied, they would all consist of a combination of canals, pipelines, and pumps that would start at Semitropic's 120-inch diameter Stored Water Recovery Unit pipeline and end near SWID's North System intake point at the Friant-Kern Canal.

Operating in the west-to-east mode, water would be conveyed directly to SWID's intake point (near the Friant-Kern Canal), allowing for the SWID system to operate as normal, by gravity, and eliminating the risk of damaging SWID's low-head pipes from pressurized reverse flow operation.

However, at an estimated cost of over \$70M, the Multi-District Conveyance Facility would be very difficult to fund locally. There is also concern that the water supplies to be delivered from west to east to support the use of this facility are limited at this time due to the constraints in moving water south of the Sacramento-San Joaquin Delta.

SWID/North Kern North Interconnection

A project nearing completion is the North Interconnection between SWID and North Kern that connects North Kern's Calloway Canal to SWID's North System (Lateral 134.4) (See Figure 10). The connection consists of approximately 180 ft of 48-inch diameter pipe and 120 ft of 24-inch diameter pipe, both with a pumped capacity of 75 cfs. The connection allows bidirectional delivery of water between SWID and North Kern.

In a wet year, when there are surplus supplies available off of the Friant-Kern Canal, the facility would be run in a mode of delivery into the Calloway Canal. From there, supplies can be delivered to the North Kern's direct and in-lieu recharge facilities. Also, in a wet year, if there are any supplies available to North Kern that may be delivered to USBR designated excess lands, this facility is a means of moving such water into Shafter Wasco's north system. In a dry year, the facility may be used to deliver North Kern deepwell produced water to Shafter-Wasco. Deliveries would be made either in return of a prior year Shafter-Wasco banked supply or for North Kern to delivery off-peak season water in exchange for peak season water for energy and supply management purposes. This project is currently under construction at an estimated cost of \$650,400.

SWID/North Kern South Interconnection

Another interconnection project between North Kern and SWID is the South Interconnection that would connect North Kern's 8-5 ditch to SWID's South System (Lateral 137.2) via a 50cfs pipeline.

This project would allow Kern-Tulare Water District to convey its Kern River Water through the Calloway Canal and deliver it to SWID. In exchange, SWID's Friant water can then be delivered to Kern-Tulare. Without the project, Kern-Tulare delivers its 23,000 acre-feet per year of Kern River through an exchange with Arvin-Edison. This exchanged incurs a 20% loss to Kern-Tulare. Completion of the project will allow Kern-Tulare to exchange water with Shafter-Wasco and reduce losses to Kern-Tulare by 4,600 acre-feet per year. At this time, SWID cannot deliver its CVP water to lands within its service area designated as Excess under Reclamation Law. Therefore, this demand of approximately 15,000 acre-feet must be pumped from the groundwater basin. Once the project is completed, SWID will be able to take delivery of Kern River Water and banked groundwater directly from North Kern. The short term benefit of delivering non-CVP water in-lieu of pumping groundwater is the savings in energy charges. In the long term, the project saves groundwater for use in dry years and helps to off-set for regional groundwater overdraft which has been exasperated by San Joaquin River settlement. This project would also allow North Kern to deliver water stored in its groundwater directly to SWID. In exchange, SWID's Friant water can then be delivered directly to any CVP Contractor along the Friant-Kern or Madera Canal. This project significantly enhances North Kern's ability to complete exchanges of surface water supplies.

The South Interconnection between SWID and North Kern is ready for construction and is estimated to cost \$600,000 to construct.

Findings and Recommendations

Table 2 shows the potential monthly capacity and variable operating costs of each project. Note that of the four interconnection projects with Semitropic, the Interconnection on Madera Avenue would be the least costly to operate per acre-feet of water.

Table 2

Project	Potential Monthly Capacity (ac-ft/mo)	Pumping Head (ft)	Capital Costs	Variable Operating Costs (\$/ac-ft)
SWID/Semitropic Existing Interconnection	1,500	170	-	\$29
SWID/Semitropic Kimberlina Road Interconnection	4,500	70	\$12M	\$12
SWID/Semitropic Madera Ave. Interconnection	3,000	60	\$5M	\$10
Multi-District Conveyance Facility	18,000	211	\$70M	\$36
SWID/North Kern North Interconnection	4,500	-	\$0.65M	-
SWID/North Kern South Interconnection	3,000	-	\$0.60M	-

To improve the operational capacity of the existing interconnection between SWID and Semitropic, GEI recommends that the districts meet to create operational protocols and

mutually acceptable criteria for operation of the interconnection. Details of the design changes recommended by GEI can be found in the 2008 Technical Memorandum addressing this Interconnection.

In order to implement the improvements to the existing interconnection with Semitropic and the three proposed conveyance connections (Kimberlina, Madera, Multi-District), SWID will need outside funding. A long-range goal will be to evaluate potential funding arrangements related to supporting the Semitropic Groundwater Bank, Reclamation Grant Programs, and possible funding through the Poso Creek IRWM Plan.

Regarding the three proposed new conveyance connections, SWID's preference would be to construct the Madera Avenue Interconnection between Semitropic and SWID's South System. There is no existing interconnection between SWID's South System with Semitropic, as an interconnection already exists on SWID's North System. The interconnection on Madera Avenue is also the least expensive of the proposed interconnections with Semitropic. However, SWID's first priority is to complete the North and South interconnections with North Kern. The North Interconnection is near completion, while the South Interconnection is ready for construction.

Therefore, SWID's overall preference and priority is to add conveyance flexibility by making the following improvements:

1. Finish the North Interconnection with North Kern
2. Construct the South Interconnection with North Kern
3. Improve the existing Interconnection with Semitropic
4. Construct the Madera Interconnection with Semitropic
5. Evaluate the Multi-District Conveyance Facility as a Regional Project

