Attachment 3

Work Plan

Santa Ana One Water One Watershed IRWM Prop 84,
Round 2 Implementation Proposals

Work Plan

Proposal Goals and Objectives

SAWPA's request for funding through Proposition 84, Chapter 2 Integrated Regional Water Management will be used to support the second phase of funding needed to advance the One Water One Watershed (OWOW) vision. The OWOW program, developed and maintained through an ongoing collaborative stakeholder process facilitated by SAWPA, is based upon the long-term vision where the Santa Ana Watershed is:

- A watershed that is sustainable, drought-proofed and salt-balanced by 2030, and in which water resources are protected and water is used efficiently;
- A watershed that supports economic and environmental viability;
- A watershed that is adaptable to climate change;
- A watershed in which environmental justice deficiencies are corrected;
- A watershed in which interruptions to natural hydrology are minimized, and;
- A watershed where a new water ethic is created at the institutional and personal level.

This portfolio of projects is intended to implement the second phase of the Santa Ana River Watershed's One Water One Watershed (OWOW), Integrated Regional Water Management Plan (IRWM). With the input and direction of the OWOW Steering Committee, a group of leaders from local government, water agencies, the business and environmental community, the Santa Ana Watershed Project Authority (SAWPA) developed a portfolio of 20 projects that are 1) ready to implement in a timely manner and 2) address strategies identified in the OWOW plan. The project portfolio integrates projects across geographic boundaries and provides multiple benefits to the region.

In this next round of funding, staff sought to further expand the power of multi-agency cooperation as a means for more holistic, integrated program/project implementation. The intent of this approach is to address the need for funding (through grants) to enable agencies to budget for time and resources dedicated to new and/or innovative agreements that would not otherwise be realized. If all those with an interest in water take a broader view, this watershed approach also can create opportunities for local agencies to help shape the actions that restore functionality, solve problems, and provide long-term sustainability.

California's most recent water bond included a means for such integrated projects to move forward. Proposition 84, Chapter 2 was intended to incentivize this more integrated, collaborative model for watershed management. Rather than managing a watershed through the implementation of numerous Capital Improvement Programs, Integrated Regional Watershed Management (IRWM) seeks to provide financial resources for those that develop work in a collaborative, integrated manner that views the watershed in its entirety. Through Proposition 84, Chapter 2, $114 million was allocated to the Santa Ana River Watershed for such projects and programs.

<u>Second Round of Funding</u>

In the second phase of the OWOW integrated regional water management planning process, projects were solicited for inclusion in the One Water One Watershed (OWOW) 2.0 updated plan. In this project/program solicitation, there were 136 projects submitted for rating and ranking. Of these projects, 52 requested funding in this round. Others provided project information for planning/partnership development purposes and to be eligible for other funding sources, such as Proposition 1E.

Projects were ranked by an independent consultant using a decision support model that accounted for the following integrated benefit criteria:

1. Improved water reliability and reduced reliance on imported water;
2. Improved water quality and salt balance;
3. Management of flood waters through preservation and restoration of natural hydrology;
4. Reduction in greenhouse gas emissions from water management activities, and;
5. Cost effectiveness.

Each criterion was given equal weight in the ranking to ensure that the project portfolios provide integrated regional benefit.

Based on the project numeric score, projects were assigned to one of three tiers. Placement in a specific tier was based on an analysis of score distributions by the independent consultant for all ranked projects. The tiers represent how well a specific project meets the OWOW benefit criteria.

Definitions of project tiers are as follows:

1. Tier 1 projects- Projects that appear to closely match the OWOW Project criteria;
2. Tier 2 projects- Projects that appear to match the OWOW project criteria in some respects, but have deficiencies in some specific project areas;
3. Tier 3 projects- Projects that provide lesser benefits than projects in tiers 1 or 2, or projects earlier in the development phase and their benefits cannot be accurately calculated.

Projects in tier 1 and in the first one-third of the tier 2 group were scheduled for an interview with an independent Project Review Committee (PRC) for consideration for Prop 84 funding. Additionally, projects requesting funding under the Disadvantage Communities (DAC) and conservation rate set-aside programs also were interviewed for potential funding.

Prior to the interview, project proponents also were asked to document eligibility for OWOW funding addressing the following "eligibility gates":

1. Project meets the State of California statutory eligibility requirements, including compliance with AB 1420 (Urban Water Management Planning Act) where applicable;
2. The project is the result of significant multijurisdictional collaboration;
3. There is a cost match commitment of 25% or the project is exempt from a cost match; and,
4. The project proponent can show evidence that the project can be completed within five years of entering into a contract with the California Department of Water Resources.

The independent, expert PRC reviewed the top 36 ranked project submissions, including the applicants for DAC and WUE rate funding. They considered the project application and support materials, comments received from the stakeholder community, and interview questions of the project applicants, as well as those of their partners. They were focused on finding projects that were not only technologically feasible, but projects that were integrated and provided regional benefit. In the review process, the PRC first vetted the claims made by the project proponents on their on-line application, in terms of data accuracy and project eligibility. Second, they focused on the projects in the context of the goals and objectives of OWOW. Projects that provided single benefits, were not regional in scope and impact, or were not representative of significant collaboration were not considered for funding. The PRC sought to identify and move forward the projects that exemplified the integrated planning concept and provided the most benefit to the OWOW planning region.

Project Portfolio Selection

Although there were many meritorious projects, 20 projects and programs are recommended for funding. All these projects were all developed through a collaborative process involving multiple agencies and disciplines. The portfolio provides water use efficiency, enhanced groundwater recharge, integrated flood control/habitat benefits, non-point source pollution reduction, salt removal from local aquifers, and assistance to disadvantaged communities.

All projects selected are the result of significant collaboration between multiple partners representing multiple disciplines. For example, one project was the result of a collaboration of 20 agencies all bound by a formal agreement to address a specific issue. A complete list of all project partners can be found with project descriptions at:

http://www.sawpa.org/wp-content/uploads/2012/07/ProjectListProp84R2Tier1.pdf.

Finally, the regional benefit provided by the project was considered. There were numerous project proposals that, for a relatively modest cost when compared to more traditional single purpose projects, provided a broad set of benefits for watershed residents.

Specific Project Goals and Objectives

The specific project goals and objectives are for each of the 20 portfolio projects are discussed in detail within the sections discussing individual project proposals.

Purpose and Need

This proposal implements the first phase of the One Water One Watershed program. Projects were selected for inclusion in the portfolio based on 1) an objective, numeric process developed to select multi-benefit, regional projects, and 2) the determination by the Steering Committee that the included projects could be completed in a reasonable time frame.
The projects recommended for funding are described briefly below and are classified by primary benefit:

Stormwater/Recycled Water Projects

Wineville Regional Recycled Water Pipeline and Groundwater Recharge System Upgrades, Lead Agency: Inland Empire Utilities Agency

The project will increase recycled water direct use by 1,500 AFY and indirect use by 4,500 AFY. The recharge component of the project allows water banking in the groundwater basin to meet multiple demands and different hydrological conditions on a consistent basis. This project also restores hydrologic function within the region.

San Sevaine Ground Water Recharge Basin, Lead Agency: Inland Empire Utilities Agency

The project will provide for increased infiltration of recycled water and stormwater in the San Sevaine Basins. The expected benefits include 4,500 AFY of recycled water recharge and 2,000 AFY of stormwater recharge. The recharge program allows water banking in the groundwater basin to meet multiple demands and different hydrological conditions on a consistent basis. This project also restores hydrologic function within the region.

Vulcan Pit Flood Control and Aquifer Recharge Project, Lead Agency: City of Fontana

The proposed project includes basins and related improvements together with conveyance facilities for storm and recycled water systems in a 58-acre abandoned Vulcan mine pit site. The proposed flood control and aquifer recharge basin will occupy the east 48 acres, and the remaining ten acres will be surplus property. The proposed recharge basin will provide a storage volume of approximately 2,000 acre-feet, primarily below grade. This project also restores hydrologic function within the region.

Wilson III Basins Project and Wilson Basins/Spreading Grounds, Lead Agency: City of Yucaipa

The project develops sites to construct detention/recharge basins for discharge and percolation of State project water and native water for groundwater recharge along Wilson Creek and Oak Glen Creek. The project provides improved water quality by reducing stream sediment loading, reduction of non-point source pollutants during storm events, environmental restoration and enhancements, and enhanced multi-purpose recreational trails. This project also restores hydrologic function within the region.

Francis Street Storm Drain and Ely Basin Flood Control and Aquifer Recharge Project, Lead Agency: City of Ontario

The project will construct conveyance facilities for stormwater together with basin improvements along Francis Street in the City of Ontario. The system includes the construction of pipelines, manholes, catch basins, and diversion structures to convey stormwater runoff to the Ely Recharge Basins. This project also restores hydrologic function within the region.

Plunge Creek Water Recharge and Habitat Improvement, Lead Agency: San Bernardino Valley Water Conservation District

The project will provide habitat improvements above the mitigation requirements for impacts to the San Bernardino Kangaroo Rat resulting from implementation of the Wash Plan, while also providing groundwater recharge from native stream flow in Plunge Creek, and from managed flows from water transmission canals. Enhancement activities include vegetation removal/thinning, along with stream course widening focusing on clearing all non-native grass down to soil substrate to create habitat in excess of mitigation requirements. This project also restores hydrologic function within the region.

Enhanced Stormwater Capture and Recharge along the Santa Ana River, Lead Agency: San Bernardino Valley Municipal Water District

The project will improve existing facilities owned and operated by the San Bernardino Valley Water Conservation District, and construct new facilities that will increase the amount of stormwater that can be captured and recharged along the Santa Ana River to 80,000 ac/ft in a single year, and 500 cubic feet per second instantaneous flow.

14th Street Groundwater Recharge and Storm Water Quality Treatment Integration Facility, Lead Agency: City of Upland

The project will capture and convey an additional flow of approximately 400 ac/ft per year to the Upland Basin. The project consists of the construction of a 23 ac/ft retention basin to collect upstream storm water for flood control, water quality treatment and recharge, and approximately 4,800 feet of stormwater pipelines to connect the proposed basin to existing storm drains to provide for natural treatment of stormwater.

Recycled Water Project Phase I (Arlington-Central Avenue Pipeline), Lead Agency: City of Riverside

The project consists of the construction of recycled water pipelines to convey recycled water produced at the City's Regional Water Quality Control Plant (RWQCP). This pipeline will supply recycled water to irrigate parks, large industrial/institutional customers, golf courses, schools, and medians. The construction of this pipeline is a major operable unit to the City's recycled water distribution system, and will serve as the backbone to this system.

<u>Water Quality Improvement Projects</u>

Perris Desalination Program - Brackish Water Wells 94, 95 and 96, Lead Agency: Eastern Municipal Water District

The project will remove up to an additional 2,900 AFY of brackish water from the Perris groundwater basin by the addition of groundwater wells to the existing brackish water distribution system that supplies the existing Perris Desalter. The project entails constructing three new wells and associated equipment, approximately 8,100 feet of pipeline, appurtenances, and other equipment.

Peters Canyon Channel Water Capture and Reuse Pipeline, Lead Agency: City of Irvine

The project will capture and permanently divert discharges of selenium-laden groundwater at four locations along the Peters Canyon Channel. Flows will be transported through an underground pipeline to the Orange County Sanitation District (OCSD) Fountain Valley facility
for treatment and subsequent discharge to the Orange County Water District (OCWD) Groundwater Replenishment System (GWRS).

Corona/Home Gardens Well Rehabilitation and Multi-Jurisdictional Water Transmission Line Project, Lead Agency: City of Corona Department of Water & Power

The project will rehabilitate an inactive, non-potable, groundwater well located on Grant Street in the unincorporated area of Home Gardens. The project includes the construction of over 11,000 feet of pipeline from

the well site to well collection lines in Corona. The high nitrate flow will be blended with the low nitrate and total dissolved solids water that is produced by the Temescal Desalter from DWP's existing well collection system.

Quail Valley Subarea 9 Phase 1 Sewer System Project, Lead Agency: Eastern Municipal Water District

The project will install a sewer collection system to replace the approximately 149 failing individual septic systems in the disadvantaged community of Quail Valley. The project includes the construction of approximately 8,400 linear feet of gravity sewer line, 22 manholes, 6,700 linear feet of laterals, and connection to EMWD's sewage collection system.

Prado Basin Sediment Management Demonstration Project, Lead Agency: Orange County Water District

The project will remove sediment from within Prado Basin and reintroduce the sediment into the river below the dam to demonstrate sediment transport through Prado Basin. Sediment will be removed from Prado Basin by dredging, and then transported to a temporary holding area near the spillway. Removal will occur during the late summer to fall to avoid impacts to endangered species and will occur in areas with *Arundo donax* to maximize removal of this non-native plant. Sediment will be re-entrained in SAR flows during periods of high storm flow, and then be re-distributed in the lower SAR by natural sediment transport processes. This project also restores hydrologic function within the region and addresses an issue of watershed-wide importance.

Soboba Band of Luiseño Indians Wastewater Project, Lead Agency: Soboba Band of Luiseno Indians

The project constructs an on-site centralized wastewater treatment facility to improve service and increase effectiveness of the wastewater treatment process on Soboba Indian lands to improve the health and welfare of Soboba members and surrounding communities (San Jacinto & Hemet).

Canyon Lake Hybrid Treatment Process, Lake Elsinore and San Jacinto Watersheds Authority

The project will consist of a combination alum application and installations of a hypolimnetic oxygenation system using oxygen injection to maintain aerobic conditions all year throughout the water column in the main body of Canyon Lake. This system will address aerobic conditions in Canyon Lake and is expected to provide improvements in water quality including reduced iron, manganese, ammonia, hydrogen sulfide, and phosphorus, with probable reductions in algal densities.

<u>Water Conservation/ Water Use Efficiency Projects</u>

Commercial/Industrial/Institutional Performance-Based Water Use Efficiency Program, Lead Agency: Municipal Water District of Orange County

The program provides monetary incentives to Commercial/Industrial/Institutional (CII) and large-landscape (LL) sites (landscapes greater than one acre) for reduced water use, based on volumetric water savings. The program includes reduction through comprehensive process improvements (e.g. on-site industrial process reuse) and/or the one-to-one replacement of high water-using devices for water efficient devices (e.g. standard toilet for a high-efficiency toilet).

Customer Handbook to Using Water Efficiently in the Landscape, Lead Agency: Western Municipal Water District

The project will create an engaging customer handbook to promote the use of, and assist customers in, using landscape water efficiently. The handbook will include an overview of the watershed soils including texture, drainage, fertility, compost, mulch, and amendments; irrigation design and layout including equipment, scheduling, non-point source pollution; and plant types including planting and care, pruning, pests and a guide to designing a residential landscape.

Regional Residential Landscape Retrofit Program, Lead Agency: Inland Empire Utilities Agency

The program will provide water savings through outdoor surveys and retrofits of landscape devices. The target audience is residential customers that fall within the top ten-percent of the associated retail water providers' customer base. Retrofits include the installation of smart controllers and high efficiency sprinkler nozzles where the resident approves the changes.

Water Improvement through Ecosystem Restoration

Forest First - Increase Stormwater Capture and Decrease Sediment Loading through Forest Ecological Restoration, USDA Forest Service – Lead Agency: San Bernardino National Forest
The Forest Service and its partners propose to implement a planned ecosystem restoration (thinning/vegetation removal and road reconstruction) project in the San Bernardino National Forest to quantify benefits on water quality (sediment reduction), water supply (less evapotranspiration), and reducing operations and maintenance costs (sediment reduction). Modeling of sediment production impacts due to a severe wildfire in the project area indicate that the amount of sediment and debris that could flow downstream following a large rain event could be up to four million cubic yards. This project also restores hydrologic function and increases habitat interconnectivity within the region.

Project List

	Project Title	Lead Agency	Cooperating Agencies	Percent Design Completed	Abstract
A	Perris Desalination Program – Brackish Water Wells 94, 95 and 96	Eastern Municipal Water District	City of Perris, Western Municipal Water District, City of Moreno Valley, County of Riverside, City of Menifee	100% Design	Eastern Municipal Water District (EMWD) project will supply brackish feed water to the existing Menifee and Perris I Desalters located within the Perris Valley, then ultimately supply brackish feed water to the Perris II Desalter (planned to be operational in 2018).
B	Quail Valley Subarea 9 Phase 1 Sewer System Project	Eastern Municipal Water District	County of Riverside, Elsinore Valley Municipal Water District, City of Menifee, Quail Valley Environmental Coalition, City of Canyon Lake	30% Preliminary Design	This project will construct a sewer collection system in a portion of Quail Valley to replace approximately 149 failing individual septic systems.

C	Forest First – Increase Stormwater Capture and Decrease Sediment Loading through Forest Ecological Restoration	US Forest Service	San Bernardino Valley Municipal Water District, County of San Bernardino – Dept of Public Works, Western Municipal Water District	30% Preliminary Design	This project will reduce the fire risk and improve forest health in two locations.
D	Wineville Regional Recycled Water Pipeline and Groundwater Recharge System Upgrades	Inland Empire Utilities Agency	Inland Empire Utilities Agency, City of Fontana, Fontana Water Company, San Bernardino County Flood Control District, Chino Basin	30% Preliminary Design	This project will design and construct a pipeline segment of 5,200 linear feet (LF) of 24-inch recycled water and a segment of 28,500 LF of 36-inch recycled water pipeline.
E	Plunge Creek Water Recharge and Habitat Improvement	San Bernardino Valley Water Conservation District	San Bernardino County Flood Control and Water Conservation District, San Bernardino Valley Municipal Water District, US Fish and Wildlife Service, Inland Empire Resource Conservation District, Santa Ana Wash Plan Task Force, Santa Ana Wash Plan Task Force	Planning Studies Complete	This project will develop additional habitat for San Bernardino kangaroo rat and related threatened and endangered species in the Santa Ana River Wash area, improve the function of the stream system, create additional groundwater recharge of native surface water/storm flows, further enhance habitat and water conservation.
F	Prado Basin Sediment Management Demonstration Project	Orange County Water District	United States Army Corps of Engineers	30% Preliminary Design	The main project goal is to develop a new method to manage sediment movement in the SAR Watershed.
G	San Sevaine Groundwater Recharge Basin	Inland Empire Utilities Agency	San Bernardino County Flood Control District, Chino Basin Water Conservation District, Chino Basin Watermaster	Planning Studies Complete	The objective of this project is to increase the infiltration of recycled water and stormwater in the San Sevaine Basins.
	Corona/Home Gardens Well Rehabilitation and Multi-	City of Corona	Home Gardens County Water District	Planning Studies	The City of Corona Department of Water and Power (DWP) is

H	Jurisdictional Water Transmission Line Project			Complete	partnering with the Home Gardens County Water District (District) to replace two inactive, non-potable, ground water wells.
I	Enhanced Stormwater Capture and Recharge along the Santa Ana River	San Bernardino Valley Municipal Water District	Western Municipal Water District, Riverside Public Utilities, San Bernardino Valley Water Conservation District	30% Preliminary Design	This project will improve existing facilities and construct new facilities which will increase the amount of stormwater that can be captured and recharged along the Santa Ana River.
J	Regional Residential Landscape Retrofit Program	Inland Empire Utilities Agency	City of Chino, City of Chino Hills, Cucamonga Valley Water District, Fontana Water Company, Monte Vista Water District, City of Ontario Municipal Utilities Company, San Antonio Water Company, City of Upland	Ready for Construction Bid	The project will improve water management and reductions in energy consumption through water conservation, by retrofitting approximately 600 single family residential landscapes that currently use high water consuming devices, with high efficiency ones.

K	Canyon Lake Hybrid Treatment Process	Lake Elsinore San Jacinto Watershed Authority	Caltrans, City of Beaumont, City of Canyon Lake, City of Hemet, City of Lake Elsinore, City of Menifee, City of Moreno Valley, City of Murrieta, City of Perris, City of Riverside, City of San Jacinto, City of Wildomar, County of Riverside, Game, Eastern District, Elsinore Water District, March ARB, March JPA, San Jacinto Agricultural Operators, CAFO Operators	Planning Studies Complete	The Project goal is to complete five alum applications to the entire lake to improve water quality.
L	14th Street Groundwater Recharge and Stormwater Quality Treatment Integration Facility	City of Upland	Chino Basin Water Master	100% Design	This project plans to build a groundwater recharge and stormwater quality treatment facility with an integrated, regional approach to enhance water quality, increases aquifer recharge, and improves flood protection, directly benefiting the City as well as other water producers locally in the Santa Ana watershed.
M	Customer Handbook to Using Water Efficiently in the Landscape	Western Municipal Water District	San Bernardino County Farm Bureau, Elsinore Valley Municipal Water District, Eastern Municipal Water District, Inland Empire Utilities Agency, Municipal Water District of Orange County, San Bernardino Valley Municipal Water District	15% Conceptual Design	The goal of this project is to produce and distribute a customer handbook that educates users on how to be water efficient in the landscape. The goal is to reduce overall watershed water use by 7,240 AF per year.

N	Vulcan Pit Flood Control and Aquifer Recharge Project	City of Fontana	County of San Bernardino, Inland Empire Utilities Agency	30% Preliminary Design	This flood control facility and collection system will improve flood protection and to enhance water conservation and water quality through groundwater recharge and stabilize water rates.
O	Francis Street Storm Drain and Ely Basin Flood Control and Aquifer Recharge Project	City of Ontario	County of San Bernardino, San Bernardino County Flood Control District	100% Design	This flood control facility and collection system will improve flood protection and to enhance water conservation and water quality through groundwater recharge.
P	Commercial/Industrial/Institutional Performance-Based Water Use Efficiency Program	Metropolitan Water District of Orange County	City of Brea, City of Buena Park, City of Fountain Valley, City of Garden Grove, City of Huntington Beach, City of La Habra, City of La Palma, City of Newport Beach, City of Orange, City of Tustin, City of Westminster, East Orange County Water District, Golden State Water Company, Irvine Ranch Water District, Mesa Water District Orange County Water District, Serrano Water District Yorba Linda Water District, City of Anaheim, City of Fullerton, City of Santa Ana, City of Seal Beach	100% Design	The Program targets CII and LL sites, encouraging the reduction of water use by offering incentives based on volumetric water savings to customers within the watershed.
Q	Peters Canyon Channel Water Capture and Reuse Pipeline	City of Irvine	City of Tustin, Orange County Flood Control District, California Department of Transportation, (Caltrans) District 12	15% Conceptual Design	This project is a reuse pipeline that improves nitrogen and selenium water quality within Peters Canyon Channel by capturing and permanently diverting discharges of selenium and nitrogen-laden surface

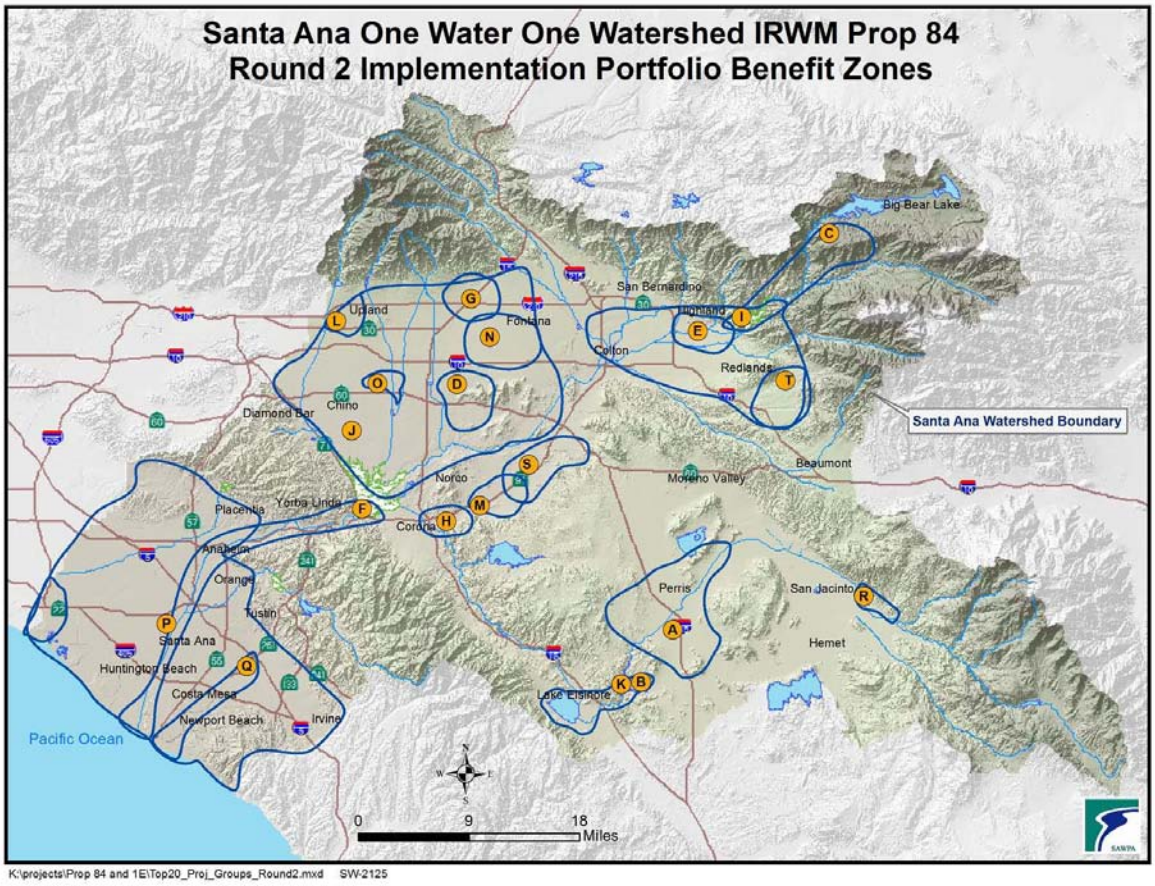
			Transportation Corridor Agencies, Irvine Ranch Water District		and groundwater.
R	Soboba Band of Luiseño Indians Wastewater Project	Soboba Tribe	Eastern Municipal Water District, Lake Hemet Municipal Water District, DOI/Bureau of Indian Affairs- Southern California Agency	Planning Studies Complete	
S	Recycled Water Project Phase I (Arlington-Central Avenue Pipeline)	City of Riverside	None	Planning Studies Complete	The Arlington/Central Project involves construction of approximately 44,000 linear feet of 8-inch, 12-inch, 16-inch, and 24-inch diameter recycled water pipelines and a booster pump station to reduce RPU's dependence on imported water.
T	Wilson III Basins Project and Wilson Basins/Spreading Grounds	City of Yucaipa	San Bernardino County Flood Control, San Bernardino Valley Municipal Water District, Yucaipa Valley Water District, Inland Empire Resource Conservation District, City of Calimesa	15% Conceptual Design	This project will improve storm water and sediment control, native and artificial groundwater recharge, improve water quality, reduce non-point source pollutants, increase environmental restoration and enhancements, and enhance trails for use by equestrians, pedestrians and bicyclists.

Integrated Elements of Projects

There are a number of project synergies or linkages resulting in added value or in some cases require coordinated implementation or operation. The projects selected by the OWOW Steering Committee fall into three primary benefit groups: 1) groundwater recharge/ recycled water projects; 2) flood control/ habitat enhancement projects, and; 3) groundwater desalination/ salt removal (or other groundwater contaminant removal). Integration of specific project elements is discussed in the description of each project.

Regional Maps

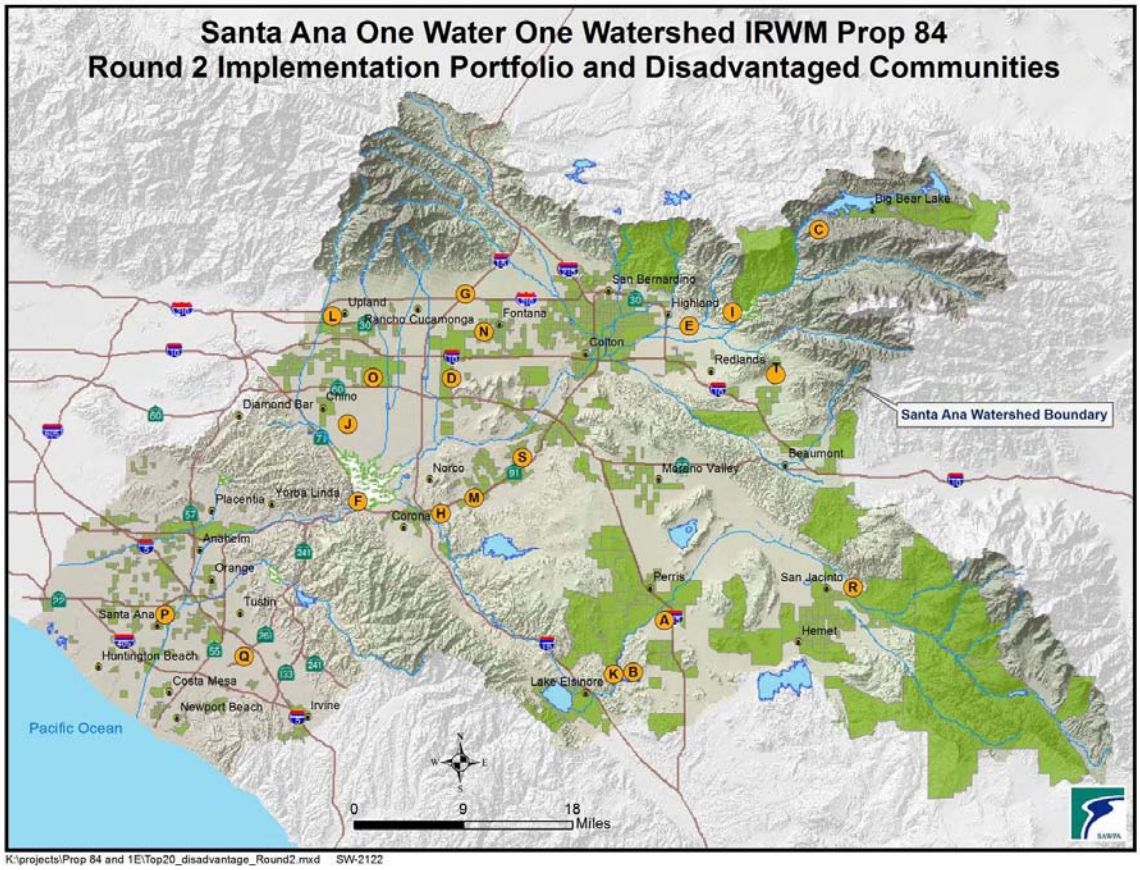
Regional Map 1: Santa Ana One Water One Watershed IRWM Prop 84 Round 2 Implementation Project Portfolio Benefit Zones



Prop 84 Round Two Funded Projects

A. Perris Desalination Program - Brackish Water Wells 94, 95 and 96
B. Quail Valley Subarea 9 Phase 1 Sewer System Project
C. Forest First-Increase Stormwater Capture and Decrease Sediment Loading through Forest Ecological Restoration
D. Wineville Regional Recycled Water Pipeline and Groundwater Recharge System Upgrades
E. Plunge Creek Water Recharge and Habitat Improvement
F. Prado Basin Sediment Management Demonstration Project
G. San Sevaine Ground Water Recharge Basin
H. Corona/Home Gardens Well Rehabilitation and Multi-Jurisdictional Water Transmission Line Project
I. Enhanced Stormwater Capture and Recharge along the Santa Ana River
J. Regional Residential Landscape Retrofit Program
K. Canyon Lake Hybrid Treatment Process
L. 14th Street Groundwater Recharge and Storm Water Quality Treatment Integration Facility
M. Customer Handbook to Using Water Efficiently in the Landscape
N. Vulcan Pit Flood Control and Aquifer Recharge Project
O. Francis Street Storm Drain and Ely Basin Flood Control and Aquifer Recharge Project
P. Commercial/Industrial/Institutional Performance-Based Water Use Efficiency Program
Q. Peters Canyon Channel Water Capture and Reuse Pipeline
R. Soboba Band of Luiseno Indians Wastewater Project
S. Recycled Water Project Phase I (Arlington-Central Avenue Pipeline)
T. Wilson III Basins Project and Wilson Basins/Spreading Grounds

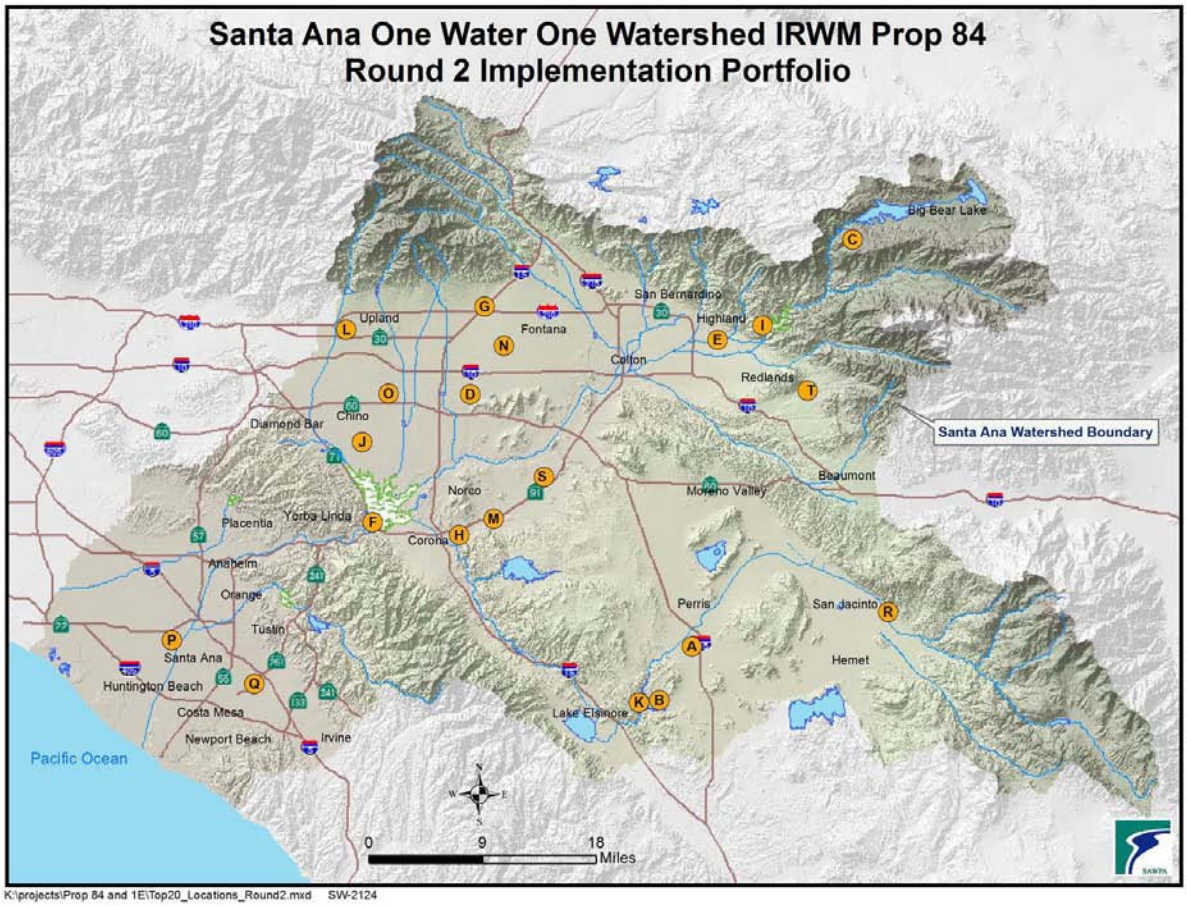
Regional Map 2: Santa Ana One Water One Watershed IRWM Prop 84 Round 2 Implementation Project Portfolio and Disadvantaged Communities



Prop 84 Round Two Funded Projects

A. Perris Desalination Program - Brackish Water Wells 94, 95 and 96
B. Quail Valley Subarea 9 Phase 1 Sewer System Project
C. Forest First- Increase Stormwater Capture and Decrease Sediment Loading through Forest Ecological Restoration
D. Wineville Regional Recycled Water Pipeline and Groundwater Recharge System Upgrades
E. Plunge Creek Water Recharge and Habitat Improvement
F. Prado Basin Sediment Management Demonstration Project
G. San Sevaine Ground Water Recharge Basin
H. Corona/Home Gardens Well Rehabilitation and Multi-Jurisdictional Water Transmission Line Project
I. Enhanced Stormwater Capture and Recharge along the Santa Ana River
J. Regional Residential Landscape Retrofit Program
K. Canyon Lake Hybrid Treatment Process
L. 14th Street Groundwater Recharge and Storm Water Quality Treatment Integration Facility
M. Customer Handbook to Using Water Efficiently in the Landscape
N. Vulcan Pit Flood Control and Aquifer Recharge Project
O. Francis Street Storm Drain and Ely Basin Flood Control and Aquifer Recharge Project
P. Commercial/Industrial/Institutional Performance-Based Water Use Efficiency Program
Q. Peters Canyon Channel Water Capture and Reuse Pipeline
R. Soboba Band of Luiseno Indians Wastewater Project
S. Recycled Water Project Phase I (Arlington-Central Avenue Pipeline)
T. Wilson III Basins Project and Wilson Basins/Spreading Grounds

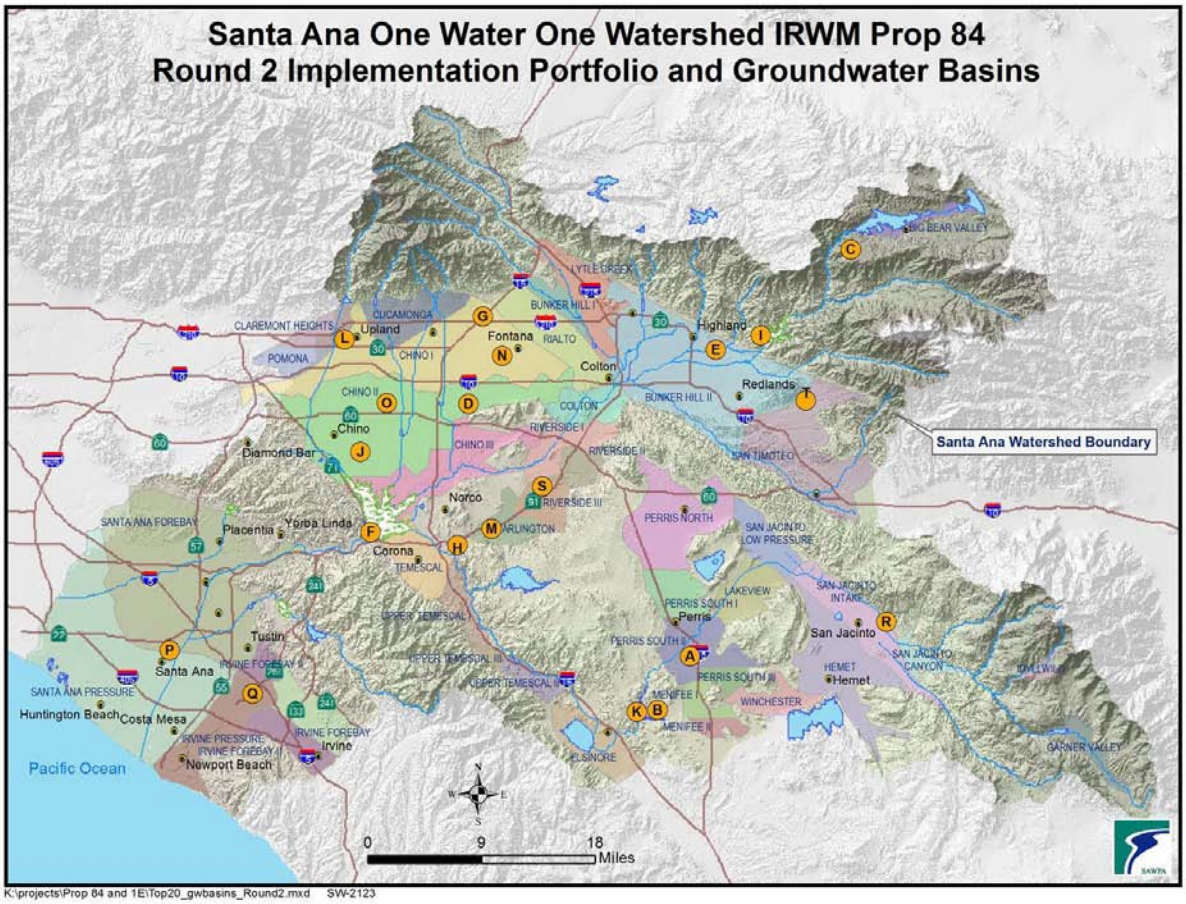
Regional Map 3: Santa Ana One Water One Watershed IRWM Prop 84 Round 2 Implementation Project Portfolio



Prop 84 Round Two Funded Projects

A. Perris Desalination Program - Brackish Water Wells 94, 95 and 96
B. Quail Valley Subarea 9 Phase 1 Sewer System Project
C. Forest First-Increase Stormwater Capture and Decrease Sediment Loading through Forest Ecological Restoration
D. Wineville Regional Recycled Water Pipeline and Groundwater Recharge System Upgrades
E. Plunge Creek Water Recharge and Habitat Improvement
F. Prado Basin Sediment Management Demonstration Project
G. San Sevaine Ground Water Recharge Basin
H. Corona/Home Gardens Well Rehabilitation and Multi-Jurisdictional Water Transmission Line Project
I. Enhanced Stormwater Capture and Recharge along the Santa Ana River
J. Regional Residential Landscape Retrofit Program
K. Canyon Lake Hybrid Treatment Process
L. 14th Street Groundwater Recharge and Storm Water Quality Treatment Integration Facility
M. Customer Handbook to Using Water Efficiently in the Landscape
N. Vulcan Pit Flood Control and Aquifer Recharge Project
O. Francis Street Storm Drain and Ely Basin Flood Control and Aquifer Recharge Project
P. Commercial/Industrial/Institutional Performance-Based Water Use Efficiency Program
Q. Peters Canyon Channel Water Capture and Reuse Pipeline
R. Soboba Band of Luiseno Indians Wastewater Project
S. Recycled Water Project Phase I (Arlington-Central Avenue Pipeline)
T. Wilson III Basins Project and Wilson Basins/Spreading Grounds

Regional Map 4: Santa Ana One Water One Watershed IRWM Prop 84 Round 2 Implementation Project Portfolio and Groundwater Basins



Prop 84 Round Two Funded Projects

A. Perris Desalination Program - Brackish Water Wells 94, 95 and 96
B. Quail Valley Subarea 9 Phase 1 Sewer System Project
C. Forest First-Increase Stormwater Capture and Decrease Sediment Loading through Forest Ecological Restoration
D. Wineville Regional Recycled Water Pipeline and Groundwater Recharge System Upgrades
E. Plunge Creek Water Recharge and Habitat Improvement
F. Prado Basin Sediment Management Demonstration Project
G. San Sevaine Ground Water Recharge Basin
H. Corona/Home Gardens Well Rehabilitation and Multi-Jurisdictional Water Transmission Line Project
I. Enhanced Stormwater Capture and Recharge along the Santa Ana River
J. Regional Residential Landscape Retrofit Program
K. Canyon Lake Hybrid Treatment Process
L. 14th Street Groundwater Recharge and Storm Water Quality Treatment Integration Facility
M. Customer Handbook to Using Water Efficiently in the Landscape
N. Vulcan Pit Flood Control and Aquifer Recharge Project
O. Francis Street Storm Drain and Ely Basin Flood Control and Aquifer Recharge Project
P. Commercial/Industrial/Institutional Performance-Based Water Use Efficiency Program
Q. Peters Canyon Channel Water Capture and Reuse Pipeline
R. Soboba Band of Luiseno Indians Wastewater Project
S. Recycled Water Project Phase I (Arlington-Central Avenue Pipeline)
T. Wilson III Basins Project and Wilson Basins/Spreading Grounds

Project A: Perris Desalination Program – Brackish Water Wells 94, 95 and 96 (Eastern Municipal Water District)

Part One – Introduction

Eastern Municipal Water District (EMWD) project will supply brackish feed water to the existing Menifee and Perris I Desalters located within the Perris Valley, then ultimately supply brackish feed water to the Perris II Desalter (planned to be operational in 2018). EMWD views the use of desalters to make effective, beneficial use of local degraded brackish groundwater supplies as a viable, long-term step in generating new local potable water resources.

The project is part of EMWD's Perris Desalination Program, which comprises the existing Menifee and Perris I Desalters, and twelve existing brackish water extraction wells. Planned construction of the Perris II Desalter includes six new brackish water supply wells with connecting pipelines, boosting facilities, well-head treatment and monitoring facilities, and other ancillary facilities and equipment. Wells 94, 95, and 96 will ultimately provide raw water to the Perris II Desalter, but in the interim will provide water to the existing Menifee and Perris I Desalters.

With this project, EMWD proposes to construct three extraction wells and 5,500 lineal feet of 24-inch pipeline, and 2,700 lineal feet of 12-inch pipeline as new components of the Perris Desalination Program. The ongoing desalination program is part of a regional effort to improve the water supply through reclamation of impaired groundwater sub basins with the added benefit of salt removal. Construction of the Perris Desalination Program – Brackish Water Wells, 94, 95, and 96 (Project) will provide additional capacity to remove approximately 3,000 acre-feet (AF) of brackish groundwater per year. Product water will be used to offset demands on the State Water Project and brine will be transported out of the basin through existing capacity in the Santa Ana Regional Interceptor (SARI) pipeline.

EMWD has adopted a goal of 100% wastewater recycling. Groundwater basin reclamation and salt removal are essential elements of meeting the recycling objective. The proposed Project also contributes to environmental enhancement and long range storage opportunities.

Goals and Objectives

One of the IRWM strategies suggests that regional and local entities implement a diverse portfolio of water management techniques to better address uncertainties of changing water patterns.

As a SAWPA member agency, EMWD's goals and objectives are consistent with the Santa Ana Basin IRWMP—more specifically addressed in the sub-regional San Jacinto River Watershed Council IRWMP including:

- Mitigate exceedances of the primary MCLs for Nitrate and Perchlorate
- Mitigate exceedances of the secondary MCL for Total Dissolved Solids (TDS)
- Protect local drinking water sources
- Supplement basin water supplies
- Increase local reliability
- Reduce demand on imported water
- Remove salt from the basin
- Provide improved resource management capabilities

Project-specific goals include:

- Desalination which provides an efficient use of local brackish groundwater resources and is more energy efficient than using imported water supplies thereby also reducing EMWD's Greenhouse Gas footprint; and
- Utilize water that would not otherwise be useable thereby conserving water resources for use in other areas.

EMWD has successfully constructed two groundwater desalination plants and implemented a desalination program within the last 5 years. Currently, up to 8.4 MGD of locally derived potable water can be generated by the desalters. These efforts were implemented in order to:

- Increase reliance on local groundwater, decreasing dependence on imported water;
- Increase reliance on local water resources in the event of an emergency (such as an earthquake) that cuts off imported water supplies;
- Increase local drought preparedness and mitigation responsiveness;
- Supplement water supplies to local communities

Technical objectives identified in EMWD's *West San Jacinto Groundwater Basin Groundwater Management Plan* including the following quality objectives:

Management Zone	**TDS (mg/L)**	**NO3-N (mg/L)**
Perris North	570	5.2
Perris South	1,260	2.5
Menifee	1,020	2.8
Lakeview/Hemet North	520	1.8
Hemet South	730	4.1
San Jacinto Lower Pressure	520	1.0

Purpose and Need

The proposed Project will provide for the operation of 3 additional extraction wells located in the Perris South Management Zone of the West San Jacinto Groundwater Basin where TDS and nitrate levels have been observed as high as 2,000 mg/l and 39 mg/l respectively. The contaminant plume threatens good-quality zones where potable wells are located and precludes EMWD from using the area for storage and recovery. The Project purpose is to remove a significant volume of contaminated groundwater to effect control on the hydraulic gradient and eventually reclaim the zone for storage and recovery.

The proposed well construction is a crucial component of EMWD's long-range objective of 100% water recycling. As such, immediate and integrated benefits from well construction and operation promote the Santa Ana IRWM Plan's goal and objectives as follows:

1) Reliable Water Supply:
   a. 3,000 AF of brackish water will be extracted and treated to produce 2,348 AF of product water and 652 AF of brine waste [(1)].
   b. Contaminated groundwater will immediately flow towards the extraction wells and away from existing potable supply wells increasing the reliability of existing wells.
   c. Use of local product water will reduce dependence on import (SWP) supplies.
   d. After the basin is reclaimed, infrastructure will continue indefinitely as a component of EMWD's recharge and recovery system for water recycling including benefits from: location; storage volume; monitoring, production, transmission, and treatment facilities; and salt removal.
   e. The reclaimed basin will provide opportunities for stormwater retention and recharge.
   f. The reclaimed basin may also be incorporated into regional storage plans.
   g. Listed factors define improved local reliance relative to: emergency response, local drought preparedness, and mitigation response.
2) Preserve/Enhance the Environment:
   a. 5,900 tons of salts will be removed from the basin annually.

b. 25.2 tons of nitrates will be removed from the basin annually.
c. Reduced importation will reduce SWP energy usage by 6,111 megawatt hours annually.
d. The SWP energy reduction represents a 3,403 metric ton reduction in greenhouse gas emissions.
e. Contaminate migration into good-quality zones will be mitigated/reduced.
f. Salt-loading will be mitigated.

3) Promote Sustainable Water Solutions:
   a. The proposed Project is a crucial component of a complex sustainability plan.
   b. Environmental enhancement and improved water quality are essential to the sustainability plans outlined by the State, the Region, and EMWD.
   c. The Project provides short-term benefits while creating opportunities for long-term solutions thereby reducing risk.

4) Ensure High-Quality Water:
   a. 3,000 AF of brackish groundwater water will be extracted annually from the West San Jacinto Groundwater Basin, Perris South Management Zone.
   b. 5,900 tons of salts will be removed from the basin annually.
   c. 25.2 tons of nitrates will be removed from the basin annually.
   d. High-quality product water from the desalters will be introduced into the potable supply system.
   e. Basin reclamation will facilitate the future management of high-quality water.

5) Provide Economically Effective Solutions:
   a. Desalter product water is estimated to cost $591 per acre foot compared with current MWD Tier One import rate of $847 per acre foot.
   b. Maximum return-on-investment due to integration with existing facilities and existing O&M division with over 5 years of experience.
   c. Minimized expenditures due to shared O&M and life-cycle costs with EMWD's existing investment in salinity management infrastructure.
   d. Enhanced opportunities for water recycling, rainfall retention and regional storage are made possible through the proposed Project.

6) Improve Regional Integration & Coordination:
   a. Program/Project development is the result of extensive regional collaboration.
   b. Program/Project implementation and performance will receive intensive review.
   c. Extensive opportunities for integration and coordination of resource management activities as well as public awareness and involvement will be created.
   d. MOU dated September 1, 2012 between EMWD, Western Municipal Water District, the County of Riverside, the City of Menifee, the City of Perris, the City of Moreno Valley regarding collaborative planning effort.
   e. Participation in OWOW.

7) Use Rainfall as a Resource:
   a. Naturally occurring recharge in contaminated areas will be available for beneficial use.
   b. Although the basin-reclamation program improves the potential for added rainfall benefits, stormwater management features are not included in the proposed project.

8) Provide Recreational Opportunities:
   a. The Project does not directly benefit Recreation.

9) Maintain Quality of Life:
   a. Water supply, environmental enhancement, and salinity reduction are important factors in maintaining the quality of life.
   b. The project benefits disadvantaged communities within EMWD's service area.

10) Environmental Justice:
   a. Information on disadvantaged communities (DAC) within EMWD's service area:

Name	FDI	Population	MHI
Mead Valley	494	17,616	43,314
Good Hope	495	8,112	36,100
Meadowbrook	493	2,731	34,107
Homeland	479	7,004	37,023
Green Acres	498	1,421	31,836
San Jacinto	88	41,203	45,567
Hemet	90	76,403	35,306
Valle Vista	483	13,957	41,804

Source: DWR website

b. The proposed Project benefits all water customers within EMWD's service area equally.
c. DAC areas overlay contamination plumes creating localized concerns regarding water quality.
d. DAC public outreach is an ongoing resource management activity.

11) Climate Change:
   a. Project implementation promotes a diverse portfolio of water management techniques to better address uncertainties of changing water patterns.

(1) EMWD continues to investigate opportunities to improve treatment efficiencies to reduce both power consumption and brine volume.

Project List

The Project consists of three elements: 1) well construction, 2) well equipping, and 3) conveyance pipelines. All environmental compliances and permit requirements are complete. Well designs are 100% complete. Equipment needs are dependent on information obtained during drilling and after testing. Pump/motor designs will be provided 90 days after well testing. Final designs for the pipelines and appurtenances are 100% complete. EMWD will provide administration and contract for all construction activities. Each well could also be considered a project independent of the other wells and pipelines.

Integrated Project Elements

The fundamental linkages and integrated operation of a simple well field are commonly known. A benefit/cost (b/c) analysis would need to be completed for available funds to omit project features should insufficient funding be available to complete the entire Project. Typically the b/c ratio is non-linear for alternative projects. Operational variables within EMWD's desalting program are significant and beyond the scope of this text. Additional information on EMWD's salinity management program can be found in EMWD's West San Jacinto Groundwater Basin Groundwater Management Plan.

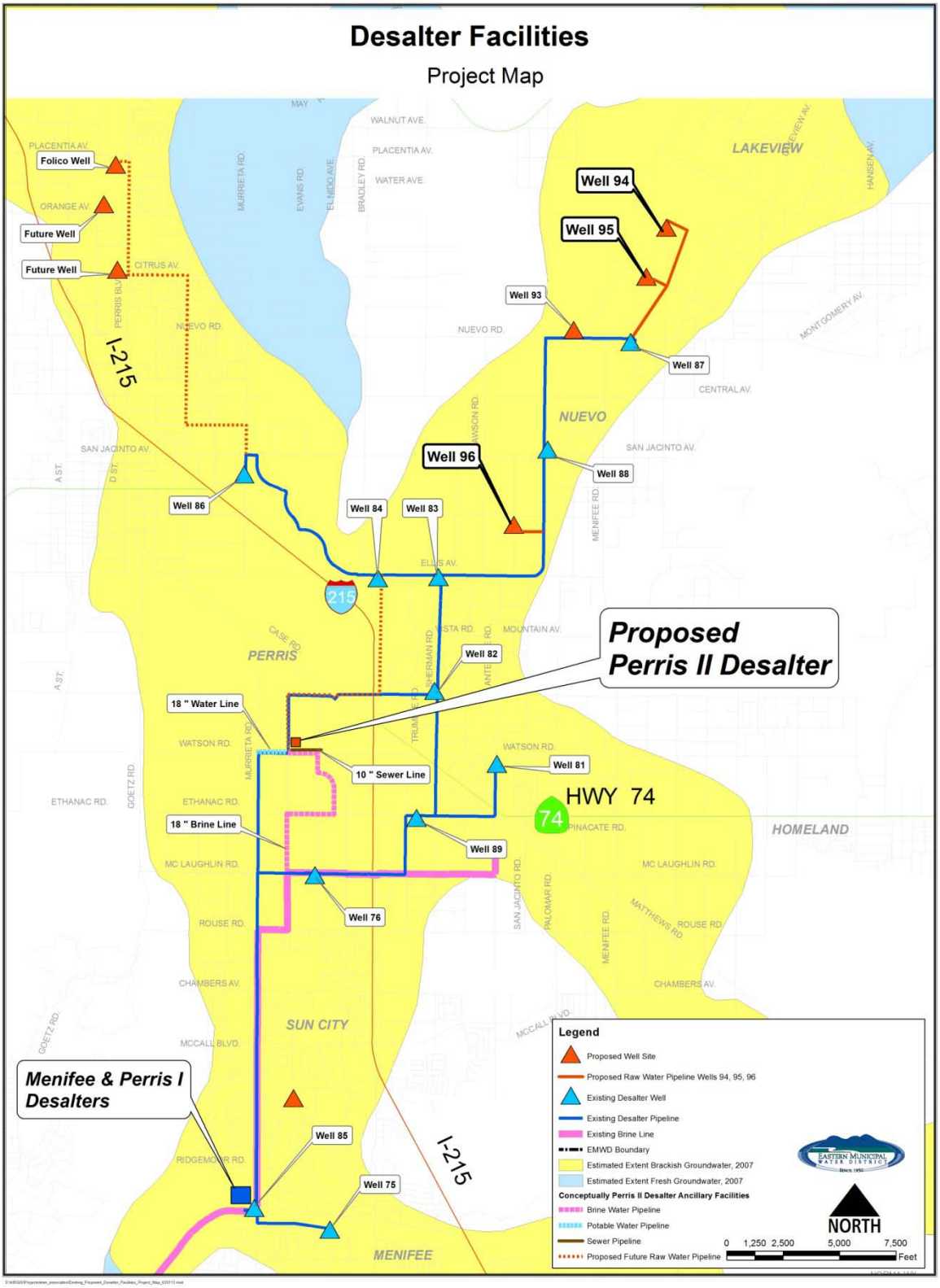
Completed Work

A CEQA Mitigated Negative Declaration (MND) for the Perris II Desalter was adopted on March 22, 2006, with the U.S. Army Corps of Engineers adopting a Finding of No Significant Impact under NEPA simultaneously. A subsequent MND was adopted on January 21, 2009 to cover an increase in the design capacity of the Perris II Desalter. An amendment to same, addressing an additional increase in design capacity of the Perris II Desalter and the specific locations of the supply wells, was adopted on October 20, 2010. The Notice of Determination for the latter was filed with the Riverside County Clerk on October 25, 2010.

Existing Data and Studies

The proposed Project is an extension of EMWD's ongoing desalting program. Studies defining the overall plan have been completed and facilities have been constructed including: two of ultimately three desalters, 12 extraction wells, and 8,200 feet of pipeline as described by the Project Map.

Project Map


Desalter Facilities
Project Map
Folico Well
Future Well
Future Well
Well 94
Well 95
Well 93
Well 87
Well 96
Well 88
Well 86
Well 84
Well 83
Well 82
Well 81
Well 89
Well 76
Well 85
Well 75
Proposed Perris II Desalter
Menifee & Perris I Desalters
18 " Water Line
10 " Sewer Line
18 " Brine Line
HWY 74
I-215
LAKEVIEW
NUEVO
PERRIS
SUN CITY
MENIFEE
HOMELAND
Legend
Proposed Well Site
Proposed Raw Water Pipeline Wells 94, 95, 96
Existing Desalter Well
Existing Desalter Pipeline
Existing Brine Line
EMWD Boundary
Estimated Extent Brackish Groundwater, 2007
Estimated Extent Fresh Groundwater, 2007
Conceptually Perris II Desalter Ancillary Facilities
Brine Water Pipeline
Potable Water Pipeline
Sewer Pipeline
Proposed Future Raw Water Pipeline
0 1,250 2,500 5,000 7,500 Feet
NORTH

Project Timing and Phasing

The proposed Project is a component of the Perris II Desalter Program which is in-turn a component of EMWD's Water and Wastewater Salinity Management Program. The completed Project will be capable of supplying feed water to all three of EMWD's desalters (Menifee, Perris, and Perris II) through the use of existing pipelines. Design is complete for the Perris II Desalter and is awaiting construction funds. The Perris II Desalter is expected to become operational in 2018. Existing capacity in EMWD's brine pipelines is adequate to support Project operations.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
EMWD will perform the following administrative activities with respect to the Project:

a. Administer contracts with design engineers and construction contractors
b. Implement recommendations of environmental studies
c. Perform Project accounting
d. Perform Project reporting

Deliverables: Invoices and other deliverables as required.

Task 2: Labor Compliance Program
EMWD will utilize existing Labor Compliance Plan 2011.00956 approved by the Department of Industrial Relations.

Deliverables: Labor Compliance Program 2011.00956.

Task 3: Reporting
EMWD will prepare and submit daily inspection reports and quarterly, annual and final Project Status Reports to SAWPA as specified in the Grant Agreement.

Deliverables: Submission of project monitoring plan, daily inspection reports, and quarterly, annual and final reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

Sites for Wells 94, 95, and 96 have been purchased by EMWD for the Project: Riverside County Assessor's Parcel Nos. for the sites are 309-380-006 (1.21 acres), 307-210-010 (1.05 acres), and 307-210-017 (1.20 acres).

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
A study was conducted in 2009 to select a suitable well sites for purchase.
An exploratory drilling report was completed in March 2010.

Deliverables: Exploratory drilling report.

Task 5: Final Design
100% plans and specifications for construction of the well have been completed.
Based on well test results, plans and specifications for equipping of the well will be revised as necessary, and are expected to be complete approximately three months after the well testing completion.

Deliverables: 100% plans and specifications for construction of the well. 90% and 100% plans and specifications for equipping of the well.

Task 6: Environmental Documentation

- **Subtask 6.1 CEQA/NEPA Documentation**

A CEQA Mitigated Negative Declaration (MND) for the Perris II Desalter was adopted on March 22, 2006, with the U.S. Army Corps of Engineers adopting a Finding of No Significant Impact under NEPA simultaneously. A subsequent MND was adopted on January 21, 2009 to cover an increase in the design capacity of the Perris II Desalter. An amendment to same, addressing an additional increase in design capacity of the Perris II Desalter and the specific locations of the supply wells, was adopted on October 20, 2010. The Notice of Determination for the latter was filed with the Riverside County Clerk on October 25, 2010.

An additional CEQA document that addresses the specific sites for Wells 94, 95, and 96 is expected to be completed in 2013.

- **Subtask 6.2 Tribal Notification**

On November 10, 2008, EMWD mailed copies of the Notice of Intent to Adopt a Mitigated Negative Declaration for the Subsequent EA/Initial Study and Mitigated Negative Declaration to the following persons:

James J. Fletcher, Superintendent
Southern California Agency
Bureau of Indian Affairs
U.S. Department of the Interior
Debbie Pilas-Treadway
Associate Governmental Program Analyst
Native American Heritage Commission
John Marcos, Chairman
Santa Rosa Band of Mission Indians
HarroldArres, Cultural Resources Manager
Soboba Band of Luiseno Indians

Deliverables: Approved and adopted CEQA/NEPA documentation.

Task 7: Permitting

Necessary permits:

a. County Drilling Permit (to be obtained by drilling contractor)
b. Encroachment Permit from County of Riverside Transportation Department
c. Permit to enter and construct from adjacent property owners (obtained by EMWD)

Deliverables: Permit documentation for each.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

100% plans and specifications for construction of the wells have been completed.
Bid review and solicitation will be completed subsequent to a finalized project funding agreement.
Bid solicitation efforts have not yet commenced.

Deliverables: Final Plans and Specifications, Summary of Bid Process.