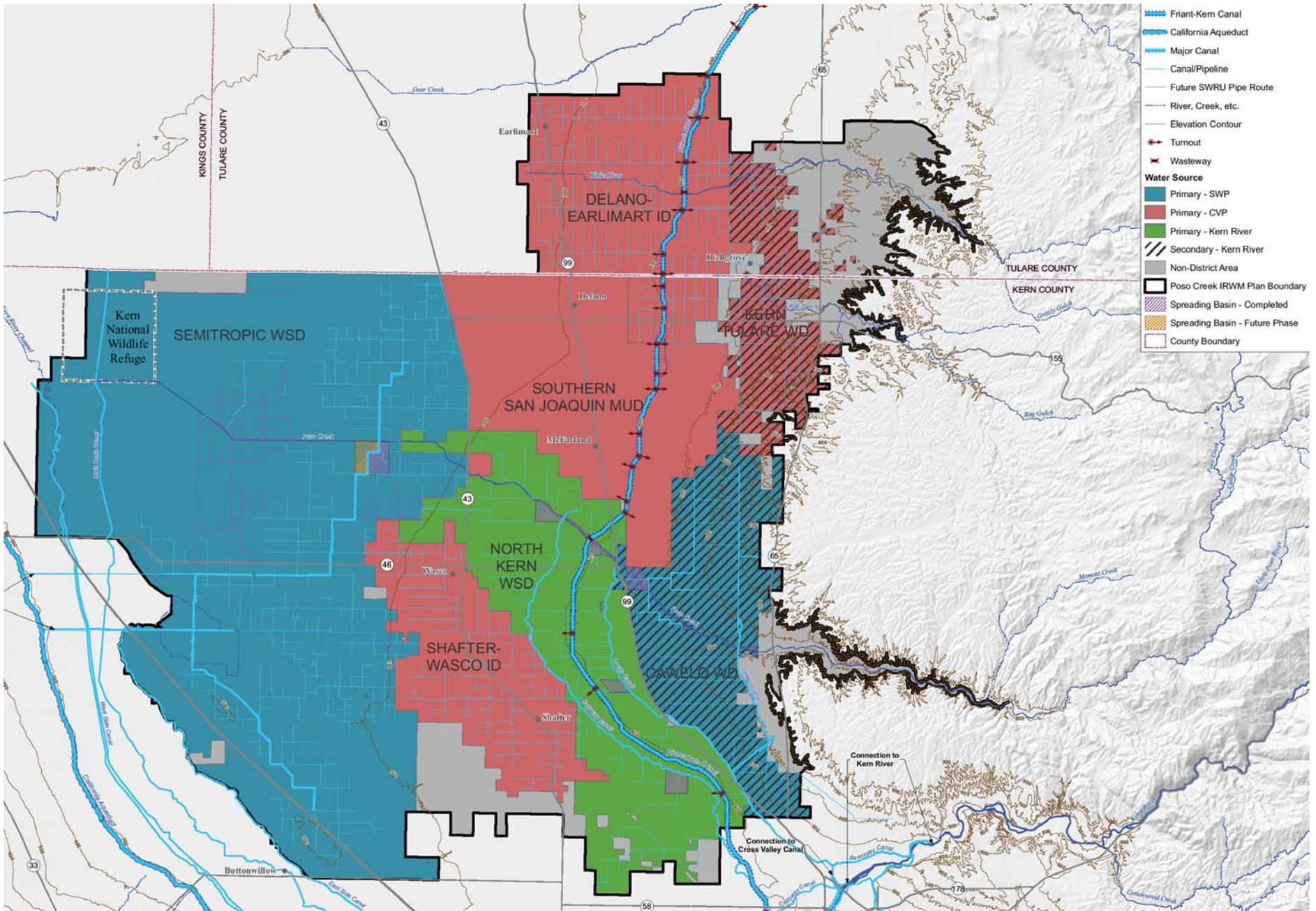


Figure 1. Shafter-Wasco Irrigation District and neighboring districts.



Figure 2. Existing farm turnout standpipe.



Figure 3. Water meter at top of turnout riser located within the standpipe.



Figure 4. Turnout riser located outside of the standpipe with easily accessible meter.

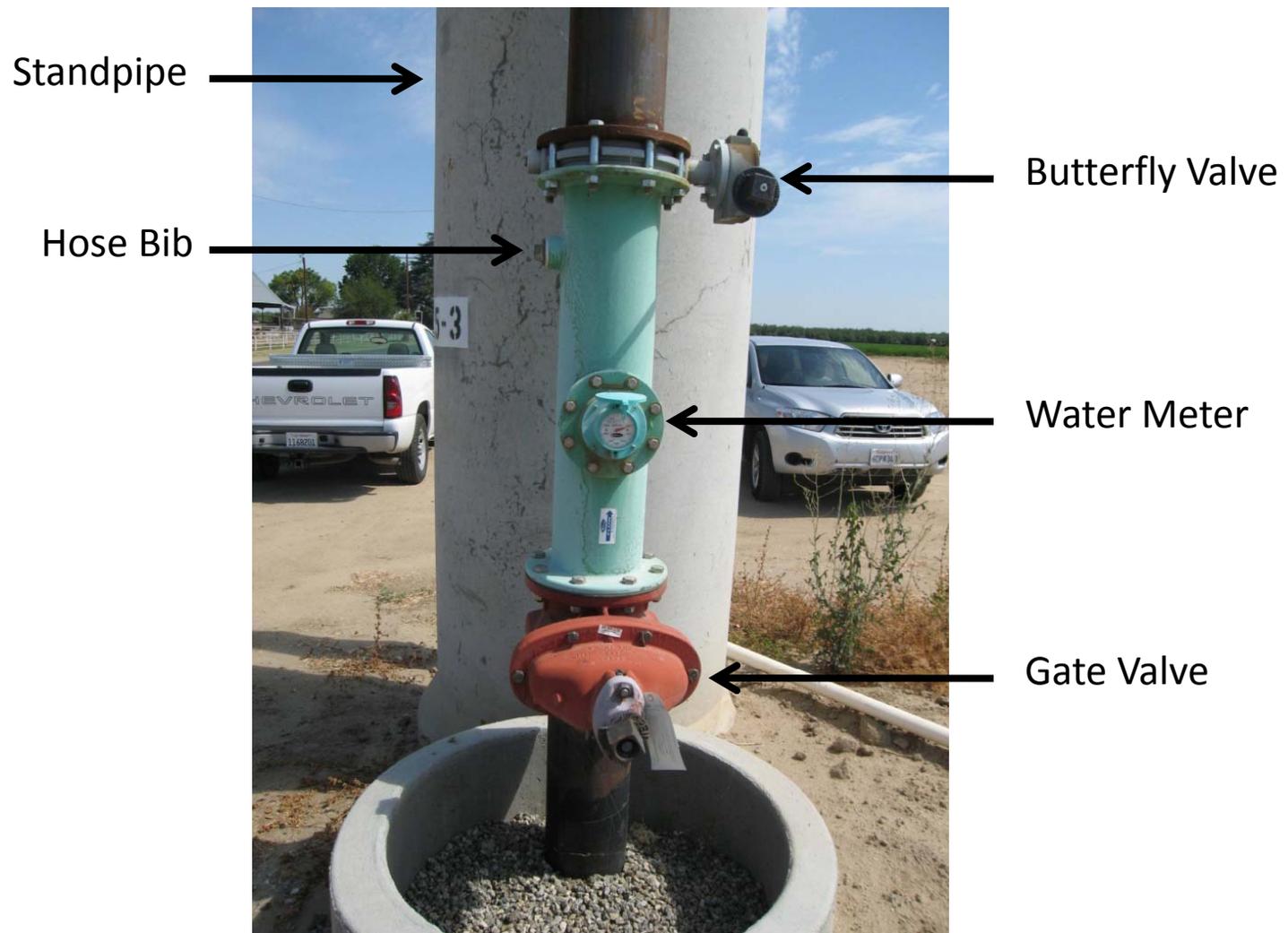


Figure 5. *Modernized farm turnout with gate valve, water meter, hose bib, and butterfly valve.*

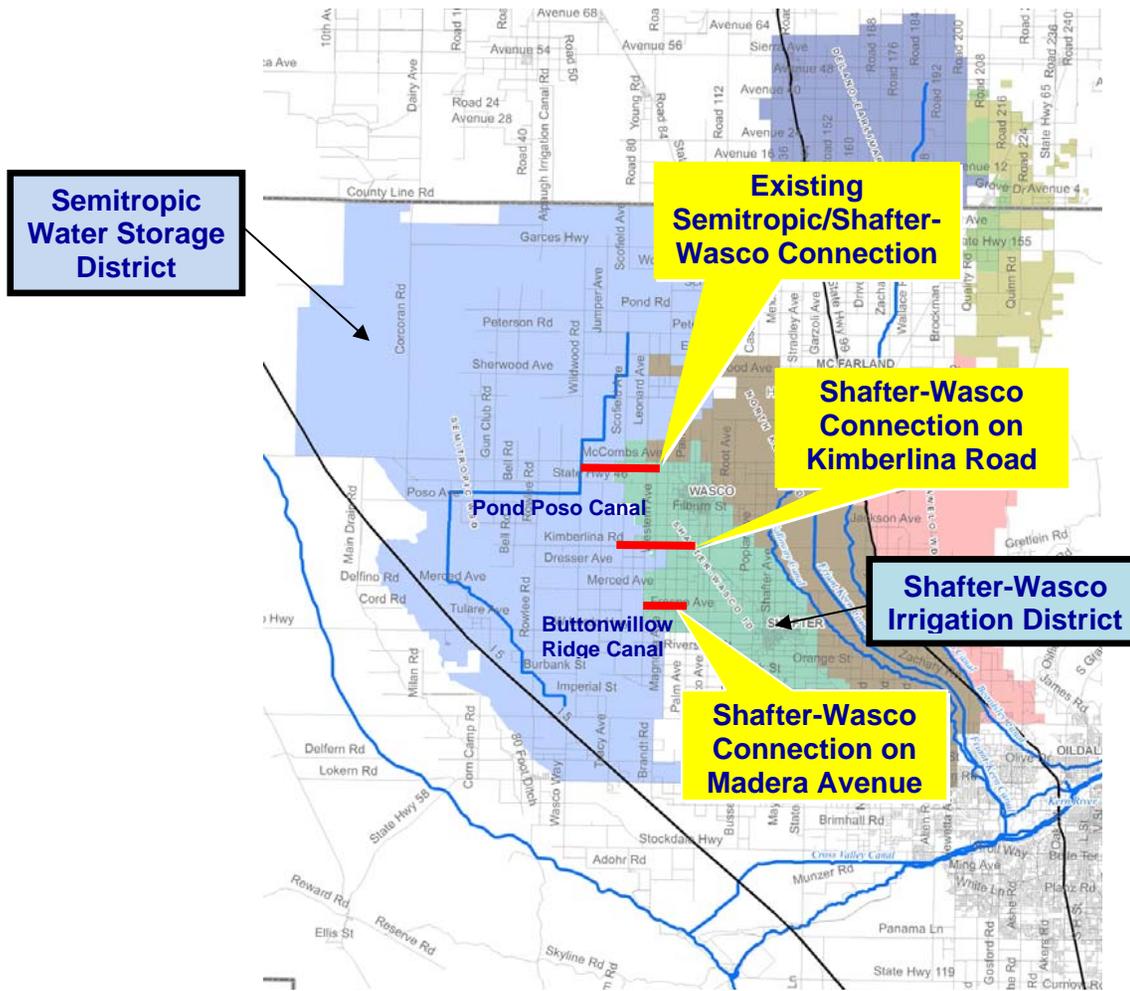


Figure 6. Semitropic Water Storage District and Shafter-Wasco Irrigation District with locations of the Existing Interconnection, Kimberlina Road Interconnection, and Madera Avenue Interconnection.