Task 9: Construction

- **Subtask 9.1 Mobilization and Site Preparation**

Subtask 9.1.a Drilling Contractor

1) Mobilization
2) Site security and installation of temporary fencing
3) Implementation of measures as needed to comply with noise suppression requirements

Subtask 9.1.b Equipment Contractor

1) Mobilization
2) Clear and grub site
3) Site grading to raise well site and to construct blow-off pond
4) Site security and installation of permanent fencing
5) Implementation of measures as needed to comply with noise suppression requirements

Subtask 9.1.c Pipeline Contractor

1) Mobilization
2) Clear and grub site
3) Site security and installation of permanent fencing
4) Implementation of measures as needed to comply with noise suppression requirements

- **Subtask 9.2 Project Construction**

Subtask 9.2.a Well Construction (Each Well)

General Standards: DWR Bulletins 74-81 and 74-90

1) Installation of 42-inch conductor casing and 50-ft. sanitary seal (ASTM Standards A-569 and C150)
2) 12-inch pilot borehole drilling (reverse circulation rotary drilling method)
3) Down-hole geophysical logs
4) Final borehole reaming (reverse circulation rotary drilling method)
5) Caliper log
6) Installation of 18-inch ASTM Standard A240, 316L Stainless well casing and shutter screen (currently estimated at 350 feet. Final depth will be determined by field conditions, and may be greater than the currently estimated 350 feet.)
7) Installation of tubing, gravel pack and annular seals
8) Well development by airlift swabbing and chemical methods
9) Well alignment surveys
10) Well development by surge pumping

Subtask 9.2.b Well Equipping (Each Well)

1) Construction of well head pump pedestal, including extension of well casing, tubing, conductor casing, annular seals and related work
2) Construction of site facilities including blow off structure, blow off pond high water level float switch, building drain system, liquid chlorine leak detection system piping and dry well, and site lighting
3) Construction of well discharge and blow off site piping, valves and appurtenances
4) Construction of electrical and chlorine generation building including HVAC equipment, receptacles, and lighting
5) Construction of chlorine generation equipment, piping, electrical, valves, chlorine injector, brine storage tank, chlorine storage tank, dosing pumps, ventilation blowers, emergency shower eyewashes, and appurtenances
6) Furnishing and Installation of submersible vertical turbine pumping unit, including pump, column, and well-discharge head
7) Construction of Southern California Edison electrical service conduit and service meter/main (switchgear)

8) Construction of electrical motor control equipment (MCC), variable frequency drive (VFD), well level transducer, well electrical conductivity sensor, discharge pressure switches and transducer, and associated wiring
9) Construction of telemetry equipment
10) Final site grading, including installation of site surfacing material

Subtask 9.2.c Pipeline Construction

1) Construction of well head pump pedestal, including extension of well casing, tubing, conductor casing, annular seals and related work
2) Construction of site facilities including blow off structure, blow off pond high water level float switch, building drain system, liquid chlorine leak detection system piping and dry well, and site lighting
3) Construction of well discharge and blow off site piping, valves and appurtenances
4) Construction of electrical and chlorine generation building including HVAC equipment, receptacles, and lighting
5) Construction of chlorine generation equipment, piping, electrical, valves, chlorine injector, brine storage tank, chlorine storage tank, dosing pumps, ventilation blowers, emergency shower eyewashes, and appurtenances
6) Furnishing and Installation of submersible vertical turbine pumping unit, including pump, column, and well-discharge head
7) Construction of Southern California Edison electrical service conduit and service meter/main (switchgear)
8) Construction of electrical motor control equipment (MCC), variable frequency drive (VFD), well level transducer, well electrical conductivity sensor, discharge pressure switches and transducer, and associated wiring
9) Construction of telemetry equipment
10) Final site grading, including installation of site surfacing material

- **Subtask 9.3 Performance Testing and Demobilization**

Subtask 9.3.a Well Performance Testing and Demobilization (Each Well)

1) Final pumping tests and flow meter survey (spinner log)
2) Down-hole well video
3) Final well chlorination and capping
4) Site cleanup
5) Demobilization

Subtask 9.3.b Pump Performance Testing and Demobilization (Each Well)

1) Pump and motor shop testing
2) Pump station equipment startup, including, but not limited to, pump and motor start-up and testing and chlorine generation equipment startup and testing
3) Site cleanup
4) Demobilization

Subtask 9.3.c Pipeline Performance Testing and Demobilization (Each Well)

1) Pump and motor shop testing
2) Pump station equipment startup, including, but not limited to, pump and motor start-up and testing and chlorine generation equipment startup and testing
3) Site cleanup
4) Demobilization

Deliverables: Water well driller's report; well video recording; construction completion report; quarterly, annual, final construction reports; and pump station start-up report.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

The MND included a number of mitigation measures. The only such mitigation measure pertinent to the Project as described herein is Mitigation Measure IX, pertaining to Noise. Provisions for noise reduction in conformance with Mitigation Measure IX have been included in the specifications for well construction and will be included in the specifications for well equipping.

Budget Category (f): Construction Administration

Task 11: Construction Administration

Construction administration and construction inspection will be performed by EMWD staff as in-kind labor. Construction phase engineering support services may be provided by third party engineering and surveying firm(s) and include the following components: construction phase engineering support, Contractor's submittal review and response, Contractor's request for information review and response, attendance of course of construction meetings and site meetings, construction staking, soils observation and testing, and preparation of record drawings.

Deliverables: Quarterly, annual, final construction reports.

Project B: Quail Valley Subarea 9 Phase I Sewer System Project (Eastern Municipal Water District)

Part One – Introduction

Eastern Municipal Water District (EMWD) proposes to construct a sewer collection system in a portion of Quail Valley to replace approximately 149 failing individual septic systems. The Quail Valley Subarea 9 Phase I Sewer System Project (Project) specifically benefits a *Severely Disadvantaged Community* located within the City of Menifee, upstream and in close proximity to Canyon Lake. The proposed Project will consist of approximately 8,400 linear feet of gravity sewer line, 22 manholes, 6,700 linear feet of laterals, and a connection to EMWD's existing sewer system. Sewer flows from the area will either be treated at Elsinore Valley Municipal Water District's (EVMWD) Railroad Canyon Wastewater Treatment Plant (RCWTP), or EMWD will construct a lift station and convey flows to their Perris Valley Regional Wastewater Reclamation Facility (PVRWRF). The total Project cost is estimated at $5,600,000 and final design and construction are expected to last approximately three years.

The failing septic systems result in septic effluent running through the community and downstream to Canyon Lake. Especially in wet weather conditions, children walk through the surface effluent on their way to school. Additionally, in some areas the soil between the surface and underlying bedrock has become saturated with septic effluent and gray water, thus allowing for surface and subsurface migration of pollutants to Canyon Lake. Due to the age of the existing water lines in Quail Valley (constructed approximately 40 years ago), the potential exists for septic effluent to enter the potable water system. The contaminated groundwater is also a supply source for privately owned wells. Canyon Lake Reservoir is listed as an impaired water body by the federal government due to elevated levels of nitrates, phosphorus, and pathogens. The reservoir is a potable water supply source for Elsinore Valley Municipal Water District and a popular recreational facility. Canyon Lake has received considerable media attention for closures to swimming, wading, and water skiing due to high bacteria levels.

Quail Valley is a Severely Disadvantaged Community, with a yearly Median Household Income (MHI) of $31,650. A Severely Disadvantaged Community is defined as having an MHI of less than 60% of the Statewide MHI. On August 29, 2006 the County of Riverside adopted Ordinance No. 856, which established a septic tank prohibition for specified areas of Quail Valley. On October 3, 2006, the SCRWQCB, Santa Ana Region, adopted Resolution No. R8-2206-0024 which prohibited new septic systems.

Eliminating the environmental health hazards prevalent in Quail Valley and surrounding communities is necessary to allow property owners to improve existing residences or to build on or sell unimproved lots. Without improvements the communities will continue to decline into disrepair. The Quail Valley Environmental Coalition (QVEC), in cooperation with SAWPA, will continue to conduct an extensive public outreach campaign to inform local residents of the Project status and other efforts aimed at improving the residents' quality of life. The QVEC will also solicit comments and coordinate with resource agencies to communicate problems and facilitate solutions.

Goals and Objectives

Project-specific goals include:

- Eliminate public health hazards
- Assist disadvantaged communities
- Protect local drinking water sources
- Mitigate exceedances of the primary MCLs for Nitrate, and Pathogens
- Mitigate exceedances of the secondary MCL for Total Dissolved Solids (TDS)
- Supplement basin water supplies
- Increase local reliability
- Reduce demand on imported water
- Benefit public recreation
- Benefit wildlife and habitat
- Provide improved resource management capabilities

Purpose and Need

The proposed Project will provide the opportunity for property owners in Quail Valley Subarea 9 to abandon existing septic systems and connect to EMWD's regional sewer system. The Project purpose is to collect and transport raw sewage away from the community to an EMWD or EVMWD treatment facility. The need for the Project is rooted in the fact that local soil conditions are generally inadequate for proper septic system operations as evident by County of Riverside Ordinance No. 856 which establishes a septic tank prohibition for specified areas of Quail Valley. Bedrock traps septic effluent in shallow sandy soils, and bacteria and other contaminants are flushed to the surface under certain circumstances and generally with only nominal rainfall. This condition presents a public health hazard for the local community as well as downstream users including private well owners and operators of Canyon Lake Reservoir (EVMWD).

The proposed sewer collection system is typical of septic conversion projects conducted state-wide over the past decades. Although protecting public health is the austere goal, immediate and integrated benefits from this septic conversion project promote the Santa Ana IRWM Plan's goals and objectives as follows:

1) Reliable Water Supply:
    a. An estimated 44 acre-feet (AF) of septic effluent generally lost to the environment will be converted to controlled wastewater, treated and made available for recycled use annually.
    b. Use of local wastewater will reduce dependence on import (SWP) supplies.
    c. Contaminants flushed to the soil surface and transported as runoff to Canyon Lake (EVMWD surface water supply) will be halted.
    d. Contaminants entering the groundwater through the septic systems will be halted. Flushing the soil profile with natural recharge will be a long process but one that will yield significant water-quality benefits in local wells and in Canyon Lake (EVMWD surface water supply).
    e. Listed factors define improved local reliance relative to: emergency response, local drought preparedness, and mitigation response.

2) Preserve/Enhance the Environment:
    a. Mitigate loading of nitrates, phosphorus, and pathogens in Canyon Lake.
    b. Mitigate loading of nitrates, and phosphorus, and pathogens into the local groundwater basin.
    c. Migration of contaminates into good-quality zones will be curtailed.

3) Promote Sustainable Water Solutions:
    a. The proposed Project is a crucial component of a simple sustainability plan.
    b. Environmental enhancement and improved water quality are essential to the sustainability plans outlined by the State, the Region, and EMWD.
    c. The Project provides short-term benefits while creating opportunities for long-term solutions thereby reducing risk.

4) Ensure High-Quality Water:
    a. 44 AF of septic effluent will be diverted annually from entering the shallow groundwater and/or migrating to Canyon Lake.
    b. Local water supply wells will be less likely to become contaminated.
    c. Drinking water supply pipelines will not be exposed to soils saturated with septic effluent preventing possible contamination.

5) Provide Economically Effective Solutions:
    a. Disadvantaged Community (DAC) assistance is necessary to achieve Project benefits.
    b. The larger objective of providing sewer improvements to the entire community has been phased to gauge effectiveness and achieve affordability.
    c. The phased Project returns the highest value for the investment considering alternatives.
    d. Maximum return-on-investment due to integration with existing facilities.
    e. Enhanced opportunities for water recycling are made possible.

6) Improve Regional Integration & Coordination:
   a. Program/Project development is the result of extensive regional collaboration.
   b. Ongoing public outreach through the Quail Valley Environmental Coalition.
   c. Extensive opportunities for integration and coordination of resource management activities as well as public awareness and involvement will be created.
   d. An MOU dated September 19, 2012 between EMWD, Elsinore Valley Municipal Water District, the County of Riverside, the City of Menifee, the City of Canyon Lake, and the non-profit Quail Valley Environmental Coalition regarding a collaborative planning effort has been executed.
   e. Participation in OWOW.

7) Use Rainfall as a Resource:
   a. Naturally occurring recharge in contaminated areas will be available for beneficial use.
   b. The reclaimed soil profile will provide opportunities for rain water retention and recharge.
   c. Although the septic conversion project improves the potential for added rainfall benefits, stormwater management features are not included in the proposed Project.

8) Provide Recreational Opportunities:
   a. Contaminated runoff and groundwater seepage entering Canyon Lake will be curtailed.
   b. Benefits full-body water contact and wildlife habitat.

9) Maintain Quality of Life:
   a. Removal of grey water and raw sewage from neighborhoods where children play.
   b. Water supply, environmental enhancement, and recreational opportunities are important factors in maintaining the quality of life.

10) Environmental Justice:
   a. Information on DACs within EMWD's service area:

Name	**FDI**	**Population**	**MHI**
Mead Valley	494	17,616	43,314
Good Hope	495	8,112	36,100
Meadowbrook	493	2,731	34,107
Homeland	479	7,004	37,023
Green Acres	498	1,421	31,836
San Jacinto	88	41,203	45,567
Hemet	90	76,403	35,306
Valle Vista	483	13,957	41,804

Source: DWR website

   b. September 20, 2012 RCAC survey results in MHI of $31,650 for Quail Valley, population 4,500.
   c. DAC areas overlay contamination plumes creating localized concerns regarding water quality.
   d. DAC public outreach is an ongoing resource management activity through the Quail Valley Environmental Coalition.

11) Climate Change:
    a. Project implementation promotes a diverse portfolio of water management techniques to better address uncertainties of changing water patterns.

Project List

The Project consists of approximately 8,400 linear feet of gravity sewer line, 22 manholes, 6,700 linear feet of laterals, and a connection to EMWD's existing sewer system. All environmental compliances are complete. Preliminary project designs are 90% complete. Construction is proposed through a single contract. EMWD will provide administration and contract for all construction activities.

Integrated Elements of Projects

The Quail Valley Community consists of 3,981 residential parcels in an area of about 1.3 square miles. The local population estimated at 4,500 resides in homes on 1,339 parcels—all of which are on individual septic systems. Extending sewer improvements to the entire area is cost prohibitive. Subarea 9 has been developed as most practical and cost effective "first-step" in mitigating the problems associated with failing septic systems. Future projects to extend the sewer will benefit from this first-step, however the proposed Project stands alone based on available conveyance and treatment capacities of existing facilities.

Completed Work

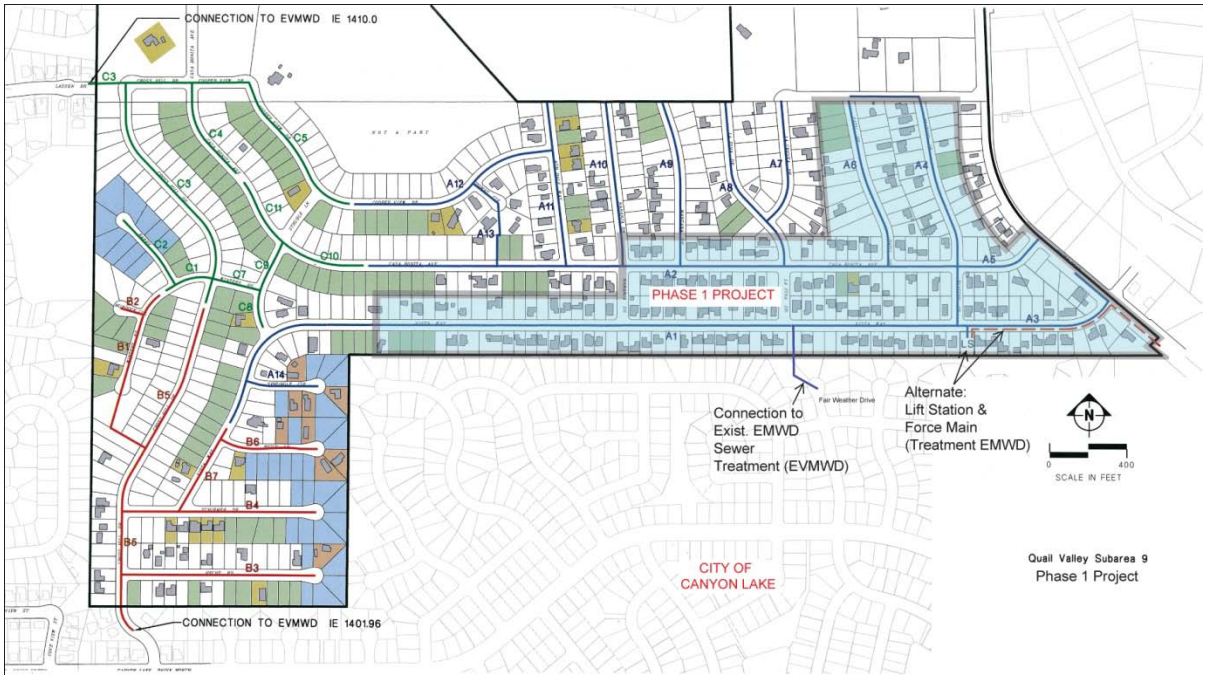
A CEQA Mitigated Negative Declaration (MND) for the Quail Valley Sewer Project was adopted on June 23, 2010. The Notice of Determination was filed with the Riverside County Clerk on June 24, 2010.

The results of a Median Household Income Survey conducted by the Rural Community Assistance Corporation were published by letter dated September 20, 2012. The survey results indicate an MHI of $31,650.

Existing Data and Studies

The Quail Valley Water Improvement District was formed in 1958. The Riverside County Department of Environmental Health documented "widespread instances and evidences of septic system failures" in its February 2005 study. Studies by the City of Canyon Lake found high levels of pathogens in runoff emanating from Quail Valley. The first comprehensive engineering analysis for sewer improvements was prepared in 2005 ("Quail Valley Sewer Improvements Alternatives Study", EMWD, PBS&J, October, 2005). The 2005 report estimates wastewater generation at a rate of 240 gpd/du (pg. 3-3). EMWD commissioned the "Quail Valley Sewer Improvements Subarea 9 Preliminary Design Report (PBS&J), which was completed in February 2010.

Project Map



Project Timing and Phasing

The proposed Project only partially addresses the sewer needs of 149 existing homes through main and lateral construction. The proposed Project does not provide for connecting the individual homes to the sewer line, nor does it address costs associated with connection fees (both for conveyance and treatment). Conveyance and treatment capacities outside the Project are adequate to service the new connections; however the costs associated with these services cannot be waived by a public utility. The mechanisms for paying these costs and requiring connection will be identified prior to the completion of construction. It is anticipated that the financing and regulatory structure necessary to ensure 100% participation will be similar to that of the ongoing Enchanted Heights Project funded by the California Department of Public Health and the State Water Resources Control Board. Complete participation by the landowners is essential to achieving full benefits.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration

EMWD will perform the following administrative activities with respect to the Project:

a. Administer contracts with design engineers and construction contractors
b. Implement recommendations of environmental studies
c. Perform Project accounting
d. Perform Project reporting

Deliverables: Invoices and other deliverables as required.

Task 2: Labor Compliance Program
EMWD will utilize existing Labor Compliance Plan 2011.00956 approved by the Department of Industrial Relations.

Deliverables: Labor Compliance Program 2011.00956.

Task 3: Reporting
EMWD will prepare and submit daily inspection reports, and quarterly, annual and final Project Status Reports to SAWPA as specified in the Grant Agreement.

Deliverables: Submission of project monitoring plan, daily inspection reports, and quarterly, annual and final reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

If sewage flows are conveyed to EVMWD's RCWTP, a lot in the City of Canyon Lake, adjacent to the Project area, will be purchased too allow a connection to be made to EVMWD's conveyance system. If EMWD decides to construct a lift station to convey flows to their PVRWRF, a lot within the project area will be purchased for the lift station site.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
The "Quail Valley Sewer Improvements Alternatives Study" was completed in October, 2005. EMWD commissioned the "Quail Valley Sewer Improvements Subarea 9 Preliminary Design Report (PBS&J), which was completed in February 2010.

Deliverables: Studies

Task 5: Final Design

1) Update the design criteria
2) Verify proposed line sizes
3) Final selection of a lift station site
4) Perform additional field investigation needed to confirm existing conditions
5) Pothole and geotechnical borings
6) Prepare contract drawings and specifications
7) Obtain necessary easements
8) Obtain permits
9) Contact City of Menifee for:
    - any necessary building permit applications
    - perform plan checks
    - confirm traffic plan requirements
10) Perform quality reviews including design reviews at 60, 90, and 100-percent plans
11) Performs bid review prior to advertisement

Deliverables: 100% plans, specifications, and cost estimates for construction of gravity sewer pipelines, abandonment of existing septic systems, connection of residences to the sewer system, and the lift station.

Task 6: Environmental Documentation
A CEQA Mitigated Negative Declaration (MND) for the Quail Valley Sewer Project was adopted on June 23, 2010. The Notice of Determination was filed with the Riverside County Clerk on June 24, 2010.

Deliverables: Approved and adopted CEQA/NEPA documentation.

Task 7: Permitting
Necessary permits:

a. Encroachment Permit from County of Riverside Transportation Department
b. Encroachment Permit from Riverside County Flood Control District (potential)
c. Encroachment Permit from City of Menifee
d. Building Permit from City of Menifee
e. Air Quality Permit from South Coast Air Quality Management District

Deliverables: Permit documentation for each.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting
Preliminary plans for construction of the sewer improvements have been completed.
Final plans and specifications and bid solicitation efforts have not yet commenced.

Deliverables: Final Plans and Specifications, Summary of Bid Process.

Task 9: Construction

- **Subtask 9.1 Mobilization and Site Preparation**
  Mobilization
  1) Site security and installation of temporary fencing
  2) Installation of noise control barrier walls and other measures as needed to comply with noise suppression requirements
  3) Acquisition of laydown area, site office area, and staging area
  4) Temporary power and water sources for use by contractor during construction
  5) Temporary sanitary facilities

- **Subtask 9.2 Project Construction**
  Eastern Municipal Water District maintains General Standards for construction projects.
  1) Pre-construction videotaping of the construction site
  2) Construction staking
  3) Trenching for mainline sewer and connections
  4) Pipe installation for mainline sewer and connections
  5) Paving of trenches
  6) On-site connections and abandonment of existing septic systems
  7) Lift Station excavation
  8) Lift Station power and water connections
  9) Lift Station building construction
  10) Lift Station security fencing construction
  11) Lift Station equipment installation

- **Subtask 9.3 Performance Testing and Demobilization**
  1) Pressure testing of sewer lines
  2) Lift Station pump testing
  3) Lift Station equipment components testing
  4) Site cleanup
  5) Removal of temporary office, security and fencing, and sound barrier walls

Deliverables: Daily inspection reports; quarterly, annual, final construction reports; videotapes; and test results

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement
The MND included a number of mitigation measures

Budget Category (f): Construction Administration

Task 11: Construction Administration

Construction administration and construction inspection will be performed by EMWD staff as in-kind labor. Construction phase engineering support services may be provided by third party engineering and surveying firm(s) and include the following components; construction phase engineering support, Contractor's submittal review and response, Contractor's request for information review and response, attendance of course of construction meetings and site meetings, construction staking, construction-phase geotechnical services, and preparation of record drawings.

Deliverables: Quarterly, annual, final construction reports.

Project C: Forest First-Increase Stormwater Capture and Decrease Sediment Loading through Forest Ecological Restoration (US Forest Service)

Part One – Introduction

The USDA Forest Service (Forest Service), San Bernardino National Forest (SBNF), proposes to reduce the fire risk and improve forest health in two locations. The Bluff Mesa project area surrounds Bluff Lake and is located in San Bernardino County, California (Figure 1). The Santa Ana Unit 3 area (Figures 2, 3) is between the communities of Highland and Mentone to the south and Running Springs and Arrowbear to the north in San Bernardino County, California.

The Big Bear Lake Valley supports a permanent population of over 20,000 residents and also supports millions of annual visitors. Many of the visitors use the Valley's ski areas, including the Bear Mountain and Snow Summit Ski Resorts, which are located within 2 miles east of the project area.

As a result of fire suppression over the last century, an unnatural increase in the density of understory tree species has occurred. In addition, drought, insects, and disease, have resulted in greater tree mortality and a high density of standing dead and down trees. Further, ground fuels have increased in montane chaparral areas and under the forest canopy. Therefore, the risk of stand-replacing crown fires has increased dramatically within the project areas over recent decades. The treatments are proposed to reduce the possibility of stand-replacing wild land fires and to restore a more sustainable forest composition and structure to the forested and chaparral stands within the Bluff Mesa area and the Santa Ana Unit 3 area.]

Goals and Objectives

The SBNF's goal of restoration is healthy resilient landscapes that will have greater capacity to survive natural disturbances and large scale threats to sustainability, especially under changing and uncertain future environmental conditions, such as those driven by climate change and increasing human uses. Treatment objectives are to meet sustainable forest management, and restore landscape capacity and conservation of biological diversity.

The Forest Service partners will be responsible for developing and performing a monitoring program to prove that forest ecological restoration benefits downstream customers through increased water supply, improved water quality (less sediment)and reduced O&M costs (less sediment).

Modeling of sediment production impacts due to a severe wild fire in the project area indicate that the amount of sediment and debris that could flow downstream following a large rain event could be up to 4 million cubic yards.]

Purpose and Need

A description of the purpose and need of the Proposal and how it addresses the adopted IRWM Plan's goals and objectives

The purpose and need for action in the Bluff Mesa Fuels Reduction project is based on the Forest Plan. As a result of the fact that the existing and the desired conditions do not coincide in terms of vegetation and fuel conditions in the project area, the Bluff Mesa project has been developed to move the project area closer to the desired condition. The purpose and need for the project is to provide for firefighter safety in the event of a wildfire, provide additional protection for Big Bear Lake and neighboring communities and developments, and to improve the resiliency of the forest ecosystem by reducing the potential for stand-replacing fires.
The SBNF proposes to re-establish and maintain the Santa Ana Fuel break in order to: Decrease the risk of wildfire to the surrounding communities by lowering fire intensity within the fuel break; Slow or reduce the size of the fire as it interacts with the fuel break; and Provide strategic locations within the fuel break for deployment of personnel and equipment in a safer wildfire environment.

The SBNF further proposes to re-establish forest health by treating conifer plantations and natural stands in the project area. The treatment methods include, but may not be limited to, mowing, hand cutting, mastication, mechanical crushing, mechanical cutting, pruning, thinning, felling, chipping, piling, pile burning and prescribed area burning. These plantations are currently overstocked, and in some areas have 100 percent crown closure. They are infested with bark beetles, have high mortality, are subject to wind throw, and have heavy fuel loads. The brush within the plantations surrounds and grows into and under the drip line of the trees, and also has high mortality. The shrubs are over six feet high and have a large percentage of dead material in the lower branches. The general conditions of these plantations are high risk for a stand replacement wildfire. Large Spanish broom plants infest several acres of the plantations.

Past forest management and fire suppression has led to over stocking of vegetation across the headwaters of the Santa Ana River, where 90% of the watershed precipitation originates. Within the forest boundaries are an estimated 7 billion dollars of values at risk that include homes, businesses, 5 high voltage power lines, the busiest railroad pass worldwide and two of the 4interstate highways into southern California. Fuels treatment NEPA analysis has been focused on community protection and access.

FSR 1N09 was installed prior to the focus on downstream watershed health. Road drainage was focused on getting the water off as quickly as possible to maintain the road, without thought to sediment delivery downstream. FSR 1N09 has many live stream crossings where each vehicle stirs up and deposits sediment in the creeks. Millions of visitors use the San Bernardino National Forest annually, and FSR 1N09 is a popular route seeing year long use.

The Forest Service partners will develop and implement a monitoring program to determine if forest ecological restoration provides sufficient benefits to downstream water customers to consider future investment in forest management.

The project is estimated to increase water delivery from the treated acres by 15%, indicating that in precipitation years of up to15% below normal the current water delivery remains [reliable water supply]. By reducing risk of catastrophic wildfire, the project reduces long-term sedimentation to Seven Oaks Dam and Plunge Creek [reliable water supply], reduces trees per acre to historic levels [enhance environment], maintain low TDS water [ensure high quality water], and protects tourism, trails, and campsites in the DAC Big Bear area [provide recreational opportunities]. The project enhances the meadow and riparian environment. As a pilot project bringing downstream water agencies into partnership with the USDA Forest Service, the project improves regional integration and coordination. The multi-benefit nature of the project [improved forest health, water quality, and local water supply] Promotes sustainable water solutions.]

Project List

A table of specific projects in the Proposal, including, an abstract of each project, the current status of each project in terms of percent completion of design, and implementing agencies.

Project component	**Abstract**	**Current status**	**Implementing agencies**
Bluff Mesa fuels and road improvement project	Forest health improvement; road decommissioning; road improvement; recreation improvement; meadow improvement	90%	Forest Service – SBNF
Santa Ana fuels Unit 3 and road improvement project	Forest health improvement; road improvement; recreation improvement	60%	Forest Service – SBNF
Road crossing improvement along FSR 1N09 within Santa Ana fuels Unit 3	Aquatic passage crossings of perennial creeks – NEPA and implementation	10%	Forest Service – SBNF

Integrated Project Elements

A description of synergies or linkages between projects that result in added value, or require coordinated implementation or operation.

[Fuels reduction and road decommissioning meet the Purpose and Need described in the Forest Service NEPA decision. Reduction in wildfire risk and reduction in road sediment delivery allow downstream water users to save O&M dollars from sediment removal avoided costs.

Reduced fuel loading allows more water to flow downstream providing more local water.

Roads require improvement to allow for contractor implementation and future fire access. Reduction in wildfire risk and reduction in road sediment delivery allow downstream water users to save O&M dollars from sediment removal. Road reconstruction has been shown to reduce sediment loading by up to 10 tons/mile/year.

Downstream water districts and county flood officials already spend budget on water flow data collection through USGS gaging stations. Removal of sediment from basins costs $10/cu.yd.]

Completed Work

A description of the work that has been completed or is expected to be completed prior to the grant award date. For example, if CEQA/NEPA and other environmental compliance efforts have been completed discuss the environmental determination made by the lead agency and the documents that were filed.

[The Bluff Mesa Fuels and Road Improvement project has a signed Decision Notice and Finding of No Significant Impact as per NEPA regulations, in October 2011.

The Santa Ana Fuels Unit 3 and Road Improvement project has a completed Environmental Analysis and there is an expectation of a signed Decision Notice and Finding of No Significant Impact as per NEPA regulations, by Federal Fiscal year (FFY) 2013.

The two perennial crossings, at Fredalba Creek and Plunge Creek, have been identified for NEPA analysis of the appropriate crossing type that will hydrologically disconnect Forest Service Road (FSR) 1N09 from these drainages. Survey work for environmental analysis has been partially done during the Santa Ana Fuels Unit 3 NEPA work.]

Existing Data and Studies

A brief discussion of the data that have been collected and studies that have been performed that support the project(s) site location, feasibility, and technical methods. If necessary, include references to the page locations of the studies or reports that support the claims made in this discussion.

Topic: Benefit to carbon reduction

A study on fuel treatment effects on stand level carbon pools, treatment–related emissions, and fire risk in a Sierra Nevada mixed conifer forest (Mitchell et al. 2009) concluded that in fire-prone dry coniferous forests of the western United States, which historically burned frequently, some of the carbon should be removed using active treatments, including prescribed fire, mechanical thinning from below, and mastication. This will reduce total stored carbon in the short term but increase fire resistance in the long term.

Previously published work by Narayan etal. (2007) suggests that the use of prescribed burning as mitigation for potential wildfire CO2 emissions is a valid approach to reducing overall GHGs under the Kyoto Protocol.

Topic: Fuels accumulation and high severity fire risk

As stated by Miller et. al (2011), “Many forests in the western USA are more susceptible to large, high-severity wildfires because of increased fuel accumulations from fire suppression (Agee 1993; Keane et al. 2002) and climate change (Flannigan et al. 2000; Westerling et al. 2006).Areas burned at high severity are of particular concern because of their high potential for flash floods and surface erosion (Forrest and Harding 1994; Nearly et al. 2005).

Post-fire increases in runoff and erosion can severely degrade water quality and reduce reservoir capacities (Tiedemann et al. 1979; Moody and Martin 2001; Nearly et al. 2005)."

To combat this risk, the USDA Forest Service and other land management agencies have initiated fuel reduction programs, but the areas needing treatment far exceed the available funding(GAO 1999; Sampson et al. 2000; GAO 2007) (as stated in: Miller et. al (2011).

Calkin et. al (2010) addressed wildfire risk and hazard. The "monitoring study was conducted to meet three broad goals: (1) address the WFLC monitoring question regarding fire hazard on Federal lands; (2) develop information useful in prioritizing where fuels treatments and mitigation measures might be proposed to address significant fire hazard and risk; and (3) respond to critiques by Office of Management and Budget, General Accounting Office, and Congress that call for risk-based performance measures to document the effectiveness of fire management programs."

Topic: Water yield from Forested lands related to fuels/fire

Based on personal communication (June 21, 2012), Cucamonga Valley Water District uses approximately750 AFY from Cucamonga Canyon when the intake and water treatment plant (WTP) are on-line. Due to the Grand Prix fire (2003) and 2010 floods, this WTP has been offline roughly 50 percent of the time over the past 10 years from increased sediment, which equates to a lost yield of up to 375 AFY compared to an unburned watershed with natural background sediment. The watershed to the WTP intake is 6,500 acres, so this translates to a loss in yield of 0.06 AFY/ac.

CardnoENTRIX (2012) were contracted by SAWPA to describe "the methodology and data used to estimate the expected economic benefits related to Santa Ana River Watershed water supplies of restoring forest health in the San Bernardino and Cleveland National Forests. Specifically, we describe methods to estimate the cost savings to the Santa Ana River Watershed that would result from two types of forest restoration projects: forest thinning to restore stand density and forest road retrofitting. The analysis is limited to estimating benefits related to water quantity and water quality; additional benefits related to avoided damage to infrastructure and private property, recreation, species habitat, and human health are not estimated.

The present value benefits of thinning over a 20-year period are also estimated in the analysis. Based on a discount rate ranging from 3 percent to 7 percent (with a most likely value of 5 percent), present value per acre thinned is estimated to range with 90 percent certainty from approximately $700 to $1,750 per acre, with a mean value of $1,200 per acre."

Topic: Roads as a sediment source

Coe (2006) studied sediment production and delivery from Forest Service roads in the Sierra Nevada. "Sediment production rates varied greatly between years and between road segments. Sediment production rates from native surface roads were 12-25 times greater than from rocked roads. On average, recently-graded roads produced twice as much sediment per unit of storm erosivity as roads that had not been recently-graded. Road sediment production is best mitigated by rocking native surface roads, decreasing sediment transport capacity by improving and maintaining drainage, and avoiding sites where unusual soil characteristics increase road surface or ditch runoff. Road sediment delivery can be minimized primarily by reducing the number of stream crossings, rocking the approaches to stream crossings, reducing the length of roads draining to stream crossings, and minimizing gully formation below drainage outlets."

Roads are the most significant source of increased sediment into stream channels on the national forests. Precipitation run-off from roads is a concern because of the efficiency with which it can reach a stream. In an unroaded area, or when there is an adequate buffer between the road and the stream, run-off from rain or snowmelt typically infiltrates into the soil of a vegetated slope before it can reach a stream channel. This process is interrupted when a road traverses a slope and collects and diverts the run-off. If no effective mitigations are applied to disperse the run-off collected on a road, it can serve as a conduit where water travels down the road surface and flows directly into nearby channels, increasing the turbidity and rate of stream flow. In turn, the available energy of a stream increases, resulting in accelerated erosion of banks and the streambed (LMP FEIS, pp.435-437).

Most of the National Forest System roads in each national forest are rated high or very high for erosion hazard. Proper maintenance and care of these roads are critical to minimizing effects due to erosion. To prevent a direct

delivery of sediment into a stream, run-off must be diverted either onto a stable and well-vegetated slope or into an adequately sized sediment basin. Greater distance between the road and the stream generally results in less sediment delivery to the channel. Once sediment enters a drainage network, either an ephemeral channel or perennial stream, it will be transported through the system as stream flow rates allow (LMP FEIS, pp.435-437).

Studies have indicated that forest roads produce the highest amount of sediment yield to streams from forest lands (Binkley et al., 1993; McClelland et al., 1999; Reid and Dunne, 1984; as referenced in Akay et al., 2008; Patric, 1976; Yoho, 1980; Swift, 1985; Binkley and Brown, 1993; Grace et al., 1998; Grace, 2002a, 2002b, 2002c, 2003, 2005a; all referenced in Grace and Clinton, 2007). These compacted road surfaces typically have very low infiltration rates and, as a result, generate large amounts of surface runoff. Road surfaces are subjected to rain splash, and the combination of rain splash with large amounts of surface runoff results in surface erosion rates that are several orders of magnitude higher than the adjacent undisturbed forest (Robichaud et al., 2010). Sediment delivered to streams from road sections leads to number of dramatic effects on water quality (i.e. increased water temperature and reduced oxygen).

Fine sediments make up at least 80 percent and usually much more of the total sediment delivered from road use (Bilby et al, 1989; Forsyth et al, 2006). Similarly, it has been demonstrated that traffic volume is the primary agent of sediment production. It is expected that sediment production will increase on roads used for hauling logs in the project area. Fines created during dry season, and usually the peak season of use, are washed away with the first storm events of each wet season (Luce and Black, 1999).]

Project Map

See attached Figures 1, 2, 3

Project Timing and Phasing

If the proposed project(s) is part of a multi-phased project complex, provide a description that demonstrates that the proposal can operate on a standalone basis, i.e., can be fully functional without implementation of the subsequent projects.

Where requested funding is for a component of a larger project, this section must describe all of the components of the larger project complex and identify project elements the IRWM Implementation grant is proposed to fund. Linkages to any other projects that must be completed first or that are essential to obtain the full benefits of the Proposal must be discussed.

1. Bluff Fuels/Roads
    a. NEPA completed in 2011 – Federal dollars
    b. Final design and contract bidding/awarding process (single contract with options) to be conducted FFY14 Q1-Q2 – Federal dollars
    c. Implementation of fuels and roads work conducted from FFY14 Q3 – FFY18 Q1 – combination of **grant dollars** and Federal dollars
    d. Contract administration coincides with implementation (FFY14 Q3 – FFY18 Q1) – combination of **grant dollars** and Federal dollars
    e. Monitoring of project area (FFY15 Q1 – FFY18 Q3) – combination of **grant dollars**, federal dollars, and in-kind services of downstream partner water and flood control agencies
    f. Project administration, invoices, and reporting (ongoing throughout project life) – combination of **grant dollars** and Federal dollars
2. Santa Ana Unit 3 Fuels/Roads
    a. NEPA expected in 2012 – Federal dollars
    b. Final design and contract bidding/awarding process (2 contracts: mastication and plantation thinning) in FFY15 Q1-Q2 and FFY16 Q1-Q2 – Federal dollars
    c. Implementation of fuels and roads work conducted from FFY15 Q3 – FFY18 Q1 – combination of **grant dollars** and Federal dollars
    d. Contract administration coincides with implementation (FFY15 Q3 – FFY18 Q1) – Federal dollars

    e. Monitoring of project area (FFY16 Q1 – FFY18 Q3) – Federal dollars and in-kind services of downstream partner water and flood control agencies
    f. Project administration, invoices, and reporting (ongoing throughout project life) – combination of **grant dollars** and Federal dollars
3. Road crossing construction along Forest Service Road 1N09 (within Santa Ana Unit 3 area)
    a. NEPA and design to be conducted FFY14 Q2 – FFY15 Q1: **Grant dollars**
    b. 401/404 permit acquisition from FFY15 Q2 – FFY15 Q4: **Grant dollars**
    c. Final design and contract bidding/awarding process FFY16 Q1-Q2: **Grant dollars**
    d. Implementation of road crossings (FFY16 Q4 – FFY18 Q1): **Grant dollars**
    e. Contract administration coincides with implementation(FFY16 Q4 – FFY18 Q1)– combination of **grant dollars** and Federal dollars
    f. Monitoring of project area (FFY17 Q2 – FFY18 Q3) – combination of **grant dollars**, Federal dollars, and in-kind services of downstream partner water and flood control agencies
    g. Project administration, invoices, and reporting (ongoing throughout project life) – combination of **grant dollars** and Federal dollars

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
[Invoice preparation is expected to be done on a quarterly basis (for 20 quarters). Preparing invoices is estimated to take 5 hours each by a GS-12 employee.]
Deliverables: Preparation of invoices and other deliverables as required.

Task 2: Labor Compliance Program
[Labor compliance documentation is expected to take 8 hours, including discussion to verify federal compliance versus state compliance. This work would be done be a by a GS-12 employee.]
Deliverables: Submission of Labor Compliance Program

Task 3: Reporting
[Annual reports are expected to take 16 hours each for a GS-12 employee with 4 hours review by a GS-13 employee. Final reports on the three primary subtasks are expected to take 80 hours total by a GS-12 employee with 16 hours review by a GS-13 employee.]
Deliverables: Submission of annual, final, and post completion reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

[Not relevant to the project because all the work will be on Forest Service managed lands.]

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
[There are sufficient background literature sources and technical studies on the effects of fuel reduction on reduced fire intensity and on reduced sediment loading. There has been Master's level Theses written about the effects of road base improvement on sediment delivery in the Sierra Nevada and also in the Big Bear watershed, which is adjacent to the Bluff area.

The literature about thinning resulting in increased water availability that was used in the cost-benefit analysis was summarized by CardnoENTRIX, a consultant hired by SAWPA. The following is an excerpt from their final report.

All stream flow responses to thinning are based on a US Geological Survey (USGS) study summarizing available data from the literature.[1] The summarized studies indicate that stream flow response to thinning is heavily influenced by the timing and amount of precipitation, which can vary significantly from year to year. Additionally, stream flow response depends on the percent reduction in stand density, with a minimal level of thinning required before responses can be detected. Several published studies indicate that a reduction of at least 25 percent is needed before any increase in stream flow can be measured. However, with high levels of stand density volume reduction, stream flow response can be significant. For example, increased stream flows of up to 80 percent have been measured in response to a 100 percent reduction in vegetation (clear cutting). **Table 2** provides the data from 13 water yield studies used in this analysis. These 13 study sites were selected from 31 studies presented in the USGS publication based on vegetation type and mean average precipitation, and stand density reduction of 25 percent or more (see **Appendix A** for a table detailing all 31 studies).

Based on these studies, this analysis assumes that stand density must be reduced by a minimum of 25 percent for positive effects on stream flow volumes to result. Second, the analysis identifies a reasonable range of how a percent change in stand density volume translates into a percent change in stream flow. For every 1 percent change in stand density, we assume that the effect on stream flow volume ranges from 0.5 percent to 0.81 percent, with 0.59 percent the most likely stream flow response to each incremental percent reduction in stand density.

Table 2 Stream flow Response to Thinning: Data from Other Studies

Watershed	A Mean Annual Precipitation (mm)	B Mean Annual Flow (mm)	C Increase in Flow (mm)	D % change flow	E % watershed treated	D/E % Change Flow Per 1% Decrease in
Values in Literature						
Beaver Creek, AZ	457	20	0	0%	100%	0.76%
Beaver Creek, AZ	508	67	11.3	17%	100%	0.17%
Beaver Creek, AZ	621	152	68.7	45%	100%	0.45%
Beaver Creek, AZ	686	172	72.9	42%	33%	1.28%
Castle Creek, AZ	639	71	16.5	23%	100%	0.23%
Deadhorse Creek, CO	648	147	75	51%	35%	1.46%
Entiat, WA	579	112	91	81%	100%	0.81%
Entiat, WA	597	155	74	48%	100%	0.48%
Entiat, WA	N/A	175	112	64%	100%	0.64%
Frazer, CO	762	283	115	41%	40%	1.02%
Meeker, CO	400	261	39	15%	30%	0.50%
Wagon Wheel Gap, CO	536	157	28.2	18%	100%	0.18%
Thomas Creek, AZ	768	82	44	54%	34%	1.58%
Values Used in Analysis						
Average	600	142	58	43%	73%	0.59%
Minimum	400	18	11	15%	30%	0.50%
Maximum	768	283	115	81%	100%	0.81%

[1] Studies summarized in: Marvin, Sarah, Possible Changes in Water Yield and Peak Flows in Response to Forest Management, Vol. 3, Chapt. 4, pp.153-199, United States Geological Survey, accessed online at http://pubs.usgs.gov/dds/dds-43/VOL_III/VIII_C04.PDF.

Note the minimum and maximum values used in the analysis are based on the studies that show the lowest and highest percent changes in flow.

The hypothesis used for this work is that the fuel reduction will reduce basal area by about 50% on average across the implemented units. This would indicate an increase in water yield of 15% from the treated area.

Deliverables: As a part of the monitoring and reporting requirements of this project, this hypothesis will be tested.]

Task 5: Final Design

[**Bluff Mesa fuels/roads project decided action. (DN and FONSI, 2011)**

My Decision
It is my decision to implement the proposed action from the Bluff Mesa Hazardous Fuels Reduction Project Environmental Assessment (EA, pages 15-29), with the following modifications that are incorporated from the response to the objection.

1. A 16" dbh (diameter) limit will be implemented for live trees within Treatment Levels 3 and 4.
2. A 20" dbh limit will be implemented for snags within Treatment Levels 3 and 4, given that safety and operability are provided.
3. If the minimum number of snags is not present in a unit, then sufficient “dying” trees will be retained as recruitment trees.
4. The description for snag retention in Treatment level 3 is clarified to say: “The 15 largest hard snags per 5 acres.”
5. The description for snag retention in Treatment level 4 is clarified to say: “The 40 largest hard snags per 5 acres.”
6. If the guidelines above do not appear to meet the Purpose and Need after a unit has been marked, the Mountaintop District will use an adaptive management approach by consulting with the John Muir Project, on the ground if possible, to determine if adjustments to the diameter limits can be agreed to on a site-specific basis.

The modified alternative was designed specifically to meet the purpose and need, while minimizing impacts to soils, water quality, Regional Forester sensitive species, and threatened and endangered species. During the identification and development of the proposed action, interdisciplinary team specialists conducted site-specific evaluations, monitoring, and reviews to determine the best methods for meeting the purpose and need to provide for community protection, while protecting valuable species habitats and other resource values. The modifications to the project to resolve objections will not substantially reduce the effectiveness of this project in meeting the purpose and need.

Selected Alternative

Under the proposed action, the entire project area would be treated by one of eight treatment levels. To meet the primary purposes of providing for firefighter safety, community protection, and reducing the potential for stand-replacing fires, the proposed action includes the creation of a shaded fuel break at the top of the ridge along roads and trails near the edge of Bluff Mesa and the creation of narrower shaded fuel breaks along several internal roads within the project area. Outside of these shaded fuel breaks, the potential for stand-replacing wildfire would be decreased by reducing tree densities and removing excess surface fuels, while at the same time maintaining essential forest structure required by wildlife.

In addition, some roads would be decommissioned while others would be converted from unauthorized roads to National Forest System roads. The treatments are shown in **Error! Reference source not found.**. A summary of the treatments is provided below.

Treatment Descriptions

Treatment Level 1 would be the inner intensive portion of the main shaded fuel break to be constructed, and it would cover approximately 85 acres. It would be located on top of the ridge near the west and south project area

boundaries and would follow existing roads and trails in many locations. The main shaded fuel break would provide firefighters a defensible space from which to carry out firefighting operations in order to prevent wildfires, to the south and west of the project area, from burning rapidly up the ridge in the montane chaparral and then gaining a foothold as a crown fire in the montane conifer forest on top of the mesa.

Treatment Level 2 would be similar to Treatment Level 1, except less intensive. It would be implemented in the outer 400 feet (200 feet on each side) of the Treatment Level 1 corridor. It would also be implemented along several internal roads in the project area, considered strategic as secondary fire-fighting zones, as well as escape routes for firefighters and residents of the private in holding around Bluff Lake. These fuel breaks would be up to 200 feet wide (100 feet wide on each side of the roads).

Treatment Level 3 is defined for threat zones outside of shaded fuel breaks, where there are no special concerns for sensitive biological or cultural resources. This treatment level is designed to restore forest conditions similar to those experienced under historic fire regimes. The treatment objective is to reduce the potential for crown fire to be initiated in these stands. Three variations of Treatment Level 3 were developed and are: 3a - where vegetation is dominated by montane chaparral with pockets of conifer forest; 3b - rolling terrain on top of Bluff Mesa where the vegetation is dominated by montane conifer forest; and 3c - 20 to 40 year old pine plantations.

Several threatened, endangered, and sensitive plants occur within or adjacent to the project area; they are mostly associated with the montane meadow and riparian habitats. Suitable habitat is present for the California spotted owl, although no spotted owl protected activity centers (PACs) currently occur within the project area. The project area also contains suitable habitat for the southwestern willow flycatcher, mountain yellow-legged frog, several sensitive or watch list snakes, and bats. Bald eagle roosting sites occur in the northern portion of the project area. Limited treatments within these habitats may be beneficial for long-term habitat maintenance. Three treatment level variations were developed for Treatment Level 4 and are: 4a - areas identified as spotted owl nest and roost habitat and bald eagle habitat; 4b - primarily consists of suitable spotted owl habitat (outside of PACs); and 4c - montane meadows that occur both upstream and downstream of Bluff Lake.

The EA, pages 15-22 and EA Table 1on pages 23-26, provides a more detailed description of these treatment levels.

Treatment Type	Approximate Acres
Treatment Level 1 – Fuel break (intensive treatment)	**85**
Treatment Level 2 – Fuel break (less intensive treatment)	**245**
Treatment Level 3a – Forest Health	**486**
Treatment Level 3b – Forest Health	**372**
Treatment Level 3c – Plantation Thinning	**17**
Treatment Level 4a – Sensitive Areas: Sp, Owl PAC/Bald Eagle	**65**
Treatment Level 4b – Sensitive Areas: Sp. Owl HRC, Suitable Habitat	**303**
Treatment Level 4c – Sensitive Areas: Meadow	**26**
TOTAL	**1,600**

The existing road system is generally adequate for proposed project treatment activities. Road reconstruction is necessary on a few miles of National Forest System roads to provide access for timber harvesting and yarding equipment and log hauling, while protecting soil and water resources. The reconstruction would include reconditioning the roadway, repairing and improving drainage features, placing crushed rock and soil on the road surface, brush removal, and minor widening of the traveled way for safe passage. Some roads would be gated and designated as “administrative use only” and some would be decommissioned after the project. All unauthorized roads in the project area will be decommissioned and/or rehabilitated over time.

Based on an analysis of existing system and unauthorized roads and trails in the project area, their levels of use by off-road vehicles, their potential for use after project implementation for fire-fighting and for recreation, and the

potential for resource damage associated with their existence and use, the project would include the following actions:

- The two nonsystem roads accessing The Wildlands Conservancy property would be converted to administrative-use system roads. These include the 0.5-mile road accessing the east side of the property from Road 2N10 and the 0.1-mile road accessing the north side of the property from Road 2N86.
- Road 2N86B (0.5 mile), which follows the main fuel break at the north end of the project, would remain a system road, but would be gated and identified for administrative use only beyond yellow-post campsite 30, at the project boundary.
- The 0.5-mile extension of Road 2N86A, where it extends into the fuel break and heads south towards Siberia Creek, would be converted to a system road. After this conversion, Road 2N86A would be about 1.0 mile in length, and the entire length would be designated for administrative use only and would be gated.
- The 0.5-mile unauthorized road identified as Trail 1W16 that leads to the Group Camp in the southwest corner of Section 27 from Road 2N86 would become a system road to the Group Camp and would remain unauthorized beyond that point.
- The 0.3-mile Road 2N11A, which heads south from Road 2N11, would be decommissioned.
- The 0.5-mile unauthorized road that heads west from Road 2N10 into the proposed fuel break along the south edge of the Mesa would be converted to an administrative use system road.
- The 0.7-mile of closed route to Bellyache Springs that follows the southern boundary of the project area would be closed and restored.
- All unauthorized routes within the project area would be decommissioned/closed and restored. Routes used for implementation would be restored prior to project completion. Routes not used for implementation would be restored over time subject to available funds.

All treatments would need to be maintained in order to remain effective over time. Maintenance of the treatments would require additional cutting of small trees, shrub clearing, and other activities every 5 to 15 years. Prescribed burning is more likely to be used for maintenance than for initial treatment, because the fuel breaks would be in place and ground fuels would be lower. Maintenance activities on the NFS roads of the project area would occur on an ongoing basis before, during, and after project implementation, to keep the roads in operating condition consistent with their operating maintenance level.

Santa Ana fuels Unit 3, Draft EA, September 2012:

The Santa Ana Hazardous Fuels Reduction Project would be designed with the following objectives, in support of the goals and strategies outlined in the Forest Plan. These can also be considered desired future conditions.

1. Support an effective fire suppression strategy to:
    a. Protect communities and private property.
    b. Increase firefighter safety during fire suppression activities, ingress, and egress.
    c. Lower the frequency of fire in areas with historically higher-than-normal fire occurrence.
    d. Manage vegetation to establish increased fire resistance by maintaining lower fire regime condition classes of 1.
2. Re-establish, expand, and maintain the existing fuel break in order to:
    a. Maintain vegetation treatments (once established) into contiguous and strategically placed defensible zones.
    b. Reduce vegetation through manual and mechanical treatments (mowing, thinning, pruning, masticating, chipping, prescribed fire, etc.) to minimize projected rate of spread, fire line intensity, and flame length within the fuel break.
    c. Re-establish and manage the fuel break to provide opportunities to enable the use of firefighting techniques such as backfire and burn-out, and provide a ready-made area to start dozer and hand line construction.
    d. Control Spanish broom within the project area.
3. Manage, protect, and improve forest health by improving resistance to wildfire and wind events in the conifer plantations and natural stands:

a. Restore forest health to the plantations and natural occurring stands within the project area by removing dead and dying trees and brush, adjusting stocking levels to decrease water stress, and pruning to increase fire resistance and lower the risk of stand replacement wildfires and bark beetle infestation.
b. Eliminate ladder fuels within stands and plantations and create buffers around high value resources, e.g., plantations, natural stands, riparian areas, etc.
c. Provide for snags and large downed woody material as called for in the LMP (Part 2, p. 100, SBNF S4, and Part 3 p. 2, S14 and S15).
d. Modify and maintain spacing of trees to restore forest health and increase wildfire resistance, i.e., 10 feet to 20 feet spacing between crowns, achieving approximately 80 percent crown closure within the over story canopy.

UNIT 3: Vegetation type: chaparral and shrub A combination of mechanical, hand, and prescribed fire treatment methods would be utilized to accomplish fuel modification and re-establishment of a 300-foot fuel break (see Unit 3 treatment map).	
Segment 7: Eastern boundary of Unit 3 to the west boundary, which ends at Highway 330	Re-established fuel break would be treated by hand cutting and piling fuels, creating islands and clumps of shrubs with a minimum 20-foot separation between individual shrubs or shrub groups. Shrub groups would not be larger than 20 feet in diameter, creating a mosaic of shrubs within the fuel break. Fuel break segments are generally steep with heavy fuels and have hand treatments using cut, pile, chip, and burn, or by mechanized equipment (e.g., roller crusher) along the road. Treatment preference would be to treat 100 feet above Forest Road 1N09 and 200 feet below the road.
Segment 8: Plantations and individual conifer trees planted after the Bear Fire of 1970	Thin dense and overstocked stands. Maintain a live tree crown spacing of 10 to 20 feet within conifer plantations to approximately 80 percent crown closure in the over story. Remove dead and dying trees killed by bark beetle infestations, while meeting requirements of LMP Part 2, p. 100, S4, and Part 3 p. 2, S14 and S15, and apply fungicide in accordance with LMP S5, p. 5 Part 3. Limit live tree mortality with prescribed fire treatments to approximately 10 percent. Branches would be pruned 10 feet up in trees 50 percent of stem-to-crown ratio, whichever is less to prevent the risk of crown fire (professional recommendation based on modeled fire behavior). All shrubs and other understory vegetation within 30 feet of a tree's drip line would be cut and removed or chipped.

Deliverables: Completion of project plans and specifications at the final level.

Task 6: Environmental Documentation

[The NEPA phase of the Bluff fuels area and the Santa Ana fuels Unit 3 area has already been completed. For the Bluff Area project, the Decision Notice and Finding of No Significant Impact were signed in 2011. For the Santa Ana Area fuels reduction project, the Decision Notice and Finding of No Significant Impact are expected in Federal Fiscal Year (FFY) 2013.

The NEPA phase for the perennial crossings along Forest Service Road (FSR) 1N09 will be completed using an Interdisciplinary (ID) Team of Forest Service professionals with decades of experience, at the GS-9 through GS-13 level, for about 90 days of work. This NEPA task is expected to take one year (FFY14 Q2 – FFY15 Q1). For the purposes of the PSP, this portion of the project is in the 10% (conceptual) design phase because the sites have been chosen and some background information is available from the Santa Ana fuels Unit 3 NEPA document.]
Deliverables*:* Approved and adopted NEPA documentation

Task 7: Permitting

[The Forest Service has an agreement with California State Fish and Wildlife (formerly Fish and Game) that allows work in riparian areas using Forest Service approved practices without requiring the acquisition of Section 1600 permits.

401/404 permits will be potentially required for the hydrologic disconnection of the two perennial stream crossings along FSR 1N09. Forest Service shall consult with the local State Water Quality Control Board and local branch of the Army Corp of Engineers to determine if a joint 401/404 permit is required. If a 401/404 permit is required, the Forest Service will work with both agencies to obtain them.

A similar project was implemented in FFY12 at the Deer Creek crossing and FSR 1N09 that required permit acquisition and lessons were learned during that process. Santa Ana Regional Water Quality Control Board personnel will be invited to the site locations early in the NEPA process to facilitate the process of permit acquisition. Given the staffing levels at each agency, 3 quarters are scheduled for this task.]
Deliverables: Section 401, 404, if necessary.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

[For fuels related projects: Ecological Restoration Fuels Reduction projects begin with project planning and field surveys to aid in the project design. The Forest Service has in-house forestry staff for unit layout and basel area determinations for the project implementation bid package. Once cost and product value have been determined a stewardship contract package is written and submitted to the Forest Service Region 5 procurement office for contract procurement. The procurement office will advertise the project using the Federal procurement system. Once bids are received and evaluated, the Contracting Officer will make a contract award to the preferred bidder.

For roads related projects: Once the design package is completed by Forest Service engineering personnel, engineers will put together a preliminary contract procurement package, which is submitted to the Forest Service Region 5 procurement office for contract procurement. The procurement office will advertise the project using the Federal procurement system. Once bids are received and evaluated, the Contracting Officer will make a contract award to the selected bidder.]
Deliverables: Advertisement for bids; pre-bid contractors meeting; evaluation of bids; award contract

Task 9: Construction

[Stabilization of the proposed native surface Forest Service roads will include: road reconditioning, construction of various drainage structures, importation of aggregate base and surface course from approved sources, controlled compaction of the base and surface course, and finished surface grading.

Road stream crossing improvement work will include: Importation of structural fill material from an approved borrow source, vertical grade modifications of the existing roadway near the stream crossing, construction of a culverted low-water road crossing, installation of riprap armoring to reduce scour potential, erosion control, and other Forest Service Best Management Practice (BMP) implementation.

The selected contractor shall mobilize all equipment and materials required to complete the project. All construction work will be performed in accordance with Forest Service requirements. Construction work is typically completed in late summer to early fall. Performance testing will be in accordance with Forest Service road construction specifications, which are primarily based on the Federal Highway Administration FP-03 specifications. The contractor is responsible for all quality control on the project, while the Forest Service provides quality assurance inspections to ensure contract compliance. Once the project is completed and accepted by the Forest Service, the contractor will demobilize all equipment and materials off of the forest.]

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

[Forest Service BMPEP monitoring is done to ensure that BMPs are implemented and effective. BMPs are used to make sure that sediment generated during the implementation of fuels and roads work does not deliver to water channels in significant quantities. Implementation monitoring is done during and just after project activities, as well as before the winter season. Effectiveness monitoring is used to determine if the BMPs that were implemented were effective. Problems found are corrected and noted for adaptive management purposes. After each winter season and spring snowmelt, the treated areas are monitored to check for BMP compliance.

On an annual basis, the GS-9 staff person will conduct monthly BMP monitoring inspections for the 6 wettest months and be scheduled to inspect following summer thunderstorms in the area during the dry season. Senior watershed staff (GS-12) will provide supervision and recommendations for fixes, as needed. The number of hours of work varies annually based on the phased nature of the implementation schedule and the travel distance to each of the locations (detailed in the Budget attachment).

Basal area reduction of vegetation (to correlate with reduced evapotranspiration) is measured through compliance with the contract specifications of the fuels treatment and is a part of construction administration.

Project partners, San Bernardino Valley Municipal Water District and Western Municipal Water District, have pledged to use internal resources (in-kind services) to continue to fund USGS stream gage data collection program which will be used to analyze water flows from project areas in an effort to quantify changes in flow which may be attributable to fuels reduction. In addition, San Bernardino County Flood Control District monitors their debris basins on an annual basis and will provide documentation of sediment removal.]

Budget Category (f): Construction Administration

Task 11: Construction Administration

[Fuels reduction projects: Project and program management is performed by various USFS personnel, both in the office and in the field. The work leaders are typically the Forest Fuels officer, the District Fuels officer, and the crews consist of Assistant Fuels officers, Fuels technicians, Contracting Officer Representatives (CORs), Inspectors, and resource specialists for wildlife, botany, and heritage. Depending on the complexity of the task and availability of personnel, any of these employees could be responsible for parts of the work.

Road related projects: Construction contract administration is handled by San Bernardino National Forest engineering staff. CORs and inspectors certified through the Forest Service National Construction Certification Program will administer the project in accordance with current Federal and Forest Service Acquisition Regulations. All construction and construction management will be contracted to a general contractor with sufficient satisfactory past experience performing projects similar to the proposed road project.]

Decision Notice and Finding of No Significant Impact

United States
Department of
Agriculture

Forest
Service

October 2011

Bluff Mesa Hazardous Fuels Reduction Project

Mountaintop Ranger District, San Bernardino National Forest
San Bernardino County, California

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Introduction

This notice documents my decision for the Bluff Mesa Hazardous Fuels Reduction project (Bluff Mesa project). I am issuing this decision under the authorities provided in the Healthy Forest Restoration Act (HFRA).

This document explains the decision I am making and the rationale for my decision. It also documents the public input, other alternatives, and analyses that I am considering in making my decision. Also included in this document is my Finding of No Significant Impact (FONSI), which supports my decision.

On July 8, 2011, the project was objected by the John Muir Project. The San Bernardino National Forest held a conference call on August 8, 2011 with the objector, resulting in resolution of the objection.

The Bluff Mesa project area includes approximately 1,600 acres, occurring mostly between 7,500 and 8,000 ft. above mean sea level. The area lies just south of the west end of Big Bear Lake (which includes extensive shoreline developments) and just west of the Big Bear Lake community. The Big Bear Valley supports a permanent population of over 20,000 residents and also supports millions of visitors annually. Many of the visitors use the Valley's ski areas, including the Bear Mountain and Snow Summit Ski Resorts, which are located within 2 miles east of the project area. An inholding of private property around Bluff Lake (currently owned by The Wildlands Conservancy) is completely surrounded by National Forest System lands in the project area. The project area also includes a group campground and several "yellow-post" campsites.

My Decision

It is my decision to implement the proposed action from the Bluff Mesa Hazardous Fuels Reduction Project Environmental Assessment (EA, pages 15-29), with the following modifications that are incorporated from the response to the objection.

1. A 16" dbh (diameter) limit will be implemented for live trees within Treatment Levels 3 and 4.
2. A 20" dbh limit will be implemented for snags within Treatment Levels 3 and 4, given that safety and operability are provided.
3. If the minimum number of snags are not present in a unit, then sufficient "dying" trees will be retained as recruitment trees.
4. The description for snag retention in Treatment level 3 is clarified to say: "The 15 largest hard snags per 5 acres."
5. The description for snag retention in Treatment level 4 is clarified to say: "The 40 largest hard snags per 5 acres."
6. If the guidelines above do not appear to meet the Purpose and Need after a unit has been marked, the Mountaintop District will use an adaptive management approach by consulting with the John Muir Project, on the ground if possible, to determine if adjustments to the diameter limits can be agreed to on a site-specific basis.