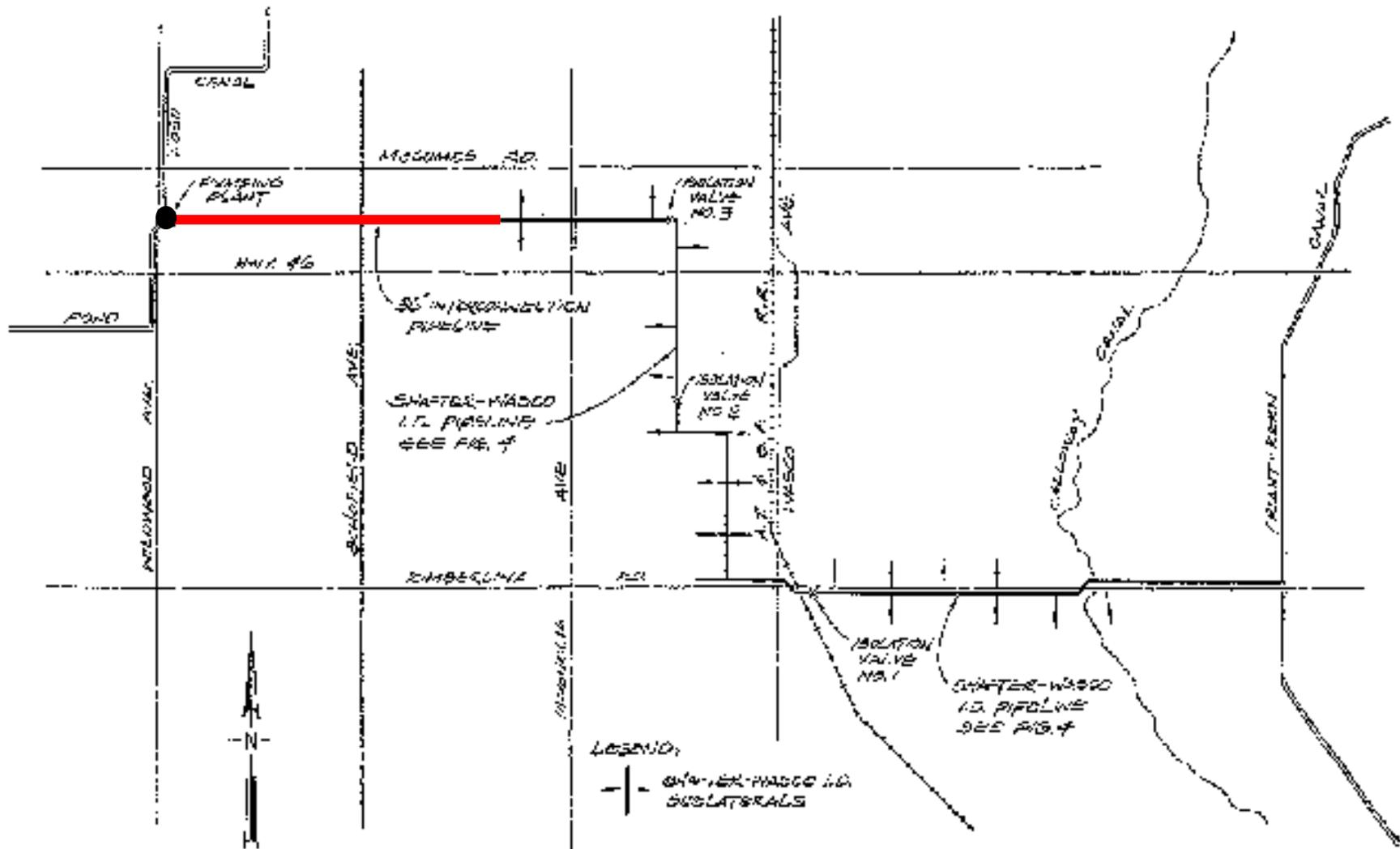


Figure 7. Existing Interconnection between Semitropic Water Storage District and Shafter-Wasco Irrigation District.

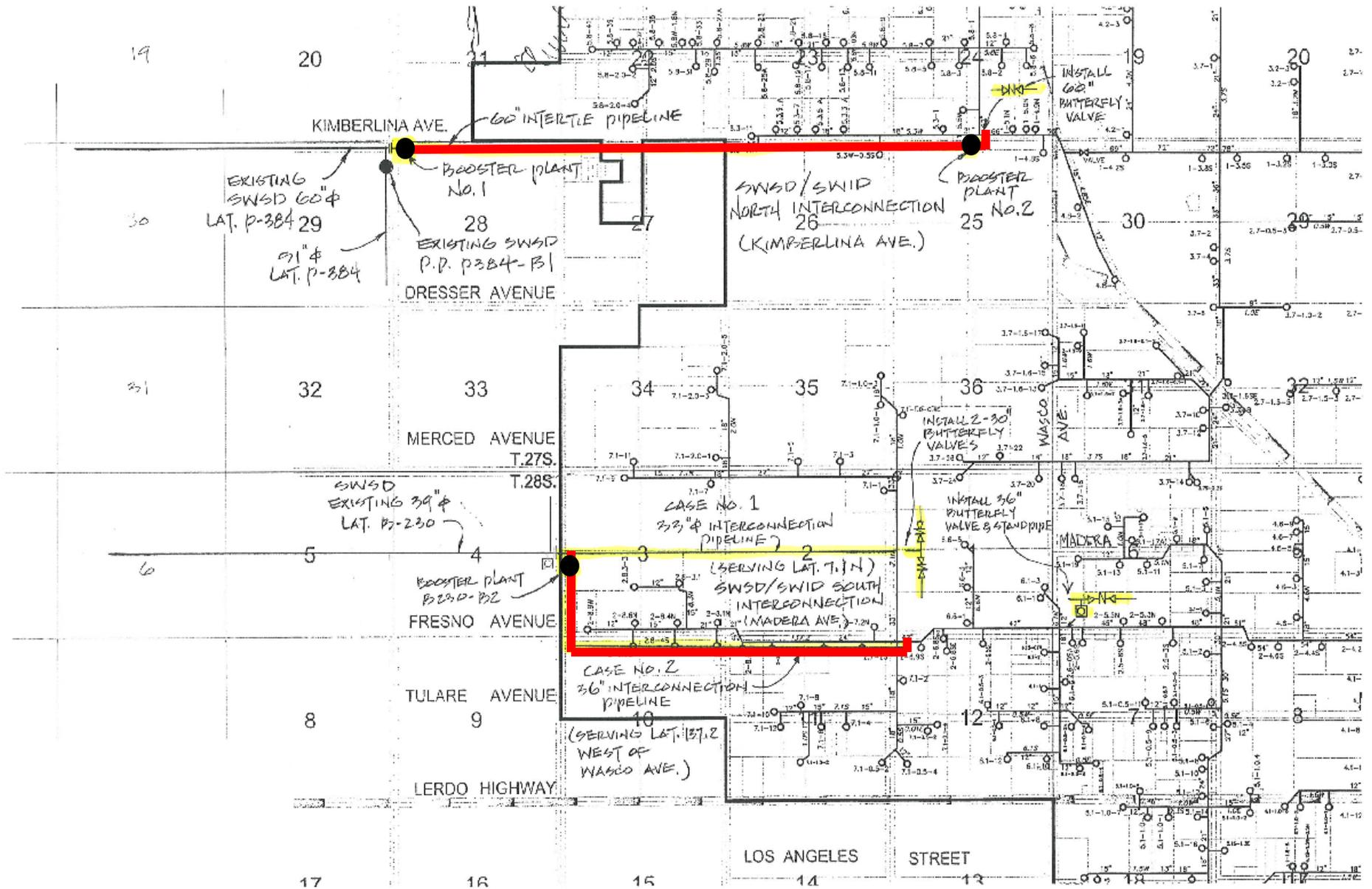


Figure 8. Proposed Kimberlina Road and Madera Avenue interconnections between Semitropic Water Storage District and Shafter-Wasco Irrigation District.

MULTI-DISTRICT WATER CONVEYANCE STUDY
 JUNCTION RESERVOIR TO FRIANT-KERN CANAL
 CANAL/DIAPHRAGM ALTERNATIVE

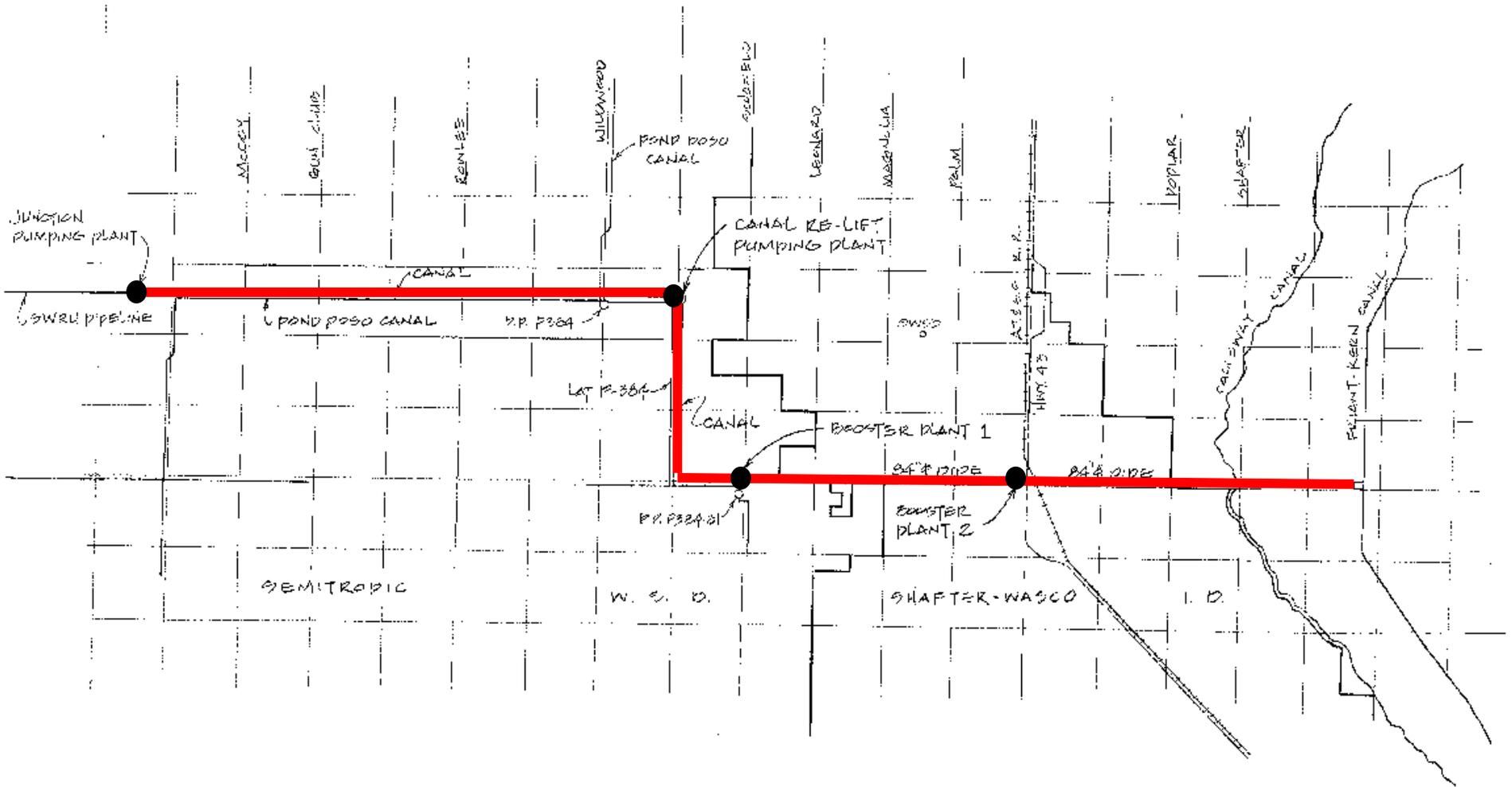


Figure 9. Proposed Multi-District Conveyance Facility from Semitropic's SWRU Pipeline to the Friant-Kern Canal.

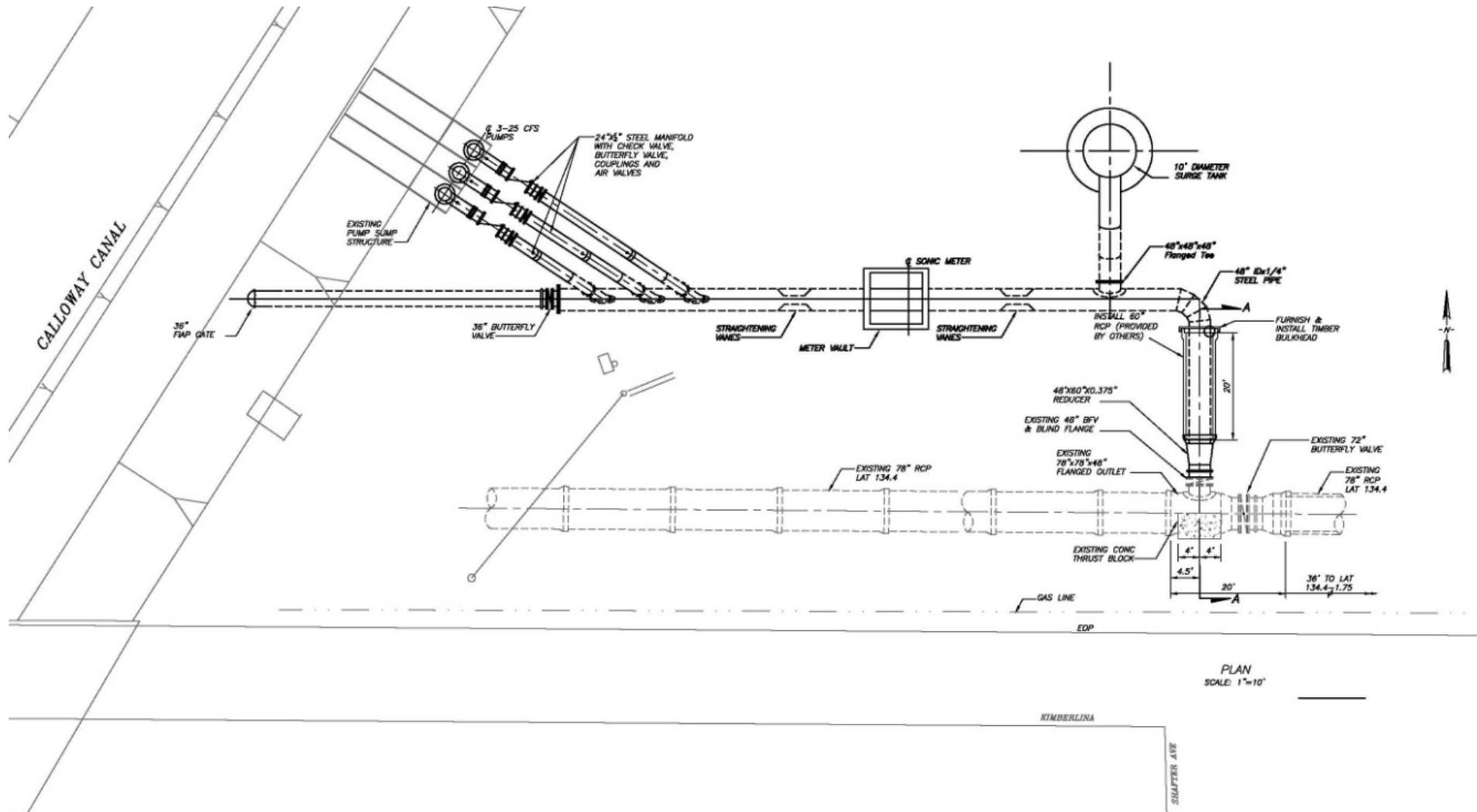


Figure 10. North Interconnection between North Kern's Calloway Canal and Shafter-Wasco's North System (Lateral 134.4).