The modified alternative was designed specifically to meet the purpose and need, while minimizing impacts to soils, water quality, Regional Forester sensitive species, and threatened and endangered species. During the identification and development of the proposed action, interdisciplinary team

specialists conducted site-specific evaluations, monitoring, and reviews to determine the best methods for meeting the purpose and need to provide for community protection, while protecting valuable species habitats and other resource values. The modifications to the project to resolve objections will not substantially reduce the effectiveness of this project in meeting the purpose and need.

Selected Alternative

Under the proposed action, the entire project area would be treated by one of eight treatment levels. To meet the primary purposes of providing for firefighter safety, community protection, and reducing the potential for stand-replacing fires, the proposed action includes the creation of a shaded fuelbreak at the top of the ridge along roads and trails near the edge of Bluff Mesa and the creation of narrower shaded fuelbreaks along several internal roads within the project area. Outside of these shaded fuelbreaks, the potential for stand-replacing wildfire would be decreased by reducing tree densities and removing excess surface fuels, while at the same time maintaining essential forest structure required by wildlife.

In addition, some roads would be decommissioned while others would be converted from unauthorized roads to National Forest System roads. The treatments are shown in Figure 1. A summary of the treatments is provided below.

Treatment Descriptions

Treatment Level 1 would be the inner intensive portion of the main shaded fuelbreak to be constructed, and it would cover approximately 85 acres. It would be located on top of the ridge near the west and south project area boundaries and would follow existing roads and trails in many locations. The main shaded fuelbreak would provide firefighters a defensible space from which to carry out firefighting operations in order to prevent wildfires, to the south and west of the project area, from burning rapidly up the ridge in the montane chaparral and then gaining a foothold as a crown fire in the montane conifer forest on top of the mesa.

Treatment Level 2 would be similar to Treatment Level 1, except less intensive. It would be implemented in the outer 400 feet (200 feet on each side) of the Treatment Level 1 corridor. It would also be implemented along several internal roads in the project area, considered strategic as secondary fire-fighting zones, as well as escape routes for firefighters and residents of the private inholding around Bluff Lake. These fuelbreaks would be up to 200 feet wide (100 feet wide on each side of the roads).

Treatment Level 3 is defined for threat zones outside of shaded fuelbreaks, where there are no special concerns for sensitive biological or cultural resources. This treatment level is designed to restore forest conditions similar to those experienced under historic fire regimes. The treatment objective is to reduce the potential for crown fire to be initiated in these stands. Three variations of Treatment Level 3 were developed and are: 3a - where vegetation is dominated by montane chaparral with pockets of conifer forest; 3b - rolling terrain on top of Bluff Mesa where the vegetation is dominated by montane conifer forest; and 3c - 20 to 40 year old pine plantations.

Several threatened, endangered, and sensitive plants occur within or adjacent to the project area; they are mostly associated with the montane meadow and riparian habitats. Suitable habitat is present for the California spotted owl, although no spotted owl protected activity centers (PACs) currently occur within the project area. The project area also contains suitable habitat for the southwestern willow flycatcher, mountain yellow-legged frog, several sensitive or watch list snakes, and bats. Bald eagle roosting sites

occur in the northern portion of the project area. Limited treatments within these habitats may be beneficial for long-term habitat maintenance. Three treatment level variations were developed for Treatment Level 4 and are: 4a - areas identified as spotted owl nest and roost habitat and bald eagle habitat; 4b - primarily consists of suitable spotted owl habitat (outside of PACs); and 4c - montane meadows that occur both upstream and downstream of Bluff Lake.

The EA, pages 15-22 and EA Table 1 on pages 23-26, provides a more detailed description of these treatment levels.

Treatment Type	Approximate Acres
Treatment Level 1 – Fuelbreak (intensive treatment)	**85**
Treatment Level 2 – Fuelbreak (less intensive treatment)	**245**
Treatment Level 3a – Forest Health	**486**
Treatment Level 3b – Forest Health	**372**
Treatment Level 3c – Plantation Thinning	**17**
Treatment Level 4a – Sensitive Areas: Sp, Owl PAC/Bald Eagle	**65**
Treatment Level 4b – Sensitive Areas: Sp. Owl HRC, Suitable Habitat	**303**
Treatment Level 4c – Sensitive Areas: Meadow	**26**
TOTAL	**1,600**

The existing road system is generally adequate for proposed project treatment activities. Road reconstruction is necessary on a few miles of National Forest System roads to provide access for timber harvesting and yarding equipment and log hauling, while protecting soil and water resources. The reconstruction would include reconditioning the roadway, repairing and improving drainage features, placing crushed rock and soil on the road surface, brush removal, and minor widening of the traveled way for safe passage. Some roads would be gated and designated as "administrative use only" and some would be decommissioned after the project. All unauthorized roads in the project area will be decommissioned and/or rehabilitated over time. These actions are consistent with the Roads Analysis within the San Bernardino National Forest Land Management Plan.

Based on an analysis of existing system and unauthorized roads and trails in the project area, their levels of use by off-road vehicles, their potential for use after project implementation for fire-fighting and for recreation, and the potential for resource damage associated with their existence and use, the project would include the following actions:

- The two nonsystem roads accessing The Wildlands Conservancy property at Bluff Lake would be converted to administrative-use system roads. These include the 0.5-mile road accessing the east side of the property from Road 2N10 and the 0.1-mile road accessing the north side of the property from Road 2N86.
- Road 2N86B (0.5 mile), which follows the main fuelbreak at the north end of the project, would remain a system road, but would be gated and identified for administrative use only beyond yellow-post campsite 30, at the project boundary.
- The 0.5-mile extension of Road 2N86A, where it extends into the fuelbreak and heads south towards Siberia Creek, would be converted to a system road. After this conversion, Road 2N86A would be

about 1.0 mile in length, and the entire length would be designated for administrative use only and would be gated.

- The 0.5-mile unauthorized road identified as Trail 1W16 that leads to the Group Camp in the southwest corner of Section 27 from Road 2N86 would become a system road to the Group Camp and would remain unauthorized beyond that point.
- The 0.3-mile Road 2N11A, which heads south from Road 2N11, would be decommissioned.
- The 0.5-mile unauthorized road that heads west from Road 2N10 into the proposed fuelbreak along the south edge of the Mesa would be converted to an administrative use system road.
- The 0.7-mile of closed route to Bellyache Springs that follows the southern boundary of the project area would be closed and restored.
- All unauthorized routes within the project area would be decommissioned/closed and restored. Routes used for implementation would be restored prior to project completion. Routes not used for implementation would be restored over time subject to available funds.

All treatments would need to be maintained in order to remain effective over time. Maintenance of the treatments would require additional cutting of small trees, shrub clearing, and other activities every 5 to 15 years. Prescribed burning is more likely to be used for maintenance than for initial treatment, because the fuelbreaks would be in place and ground fuels would be reduced. Maintenance activities on the NFS roads of the project area would occur on an ongoing basis before, during, and after project implementation, to keep the roads in operating condition consistent with their operating maintenance level.

Design Criteria

A wide array of mitigation measures and design criteria would be implemented in order to lessen the environmental effects from the proposed action. The EA Appendix A provides a complete list of the project-specific design criteria that are part of the proposed action and are intended to guide the implementation of the Bluff Mesa project. The design criteria would assure that treatment levels protect resources as defined in the Forest Plan, including threatened, endangered, and sensitive plants and wildlife and cultural resources. This includes all applicable Forest Plan strategies and standards, using the program emphasis objectives and national and regional direction, and project-specific design criteria that are identified in the specialist reports. In addition, "Best Management Practices" (BMPs) have been incorporated to meet the requirements of the Clean Water Act.

Methods to be Used

The project may be implemented using commercial and noncommercial contracts. The EA describes in detail the logging methods, transportation systems, and fuels treatments that will be used during the project. A map showing the treatment levels and road management activities planned for the proposed action can be found in Figure 1.

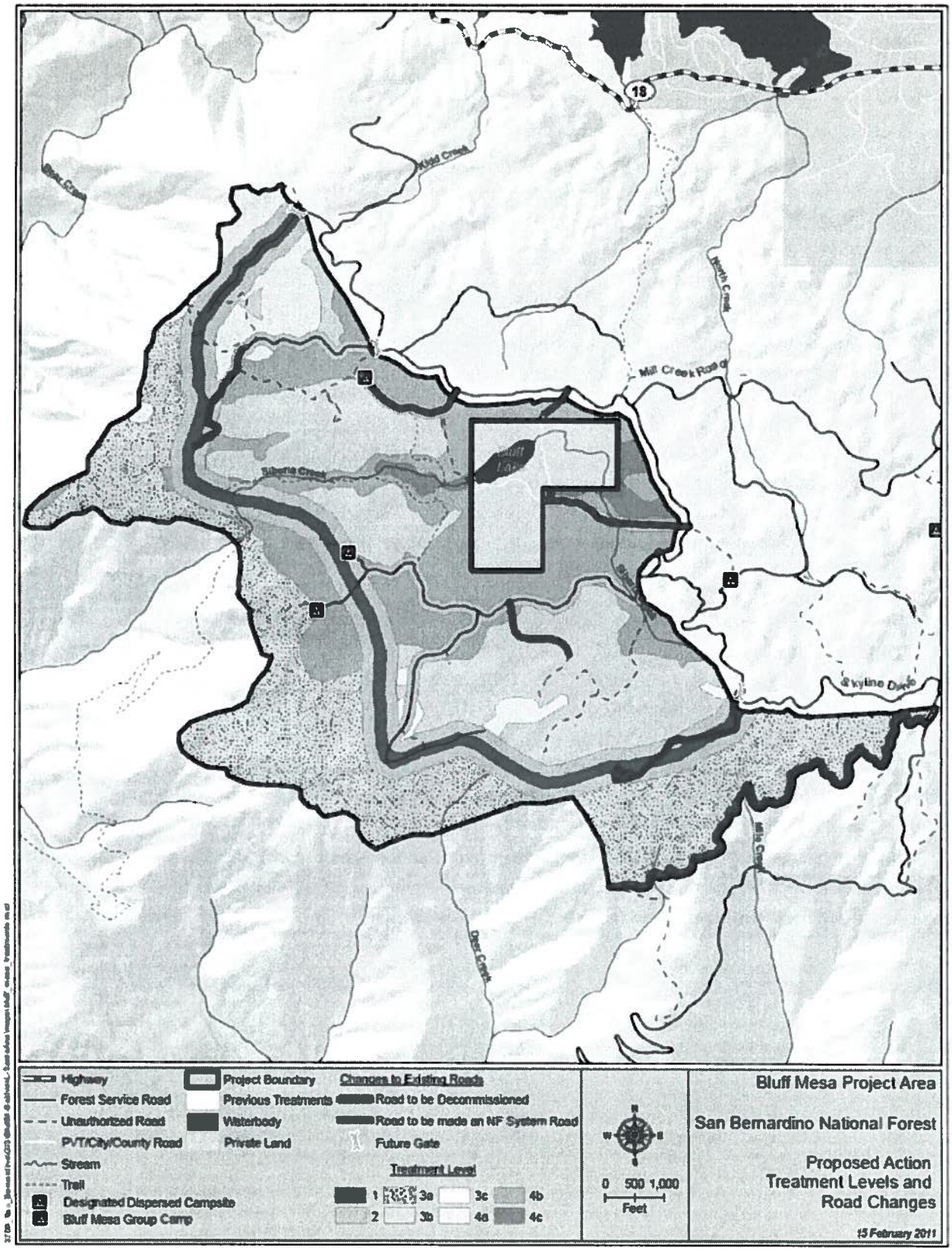


Figure 1: Proposed fuel treatments and road changes within the project area

Rationale for My Decision

The project design criteria and best management practices listed in Appendix A of the EA were designed to reduce the impacts of this project, and are based upon experience gained from implementing other fuels reduction projects on the district and site-specific information gathered by the interdisciplinary team during the design of the proposed action. Implementation of these design features is the basis for the rationale of my decision, and my finding of no significant impact.

My criteria for making a decision on this project was based on how well the management actions analyzed in the EA meet the purpose and need of the project, and address concerns that were raised during the scoping process and the objection period. I have made sure that the project complies with the San Bernardino National Forest Land Management Plan and other applicable laws and regulations. I have tried to take into account the competing interests and values of the public while ensuring that the project meets its purpose and need. I am confident that the project as described in this decision will meet the purpose and need while meeting the concerns raised during the objection process.

Based upon the review of the tests for significance and the environmental analyses conducted, I have determined that the selected alternative analyzed for the Bluff Mesa project is not a major federal action. In addition, the implementation of this project will not significantly affect the quality of the human environment. Accordingly, I have determined that an environmental impact statement need not be prepared for this project.

Meeting the Purpose and Need

Chapter 1 of the EA describes in detail the purpose and need for this project. The purpose and need is supported by a thorough description of the existing condition (EA, pages 5-10) and the desired future condition (EA, pages 10-12), which supports the compelling need for this project. The primary purposes of this project are:

1. Firefighter Safety: Currently, over 75 percent of the project area is predicted to exhibit crown fires (active/passive) under hot, dry weather conditions. Fireline intensities would be such that fire suppression will be limited, difficult, and dangerous. There is a need to reduce fuels to a condition where there will primarily be surface fires under most weather conditions (other than extreme) so that effective suppression efforts can be conducted safely to protect communities and natural resources.

   The proposed action will substantially contribute towards firefighter safety by reducing the potential for crown fires under hot, dry conditions from over 75 percent to less than 50 percent over the project area. The major portion of the remaining crown fire areas are south and west of the project area in montane chaparral. Therefore, the proposed action will include development of a wide, shaded fuelbreak on top of the ridge near the west and south project area boundaries that will follow existing roads and trails in many locations. This main shaded fuelbreak will provide firefighters a defensible space from which to carry out firefighting operations in order to prevent wildfires in the montane chaparral to the south and west of the project area, from burning rapidly up the ridge and then gaining a foothold as a crown fire in the montane conifer forest on top of the mesa. Shaded fuelbreaks will also be implemented along several internal roads in the project area, considered strategic as secondary fire-fighting zones, as well as escape routes for firefighters.

2. Protect Communities in the Vicinity of Big Bear Lake: There is a large permanent population and even larger seasonal populations in the Big Bear Lake Valley, and an inholding of private property around Bluff Lake is completely surrounded by National Forest System lands in the project area. Because of the risk of crown fire in the project area and the difficulty associated with suppression, there is a need to reduce fuels to a condition that the risk of loss of human life, structures, and improvements is substantially reduced.

   The proposed action will substantially contribute towards protecting communities by reducing the potential for crown fires under hot, dry conditions from over 75 percent to less than 50 percent over the project area. In addition, it will create shaded fuelbreaks that will greatly improve tactical firefighter operations and their potential for success. Further, these fuelbreaks will provide improved escape routes for residents of the private inholding around Bluff Lake and for recreationists in the project area.

3. Restore Healthy Forest Conditions: Fire exclusion, drought and other sources of natural mortality, and historic logging have resulted in dramatic changes in stand structure including a higher density of standing dead and down trees. Further, ground fuels have increased in montane chaparral areas and under the forest canopy. Therefore, the risk of stand-replacing crown fires has increased dramatically within the project area over recent decades. There is a need to manage forests to produce naturally appearing, healthy, vigorously growing stands that have uneven-aged structure, and a diversity of species and size classes, and are more resilient to the risk of stand-replacing fires.

   Ecological restoration is becoming increasingly important to address the potential effects of climate change and the forests resiliency to survive natural disturbances and sustain the ability to provide ecosystem services. The proposed action will move project area stands closer to historic conditions by reducing stand densities (especially in the smaller diameter classes), reducing average canopy cover, reducing the relative abundance of shade-tolerant white fir, increasing crown base heights, and reducing dead and down woody materials. Further, it will improve the effectiveness of future wildfire suppression efforts and permit the reintroduction of prescribed fire for the maintenance of historic conditions. As a result, the risk of stand-replacing fires in the project area will be substantially reduced.

Consideration of Public Comments and Concerns

I have considered all comments and opinions that have been received to date on this project in making my decision. We invited residents that live near the project area, federal, state, and local government agencies, the general public, and other groups and individuals potentially interested in or affected by the project to review and comment on our initial proposal and the purpose and need for the project. I have reviewed all the public comments and find that all concerns and issues have been addressed. The complete comment analysis is in the project file (see Bluff Mesa Scoping Report, project record).

Public Involvement

On September 18, 2009, the Mountaintop Ranger District of the SBNF initiated the NEPA analysis for the Bluff Mesa Fuels Reduction project by sending out a scoping letter, along with a description of the proposed action including maps, to a project mailing list consisting of agencies, other organizations, and

individuals. This letter requested public comments relative to items that should be addressed in the NEPA analysis by October 19, 2009. In addition, a letter was sent to the San Manuel Band of Serrano Mission Indians requesting input regarding the project and its NEPA analysis. All comments received throughout the scoping period and up through the development of the EA were considered by the Forest Service in the preparation of the EA.

In addition, the following meetings, field trips, and other public involvement activities were conducted to inform the public and organizations about the project and to solicit input regarding the issues:

Meeting was held on April 3, 2009, with the MAST Operations Group in the community of Lake Arrowhead, including representatives from NRCS, CalFire, San Bernardino Co. Fire, San Bernardino Co. Solid Waste, San Bernardino Co. Land Use Services, Running Springs Fire Dept., Big Bear City Fire Dept., and San Bernardino National Forest Association Forest Care.

Notification, inviting the public to attend a field trip to review and discuss planned hazardous fuels reduction activities in the Big Bear Lake area (including the Bluff Mesa project), was published in the Big Bear Grizzly on May 6, 2009.

A field trip to review and discuss the Bluff Mesa project (and other projects in the Big Bear Lake area) was held on May 21, 2009. Attendees included 21 individuals, each representing an organization, including the San Manuel Band Tribe, John Muir Project, Wildlands Conservancy, Friends of Fawnskin, Sierra Club, and a variety of fire protection organizations and municipalities.

The project was identified and the scoping materials were posted on the public website for the Forest and listed in the Schedule of Proposed Actions. An email address was set up to receive comments.

In addition to verbal comments received at meetings and field trips, the Forest Service received six scoping comment emails and letters. These documents included multiple comments, which entailed statements of concerns, requests for more information, statements of support for the project, or comments that disagreed with a statement used in support of the proposed action. A few variations to the proposed action were proposed as a result of comments received. All comments were analyzed to identify the issues.

The EA cover letter including a link for the EA was sent via email or mail to interested parties and pertinent agencies and tribes. The EA was also posted on the Forest website. The 30-day objection period was announced via a legal notice published in the Big Bear Grizzly newspaper (newspaper of record) on June 8, 2011. The objection period ended on July 8, 2011. One objection letter was received. A telephone meeting was held between the Forest Service and the objecting party on August 8, 2011 and a resolution agreement was signed by both parties on August 9, 2011. This resolution agreement and its terms are incorporated into my decision.

Alternatives Considered

The EA describes two alternatives that were analyzed in detailed study, the Proposed Action and No Action alternatives. Additionally, the EA describes three alternatives that were considered, but eliminated from detailed study; these alternatives were proposed during scoping through comments received on the proposed action. Two of the alternatives were to limit green tree removal to trees less than 12 and 16

inches in diameter, respectively, and limit removal of dead trees to trees less than 15 inches in diameter. The third alternative was to limit tree removal to within 200 ft of homes.

The analysis disclosed in the EA (pages 30-31) regarding the diameter limit alternatives, discusses the tradeoffs towards meeting the purpose and need of firefighter safety, protecting communities, and restoring healthy, resilient forest conditions. The compelling need to achieve firefighter safety, protect communities, and improve forest health, compared with the reduction in benefits as a result of the proposed action led me to conclude that the alternatives proposed would not sufficiently meet the purpose and need to be considered in detail.

The third alternative (EA, page 31) was based on a recommendation that, "rather than spending resources on logging projects considerable distances from homes, the Forest Service should instead conduct light thinning of small trees within 200 feet of homes; and where this consists of private lands," the Forest Service should "offer to thin brush for willing homeowners to ensure home protection." This alternative is based on the assumption that the probability of occurrence of a high-severity fire is low. Because the project area does not contain any year-round homes and few structures, this alternative would result in very limited fuel reduction and would not adequately address the purpose and need; therefore, I concluded that it would not be considered in detail.

I believe the alternatives considered in the Environmental Assessment are adequate for this NEPA analysis and for the complexity of the project, and meet the requirements identified in the Healthy Forest Restoration Act.

Finding of No Significant Impact (FONSI)

The Council on Environmental Quality (CEQ) regulations note that when an environmental assessment has been prepared, the responsible official shall review that document and determine whether the project may have a significant effect on the quality of the human environment and if an Environmental Impact Statement (EIS) should be prepared (40 CFR 1508.13).

I have reviewed the direct, indirect, and cumulative effects of the proposed activities documented in the EA for the project. I have also reviewed the project record for this analysis and the effects of the proposed action as disclosed in the EA. Implementing regulations for National Environmental Policy Act (NEPA) (40 CFR 1508.27) provide criteria for determining the significance of effects.

Context

For this project, the disclosure of effects in the EA found the actions limited in context. The project area is limited in size and the activities limited in duration. Effects are local in nature and are not likely to significantly affect regional or national resources.

Intensity

The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27. The following have been considered in my evaluation of intensity for this proposal.

1. Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

Impacts associated with the project are discussed in the EA. These impacts are within the range of those identified in the Forest Plan. The actions will not have significant impacts on other resources identified and described in the Environmental Consequences sections of the EA (pages 34-87). The effects of the decision to be made are not significant in either the long or short term. Effects are local in nature and are not likely to significantly affect regional or national resources. The EA shows that the beneficial effects and any economic return from the removal and potential sale of trees will not occur at the expense of other resources.

2. The degree to which the proposed action affects public health or safety.

There will be no significant adverse effects on public health and safety. Objectives for the project include community protection from wildfire. This action will substantially reduce the potential for crown fire, increasing the potential for successful fire suppression and community protection. Treatments along the main Bluff Mesa fuelbreak, adjacent to main roads within the project area and adjacent to private property will increase the safety of firefighters and the public, providing safe access. This action and the range of activities is typical of management actions taken in the National Forests, including logging truck traffic and other activities that involve the removal of timber or the cutting of trees. This project will have minor social and economic impacts on San Bernardino County residents by supporting local employment and income (EA, Economics section, pages 85-87). This project will not affect minority or low-income populations, and has the potential to benefit these populations.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecological critical areas.

There will be no significant effects on unique characteristics of the area, or ecologically critical areas such as historic or cultural resources, parklands, prime farmlands, wetlands, inventoried roadless areas, and wild and scenic rivers, (EA, Environmental Consequences, pages 34-87). There are no parklands, prime farmlands, inventoried roadless areas or wild and scenic rivers within or adjacent to the project area (although Siberia Creek is an eligible wild and scenic river). Specific design features incorporated into the proposed action will avoid adverse impacts to historic and cultural sites, and to wetlands (EA, Appendix A).

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The effects on the quality of the human environment are not likely to be highly controversial with the majority of the interested and involved public because they are proposed in a national forest where fuels reductions, prescribed fire and silvicultural activities have occurred for the past several decades in an area compatible with those forest management activities. Through project design features all potentially

controversial issues have been alleviated. The actions in the proposed project are well founded in science, current research, and other available information that is relevant to the actions.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

Scoping did not identify highly uncertain, unique, or unknown risks (Scoping Comment Analysis, Project Record). The possible effects on the human environment are not highly uncertain nor do they involve unique or unknown risks. The technical analyses conducted for determinations of the impacts to the resources are supportable with use of accepted techniques, reliable data, and professional judgment. The Forest Service has considerable experience with the types of thinning and fuels reduction activities to be implemented. The effects analysis shows the effects are not uncertain, and do not involve unique or unknown risk (EA, Environmental Consequences, pages 34-87).

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

This project is not setting a precedent for future actions with significant effects. The sites receiving treatments have been designated in the San Bernardino National Forest Land Management Plan for a variety of vegetation management activities and fuels reduction actions. The management practices are compatible with the San Bernardino National Forest Land Management Plan, and with the capabilities of the land.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.

The analysis discloses a comprehensive list of potential past, ongoing, and foreseeable future actions that may create cumulative effects (EA, Environmental Consequences, pages 34-87). In the EA under each resource section, cumulative impacts are disclosed for each of the resource areas analyzed, and I find that cumulative impacts are not considered significant.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

The action will have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. The action will also not cause loss or destruction of significant scientific, cultural, or historical resources, (EA, Heritage Resources, pages 82-83).

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

The action is not expected to adversely affect any endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973. A biological assessment for threatened and endangered species was completed and a "may affect, not likely to adversely affect"

determination was made for two wildlife species and a "may affect, not likely to adversely affect" determination was made for three plants and their critical habitat for all activities except prescribed burning of the Bluff Mesa meadows (EA, pages 55 and 69-70; Biological Assessment, project record). For prescribed meadow burning, the determination for these three plants and their critical habitat was "may affect." This project activity would be deferred until formal consultation with the U.S. Fish and Wildlife Service occurs.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The action will not violate Federal, State, and local laws or requirements for the protection of the environment. Applicable laws and regulations were considered in the EA (Project Record). The action is consistent with the San Bernardino National Forest Land Management Plan (EA, Environmental Consequences, pages 34-87).

Findings Required by Other Laws and Regulations

The proposed action would not threaten a violation of federal, state, or local law, or requirements imposed for the protection of the environment.

National Forest Management Act of 1976, as amended

The decision is consistent with the intent of the San Bernardino National Forest Land Management Plan's long term goals and objectives. Compliance with NFMA in regards to both sensitive species and management indicator species is analyzed in the wildlife and botany sections of the EA (pages 51-71). The San Bernardino National Forest Land Management Plan complies with all resource integration and management requirements of 36 CFR 219.14 through 219.27 and conforms to requirements of the National Forest Management Act of 1976. Application of San Bernardino National Forest Land Management Plan direction for the project ensures compliance at the project level. With the inclusion of San Bernardino National Forest Land Management Plan direction, this proposed project will move the existing condition toward the proposed desired condition.

Endangered Species Act of 1973, as amended

The action is not expected to adversely affect any endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973. A biological assessment for threatened and endangered species was completed and a "may affect, not likely to adversely affect" determination was made for two wildlife species and a "may affect, not likely to adversely affect" determination was made for three plants and their critical habitat for all activities except prescribed burning of the Bluff Mesa meadows (EA, pages 55 and 69-70; Biological Assessment, project record). For prescribed meadow burning, the determination for these three plants and their critical habitat was "may affect." This project activity would be deferred until formal consultation with the U.S. Fish and Wildlife Service occurs. The Forest Service has met the requirements of Section 7 of the Endangered Species Act by completing the project compliance using the counterpart consultation regulations on August 9, 2011.

National Historic Preservation Act of 1966, as amended

The action will have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. The action will also not cause loss or destruction of significant scientific, cultural, or historical resources, (EA, Heritage Resources, pages 82-83).

Federal Water Pollution Control Act (Clean Water Act) of 1972, as amended

The San Bernardino National Forest has entered into a Management Agency Agreement between the State water resources control board, State of California, and the Forest Service, Region 5 (1981). Through this agreement, the Forest Service has agreed and is required to accept responsibility of the Water Quality Management Agency designation for National Forest System lands in the State of California; and to provide periodic project site reviews to ascertain implementation of management practices and environmental constraints identified in the environmental document and/or contract and permit documents.

Clean Air Act of 1970 (as amended)

All burning is expected to be conducted with an approved South Coast Air Quality Management District Smoke Management Plan using best management practices, and applying appropriate mitigation measures. It is up to the Forest Service to establish priorities for burning and the responsibility of the Air Quality Management District to manage all burning in the basin on any given day. Because air quality is strictly regulated, overlapping effects to air quality are minimized. Project implementation will dictate actual amounts of material moved off-site and, therefore, the amount of emissions saved.

Executive Order 11988, Clean Water

This project is fully consistent with this executive order.

Executive Order 12898, Environmental Justice

This executive order insures that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment. Implementation of any project activity is not anticipated to cause disproportionate adverse human health or environmental impacts to minority or low-income populations.

Executive Order 13112, Invasive Species

Implementation of the selected alternative will create conditions for the introduction and establishment of certain non-native plant species. As part of the proposed action, grazing management may be altered if new infestations of noxious weeds are detected to minimize spread.

Executive Order 13186, Migratory Birds

Management objectives of this executive order will be met. No significant impacts on migratory bird species are expected (Wildlife Report).

Objections under the Healthy Forest Restoration Act

This project is consistent with the Healthy Forest Restoration Act (HFRA) of 2003 (P.L. 108-248). Thus, it is not subject to the notice, comment, and appeal procedures of 36 CFR 215. In accordance with 36 CFR 218, subpart A, I accepted objections to my proposed decision for 30 calendar days from the date of publication of the legal notice in the Big Bear Grizzly on June 8, 2011.

Objections to the project were resolved by modifying the project as described in the My Decision section of this Decision Notice.

Implementation Date

Per 36 CFR 218.11, this project may be implemented immediately since the Reviewing Officer for HFRA objections has issued a written response to all objectors concerning their objections. Implementation will depend on funding availability. I hope to begin implementation in the fall of 2011.

Contact

For further information on this decision, contact Thomas Hall, Environmental Coordinator, 602 S. Tippecanoe Ave. San Bernardino, CA. 92408, thall@fs.fed.us, or 909-382-2905.