3.2 Project 2 – Lost Hills New Well and Tank Replacement

3.2.1 Introduction

The Lost Hills New Well and Tank Replacement project (Project) will provide funding to address a critical water supply need in a DAC, the community of Lost Hills. Lost Hills is an economically-challenged community based on the comparison of the statewide median household income and is therefore classified as a DAC. The project will rely on planning and design work previously completed with funds from a Prop 84 Implementation grant. The Lost Hills Utility District (formerly the Lost Hills Sanitation District (LHSD)) was formed in 1978 and provided sewer collection and treatment for the community of Lost Hills. In 1992, LHSD became LHUD and was formed in an effort to provide a potable water supply to the community of Lost Hills. LHUD provides potable water to the community of Lost Hills, I-5/46 commercial area and the region and provides sewer collection and treatment to the community of Lost Hills. LHUD currently provides service to 375 households in the community of Lost Hills. LHUD's water system consists of two production wells, an Arsenic Water Treatment Plant with raw water and treated water tanks, a transfer Pump Station, a Transmission main, a network of pipelines for their water distribution system and a 2.2 MG storage tank.

The Lost Hills New Well and Tank Replacement project consist of making improvements to LHUD's existing water distribution system including (1) constructing a new production well and (2) replacing a deteriorating water tank with a new water storage tank. The Project will help LHUD address water quality issues related to high Arsenic levels and provide reliability in terms of water capacity to meet existing and projected water demands within LHUD's service area.

The Project would be constructed by the Lost Hills Utility District under contract with Semitropic WSD, as the Grant recipient. The project budget and schedule are presented in Attachments 4 and 5, respectively. Additional information is included in Appendix 3.2-1 to this Section 3.2.

3.2.1.1 Goals and Objectives

The Project accomplishes multiple goals and objectives of the Poso Creek Integrated Regional Water Management Plan (IRWMP). Exhibit 3.2-1 presents a selection of the Poso Creek IRWM Plan Objectives, and how the Project Goals and Objectives coincide with them.

Exhibit 3.2-1

IRWM Plan Objectives	Project 2 Goals and Objectives
Enhance Water Supply	Project 2 will provide funding to construct a new well to produce water with lower Arsenic levels to a DAC.
	Project 2 will provide funding to replace a deteriorating tank of a system that supplies a DAC.
Maintain water supply costs at a level affordable to DAC communities and the continued viability of the agricultural economy which has developed in the area	Project 2 will provide funding to install a new well and replace a tank essential for supplying a DAC with water supplies.

3.2.1.2 Purpose and Need

The Project will improve the water quality and water supply reliability to the DAC of Lost Hills. The Project will help LHUD address water quality issues related to high Arsenic levels and provide reliability in terms of water capacity to meet existing and projected water demands within LHUD’s service area. The Project consists of two elements as follows:

- Replacement of LHUD’s storage tank
- Constructing a new well and tie-in into the pipeline distribution system

With regards to improving the water quality and water supply reliability in LHUD’s system, construction of a new well is being proposed. In the Poso Creek Region, Arsenic is a highly prevalent naturally occurring element in the groundwater due to the natural geology, predominantly found in the deeper parts of the groundwater aquifer. In this region, many agencies rely on the groundwater aquifer for their water supply and share a common groundwater resource. Currently, the LHUD’s wells produce water that exceeds EPA and State standards for Arsenic. The two existing wells have arsenic levels of approximately 11 to 15 ppb. The acceptable MCL for potable water is an Arsenic level of less than 10 ppb. Currently to address the high Arsenic levels, the LHUD filters the water to remove the high concentrations of Arsenic. This filtration process is an added cost that is passed down to LHUD’s customers. A new well would minimize the water quality issues currently experienced by LHUD inasmuch as the new well would be located in an area that does not have Arsenic issues and would help minimize operations and maintenance expenses to LHUD.

Also of concern is the water supply reliability of LHUD’s existing wells. Industry standards define a firm water supply for a water system comprised of wells, as the total pumping capacity minus the capacity of the largest producing well. Based on this standard, the LHUD has a firm water supply of 500 gpm. Based on monthly water production data and

projections of the Maximum Day Demand (MDD), the LHUD water demand periodically exceeds the existing firm capacity of 500 gpm. Additionally, LHUD has historically been required to operate two wells, 16 hours each day during the summer months. Operationally, the system exceeds the firm supply when both wells have to operate over 12 hours simultaneously.

Based on the California Department of Public Health's (CDPH) revised water works standards, CDPH recommends a Maximum Day Demand (MDD) to Maximum Month Demand (MMD) peaking factor of at least 1.5. The LHUD monthly production data indicates several maximum month demands greater than 15 million gallon per month (mgm). These demands occurred in 5 months between 2003 and 2007 in either July or August. The existing maximum day demand and projected maximum day demands are 558 gpm and 797 gpm, respectively. In this regard, the existing wells do not provide enough capacity to meet existing and projected water demands within LHUD's system.

With regards to improving water supply reliability and storage, a new tank is being proposed. The existing storage tank is the only tank within LHUD's water system and it is critical for storage and for providing the required head pressure for operating LHUD's entire system. The storage tank was built in 1952 and has been in operation since it was constructed. The water tank has sustained severe damage over its life time. More recently, in 2000 the storage tank's wooden roof was severely damaged after a wind storm. Subsequently, the roof was repaired with LHUD's reserve funds. Realizing that the storage tank has been in operation for many years, LHUD performed a thorough inspection of the storage tank to determine if there were other areas that needed repair. Based on the inspection, it was determined that the storage tank was severely corroded from the inside and that the storage tank could not be repaired. The storage tank has been in service beyond its rated lifetime and it is reaching the end of its economic life. In this regard, the storage tank is burdening LHUD with excessive maintenance costs and inherent unplanned outages, which are becoming more frequent. In addition, repairs are becoming more frequent and some damages are beyond repair. Newer materials and technology have rendered the existing storage tank obsolete. The reliable operation of the storage tank is crucial for providing LHUD's customers (households in the community of Lost Hills) with a firm potable water supply and for meeting the fire protection and domestic consumption, and operational and emergency storage requirement; hence strategic replacement of the storage tank is warranted.

The operation and maintenance of the LHUD water system is exclusively financed through user and connection fees charged to system customers. Because LHUD's pool of customers consist of a very small and economically-disadvantaged pool of customers, it becomes difficult to finance system operation and maintenance including to address unexpected infrastructure failures, schedule capital projects (e.g. replacement of pipes and conveyances) and address water supply contamination in a timely manner.

The operation and maintenance of the LHUD water system is a significant financial liability because the LHUD does not have the mechanism in place to accumulate a healthy reserve to finance system operation and maintenance. The LHUD's pool of customers consist of a very small and economically disadvantaged pool of customers which makes it difficult to implement various revenue raising mechanisms such as rate hikes, benefit assessments, or special taxes to finance operation and maintenance of the water system. In this regard, the District's poor financial condition makes it difficult for LHUD to make any much needed maintenance on their water system absent state or federal grants/loans. Without any funding assistance, LHUD's water system is at a risk of experiencing complete failure and pose a health risk to the community of Lost Hills.

The proposed Project was added to the Integrated Regional Water Management Plan for the Poso Creek Region after its adoption in collaboration between the RWMG and representatives from DAC communities. This Region includes the Applicants and several other water districts that share a common groundwater resource. In particular, the Project were determined to be a high priority with regard to achieving the goals set forth in the Plan, where the overarching goal is improve water supply reliability and quality of supplies delivered to DAC areas within the Poso Creek Region.

3.2.1.3 Project Abstract

The Lost Hills New Well and Tank Replacement project will provide funding to address a critical water supply need in a DAC, the community of Lost Hills. The Project will help address water quality and water supply reliability issues currently experience by LHUD. The Project consists of making improvements to LHUD's existing water system including (1) constructing a new production well and (2) replacing a deteriorating water tank with a new water tank. With regards to the need for a new well, LHUD existing wells do not supply enough water to meet their existing or projected water demands and they have high concentrations of Arsenic. The Project would allow for the construction of a second well to replace an existing well in LHUD's water supply system that currently produces water with high Arsenic levels. The LHUD has evaluated modifying its existing wells to reduce Arsenic but has determined that the modification would involve sealing off contaminated production zones. The resulting loss of production would leave the community with an insufficient supply of water.

The existing storage tank is the only tank within LHUD's water system and it is critical for storage and for providing the required head pressure for operating LHUD's entire system. The storage tank has been in service beyond its rated lifetime and it is reaching the end of its economic life. The storage has been damaged beyond repair over its life time. The reliable operation of the storage tank is crucial for providing LHUD's customers (households in the community of Lost Hills) with a firm potable water supply and for meeting the fire protection and domestic consumption, and operational and emergency storage requirement; hence strategic replacement of the storage tank is warranted.

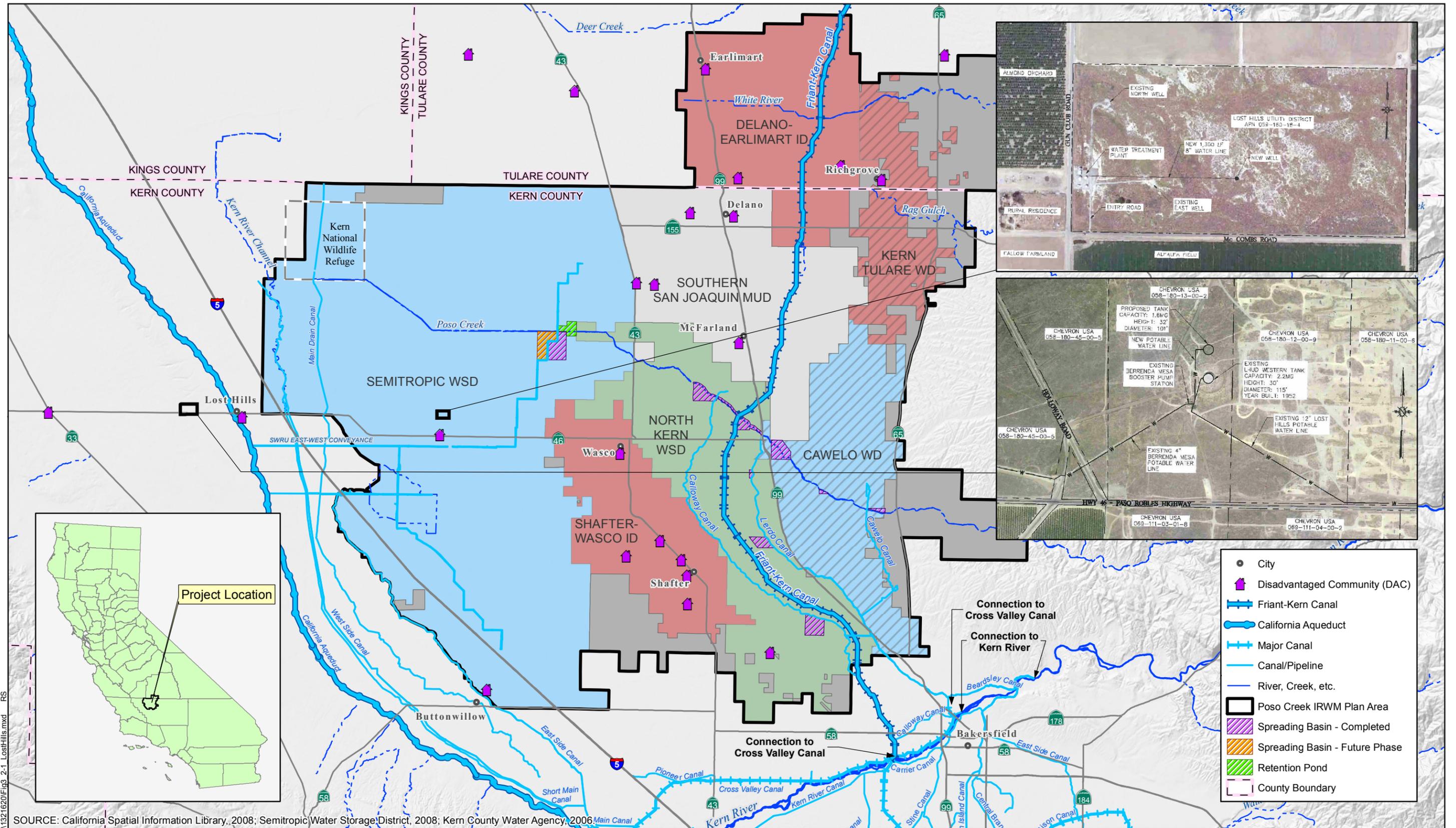
The Project would be constructed by the LHUD under contract with Semitropic WSD, as the Grant recipient. The LHUD will engage an Engineering Consultant firm to prepare a Draft Preliminary Engineering Report. This work will facilitate completing the project design to the 100%-design level.

3.2.1.4 Integrated Elements of Project

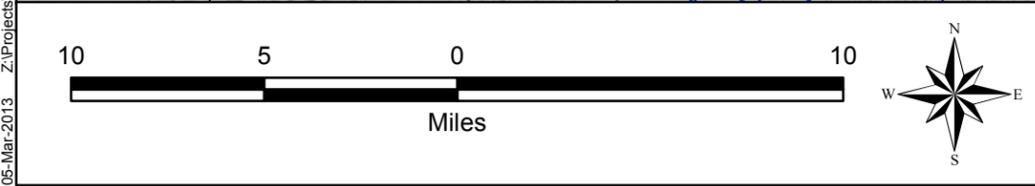
The Project is a component of the Poso Creek IRWM Plan (Plan), specifically Project 29 of the Plan, to Assist Disadvantaged Communities to Enhance Water Supply, Drinking Water Treatment, and Waste Water Treatment Facilities. The Project will allow a small water supply system serving a DAC in the Poso Creek Region to better utilize its ground water supply and meet water quality objectives necessary to protect the health of its citizens. Under funding provided by the Round 1 Implementation Grant, LHUD is completing a Water Master Plan. This Project would use the results of that work to provide benefit towards meeting one of the Region's highest priorities; providing an affordable water supply to users within the Region. This Region includes the Applicants and several other water districts that share a common groundwater resource.

3.2.1.5 Regional Project Map

The community of Lost Hills is shown on Figure 3.2-1. Delineation of Census boundaries were used as the basis for DAC status as well.



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



Poso Creek IRWMP Implementation Grant Proposal
Poso Creek IRWMP Region



LOST HILLS NEW WELL AND TANK REPLACEMENT PROJECT 2 LOCATION
MARCH 2013
FIGURE 3.2-1

05-Mar-2013 Z:\Projects\1321620\Fig3_2-1_LostHills.mxd RS

3.2.1.6 Completed Work

Under Proposition 84, Round 1, funding, Lost Hills is completing a Water Master Plan. The Water Master Plan includes preparation of a water model, identifying the model demand allocations, establishing the analysis criteria, conducting model runs to review findings on water system improvements, preparing updated information on water system facilities, and ultimately preparing the Master Plan. This work will facilitate the preparation of the Draft Preliminary Engineering Report, which will assist LHUD into moving this project forward to the 100-percent design level and ultimately into construction. At this time the Master Plan is being drafted and a copy of the report is not available for distribution. However, as soon as the report is in draft form, it will be distributed accordingly. Also, in early January 2013, the LHUD retained a tank inspection firm to inspect the LHUD's existing tank. The inspection was completed and a report drafted. A copy of the report is included in Appendix 3.2-1. No other work has been completed for this project.

3.2.1.7 Existing Data and Studies

The following technical reports define the ground-water quality problems in the Region and support the recommendations to pursue this project as discussed within the Poso Creek Region.

California Department of Public Health, Division of Drinking Water and Environmental Management. *Small Water System Program Plan*; October 2012

Carollo Engineers, Arsenic Removal Project, Preliminary Engineering Report, October 2004

Aqua Resources, Inc. *West Bakersfield Ground Water Toxics Management Study*. Draft. 1986.