10/25/11

Scott Tangenberg
District Ranger
Mountaintop Ranger District

Date

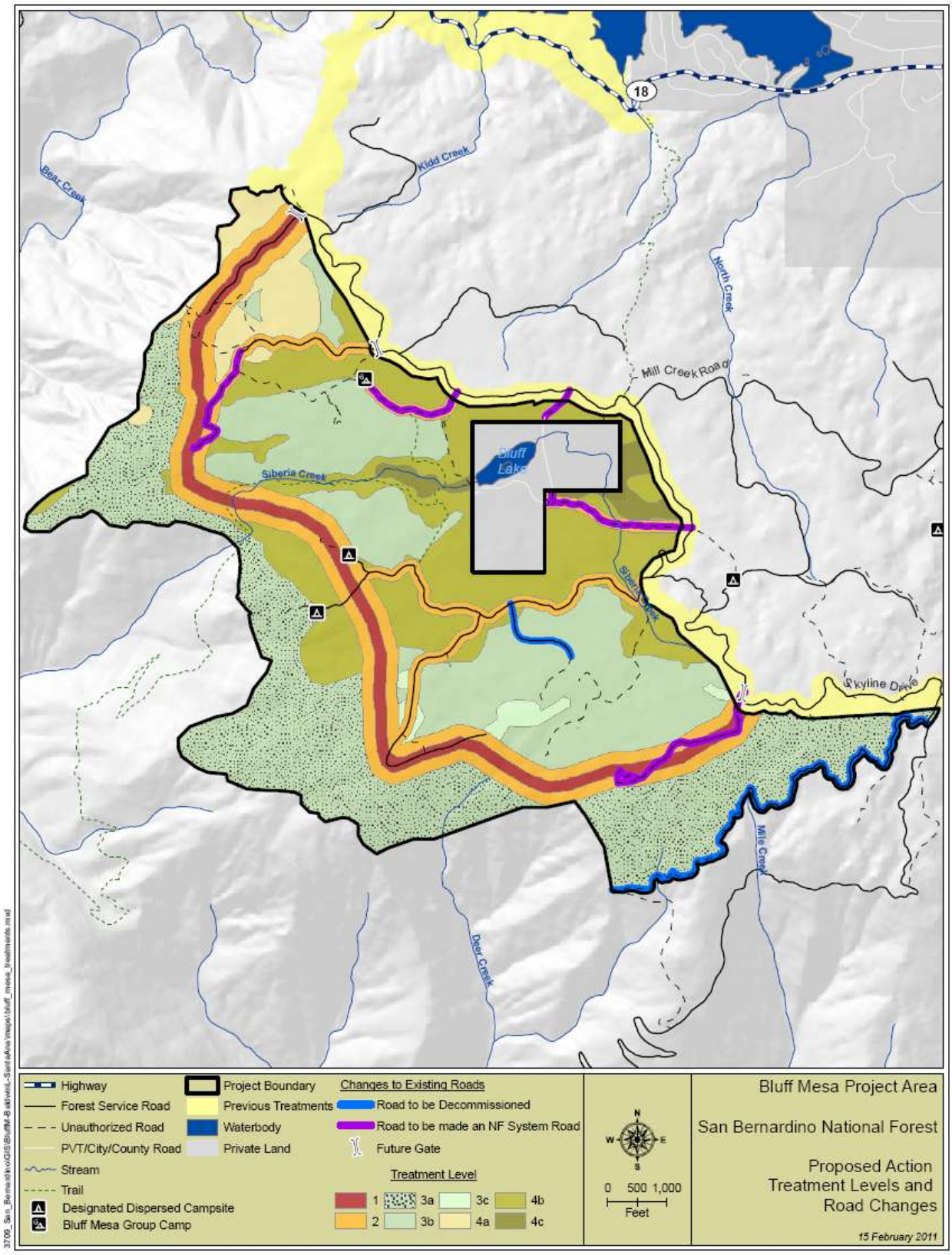


Figure 1: Proposed fuel treatments and road changes within the Bluff project area

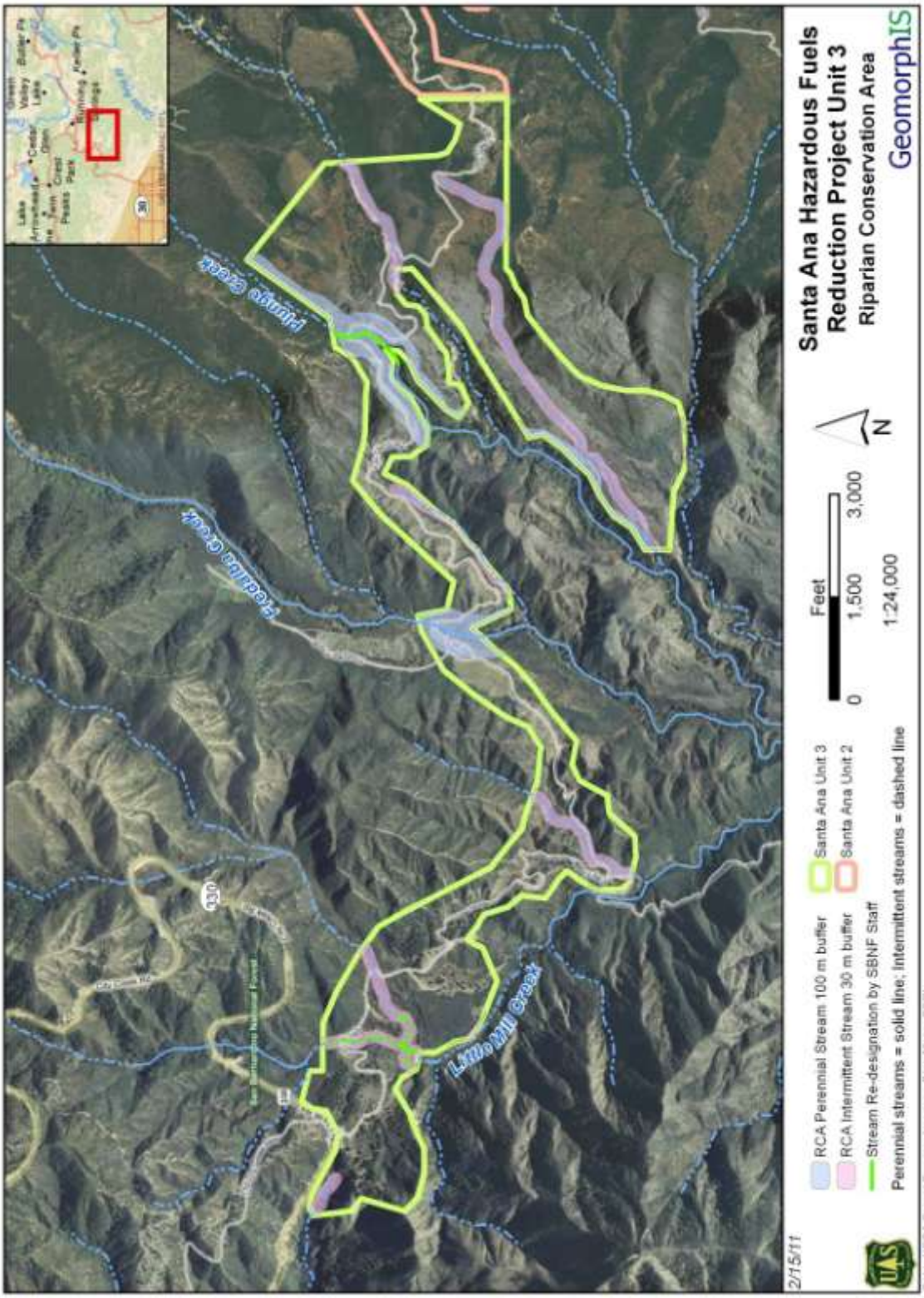


Figure 2. RCAs within Unit 3 Treatment Area (west end of Santa Ana Project Area) – Fredalba and Plunge Creek crossing areas for NEPA analysis

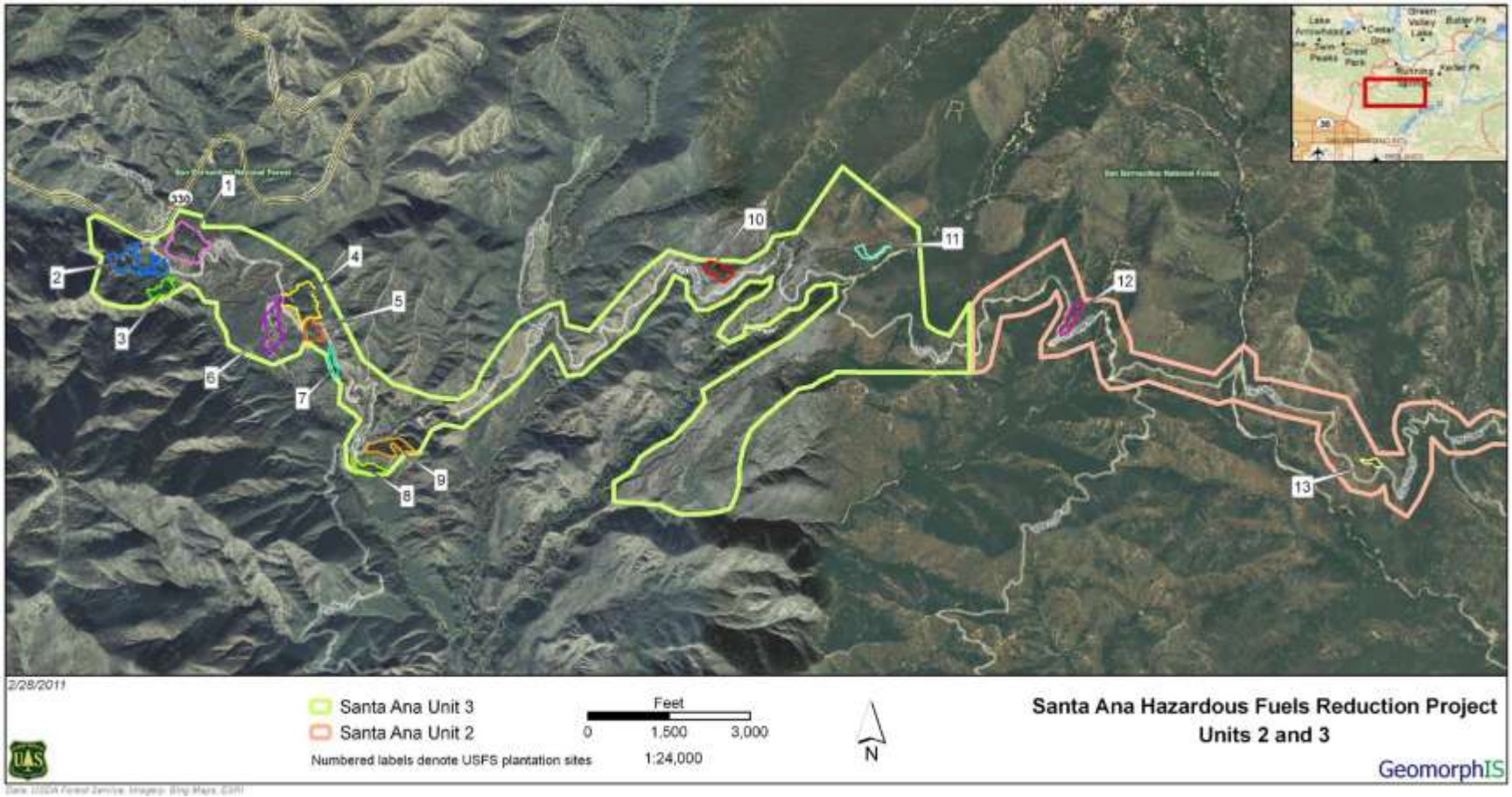


Figure 3. Santa Ana Project Area – Unit 3; showing plantation areas [Work Plan has two main components; see Work Plan notes]

Project D: Wineville Regional Recycled Water Pipeline and Groundwater Recharge System Upgrades (Inland Empire Utilities Agency)

Part One - Introduction

Goals and Objectives

Wineville Extension Recycled Water Pipeline: Inland Empire Utilities Agency's (IEUA) proposed project for the Central Project Area includes the Wineville Extension Recycled Water Pipeline, which is part of the IEUA Regional Recycled Water Distribution System. The Project will design and construct a pipeline segment of 5,200 linear feet (LF) of 24-inch recycled water pipeline along the Day Creek Channel between Airport Drive and Jurupa Street and a segment of 28,500 LF of 36-inch recycled water pipeline adjacent to the Wineville Flood Control Basin between Jurupa Street and East Francis Street within the City of Ontario. The 24-inch pipeline will parallel an existing 24-inch recycled water pipeline along Day Creek Channel. The 36-inch pipeline will extend from East Francis Street, which becomes Marlay Avenue, and continue along Cherry Avenue, Live Oak Avenue, and Village Drive to the Declez Channel and will terminate at RP-3 within the City of Fontana. The pipeline will include two large turnout facilities, which are located along the Declez Channel and RP-3 to supply recycled water for groundwater recharge, and a smaller turnout that will provide irrigation to one of the cells within the RP-3 recharge site. The project will also serve recycled water customers within the Cities of Ontario and Fontana. The estimated connected demand is approximately 275 acre-feet per year (AFY) for direct usage and 1,000 AFY for groundwater recharge. The Central Project Area is shown on Figure 1 and is located within IEUA's 1158 pressure zone. The estimated construction cost for the Wineville Extension Recycled Water Pipeline project selected alignment is $18,000,000.

Recycled Water Customer Retrofits: The project will also include retrofits of public sites, such as, schools, parks and streetscapes. Customer retrofits will require an evaluation of the existing piping at each site, design plans to modify the piping at the site from potable to recycled water, an engineering report approved by the California Department of Public Health (CDPH), construction of the site retrofits and cross connection testing once the site is retrofitted. The estimated construction cost for the Recycled Water Customer Retrofits is $2,000,000.

Groundwater Recharge SCADA Improvements: IEUA recently completed a new communication network backbone, and a Groundwater Recharge SCADA Improvements project is required to bring approximately nineteen groundwater recharge sites and several other recycled water facilities onto the new IEUA communication backbone (See Figure 2). The current system is overloaded and the groundwater recharge and recycled water sites need to be transitioned to the new system. This project will also transition the RP-5 recycled water pump station to Rockwell Automation and onto the recycled water SCADA system. The scope for this project will include radio path surveys for approximately nineteen groundwater recharge sites and seven recycled water stations, procurement, installation and programming of new hardware and software. New major equipment includes microwave radios, switches, racks, SCADA servers, SCADA drives and various cabling and appurtenances to transition the interconnection of the remote sites to IEUA's SCADA and communication networks. SCADA migration will also be included at the RP-5 recycled water pump station as provided in the recycled water SCADA Master Plan. In addition, the scope will include programming of all radio and SCADA components to provide a fully functional SCADA system. The estimated construction cost for the Groundwater Recharge SCADA Improvements is $2,000,000.

Purpose and Need

The project is needed to meet the current and future water demands by providing 4,500 AFY of recycled water for reuse in the Cities of Fontana and Ontario and in regional groundwater recharge basins. City of Fontana is geographically located at the eastern end of the IEUA service area boundary and has not been serviced with recycled water, and has not had the benefit of this alternative water source. This project enables the community to reuse the recycled water instead of solely relying on potable water for all of its needs. Many of the industries located within the project vicinity are interested in the reuse of the recycled water in order to achieve their green project objectives, which will be made possible by this project. The reuse of the recycled water from this project would meet the water

quality requirement for the various end uses, from direct reuse for industrial applications to the groundwater recharge system replenishing the Chino Basin.

This project enables the region to meet its goal of maximizing the beneficial reuse of the recycled water. The project provides reliable water supply to the entire Chino Basin in general with the addition of 3,000 AFY of groundwater recharge into the RP-3 and Declez basins. The source of supply for this project is from the wastewater flows from the service area and therefore will be consistently available to the region through all hydrologic conditions. For every molecule of water that is not imported from the State Project Water, there is an environmental benefit to the Bay-Delta and it relieves stress on the State Water Project. There is also a direct benefit on the reduction of greenhouse gases. With a project benefit of 4,500 AFY, the greenhouse gas emissions would be reduced by an estimated 4,766 metric tons (as CO2eq).

The project is part of the Regional Recycled Water Implementation Plan (RWIP) adopted by IEUA in November of 2005. The RWIP promoted a strategy to utilize recycled water to the maximum extent practicable in order to:

- Reduce dependency of the Chino Basin water users on imported State Water Project water;
- Offset groundwater pumping that exceeds the Basin's safe yield;
- Improve groundwater quality in the Basin by integrating the desalter program, the recycled water program, and the recharge program into one Optimum Basin Management Plan.
- Increase the number of times that a drop of water in the Santa Ana Watershed is used before it reaches the ocean.
- Promote resource-efficient, multiple-purpose use of flood control basins.

The Project helps to meet all of the above goals. It increases both water recycling and groundwater recharge. It increases the reliability of regional water supplies by increasing the number of times that each drop of water in the watershed is used. It reduces reliance on imported water and provides recycled water for irrigation and industrial uses so valuable potable water can be conserved for potable uses. The project objective is to increase recycled water direct use by 1,500 AFY and indirect use by 4,500 AFY.

The recharge component of the project allows water banking in the groundwater basin to meet multiple demands and different hydrological conditions on a consistent basis. Another objective of the project is to prevent the erosion of groundwater recharge capacity through improvements to the SCADA system. SCADA replacement is needed to meet the goals of the Optimum Basin Management Plan, such as ensuring enough recharge capacity to meet desalter water replacement obligations and thereby ensure the desalter program can continue to remove salt from the basin. A reasonable goal for the next 5 years is to recharge 30,000 AFY of water, made up of approximately 1/3 imported, 1/3 recycled, and 1/3 stormwater.

Project List

The main components of the project are summarized below:

Project Description	RW Demand (AFY)	Project Cost	Design Completion	Bid	Construction Completion
Wineville Ext RW Pipeline	1,000	$18,000,000	Spring 2013	Summer 2013	Winter 2014
Site Retrofits	275	$2,000,000	Winter 2014	Spring 2015	Fall 2015
GWR SCADA Improvements	N/A	$2,000,000	Winter 2013	Summer 2014	Spring 2015
Total	1,275	**$22,000,000**			

1. The Wineville Recycled Water Pipeline component of the Project consists of design and installation of six miles of recycled water and groundwater recharge distribution system, to allow for the direct reuse of the recycled water to spread in two groundwater recharge basins, RP-3 and Declez Basins. The estimated project cost is $18,000,000.

2. The Recycled Water Site Retrofit component of the Project consists of design and installation of retrofits of public sites, such as, schools, parks and streetscapes. Customer retrofits will require an evaluation of the existing piping at each site, design plans to modify the piping at the site from potable to recycled water, an engineering report approved by the California Department of Public Health (CDPH), construction of the site retrofits and cross connection testing once the site is retrofitted. This will enable the actual reuse of the recycled water at the various sites, maximizing the potable water availability for future growth. The estimated project cost is $2,000,000. This effort will be primarily led by IEUA's partnering agencies, City of Fontana and the Fontana Water Company.

3. The Groundwater Recharge SCADA System Upgrades components of the Project consist of design, upgrades and installation of a new SCADA System. IEUA recently completed a new communication network backbone, and a Groundwater Recharge SCADA Improvements project is required to bring approximately nineteen groundwater recharge sites and several other recycled water facilities onto the new IEUA communication backbone. The current system is overloaded and the groundwater recharge and recycled water sites need to be transitioned to the new system. This project will also transition the RP-5 recycled water pump station to Rockwell Automation and onto the recycled water SCADA system. The scope for this project will include radio path surveys for approximately nineteen groundwater recharge sites and seven recycled water stations spread throughout the Chino Basin, procurement, installation and programming of new hardware and software. New major equipment includes microwave radios, switches, racks, SCADA servers, SCADA drives and various cabling and appurtenances to transition the interconnection of the remote sites to IEUA's SCADA and communication networks. SCADA migration will also be included at the RP-5 recycled water pump station as provided in the recycled water SCADA Master Plan. In addition, the scope will include programming of all radio and SCADA components to provide a fully functional SCADA system. The estimated project cost is $2,000,000.

Integrated Project Elements

The recycled water pipeline extension is a collaborative effort between IEUA and the Cities of Ontario, Fontana, and Fontana Water Company. Another demonstration of collaborative efforts is the groundwater recharge system upgrades which will seamlessly integrate the 19 recharge basins in one operational control platform and maintain communication with Chino Basin Watermaster and the San Bernardino County Flood Control.

By promoting the reuse of the recycled water the watershed can have a reliable alternate water source for future years and preserve the limited potable water supplies for potable uses. The groundwater recharge project will also continue to recharge stormwater and imported water thereby enabling the increased use of recycled water for recharge.

The project is pursuing other funding mechanisms as well such as SRF loans in order to leverage the best available financing options for the major infrastructure as well as the customer retrofits.

Completed Work

A description of the work that has been completed or is expected to be completed prior to the grant award date. For example, if CEQA/NEPA and other environmental compliance efforts have been completed discuss the environmental determination made by the lead agency and the documents that were filed.

The CEQA for the pipeline project has been completed. The Wineville Pipeline project is in the final design stage. The project will be awarded for construction in May 2013. The project did not have any environmental impacts identified.

For the SCADA system, the Final Design is expected to be completed in August 2013.

There is no completed work related to the customer retrofit projects.

Existing Data and Studies

Inland Empire Utilities Agency (IEUA) completed the Recycled Water System Feasibility Study (Feasibility Study) in 2002. The Feasibility Study is the Facilities Planning Report for IEUA's Recycled Water System, based on which Capital Improvement Projects for the Recycled Water Distribution System would be developed. Since then, IEUA updated the Feasibility Study with the Regional Recycled Water Implementation Plan (RWIP) in 2005. The RWIP provides an updated overview of the recycled water supplies, existing and estimated recycled water demands, and a recommended regional backbone system to distribute recycled water throughout its service area. IEUA initiated the Three Year Business Plan (Business Plan) in 2007 to accelerate the implementation of the RWIP. The Central Project Area project was identified in the Business Plan as a priority project for IEUA's recycled water system. The various project areas identified in the Business Plan are shown on Figure 1

IEUA and its member agencies updated the Chino Basin Recharge Master Plan in 2010, and adopted the SCADA System Master Plan in June 2012to optimize and increase the groundwater recharge within the Chino Basin to make the region more self-reliant on its water sources.

STUDY AREA

The RWIP covered the entire IEUA service area, encompassing approximately 242 square miles in the southwestern corner of San Bernardino County and includes the cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, Upland and some unincorporated portions of San Bernardino County. The study area for the Central Project Area of the Business Plan is shown on Figure 3. As shown, the Central Project Area is bounded on the north by East Airport Drive and Slover Avenue, on the east by Sierra Avenue, on the west by Grove Avenue, and on the south by Philadelphia Street east of Milliken Avenue and Chino Avenue west of Milliken Avenue. The area includes the sphere of influence of two cities, the City of Fontana and the City of Ontario, and the Fontana Water Company, which is a private water company.

The SCADA System Upgrades Project at the 19 recharge facilities and the 7 pump station sites will be very critical to the overall success of the groundwater recharge program. The 26 sites are geographically spread throughout the Inland Empire service area (See Figure.)

IEUA's service area generally overlies the Chino Groundwater Basin, which is located in the northern part of the Santa Ana River watershed. The Chino Basin consists of a relatively flat alluvial valley from east to west and slopes from north to south at a one to two percent grade. Ground surface elevations in the valley range from about 500 feet above Mean Sea Level (MSL), near Prado Dam in the southern portion of the City of Chino its about 2,000 feet MSL in the foothills below the San Gabriel Mountains. Higher ground elevations, up to 2,700 feet MSL, can be found in the northern portion of the Cities of Rancho Cucamonga and Fontana, where the service area extends into the foothills of the San Gabriel Mountains. The study area includes seven pressure zones identified in the RWIP. The seven pressure zones from the north to south includes the 1830, 1630, 1430, 1299, 1158, 930, and 800 (See Figure 1).

Detailed geologic, hydro-geological, land use, and population characteristics of the study area remain unchanged from the RWIP, and can be found in Section 2 of the RWIP.

WATER SUPPLY CHARACTERISTICS AND FACILITIES

Historically, the majority of the water supply for the IEUA service area comes from Chino Basin groundwater sources at approximately 75 percent of the total demand. Approximately 25 percent of the demand comes from imported water purchased from Metropolitan Water District of Southern California (MWD). The remaining two sources are surface water from filtration plants and recycled water. The potable water demand in IEUA's service area is supplied by eight water purveyors, namely the Cities of Chino, Chino Hills, Ontario, Upland, Cucamonga Valley Water District, Fontana Water Company, Monte Vista Water District, and San Antonio Water Company. Imported water supplied by MWD is from Northern California (State Water Project water). IEUA, in its NPDES permit for its regional wastewater reclamation facilities, has an effluent Total Dissolved Solids (TDS) limitation of 550 mg/L for the discharge of treated tertiary wastewater into the Santa Ana River. As a result, in the IEUA service

area, Colorado River Water is not used because of its high TDS concentration in the water so all imported water is from the State Water Project.
Due to population increase, the potable water demand is projected to increase from 203,000 AFY in Fiscal Year 2010/2011 to 237,000 AFY by 2020. Recycled wastewater is a largely untapped source of water supply that can be used to offset the additional demand. Detailed information on the different sources of water supply in the IEUA service area can be found in Section 3 of the RWIP and in the IEUA Urban Water Management Plan (2005).

RECYCLED WATER FACILITIES

IEUA owns and operates regional sewer pipelines that receive wastewater from more than 850,000 people in the seven cities within its service area. All wastewater collected is treated at one of the four regional wastewater reclamation facilities; RP-1, RP-4, RP-5 and CCWRF to tertiary levels that allow full body contact recreation. The combined treatment capacity of the four wastewater treatment plants is currently 85.7 million gallons per day (MGD). The existing, future and ultimate capacities of each plant are summarized in Table 1. The Central Project Area is served primarily by RP-4 and the 1158 reservoirs; however, the system is looped and can receive recycled water from all IEUA facilities. Detailed characteristics of the wastewater facilities can be found in Section 4 of the RWIP.

In an effort to control the salinity in the Chino Basin, IEUA has been utilizing its Non Reclaimable Wastewater System (NRWS). The NRWS collects wastewater high in TDS from the IEUA service area and transports out of the Chino Basin in the northern service area to County Sanitation Districts of Los Angeles County (CSDLAC) and in the southern service area to Orange County Sanitation District (OCSD). The treated effluent from CSDLAC and OCSD are discharged to the ocean thereby not creating a net increase in salinity within the basin. As a result, the effluent treated water from IEUA's wastewater treatment facilities are lower in TDS, and does not reintroduce the salts into the Chino Basin.

Recycled water produced at the four recycling plants is distributed at a wholesale level by IEUA to the seven cities in its service area. The cities are responsible for distribution at the retail level in the local distribution laterals. IEUA and the Chino Basin Watermaster are also permitted to recharge the Chino Groundwater Basin with recycled water. Accordingly, the regional distribution facilities owned by IEUA are designed to supply permitted recharge sites in the Central service area.

Table 1: Regional Plant Capacities

Facility	2010 (MGD)	2030 (MGD)	Ultimate (MGD)
RP-1	44.0	51.0	60.0
RP-4	14.0	28.0	48.0
RP-5	15.0	30.0	48.0
CCWRF	11.4	11.4	20.0
Total (MGD)	**84.4**	**120.4**	**176.0**

Source: Recycled Water Implementation Plan Update (2011)

TREATMENT REQUIREMENTS FOR DISCHARGE AND REUSE

California Regulations for recycled water are contained in Title 22, Division 4 Environmental Health, Chapter 3 Water Recycling Criteria, Sections 60301 through 60355. In addition, the California Department of Public Health (CDPH) has developed regulations for groundwater recharge using recycled water. The RP-1, RP-4, RP-5, and CCWRF treatment processes are designed so that effluent water quality will meet Title 22 requirements for unrestricted recreational use. The effluent meets the stringent public health turbidity standard of 2.0 Nephelometric Turbidity Units (NTUs). This recycled water provides IEUA with a supplemental water source that may be used for irrigation of public and private land, industrial water supply, or any unrestricted recreational use, such as boating, fishing and swimming. Specific requirements for groundwater recharge were issued by the Santa Ana Regional Water Quality Control Board in October 2009. In short, blending with diluent water from storm flow or imported water is required for recycled water groundwater recharge. Further details on treatment, recycled water quality criteria and uses can be found in Section 5 of the RWIP and in specific discharge permits.

Project Map

Figure 1: IEUA Pressure Zones Location Map

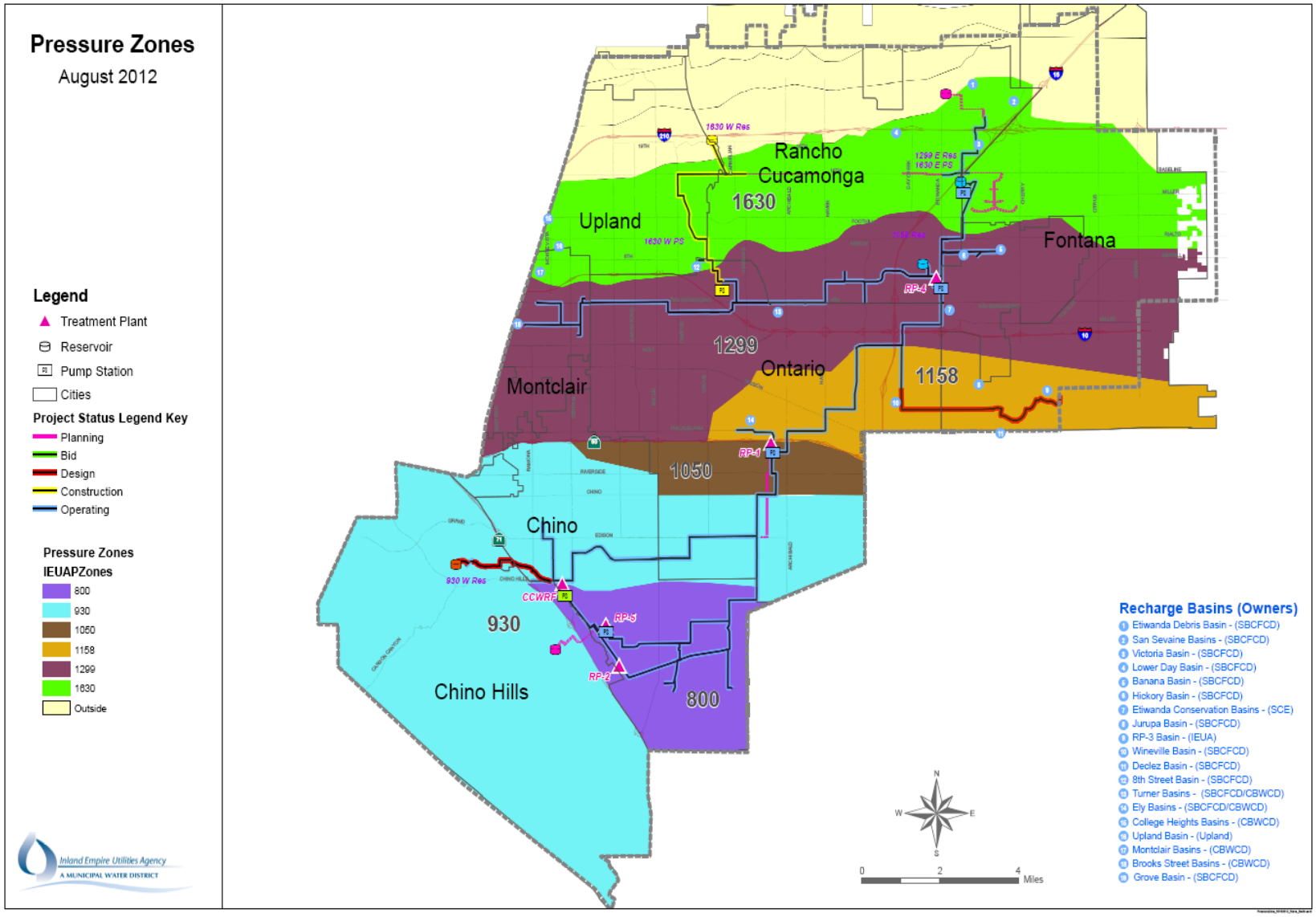


Figure 2: IEUA Wide-Area SCADA Network

IEUA WIDE-AREA NETWORK

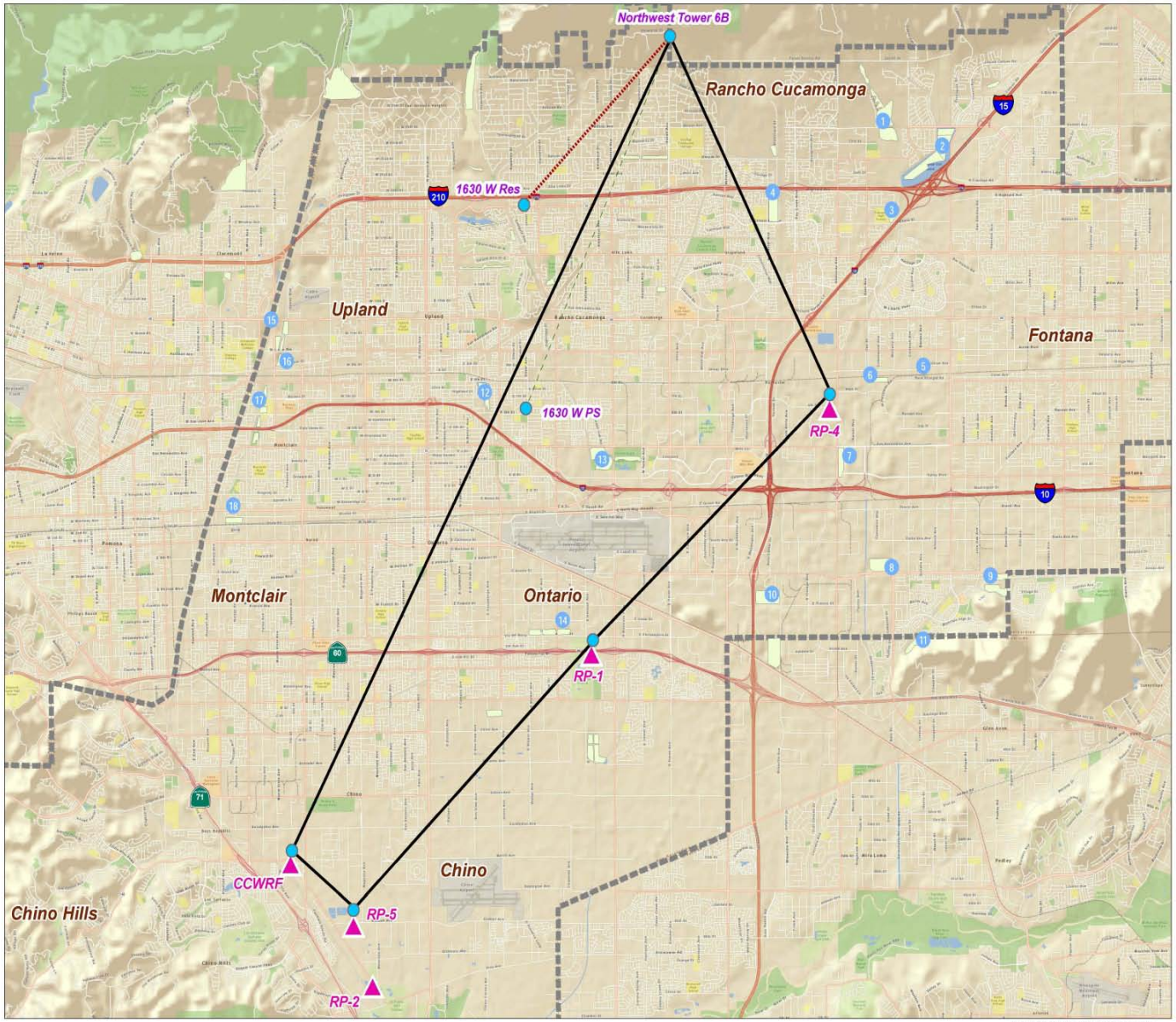
February 2011

Legend

- Treatment Plant
- Freeways_IEUA
- GroundwaterBasins_IEUA layer
- IEUA Service Boundary
- Communication Tower
- 18 GHz Point-To-Point (300 mbps)
- 18 GHz Point-To-Point (20 mbps)
- 4.9 GHz Point-To-Multipoint

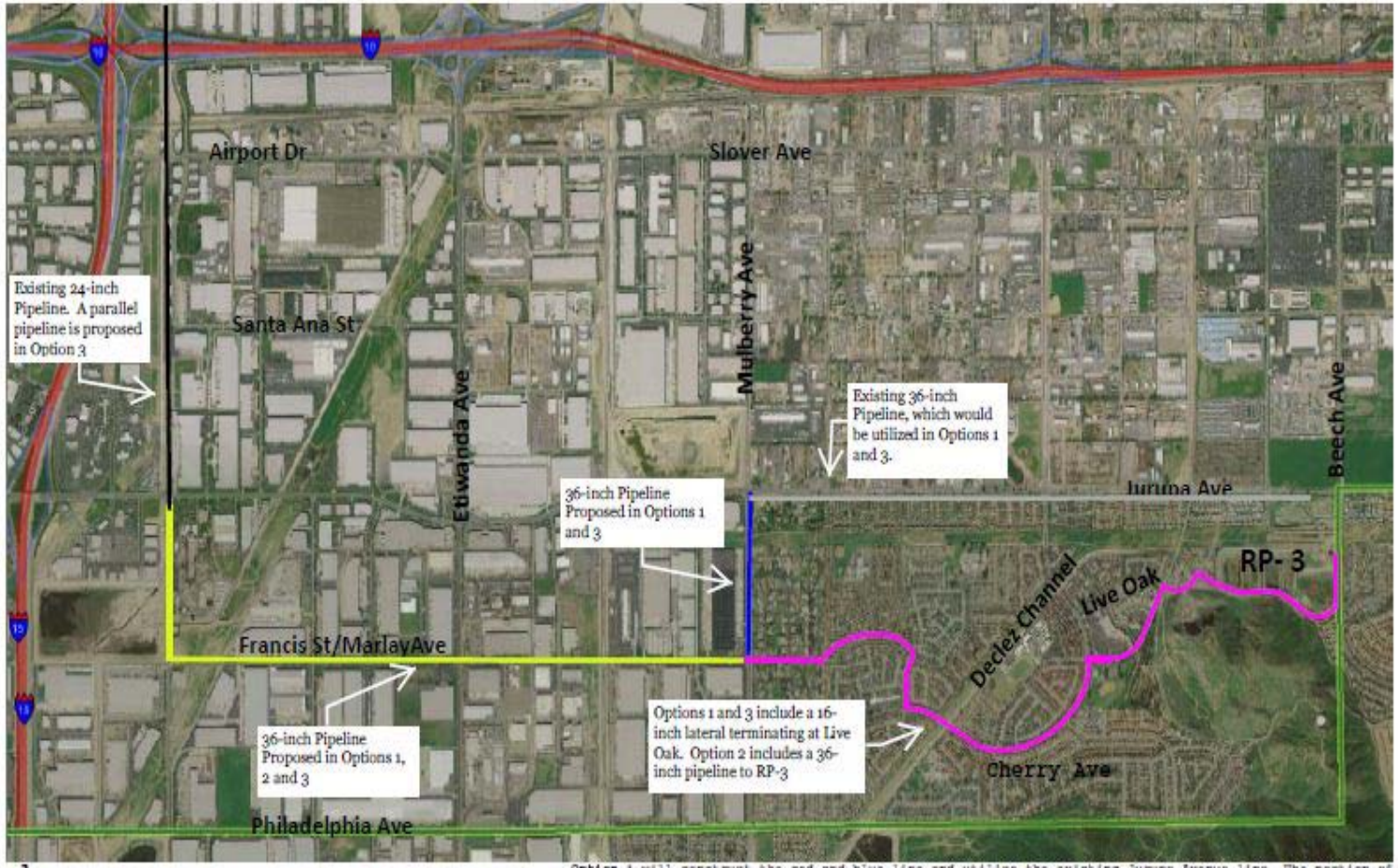
Recharge Basins (Owners)

1. Etiwanda Debris Basin - (SBCFCD)
2. San Sevaine Basins - (SBCFCD)
3. Victoria Basin - (SBCFCD)
4. Lower Day Basin - (SBCFCD)
5. Banana Basin - (SBCFCD)
6. Hickory Basin - (SBCFCD)
7. Etiwanda Conservation Basins - (SCE)
8. Jurupa Basin - (SBCFCD)
9. RP-3 Basin - (IEUA)
10. Wineville Basin - (SBCFCD)
11. Declez Basin - (SBCFCD)
12. 8th Street Basin - (SBCFCD)
13. Turner Basins - (SBCFCD/CBWCD)
14. Ely Basins - (SBCFCD/CBWCD)
15. College Heights Basins - (CBWCD)
16. Upland Basin - (Upland)
17. Montclair Basins - (CBWCD)
18. Brooks Street Basins - (CBWCD)
19. Grove Basin - (SBCFCD)



Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Figure 3: Wineville Recycled Water Pipeline Extension Map



Legend:

- 36" RW Pipeline Ontario
- 36" RW Pipeline Fontana
- IEUA Existing RW Pipeline (24``) and Proposed 24" Parallel RW Pipeline

Option 1 will construct the red and blue line and utilize the existing Jurupa Avenue line. The portion of the purple segment would be constructed and utilized as a 16-inch lateral for the City of Fontana connections. The purple pipeline would terminate at Live Oak.

Option 2 will be the red and purple alignment all 36-inch.

Option 3 will include Option 1 plus adding a parallel line along Wineville Avenue.

WINEVILLE EXTENSTION RECYCLED WATER PIPELINE

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Project Timing and Phasing
If the proposed project(s) is part of a multi-phased project complex, provide a description that demonstrates that the proposal can operate on a standalone basis, i.e., can be fully functional without implementation of the subsequent projects.

Where requested funding is for a component of a larger project, this section must describe all of the components of the larger project complex and identify project elements the IRWM Implementation grant is proposed to fund. Linkages to any other projects that must be completed first or that are essential to obtain the full benefits of the Proposal must be discussed.

The GWR SCADA Improvement project is in the preliminary design stage, with an expected completion of the overall implementation of the project by August 2014. The Wineville Pipeline project is in the final design stage, with an estimated construction completion of June 2014. The retrofits are in various planning stages, with an estimated construction completion date of June 2015. Since there are multiple sites, planning, construction, start-up and acceptance will have longer time periods than usual since each of these task will be performed at each site.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
Deliverables: Review of all costs for compliance and preparation of invoices and reporting deliverables as required in the contract.

Task 2: Reporting
Deliverables: Submission of quarterly, final, and post completion reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

Task 3: Obtaining easements
There are no easements required for the project at this time.. Work is in the public right of way. Where the alignments are crossing Southern California Edison ROW, San Bernardino County Flood Control ROW, and Railroad ROW, permits will be obtained for such work.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Pre-Design Assessment and Evaluation

Task 5: 30%, 50%, 85% and Final Design
Deliverables: Completion of project plans and specifications at the final level.

Task 6: Environmental Documentation
Deliverables*:* Approved and adopted CEQA and historical preservation documentation. For the recycled water pipeline task, CEQA is completed and it was determined that there will be no environmental impact. For the Recycled Water Site Retrofit component of the Project, each site will have to be evaluated once the specific design has been determined.
The SCADA System Upgrades Project is a Wide Area Network (WAN) communication system to remotely control and monitor the groundwater recharge facilities through computer supervisory network switches, routers, cables and control values. This project will update an antiquated system that has already been built. This project is being built where there are already existing facilities and rights of way have been established. There will be a monopole installed at each existing recharge basin as close to the existing SCADA building or facility as possible. Therefore, the SCADA System Upgrades Project will not impact the surrounding environment.

Task 7: Construction Contracting
Deliverables: Advertisement for bids; pre-bid contractors meeting; evaluation of bids; award contract

Budget Category (d): Construction/Implementation

Task 8: Construction

- Subtask 8.1 Construction Contractor Mobilization and Site Preparation
- Subtask 8.2 Project Construction
- Subtask 8.3 Start-up and Performance Testing
- Subtask 8.4 Project Acceptance

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 9: Environmental Compliance/Mitigation/Enhancement
No mitigation has been identified in the CEQA documentation. However, if mitigation is determined to be needed by the SWRCB in reviewing the SRF loan documentation, it will be done following the requirements that they indicate will be needed.

Budget Category (f): Construction Administration

Task 10: Construction Administration

- Subtask 10.1 Construction Project Management
- Subtask 10.2 Labor Compliance Program
  Deliverables: Submission of Certified Payroll, site interviews, certification of compliance to the Department of Industrial Relations.

Budget Category (g): Other Costs

- Subtask 12 Permitting

Deliverables: For the recycled water pipeline tasks, where the alignments are crossing Southern California Edison ROW, San Bernardino County Flood Control ROW, and Railroad ROW, permits will be obtained for such work.

For the SCADA system project, this project will update an antiquated system that has already been built. This project is being built where there are already existing facilities and rights of way have already been established. Due to this, no new permits will be needed. The final designs will determine the type of radio equipment that is needed in order for the project to send the communication signals properly. Depending on the type of equipment used, IEUA may be required to register the equipment with the Federal Communication Commission and the Federal Aviation Administration. This is done on line at http://wireless.fcc.gov.

Project E: Plunge Creek Water Recharge and Habitat Improvement (San Bernardino Valley Water Conservation District)

Part One - Introduction

The Plunge Creek Habitat and Water Conservation project is a collaborative project developed under the San Bernardino Valley Water Conservation District led Upper Santa Ana River Wash Area Planning effort or Wash Plan. This was plan has been in development for over 10 years working directly with the US Fish and Wildlife Service, Bureau of Land Management, California Department of Fish & Wildlife and a Task force of more than 12 community and agency stakeholders.

Goals and Objectives

The Goal of the Project is to initiate early implementation work under the Wash Plan in a cooperative project serving multiple objectives. The objectives of the project are to:

- Develop additional habitat for San Bernardino kangaroo rat and related threatened and endangered species in the Santa Ana River Wash area
- Implement the project to improve the function of the stream system
- Create additional groundwater recharge of native surface water/storm flows
- Develop methodology that can be used to further enhance habitat and water conservation

Purpose and Need

The Plunge Creek conservation project achieves the purposes and needs identified in the Wash Plan and the Santa Ana Watershed OWOW program. The watershed is urbanized in much of its area. The San Bernardino Kangaroo Rat is listed as a federally endangered species in September 1998. This project assists with restoration and enhancement of habitat for the species while at the same time increasing the permeability and surface area available for recharge in the creek. Minor modifications to the hydrologic characteristics of the creek are intended to substantial improvements to habitat quality and recharge capability... The improvement of the habitat quality will assist with enhancing habitat conditions for SBKR and contribute to species recovery. Locally, the Bunkerhill Groundwater Basin is frequently in overdraft and additional recharge is highly beneficial to the basin.

The OWOW plan has goals to improve water reliability and water quality, restore more natural hydraulic function, support cost effective project and address climate change. This single small project assists with all of the OWOW goals by:

- Increasing recharge of native water that would otherwise would be lost to beneficial use in the upper watershed
- Improving groundwater quality by recharging low salinity water to refresh groundwater
- Restoring more natural hydrology, benefiting endangered species habitat and supporting cooperatively developed integrated plans
- The project is highly cost effective because it can be constructed on District owned lands and with limited earthmoving
- Reducing the imported water needs reduced greenhouse gasses and natural hydraulic function; provide buffer to large storms and inundation of lands neat the creek.

Integrated Project Elements

The primary purpose and design concept behind this project is to achieve multiple benefits to habitat and water conservation. This is achieved through hydraulic scour and modification which results in restoration of the enlarged stream bed for higher quality habitat and increased permeability for recharge. This project will monitor progress and results to provide a working template for restoration that may be able to be implemented in other areas as part of

the Wash Plan and to others working in alluvial areas across the California. Additionally, one of the projects partners is San Bernardino County Flood and Water Conservation District, who is likely to be able to use concepts form this project in other regions of the basin and increase the benefit. This project could not be developed without close linkages with land owners, water and basin managers, flood control and the resources agencies that are planning for species recovery.

Completed Work

CEQA Compliance
The proposed project was included as an implementing action addressed in the EIR prepared for the Wash Plan, certified in November 2008. Based on the final design the District as lead agency may determine preparation of an addendum with design details is warranted. The project is also covered in a draft HCP which will be completed around the same time as Final Design of the project. While the draft HCP will be revised to accommodate additional conservation and provide additional details of restoration and development activities, the objectives and purpose of these documents remains the same.

Conceptual Design
The District has completed conceptual design closely coordinate with the USFWS, SBC Flood Control and Water Conservation District and other project partners.

The project is also part of the Upper Santa Ana Watershed IRWM plan Project List, recently amended by action of the Basin Technical Advisory Committee.

Existing Data and Studies

Habitat
As referenced above the project is included in the Santa Ana River Wash Land Use Plan and EIR, i.e. Wash Plan. This study provided basis of habitat and land management issues. As part of this project and others significant habitat survey has been complete and used for conceptual design of the project.

Water Recharge
Watershed study by Project Partner SBVMWD to provides hydrology for water recharge. The San Bernardino Valley Municipal Water District recently assessed all watershed streams to expand recharge. The results of this effort were documented in a January 2012 report. Plunge Creek was one of the creeks they documented potential for added recharge. The report indicates that the annual average flow is 6,122 acre feet per year based on historic flows from 1934-2008 (Report Figure 12). SBVMWD proposed recharge facilities downstream from the District owned project are indicated in Project Conceptual Design Exhibit, in Sections 9 and 10. Recharge estimated for these basins assuming stormwater capture like the historic period from 1934-2008, was 3,729 acre feet per year (Report Figure 92). This was based on the flows that occur, the high hydraulic conductivity of the site at 6.7 feet per day as measured in 2011 (Report Figure 66) and the size of recharge ponds proposed. The area of the proposed recharge basins located on District land or existing easements with BLM are 35% smaller than the 160 acres (Report Figure 83). Additionally, not all stream flows, such as all of Elder Creek, would be captured into the project area. Finally because the method of recharge is done in close connection to the restoration of SBKR habitat the not 100% of the 110 areas designed for restoration and recharge will be percolation areas. Considering these factors the Conceptual Design estimates that as much as 1250 acre feet per year average recharge would be developed.

Project Map

Attached is the Project Conceptual Design Exhibit. This map and shows the conceptual design element and the surrounding area. The project is on District lands and easement lands held by the Bureau of Land Management. The project is focused on Plunge Creek which lies just west of, and contiguous with, the area designated as Habitat and Water Conservation in the Wash Plan. The enhanced area is on District lands along the east-west reach of Plunge Creek in Section 11 (easterly of the confluence of Elder Creek with Plunge Creek and westerly of Section 12 and D Dike, as shown on the Conceptual Design Exhibit. Joint habitat and water recharge enhancement can work in concert with a mitigation program that was proposed in the draft HCP prepared in 2011.

Project Timing and Phasing

This project is part of an implementation of the Upper Santa Ana River Wash Land Management and Conservation Plan (Wash Plan) described above. The Wash Plan provides significant opportunity to provide enhancement to habitat, cover impacts and enhancements to habitat and through the Habitat Conservation Plan, documentation of progress. The District has completed CEQA for the Wash Plan and is developing the conservation strategy for the HCP with the USFWS. The HCP and NEPA will follow shortly. The proposal can operate on a standalone basis but would benefit from the linkages to the broader regional Wash Plan.

The project has been phased with the help of the USFWS, who recommended multiyear implementation to take advantage of varying hydrologic conditions and minimize impacts to existing habitat for the SBKR. The project will have about one year of studies, engineering, and permitting and three years of field implementation to complete the modifications to construct the project.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
SAWPA will provide program level administration described in other sections of this document. The SBVWCD Executive Management and staff will provide project level administration to insure that grant administration and contracting issues are efficiently handled, invoices and status reports prepared within deadlines. Administration costs associated for the project include:

- Construction procurement for Equipment and/or Contractors
- Approval and award of contract by District Board
- Contract administration - preparation of invoices and performance reports as required

Deliverables: Preparation of invoices, status reports and other project deliverables as required.

Task 2: Labor Compliance Program
The District will comply with the labor compliance requirements as stated in the Propositions 84 IRWM Guidelines, Section IV. The District with its staff or by contract will fulfill the General Program Requirements and adopt and enforce a labor compliance program pursuant to California Labor Code
1771.5(b). The Labor Compliance Program will include confirming receipt of certified payrolls from the contractor and subcontractors working on this project, as needed.

Deliverables: Submission of Labor Compliance Program

Task 3: Reporting
The District will comply with the specific reporting requirements as agreed to in the Grant Agreement and make general project information available on its website.

Deliverables: Submission of quarterly, final, and post completion reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

All lands are owned in fee title by the Project sponsor San Bernardino Water Conservation District or in existing easement from the US Bureau of Land Management. An MOU may be prepared to confirm Easement issues and resolution.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation

Various studies are required for the conceptual design to be developed into a final design. The primary studies are the hydrology and hydraulics, and percolation studies related to this project for design to begin. Additionally Survey and topographic information must be gathered and incorporated into the design. The Design and plans will be developed with project partners including USFWS.

Additionally, initial pre-project habitat surveys will be needed to help determine the best approach and to determine baseline conditions and to be incorporated into permit requirements.

Deliverables: Hydrology and hydraulics study, percolation studies, and biological Technical reports

Task 5: Final Design

Based on the preliminary design, technical studies and the most current habitat monitoring recommendations the final design plans will be completed including the following:

- Permit Submittals
- Initial Phase Site Preparation
- Year one modification plan, design and specifications
- Year two modification plan design and specifications
- Year three modification plan design and specifications for closeout

Deliverables: Completion of project plans and specifications at the final level.

Task 6: Environmental Documentation

The CEQA document for the Wash Plan provided for the project area and type, the District may prepare an addendum to adopt when project specifications are complete.

Deliverables*:* Approved and adopted CEQA/NEPA documentation

Task 7: Permitting

The project has planned significant coordination with the Regulatory Agencies (USACE, RWQCB, and CDFW) regarding wetland permits, as well as the wildlife agencies (USFWS and CDFW) regarding the Individual Take Permits for the project. Depending on the final design it is likely a 404 Individual Permit, a 404 Water Quality Certification, and a 1602 Streambed Alteration Permit may be required for this project. USFWS and CDFW may require Individual Take Permits (ITPs) for impacts to federally and state listed species. The federal ITP may be issues under consultation of the US Army Corps of Engineers with USFWS under Section 7 of the federal Endangered Species Act for impacts and improvement so the habitat for San Bernardino kangaroo rat, Santa Ana River woolly star and slender-horned spineflower. CDFW may also require a separate 2081 ITP under the state Endangered Species Act for impact to Santa Ana River woolly star and slender-horned spineflower.
Deliverables: Completed permit documentation 7 Consultation, and a 2081 Individual Take Permit.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

Based on the Final Design, elements of the work will be divided into efforts which will be procured and contracted and work that will be completed with District labor and equipment. The project budget is based on expected commercial contracted costs. Depending on the final design and permit requirements the District may perform tasks with District staff.

Based on Final Design and Permits, the District will advertise the elements of the project to be contracted for construction bids. Once bids are received and opened the District will evaluate a number of the lowest bidders to ensure that the apparent low bidder complies with all the language in the contract documents to ensure they have

submitted a responsive bid. Once the lowest, responsive bid is determined, the District will request award of contract from the District Board of Directors.

Deliverables: Advertisement for bids; evaluation of bids; awarded contract

Task 9: Construction

The proposed project entails the phased development of approximately 110 acres within Plunge Creek located along the east-west reach that is easterly of Boulder Avenue and southerly of Greenspot Road near the easterly terminus of Abbey Way. The 110 acre project area consists of five habitat and water conservation treatment areas. Treatment consists of modifying the existing hydrologic pattern to intentionally create stream flow conditions that will produce a scouring effect that will simulate natural ecological processes. The scouring effect is specifically intended to clear non-native grasses and to restore early successional phases of RAFFS. Additional treatments (i.e. thinning and pruning by hand) will be completed to modify existing native vegetation leaving small elevated pockets of shrub composition and density that is consistent with high quality SBKR habitat. Existing slope for these areas is approximately 2% on average.

Plunge Creek flows will be diverted to Area 1 (48.2 acres) via construction of an approximately 1,600 ft. native material soft diversion structure/canal. The project proposed two options due to an existing Pipeline existing under the creek either a or b. a.) would begin north of Abbey Way and east of the existing MWD Plunge Creek pipe crossing and would require construction of a new pipe crossing (a contingency cost), or b.) Utilize the existing MWD pipeline crossing. The diversion structure/canal will flow to an outlet structure of native materials in the southeast (upstream) portion of Area 1.

Plunge Creek flows will be diverted to Area 2 (52.0 acres), Area 3 (2.8 acres), Area 4 (4.0 acres) and Area 5 (3.1 acres) via developed native material sugar dikes beginning in the existing Plunge Creek wash and terminating outside the wash to the south (Areas 2 & 3) and north (Areas 4 & 5).

Diverted flows shall spread within the proposed habitat and water conservation areas before ultimately rejoining the primary Plunge Creek wash. The flows will scour existing silt and invasive grasses exposing the native sand and gravel substrate improving habitat for SBKR and recharge of groundwater.

The Conceptual Design provides a protective berm along the southern edge of the Plunge Creek area ensuring that no water flows into the existing excavation south of the project site. Habitat surveys and vegetation review, as well as hydrology/hydraulics and geomorphology studies for the project's final design will guide the final design and plans.

- **Subtask 9.1 Mobilization and Site Preparation**
  District will award and schedule a kickoff meeting with the contractor and any project partners and resource agencies and project management teams. Upon notice to precede the contractor will be allowed to begin work on the project, mobilize equipment to the site, secure the site, and comply with any permits. Contract will do any preliminary survey or monitoring work.

- **Subtask 9.2 Project Construction**
  Sequence of construction operations based on construction window allowed based on expected flood or hydraulic conditions, habitat and other considerations. There are three expected mobilizations based on the window. Elements of construction are listed below for all storm drains:
    - Low impact clearing
    - Low impact excavation
    - Diversion and outlet
    - Development of sugar dikes (designed to wash away in larger storm events)
    - Berm Protection, if needed
    - MWD Crossing Pipeline protection, if need (contingency item)

- **Subtask 9.3 Performance Testing and Demobilization** [Description of work]
  Upon completion, the contractor and District staff will demobilize equipment and temporary facilities from the site. Project performance will be assessed by District staff to ensure all efforts are completed and maintained for the year.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

The various permits listed above under Task 7 above, as well as the environmental documents prepared as required to meet CEQA and NEPA obligations, will result in a list for permits conditions and measures to be implemented as part of the project. Expected monitoring and requirements may include:

- Establishing baseline conditions
- Biological monitoring
- Habitat restoration
- Recharge monitoring
- Site protections

Budget Category (f): Construction Administration

Task 11: Construction Administration

Construction administration will be performed by the District staff. A field staff person or engineer will be associated with the project to insure all project elements are completed whether with District Staff or Contractors. District staff will also document and inspect work. Office support staff will also support the project.

CONCEPTUAL DESIGN

PLUNGE CREEK WATER & HABITAT CONSERVATION
SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

PHASING:

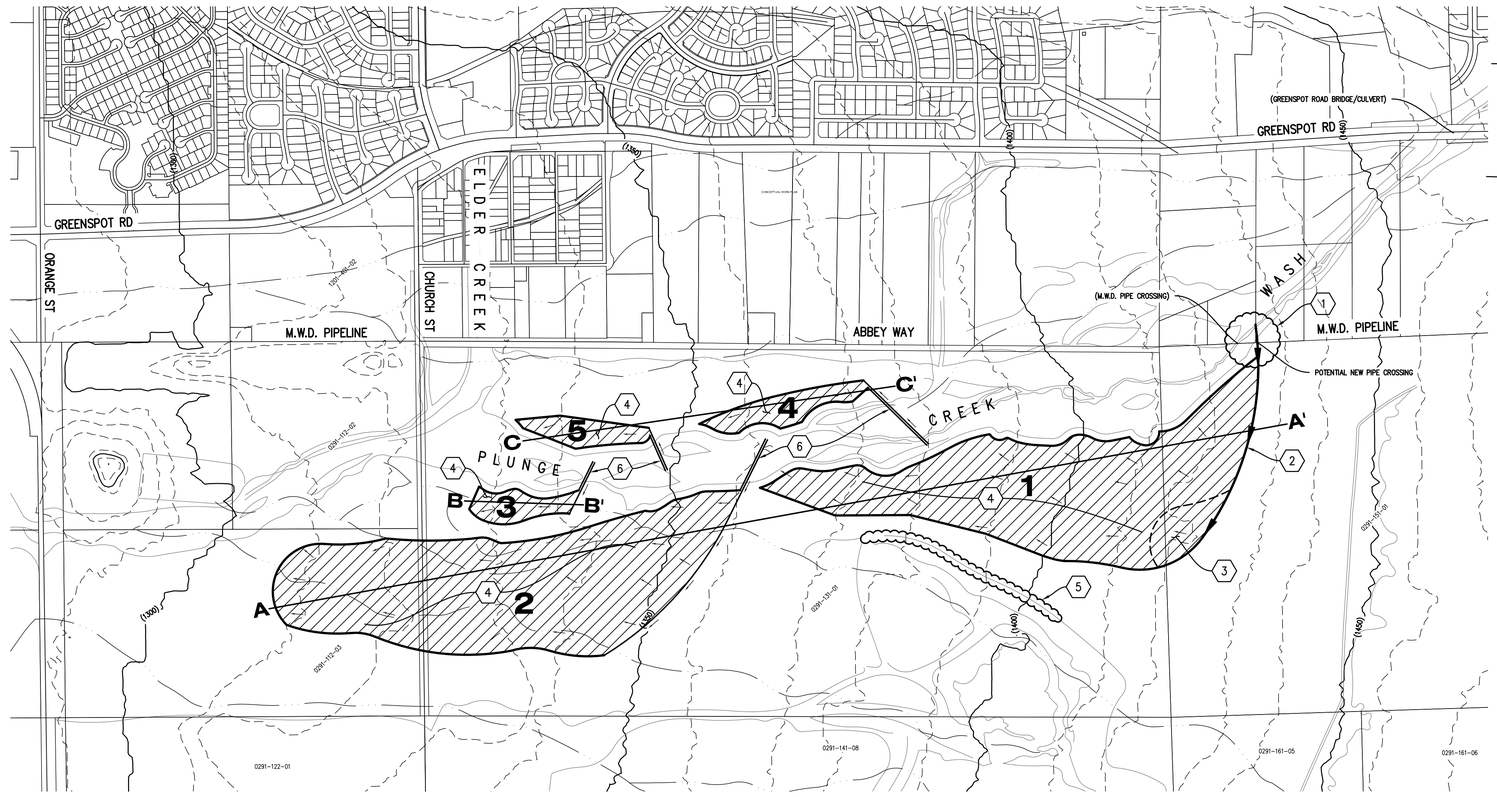
PHASE NO.	SIZE	TYPE
1	48.2 ACRES	SBKR HABITAT & WATER RECHARGE
2	52.0 ACRES	SBKR HABITAT & WATER RECHARGE
3	2.8 ACRES	SBKR HABITAT & WATER RECHARGE
4	4.0 ACRES	SBKR HABITAT & WATER RECHARGE
5	3.1 ACRES	SBKR HABITAT & WATER RECHARGE
TOTAL:	110.1 ACRES	

PRELIMINARY DEVELOPMENT NOTES:

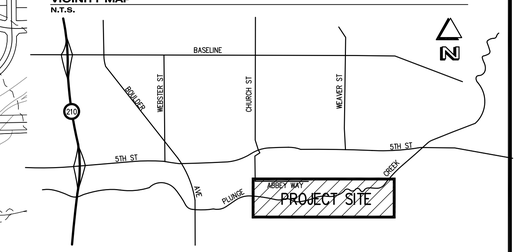
NO.	DESCRIPTION
1	DEVELOP NEW M.W.D. PIPE CROSSING OR UTILIZE EXISTING
2	DEVELOP DIVERSION CANAL
3	DEVELOP DIVERSION OUTLET SPREADING AREA
4	DEVELOP COMBINED SBKR HABITAT AND WATER RECHARGE AREA (SEE PHASING TABLE AT RIGHT)
5	INSTALL PROTECTIVE BERM NORTH OF EXISTING EXCAVATION AREAS (IF NECESSARY)
6	INSTALL SUGAR DIKE

NOTES:

1. MAP PROJECTION: NAD83 CA STATE PLAN ZONE V.
2. PARCEL & STREET CENTERLINE SHAPEFILE DATA OBTAINED FROM THE SAN BERNARDINO COUNTY G.I.M.S. DIVISION.
3. EXISTING TOPOGRAPHIC CONTOURS GENERATED FROM U.S.G.S. NATIONAL ELEVATION DATASET DIGITAL ELEVATION MODEL.
4. EXISTING TOPOGRAPHIC FEATURES PER GOOGLE EARTH IMAGERY.
5. HISTORICAL U.S.G.S. BLUE LINE STREAMS PER U.S.G.S. QUADRANGLE "REDLANDS".
6. IMPROVEMENTS SHOWN ARE CONCEPTUAL ONLY. FINAL DESIGN SHALL REQUIRE ENGINEERING DESIGN & ASSOCIATED HYDROLOGY, HYDRAULICS, GEOTECHNICAL, & GEOMORPHOLOGICAL CALCULATIONS/STUDIES.