Community Self Help. *Summary of DAC Water Supply Issues*.

Kenneth C. Schmidt and Associates. *Biennial Groundwater Monitoring Report for the Semitropic Water Storage District Water Banking Project (2001-2002)*. 2005.

Kern County Health Department. *Kern County Ground Water Pollutant Study*. 1980.

Organic Chemical Contamination of Small Public Water Systems in Kern County Health Department: 1987.

Organic Chemical Contamination of Small Public Water Systems in Kern County Health Department: 1988.

SWRCB Sacramento. *West Bakersfield Area Ground Water Quality Management Study Final Report*. 1990.

3.2.1.8 Project Map

Figure 3.2-1 includes a site map which shows the Project's geographical location and the surrounding work boundaries.

3.2.1.9 Project Timing and Phasing

It is expected that the Project will be completed in one phase although the Project can be completed in two phases inasmuch as the project elements can be completed independent of each other. Due to limited resources and funding, LHUD would not commence any work until receiving notification of a grant award. In this regard, the majority of the work would commence once notice is received of an award. The proposed schedule for implementation of the Project is included in Attachment 5, which matches with the project budget which is presented in Attachment 4.

Implementing Agency and Management of Project

The proposed Project will be implemented by the LHUD, which will enter into a Sub-grantee agreement with Semitropic WSD, the Grant recipient. The Project will be managed by LHUD, with assistance by an Engineering Consulting firm. LHUD has an engineering services contract in place with Cannon Corporation, an engineering consulting firm who will provide design, construction management, administrative, and reporting assistance as requested. In this regard, Mr. Amando Garza, with Cannon Corporation will be managing this project on behalf of LHUD. Coordination between LHUD and the Grant recipient will be achieved through a formal workshop which will be conducted by the Grant recipient to kick-off the grant and by holding subsequent formal meetings, email and telephone communication etc. A written Monitoring and Reporting Plan will be developed and be the basis for documenting construction and operations that meet project objectives. It is noted that the participants of the Poso Creek Integrated Regional Water Management Group meets regularly and some time will be set aside at these meetings to coordinate any grant activities.

3.2.2 Proposed Work

Several tasks have been defined to complete the work and are organized to track with the Project Budget and Schedule. The sequencing of the work is addressed in the Project Schedule. Below is a description of the tasks that are part of the Work Plan.

3.2.2.1 Direct Project Administration Category (a)

Task 1 –Project Administration

With regards to project administration, work will include coordination of all project activities including budget, schedule, communication, and grant and cost-share administration (preparation of invoices and maintenance of financial records). Work related to grant administration will include: review and execution of a Subgrantee Agreement; attending a

Grant kick-off meeting/workshop conducted by the Grant recipient to discuss grant requirements and establish the lines of communication and coordination through the grant process; preparation of invoices and maintenance of financial records; preparation of requests for Grant modifications (if any); and preparation of Grant deliverables, including monitoring reports containing the information discussed in Attachment 6 of this application.

It is expected that a formal Sub-grantee agreement will be executed with the Grant recipient setting forth requirements for grant compliance. Coordination between the Grant recipient and the local sponsors will be achieved through a formal workshop conducted by the Grant recipient to kick-off the grant and subsequent formal meetings, email and telephone communication etc. It is noted that the participants of the Poso Creek Integrated Regional Water Management Group meets regularly and some time will be set aside at these meetings to coordinate any grant activities.

This work will be initiated when a notice of a Grant award is received.

Deliverables: (1) Preparation of invoices and grant modifications; (2) grant administration; and (3) preparation of other deliverables as required.

Task 2 – Labor Compliance Program

A third-party consultant will be retained to develop and implement a Labor Compliance Program (LCP). The LCP will follow the rules of the California Department of Industrial Relations (DIR). The LCP will enforce the prevailing wage requirements as stipulated in the Labor Code Section 1771.5. The goal of the LCP will be to accomplish the following: inform contractors about their prevailing wage obligations; monitor compliance by obtaining and reviewing certified payroll records throughout the construction of the project; investigate complaints and other suspected violations; and take appropriate actions when violations are found. Monthly reports will be prepared which will document compliance throughout construction of the project.

This work will be initiated prior to commencing with construction.

Deliverables: (1) Submit application to Department of Industrial Relations for approval of LCP; (2) development and implementation of an LCP.

Task 3 – Reporting

Work under this task will include preparing and submitting all reports as required. Based on inspection of a template of the DWR Grant Agreement it is expected that the following reports will be prepared and submitted: Quarterly Progress Reports; Project Completion Reports; Grant Completion Report; and Project Performance Reports. Construction and operational monitoring described in Attachment 6 to this application will be included in a Monitoring and Reporting Plan that will document how project objectives have been met and

what measures might have been needed to modify the project as it is implemented. The local sponsor (LHUD) will coordinate with the Grant recipient to prepare and submit the reports specified above.

This work, including development of a Monitoring and Reporting Plan, will be initiated when a notice of a Grant award is received.

Deliverables: Submission of quarterly progress reports, project completion reports, grant completion reports and project performance reports as specified in the Grant Agreement.

3.2.2.2 Land Purchase/Easement Category (b)

Land Purchase/Easement

The proposed Project will be constructed on property owned by the LHUD. In this regard, it is anticipated that acquisition of easements will not be required.

3.2.2.3 Planning/Design/Engineering/Environmental Documentation Category (c)

Task 4 – Assessment and Evaluation

Work under this task will include preparation of a Preliminary Engineering Design Report. The purpose of this study will be:

1. To estimate the storage volume and flow rates to meet present and projected needs. The tank sizing will consider fire protection and domestic consumption, irrigation, and operational and emergency storage;
2. To estimate well capacity necessary to meet present and projected needs;
3. To analyze potential locations for the new water storage tank and new well;
4. Examine environmental restrictions affecting each site location for the new tank and the new well;
5. Evaluate different types of water storage tanks (elevated, at-grade, and buried) and their suitability to deliver the required pressures and flows;
6. To evaluate the materials commonly used for tank construction including steel and reinforced concrete, and evaluate the expected service lives and life-cycle costs of each;
7. Evaluate materials for construction of the new well (i.e. steel vs. PVC well casing, gravel rock etc.; and

8. Evaluate constructability, maintenance, costs, site factors, security, water quality, and construction schedules of each alternative for the new well and replacement tank.

This work will be initiated when a notice of a Grant award is received. Items 1 and 2 will serve to establish criteria for operational monitoring.

Deliverables: Preliminary Engineering Design Report

Task 5 – Final Design

Work under this task will be accomplished by completing the following subtasks:

- Subtask 5-1 – Final Hydraulic Analysis
- Subtask 5-2 – Geotechnical Investigation
- Subtask 5-3 – Surveying and Aerial Mapping
- Subtask 5-4 – Utility Verification
- Subtask 5-5 – Final Design
- Subtask 5-6 – Construction Cost Estimates
- Subtask 5-7 – Preparation of Plans and Specs

The subtask is described in more detail below.

Subtask 5-1 – Final Hydraulic Analysis – Work will include finalizing the hydraulic analysis evaluation to confirm system efficiency.

Subtask 5-2 – Geotechnical Investigation - A geotechnical investigation will be made at the selected replacement tank site. The geotechnical investigation will include drilling an exploratory boring, analyzing the boring cutting, and the preparation of an engineering report that will provide:

- Description of the geologic setting
- Soils profile and subsurface conditions
- Groundwater conditions
- Structural design parameters including allowable soil bearing pressures, soil foundation, lateral soil pressures and seismic criteria
- Engineering conclusions and recommendations

The geotechnical report will evaluate existing subsurface conditions and provide parameters necessary for final design.

Subtask 5-3 – Surveying and Aerial Mapping – Surveying to establish the horizontal and vertical control of the project will be completed for use for project facility design and construction. The survey will be based on the datum that is currently being relied on.

Subtask 5-4 – Utility Verification – This subtask will include coordination with utility companies impacted by the project. All utility companies will be contacted to obtain current information on the type and location of their facilities. The location (vertical and horizontal location), type, and size of the utility will be verified. This information will be incorporated into the design drawings.

Subtask 5-5 – Final Design – This subtask will consist of the layout and design of the project elements in the form of drawings and technical specifications at the 100-percent level. Work under this task will include (1) sizing and siting the new well and tank; (2) performing a hydraulic analysis; (3) completing all details for construction of the project elements. Drawings will be prepared showing construction limits, survey control points, borrow and staging areas, environmental protection requirements, construction access roads/limits of work area, and site restoration requirements. Also, drawings will be prepared showing site excavation and grading requirements, structural work, civil work, mechanical work, and electrical work. The resulting drawings will be incorporated into the bidding documents.

Subtask 5-6 – Construction Cost Estimates – A preliminary engineer’s will be prepared. The engineer’s cost estimate will be prepared for construction of the project elements, as well as for evaluation of construction bids. The cost estimate will be a budget level estimate, and construction contingencies and escalations appropriate to this level of estimate.

Subtask 5-7 – Preparation of Bid Documents – Contract documents will be prepared in anticipation for procuring a construction contract. The contract documents are expected to include front-end specifications; a defined scope of work; construction bid schedule; measurement and payment provisions; drawings; technical specifications and special provisions as necessary, including environmental and permitting requirements. Existing Specifications will be used and be modified to reflect the requirements specific to this project.

No work under this task has been completed. This work will be initiated when a notice of a Grant award is received.

Deliverables: Completion of project plans and specifications at the final level (100% level).

Task 6 – Environmental Documentation

Consultation was made with an Environmental Consulting firm regarding the preparation of a CEQA document. Based on this consultation, it is anticipated that an Initial Study will be sufficient to satisfy the requirements of the California Environmental Quality Act (CEQA). The Initial Study will evaluate the project’s potential for significant effects on the environment. It is anticipated that the Initial Study will indicate that the Project environmental compliance can be met through the preparation and filing of a Mitigated Negative Declaration. The following subtasks will be performed as part of this task.

Subtask 6-1 – Project Description – Develop a project description to support the CEQA evaluation and prepare a preliminary assessment of necessary field evaluations including biological and archeological evaluations.

Subtask 6-2 – Perform Technical Studies – Biological and archeological evaluations will be performed to comply with accepted environmental review standards and support environmental compliance and regulatory permitting requirements.

Subtask 6-3 – Environmental Impact Analysis – An Initial Study/Mitigated Negative Declaration will be prepared to satisfy the requirements of CEQA. As part of this process, activities will include preparing and distributing a Notice of Preparation (NOP); hosting public scoping meetings; preparing recommendation for consideration by the Board of Directors; providing technical support at the District’s Board meeting to consider adoption of the Mitigated Negative Declaration; and filing the Notice of Determination of the Mitigated Negative Declaration once adopted. If the Initial Study concludes that there are potentially significant impacts that cannot be mitigated, an Environmental Impact Report (EIR) would be prepared.

The CEQA Initial Study work has not been completed. It is anticipated that this work will be initiated and be completed in parallel with other critical tasks. Any mitigation requirements will be included in the Monitoring and Reporting Plan and results included in Quarterly Progress Reports and Project Completion Reports.

Deliverables: (1) Prepare an Initial Study/Mitigated Negative Declaration; and (2) file the Notice of Determination.

Task 7 – Permitting

It is anticipated that no regulatory permits will be required, inasmuch as the work will be performed on already disturbed property. In this regard, only permits related to construction will be required and application will be made for these permits prior to construction commencing. Compliance with any requirements will be monitored and results included in Quarterly Progress Reports and Project Completion Reports.

Drilling Permit-Application will be made to the Kern County Health Department for drilling of a new well.

Finally, it is noted that LHUD is not subject to the County's jurisdiction with regard to building and grading permits. IN this regard, as part of this work, LHUD will confer with legal counsel.

This work will be initiated when a notice of a Grant award is received.

Deliverables: Obtain all permits prior to construction.

3.2.2.4 Construction/Implementation Category (d)

Task 8 – Construction Contracting

A Contract for construction of the Project will be competitively bid; accordingly, the work will include publish notice soliciting bids; conduct job-site tour for prospective bidders; respond to contractors' questions; issue addenda to specifications if required; open and evaluate bids, including costs, required bonds, suppliers and subcontractors, and checking bidder's references and experience successfully executing this type of work; award of contract; and issuance of the Notice to Proceed.

This work will be initiated when the work in Task 5-Final Design has been completed.

Deliverables: (1) Advertise for bids; (2) conduct pre-bid meeting; (3) award the contract; and (4) issue the Notice to Proceed.

Task 9 – Construction

Activities under this task include construction of all project work. Below is a description of all subtasks.

Subtask 9-1 – Mobilization and Site Preparation:

Mobilization – Work will consist of the mobilization of the contractor's forces and equipment necessary for performing the work required under the contract. Mobilization activities will include transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the contractor's operations at the site; and securing all bonding.

Site Preparation – Work will include surveying the limits of the work area and clearing and grubbing the work area prior to construction work commencing.

Subtask 9-2 – Project Construction: Work under this task would include all activities necessary for construction of the project to be performed by a qualified Contractor. The process for selecting a contractor is described in Task 8 above. Activities will include

procurement of all materials/equipment; site preparation; coordination of subcontractors; and construction of all contract work.

The work will include construction of the new well and tank replacement. Both components are described in detail below.

The construction components to be completed for the new well include: (1) construct and develop the new production well, including installation of perforated and unperforated casing; well development; and test pumping; (2) furnishing and installing vertical turbine pumping unit with electric motor driver, complete with motor control equipment, meter panel, conduit wiring, termination to all electrical and control devices; and (3) furnishing and installing 1,300 linear feet of 8-inch C-900 DR 18 pipe.

The construction components to be completed for the new replacement tank include: (1) constructing a 1.6 MG storage tank complete with a sound foundation; (2) construction of 200 linear feet of 12-inch transmission line; (3) construction of an earthen sump; (4) completion of all final grading; and (5) completion of all electrical work.

Subtask 9-3 – Performance Testing and Demobilization:

Testing and Commissioning - Work under this task will include all labor, material, and equipment to field start-up and test the project facilities. Part of the work under this task will include well development and pump testing for the new well.

Demobilization - Activities include transportation of personnel, equipment, and supplies; disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

This work will be initiated when the work in Task 8-Construction Contracting has been completed.

Deliverables: (1) Construct all project work.

3.2.2.5 Environmental Compliance/Mitigation/Enhancement Category (e)

Task 10 – Environmental Compliance

With respect to environmental compliance, it is expected that the Environmental Consultant will oversee the required mitigation measures get implemented during construction of the work. It is expected that the Initial Study/Mitigated Negative Declaration will confirm that the project will not have a negative impacts on the environment. In this regard, it is expected that work under this task will be limited to retaining a certified biologist to conduct a pre-construction biological survey prior to construction commencing to confirm that no environmentally sensitive species are present at the project site at the time of construction. Accordingly, under this task, a pre-construction biological survey will be coordinated and

monitoring will be provided (if required) during construction. The results of mitigation monitoring will be included in the Monitoring and Reporting Plan and reported through Quarterly Progress Reports and Project Completion Reports. Monitoring data will be developed in a manner to be consistent in form to any relevant State databases.

Deliverables: (1) Conduct pre-construction biological field surveys; and (2) report on biological monitoring (if necessary) during construction.

3.2.2.6 Construction Administration Category (f)

Task 11 – Construction Administration and Management

This task includes both field inspection and Contract administration where the latter includes the following activities: attend weekly construction meetings; process technical submittals; process Requests for Information (RFI's); review contractor schedule and cash flows; process contract change order requests; evaluate and process claims; prepare the monthly progress estimate; maintain as-built drawings and photographic records; and contract close-out.

With respect to field inspection, activities include inspection of materials and quality of work for conformance with the plans and Specifications including the following: verification of depth and invert elevations of facilities to be constructed; record quantities of materials received or used during specified periods; maintenance of daily logs of construction and inspection activities, including photographs; and coordination of concrete and earthwork testing in support of construction.

This work will be initiated when the work in Task 8-Construction Contracting has been completed.

Deliverables: (1) Filing of the Notice of Completion; and (2) preparation of the “As-Built” plans.

3.2.3 Appendices

Appendices for this Project 2 Work Plan include:

- Appendix 3.2-1 – Tank Inspection Report

The Data Management and Monitoring Deliverables are discussed in Attachment 6 of the application.