VICINITY MAP
N.T.S.



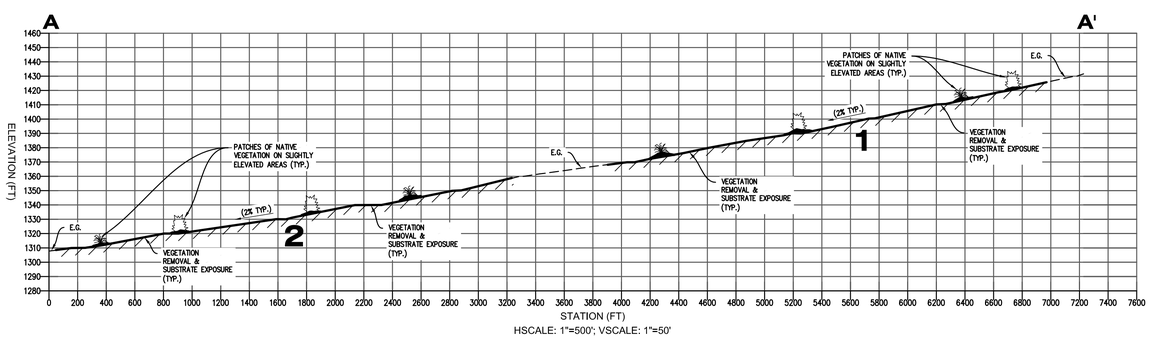
MAP LEGEND:

- PROPOSED DIVERSION STRUCTURE
- PROPOSED SBKR HABITAT & WATER RECHARGE AREAS & PHASE NO.
- PROPOSED SUGAR DIKE
- PROPOSED ADJUSTED FLOW
- EXISTING 10' TOPOGRAPHIC CONTOURS (U.S.G.S.)
- EXISTING 50' TOPOGRAPHIC CONTOURS (U.S.G.S.)
- EXISTING PROPERTY LINES (G.I.S.)
- EXISTING STREET CENTERLINES (G.I.S.)
- HISTORICAL BLUE LINE STREAMS (U.S.G.S.)

NORTH

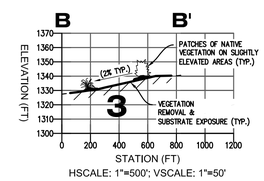
500' 0' 500' 1,000' 2,000'
GRAPHIC SCALE: 1"=500'

SECTION A-A' (PHASES 1 & 2)



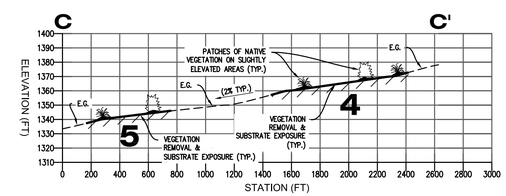
HSCALE: 1"=500'; VSCALE: 1"=50'

SECTION B-B' (PHASE 3)



HSCALE: 1"=500'; VSCALE: 1"=50'

SECTION C-C' (PHASES 4 & 5)



HSCALE: 1"=500'; VSCALE: 1"=50'

CONCEPTUAL NOT FOR CONSTRUCTION

CONCEPTUAL DESIGN
PLUNGE CREEK WATER & HABITAT CONSERVATION
SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

SBVWCD OUR NAME IS OUR MISSION

BONADIMAN CONSULTING ENGINEERS · SURVEYORS · PLANNERS
TEL: (909) 885-3806
FAX (909) 381-5771
www.bonadiman.com

PREPARED FOR: S.B.V.W.C.D.					
DRAWN BY: J.D.N.	SCALE: 1" = 500'	SHEET: 1 OF 1			C1
CHECKED BY: E.J.B.	JOB NO: 133919				
DISREGARD PRINTS BEARING EARLIER REVISION DATES	02-01-13				

Project F: Prado Basin Sediment Management Demonstration Project (Orange County Water District)

Part One - Introduction

Under natural conditions, the Santa Ana River (SAR) and its tributaries transport water and sediment. Facilities constructed in the watershed, such as dams, alter the natural sediment transport. Studies by the United States Geological Survey indicate that Prado Dam traps 95 percent or more of the sediment entering Prado Basin (Warrick and Rubin, Journal of Geophysical Research, 2007). As surface water approaches Prado Basin and Prado Dam, the flow velocity decreases and sediment otherwise carried by the water is deposited in Prado Basin. Deposition of sediment upstream of the dam impacts the environment upstream and downstream of Prado Dam.

Upstream of the dam, storage space for water conservation is reduced, changes in sediment deposition patterns and sediment grain size may impact endangered species habitat (such as habitat for the Santa Ana Sucker), and transportation infrastructure and other structures are impacted by sedimentation.

Downstream of the dam, conditions are impacted because the water released from Prado Dam is deficient in sediment, reducing sediment flow to SAR and beaches. Since the river water below the dam is sediment deficient, increased erosion occurs in the riverbed. This increased erosion impacts native habitat by causing erosion of riparian habitat. Increased erosion also threatens transportation infrastructure and other structures and negatively impacts groundwater recharge rates in the SAR. OCWD has observed declines in the riverbed groundwater recharge rate of approximately one percent per year. This decline is attributed to changes in the sediment characteristics of the riverbed that occur due to entrapment of sediment behind Prado Dam.

The Orange County Water District (OCWD) and the United States Army Corps of Engineers (ACOE) are proposing to perform a demonstration project that would remove sediment from within Prado Basin and deposit it below Prado Dam.

Sediment will be removed from Prado Basin and transported to a temporary holding area near the spillway. Sediment removal will occur during the late summer to fall to avoid impacts to endangered species. Sediment removal will be located in areas with *ArundoDonax* to maximize removal of this non-native plant. Sediment will be re-entrained in SAR flows during periods of high storm flow. The sediment will then be re-distributed in the lower SAR by natural sediment transport processes. The project will remove 300 acre feet (500,000 cubic yards) of sediment from the basin and reintroduce the sediment into the river.

The project will demonstrate the ability to reverse sedimentation trends within Prado Basin and restore the flow of sediment to the lower reach of SAR.

Enhanced sediment flow through Prado Dam will also help restore natural sedimentation patterns along SAR upstream of Prado Basin, where the sediment is trending to an environmentally adverse condition of near uniform grain size. Under natural conditions, the sediment deposited by the river would include a range of cobble, gravel, and sand, but the current condition is mostly sand due to disruptions in sediment transport.

The work area of this project is located in Riverside and Orange counties in the vicinity of Prado Dam on the SAR. Prado Dam and a portion of Prado Basin are owned and operated by ACOE. OCWD owns approximately 2,400 acres in Prado Basin that are used for water conservation, water quality improvement and environmental enhancement.

Goals and Objectives

The main project goal is to develop a new method to manage sediment movement in the SAR Watershed. The objectives of the demonstration project include: (1) restore natural sediment transport through Prado Basin, (2) assess the technical, environmental, and economic issues associated with sediment management in SAR, and (3) provide information to implement a long-term sediment management solution.
This project improves regional integration and coordination by working cooperatively with the United States ACOE, a key stakeholder of SAR watershed, to find effective solutions that meet multiple goals across geographic and

water resource areas. Restoring the flow of sediment past Prado Dam will have positive impacts within Prado Basin and in the lower reach of SAR. These benefits include:

Benefits in Prado Basin:

- Increased water storage for flood control and water conservation
- Increasing the useful life of Prado Dam
- Reduced sedimentation trends that threaten infrastructure (e.g. wetlands, roads, and bridges)

Benefits below Prado Dam:

- Reduced streambed incision, thereby halting embankment erosion which results in wildlife habitat destruction
- Providing replenishment sediment to protect infrastructure (e.g. railroad bridge at Green River Golf Course, CA 91 Freeway, SAR Reach 9 improvements)
- Reduce riverbed armoring, which decreases the capacity of groundwater recharge in the riverbed
- Provide replenishment sediment to coastal beaches

Purpose and Need

Since 1941, approximately 25,000 acre feet of storage in Prado Basin have been lost below elevation 505 feet due to sedimentation. The natural environment has also been impacted by changes in sediment transport caused by infrastructure. Enhanced sediment management improves the natural environment in the SAR watershed, increases water storage capacity for the purposes of flood control and water conservation, and implements a new strategy to maximize and ultimately increase the riverbed's recharge capacity. The project also slows or reverses sedimentation rates behind the Prado Dam and thereby increases the useful life of Prado Dam. Prado Dam was designed to accommodate sedimentation and maintain its flood control purpose through its planned useful life. Enhanced sediment management will extend the flood control facility beyond its planned useful life, potentially delaying the time at which a costly future raising of the dam is required.
This project also reduces sedimentation trends that threaten infrastructure (such as wetlands, roads and bridges), increases edge under-story riparian habitat, stops or reverses streambed incision (thereby, halting embankment erosion which destroys wildlife habitat), and provides replenishment sediment to coastal beaches. For example, OCWD's diversion of river water to the Prado Wetlands has been implemented using sand dikes constructed in SAR. Given the amount of sedimentation that has occurred at the diversion location, it is becoming increasing difficult to divert water to the wetlands with this approach. In the near future, OCWD will be faced with the need to construct hard structures to divert water to the wetlands unless the sediment transport issue is addressed.

Increased erosion downstream of Prado Dam threatens the railroad bridge at the Green River Golf Course. Additionally, other infrastructure downstream of the dam is also threatened by erosion. This threat could be addressed by increasing the amount of sand flowing past Prado Dam.

OCWD seeks to divert the maximum feasible amount of SAR water to recharge facilities in Anaheim and Orange to replenish the Orange County Groundwater Basin. The riverbed is also a very important recharge facility. Enhanced sediment management is needed to supply a more natural supply of sand past Prado Dam and minimize or reverse adverse trends in sediment characteristics in the riverbed below the dam. These adverse changes in sediment characteristics have caused a decline in the riverbed's percolation rate.

The United States ACOE and OCWD are impacted by sediment transport issues and are pursuing this project to address them.

This project addresses and meets the following One Water One Watershed (OWOW) Integrated Regional Water Management (IRWM) Plan's goals and objectives adopted by SAWPA:

- Preserve and enhance the environment (by protecting and enhancing water-related habitats and wildlife habitats, reducing or eliminating invasive species and protecting sensitive marine and estuarine environments);
- Provide appropriate flood control capacity to communities;
- Promote sustainable water solutions (by developing a partnership with ACOE for planning and implementation of economically and environmentally sustainable watershed project);
- Provide reliable water supply; and
- Improve SAR regional integration and coordination.

Integrated Elements of Projects

In the future, sediment management issues will become a more prominent issue. To date, many of the impacts associated with interruptions in sediment transport have been mitigated through relocating or re-engineering infrastructure. For example, the River Road Bridge was reconstructed at a higher elevation and the Santa Ana Regional Interceptor line was relocated out of the river bed in Orange County. Both of these expensive projects were driven by adverse impacts related to sediment transport issues. It will be more difficult to use this approach in the future as the engineering-type mitigation projects become more expensive and infrastructure funds are scarce. A holistic approach to sediment transport and sediment management will be more effective and provide multiple benefits to multiple stakeholders.
This project will help maximize the use of local water supplies, which is a long-term strategic goal of SAR watershed and OCWD. Maximizing local water supplies reduces the need to import water from the Sacramento Delta, reduces energy consumption, and strengthens the watershed's ability to withstand natural disasters such as earthquakes.

OCWD actively participates in the stakeholder efforts to prepare the Central Orange County Integrated Regional and Coastal Water Management Plan and the North Orange County Watershed Management Area IRWM Plan. OCWD's participation includes the setting of regional goals and objectives, critically reviewing and commenting on draft documents, and discussing regional priorities and potential challenges. For the North Orange County Plan, OCWD participated as a subcommittee member that assisted Orange County with the preparation of a project prioritization ranking system. OCWD is also actively involved in the development of SAWPA's OWOW IRWM Plan.

Completed Work

Since the sediment demonstration project will be performed on land owned by the ACOE, OCWD will prepare an Environmental Impact Report (EIR) to satisfy both CEQA and NEPA compliance requirements. The EIR document will be circulated for public comments and will address any concerns from the public comments. OCWD Board of Directors shall approve the EIR document at a scheduled Board meeting. As discussed under the section of "Existing Data and Studies," OCWD has completed 60 percent of a technical study entitled *"Prado Basin Sediment Management Demonstration Project Engineering Analysis."*

Deliverables: EIR for CEQA and NEPA compliance will be available upon completion and by request.

Existing Data and Studies

OCWD hired a team of thee consulting engineering firms (HDR Engineering, RBF Consulting and Golder Associates) to evaluate and study the best approach to sediment management in the Prado Basin. The project approach is thoroughly explained and described in the technical study entitled *"Prado Basin Sediment Management Demonstration Project Engineering Analysis."* All benefits claimed herein for this project are discussed in details and derived from this technical study.

Project Map

A project map showing the project geographical location and the surrounding work boundaries is attached herein.

Project Timing and Phasing

The proposed project is a demonstration project that operates on a standalone basis and is fully functional without the implementation of the subsequent project(s). This project is not a part of another larger project and is not associated with another complex project. Depending on the findings of the demonstration project, OCWD and its partner (ACOE) may decide on whether or not to proceed with the full-scale sediment management project.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
OCWD staff will prepare the project progress reports, project monitoring plan, quarterly invoices, final retention release request, project closeout documentation, and other deliverable documents as required by the Proposition 84 IRWM Implementation Grant Funding Contract.

Deliverables: Preparation of invoices, project closeout and other deliverables as specified in the Grant Funding Contract.

Task 2: Labor Compliance Program
To meet the requirements of Labor Code section 1771.5, OCWD's labor compliance program for this project will be administered by a third party administrator of California compliance programs approved and certified by the California Department of Industrial Relations.

Deliverables: Records of OCWD's labor compliance program will be provided to DWR upon request.

Task 3: Reporting
OCWD will prepare and submit the quarterly project progress reports, final project report and post-performance reports as required by the Proposition 84 IRWM Implementation Grant Funding Contract.

Deliverables: Submission of quarterly progress, final and post-performance reports as specified in the Grant Funding Contract.

Budget Category (b): Land Purchase/Easement

The land purchase does not apply to this project. The project partner, ACOE will grant an easement to OCWD to conduct this project.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
A technical study was conducted by OCWD's consultants to evaluate project needs, current problems, proposed solutions, project approach and project benefits to be derived from the implementation of this project. OCWD staff has provided critical review and comments on this technical study.

Deliverables: Prado Basin Sediment Management Demonstration Project Engineering Analysis

Task 5: Final Design

OCWD will submit project design plans and specification at 100% completion and as-built drawings to SAWPA and DWR upon completion of final design.

Deliverables: Final project plans and specifications and as-built drawings.

Task 6: Environmental Documentation

OCWD is in the process of preparing an Environmental Impact Report as the required CEQA/NEPA environmental compliance documents for this project and will provide an approved document to SAWPA and DWR upon completion.

Deliverables*:* Approved CEQA/NEPA environmental compliance documentation.

Task 7: Permitting

The anticipated permits include:

1 - Endangered Species Act (ESA) Section 7 Consultation with US Fish and Wildlife Services (FWS) and/or National Marine Fisheries Service (NMFS) Biological Opinion. The project requires ESA, Section 7 Consultation because it is partially on ACOE land and will require ACOE approval to proceed. The outcome of the biological assessment determines what level of consultation is necessary. This consultation will conclude either informally with written concurrence from the FWS and/or NMFS or through formal consultation with a biological opinion provided to the ACOE.

2 - ACOE Section 404 Permit. A permit will be required from the ACOE Regulatory Branch (Los Angeles District Office) should improvements associated with the project result in the discharge of material within the ACOE jurisdiction.

3 - ACOE Non-Recreational Outgrant Permit.

4 - State Historic Preservation Officer Section 106 Consultation.

5 - Air Quality Conformity Determination.

6 - California Department of Fish and Game (CDFG) 1602 Streambed Alteration Agreement (SAA).Areas within this project site are considered jurisdictional by the CDFG. Therefore, a 1602 SAA must be obtained prior to any CDFG jurisdictional impacts. CDFG has the duty to propose avoidance or mitigation measures that limit the project as necessary to prevent adverse impacts to fish and wildlife resources.

7 - California Endangered Species Act (CESA) Compliance- CDFG Incidental Take Permit/Consistency Determination. Measures to minimize the take of species covered by the permit (Covered Species) and to mitigate the impacts caused by the take will be set forth in one or more attachments to the permit. This attachment will generally be a mitigation plan (possibly a Habitat Conservation Plan) prepared and submitted by the permittee in coordination with CDFG staff.

8 - Regional Water Quality Control Board (RWQCB) Section 401 Permit.

9 - RWQCB Section 402 National Pollutant Discharge Elimination System (NPDES) Dewatering Permit. Section 402 of the Clean Water Act (CWA) gives states the power to regulate discharges of pollutants to surface waters through the NPDES permit program. Any activity that proposes a discharge to surface waters must demonstrate compliance with Section 402. Project-related activities that will require Section 402 authorization include construction activities that disturb more than one acre of ground and point source discharges (discrete conveyances such as pipes and human-made ditches). The RWQCB are primarily responsible for issuing CWA Section 402 authorizations. However, the State Water Resources Control Board has general permits and oversees implementation of the NPDES program.

10 - California General Construction Storm Water NPDES Permit.

11 - Right of Entry Permits.

Deliverables: Section 1602, 404, 401 and 402.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

OCWD will proceed with construction work after the completion of project design, CEQA/NEPA and all required permits. OCWD's project manager and contracting staff will administer the construction contract of this project. As a public agency, OCWD staff follows the public works construction contracting procedures. After approval by OCWD Board of Directors, staff will advertise for bids and develop the bid package including all the pertinent requirements and provisions for this project. After evaluation of all bid proposals submitted, OCWD staff will summarize bids and provide a recommendation to OCWD Board of Directors that the construction contract be awarded to the lowest bidder.OCWD's contracting staff will verify the selected contractor's bonds and insurance, and issue a Notice-To-Proceed to the selected lowest bidder after approval by OCWD Board of Directors.

Deliverables: OCWD Board of Directors authorization to advertise for bids; pre-bid contractors meeting; summary of evaluation of bids and the award of construction contract to the lowest bidder.

Task 9: Construction

It is anticipated that the major construction tasks would consist of clearing and grubbing, sediment removal, sediment re-entrainment and sediment tracking.

- **Subtask 9.1 Mobilization and Site Preparation**

Clearing and Grubbing – To allow unimpeded sediment removal, the existing vegetation within sediment removal location will need to be removed. Vegetation removal must take place prior to the bird nesting season, which typically ranges from approximately March 1st through September 15th of any given year.

In order to conduct the clearing and grubbing activities, the water elevation behind Prado Dam must be lowered to expose the base of the vegetation. Once exposed, the above-ground vegetation can be cleared, followed by removal of the vegetation's root systems. Removed vegetation will be trucked to the designated organics processing area.

Vegetation will be processed and converted to mulch and/or firewood. It is anticipated that some mulch will be reused by OCWD for beneficial uses on its properties. Remaining mulch and firewood will be exported from the site to an acceptable distribution site, and made available for public sale or given away.

The alignment for sediment removal is established partly on a desire to avoid removal of native vegetation and, instead, remove invasive vegetation such as *Arundodonax*. Selective trees will be maintained and not removed.

- **Subtask 9.2 Project Construction**

Sediment Removal – The hydraulic dredging operation of this project will entail the use of two dredgers working simultaneously within the sediment removal alignment. The dredging operation will commence at the upstream portion of the removal alignment and continue downstream with the dredgers moving in a transverse manner. By operating in this fashion, headcutting and amount of draft for the dredger can be controlled. Each dredger will be capable of agitating the retained sediment and pumping the slurry at a rate of approximately 3,500 gallons per minute. The slurry will be pumped downstream to the sediment storage location via a 12 in discharge line attached to each of the dredgers. Four slurry booster pumps will be used for each discharge line. This is due to the elevation difference between the sediment removal alignment and the sediment storage location (approximately 45 ft) and the length that the slurry needs to travel (approximately 9,000 ft).

Using two dredgers, the dredging operation will continue for approximately ten hours per day, seven days per week for five months if there is no work stoppage. This five month timeframe will allow for the removal of 500,000 cubic yards. The actual removal schedule will vary depending on weather conditions.

Sediment Re-entrainment - The dredgers will pump the slurry into a series of settling basins which allow the sediment to settle and dewater. While the preceding basin is dewatering, the next basin will be filled with slurry. Once the sediment is dried, it will be moved via heavy equipment to the dry sediment storage area and await re-entrainment.

Dried sediments placed within the storage area will be re-constituted using the water that was captured during the dewatering process. Sediment re-entrainment will occur immediately downstream of the energy dissipater located at the end of the Prado Dam concrete outlet channel via a 12-in or larger discharge line. A movable system will be used to evenly distribute the sediment into the release flows. Because of the elevation difference between the sediment storage location and the re-entrainment location, approximately 95 ft and the length that the slurry needs to travel via the discharge line, approximately 5,600 ft, three slurry booster pumps are required.

The rate and times of entrainment will depend on the outlet flows released from Prado Dam. Higher flows will be targeted for re-entrainment as this will aid in redistributing the sediment in the Lower Santa Ana River.

- **Subtask 9.3 Performance Testing and Demobilization**

Sediment Tracking - As sediment re-entrainment operations are performed, the Lower Santa Ana River will be closely monitored for excessive sedimentation patterns. If excessive sedimentation starts to develop, then re-entrainment rates and procedures will be altered to assist in mitigating any issues. Sediments will be tracked by use of cross sectional surveys, visual observation and aerial topographic surveys.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

The environmental mitigation measures for CEQA/NEPA compliance will include the following:

- Implementing a fugitive dust control plan;
- Using equipment that meets more stringent exhaust emission criteria;
- Keeping equipment well-tuned;
- Minimizing equipment idling time;
- Clearing and grubbing outside of the bird nesting season;
- Fencing construction limits;
- Trapping and removing southwestern pond turtle prior to construction;
- Having a biological monitor present;
- Noise monitoring;
- Constructing temporary noise barriers;
- Implementation of Least Bell's Vireo monitoring plans;
- Habitat compensation;
- A cultural and/or paleontological monitor present during earth disturbing activities;
- Coordination with local Native American tribes;
- Implementation of a Storm Water Pollution Prevention Plan;
- Implementation of Water Quality Control Procedures;
- Fencing operations to prevent public access;
- Implementing fire prevention measures;
- Adhering to local noise ordinances;
- Utilizing reduced noise equipment, if practicable;
- Limiting work hours as practicable and required.

Budget Category (f): Construction Administration

Task 11: Construction Administration

As a public agency, OCWD staff must request an approval from OCWD Board of Directors to issue a Request for Proposals for any construction management services for this project. In addition, the project design consulting firm will likely provide engineering services during the construction of this project. The construction administration activities will include the completion of construction tasks, compliance with regulatory and environmental regulations and on-time completion of sediment management work. OCWD assures DWR that this project will be constructed on schedule and within the project budget.

Orange County Water District

Prado Basin Sediment Management Demonstration Project 60% Engineering Analysis Partial Draft

Prepared By:

January 2013

Table of Contents

Executive Summary 1
1.0 Introduction 1-1
1.1 Study Purpose, Scope, and Current Conditions 1-2
1.1.1 Study Purpose and Scope 1-2
1.2 Current Conditions 1-3
1.3 Study Area Location ..... **Error! Bookmark not defined.**
1.4 Study Participants and Agency Coordination 1-5
1.5 Study Objectives, Constraints, and Opportunities 1-7
1.5.1 Objectives 1-7
1.5.2 Constraints 1-8
1.5.3 Opportunities 1-9
1.6 Prior Studies and Reports 1-10
2.0 Study Area Description ..... **Error! Bookmark not defined.**
2.1 Drainage Basin Description ..... **Error! Bookmark not defined.**
2.2 Prado Dam and Reservoir ..... **Error! Bookmark not defined.**
2.3 Lower Santa Ana River Basin from Prado Dam to the Pacific Ocean **Error! Bookmark not define**
2.4 Current Operations ..... **Error! Bookmark not defined.**
2.4.1 Interagency Coordination ..... **Error! Bookmark not defined.**
2.4.2 Operating Criteria ..... **Error! Bookmark not defined.**
2.5 Ongoing Projects ..... **Error! Bookmark not defined.**
2.5.1 USACE Reach 9 Phase 1, 2, and 3 improvements ..... **Error! Bookmark not defined.**
2.5.2 SARI Line Relocation ..... **Error! Bookmark not defined.**
2.5.3 Prado Basin Water Conservation Study ..... **Error! Bookmark not defined.**
2.5.4 Prado Basin Wetlands Operations ..... **Error! Bookmark not defined.**
2.5.5 Bikeway and Riding/Hiking Trail Extension ..... **Error! Bookmark not defined.**
3.0 Plan Formulation ..... **Error! Bookmark not defined.**
3.1 Planning Objectives ..... **Error! Bookmark not defined.**
3.2 Alternative Plans ..... **Error! Bookmark not defined.**
3.3 Screening of Alternatives ..... **Error! Bookmark not defined.**
3.4 Reformulation of Alternatives ..... **Error! Bookmark not defined.**
3.4.1 Design and Operating Criteria Development **Error! Bookmark not defined.**
3.4.2 Formulation of Alternatives ..... **Error! Bookmark not defined.**
3.5 Evaluation of Alternatives ..... **Error! Bookmark not defined.**
3.5.1 Hydrology, Hydraulics, and Sedimentation ..... **Error! Bookmark not defined.**
3.5.2 Geotechnical ..... **Error! Bookmark not defined.**

3.5.3 Cultural Resources Report ..... **Error! Bookmark not defined.**
3.5.4 Operations ..... **Error! Bookmark not defined.**
3.5.5 Engineering ..... **Error! Bookmark not defined.**
3.5.6 Environmental ..... **Error! Bookmark not defined.**
3.5.7 Regulatory ..... **Error! Bookmark not defined.**
3.5.8 Engineer's Opinion of Probable Cost ..... **Error! Bookmark not defined.**
4.0 Selected Plan 1-1
4.1 Plan Description 1-1
4.2 Plan Implementation 1-3
4.3 Monitoring ..... **Error! Bookmark not defined.**
4.3.1 Sediment Profile Surveys ..... **Error! Bookmark not defined.**
4.3.2 Habitat Surveys ..... **Error! Bookmark not defined.**
4.3.3 Dam Operations and Structures ..... **Error! Bookmark not defined.**
4.3.4 Air Quality ..... **Error! Bookmark not defined.**
4.3.5 Water Quality ..... **Error! Bookmark not defined.**
4.3.6 Dredging ..... **Error! Bookmark not defined.**
5.0 References ..... **Error! Bookmark not defined.**

Tables

Table 1-1 Agencies Interests 1-6
Table 3-1 Screening of Major Alternatives ..... **Error! Bookmark not defined.**
Table 3-2 Hauling Trips ..... **Error! Bookmark not defined.**
Table 3-3 Sediment Storage Locations Capacities (Slurry) ..... **Error! Bookmark not defined.**
Table 3-4 Sediment Storage Locations Capacities (Dry) ..... **Error! Bookmark not defined.**
Table 3-5 Potential SMDP Detailed Alternatives ..... **Error! Bookmark not defined.**
Table 3-6 Relative Air Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**
Table 3-7 Relative Biological Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**
Table 3-8 Relative Traffic Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**
Table 3-9 Relative Cultural Resource Impact Evaluation of Detailed Alternatives ..... **Error! Bookmark not defined.**
Table 3-10 Relative Water Quality Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**
Table 3-11 Relative Hazardous Waste Impact Evaluation of Detailed Alternatives ..... **Error! Bookmark not defined.**
Table 3-12 Relative Recreation Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**

Table 3-13 Relative Public Health and Safety Impact Evaluation of Detailed Alternatives ..... **Error! Bookmark not defined.**

Table 3-14 Relative Noise Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**

Table 3-15 Relative Water Rights Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**

Table 3-16 Relative Visual Impact Evaluation of Detailed Alternatives **Error! Bookmark not defined.**

Table 3-17 Assessment of Potential Regulatory Requirements ... **Error! Bookmark not defined.**

Table 3-18 Alternative I – Hydraulic Excavator/On-Road Hauling – Preliminary Engineer's Opinion of Probable Cost ..... **Error! Bookmark not defined.**

Table 3-19 Alternative II – Scraper Excavation/Off-Road Hauling – Preliminary Engineer's Opinion of Probable Cost ..... **Error! Bookmark not defined.**

Table 3-20 Alternative III – Hydraulic Dredging/Slurry Discharge – Preliminary Engineer's Opinion of Probable Cost ..... **Error! Bookmark not defined.**

Table 3-21 Alternative IV – Hydraulic Dredging/Slurry Discharge - Preliminary Engineer's Opinion of Probable Cost ..... **Error! Bookmark not defined.**

Table 4-1 Monitoring Approaches to Evaluate Demonstration . **Error! Bookmark not defined.**

Table 4-2 Chemical Results Range and Background Range ... **Error! Bookmark not defined.**

Figures

Figure 1-1 Project Vicinity Map ..... **Error! Bookmark not defined.**

Figure 1-2 Project Location ..... **Error! Bookmark not defined.**

Figure 2-1 Existing Mitigation Areas ..... **Error! Bookmark not defined.**

Figure 2-2 Santa Ana River Reaches ..... **Error! Bookmark not defined.**

Figure 2-3 Prado Dam Release Operating Criteria ..... **Error! Bookmark not defined.**

Figure 3-1 Transverse Cross-Section ..... **Error! Bookmark not defined.**

Figure 3-2 Site Access Route Options ..... **Error! Bookmark not defined.**

Figure 3-3 Sediment Removal Location Options ..... **Error! Bookmark not defined.**

Figure 3-4 Sediment Transport Pipeline Alignment Options ..... **Error! Bookmark not defined.**

Figure 3-5 Sediment Haul Route Options ..... **Error! Bookmark not defined.**

Figure 3-6 Temporary Sediment Storage and Handling Location Options **Error! Bookmark not defined.**

Figure 3-7 Detailed Alternative I ..... **Error! Bookmark not defined.**

Figure 3-8 Detailed Alternative II ..... **Error! Bookmark not defined.**

Figure 3-9 Detailed Alternative III ..... **Error! Bookmark not defined.**

Figure 3-10 Detailed Alternative IV 1-15

Appendices

Appendix A: MIKE21C Prado Basin Modeling

Appendix B: HEC-RAS Lower Santa Ana River Sedimentation Modeling

Appendix C: Geotechnical Investigation

Appendix D: Biological Surveys

Appendix E: Property Ownership

Appendix F: Opinion of Probable Cost Backup, Conceptual Drawings of Most Feasible Alternative, Preliminary Construction Schedule

Executive Summary

This report presents an engineering analysis of a proposed Sediment Management Demonstration Project (SMDP) for the Prado Basin and Lower Santa Ana River (LSAR). This project will provide an engineering analysis and a field demonstration of how sediment can be taken from the Prado Basin and reintroduced into the LSAR, thereby restoring sediment transport processes to the LSAR.

Prado Dam, constructed in 1941 by the U.S. Army Corps of Engineers (USACE), serves as an essential flood control and valuable water conservation opportunity for the LSAR watershed. It also acts as a significant sediment trap, having trapped an estimated 25,000 acre ft (af) (31 million cubic meters (m^3)) of sediment below 505 feet (ft) mean sea level (msl) since the dam became operational. The design of Prado Dam and the Santa Ana River Mainstem project accounts for sediment accumulation with respect to flood control over the lifetime of the project. Sediment accumulation has not impacted the design life of the flood control project. The interruption of sediment transport caused by the dam is associated with some long-term negative effects. The sediment trapping has resulted in reduced storage capacity in the Prado reservoir for water conservation purposes, impacts to infrastructure within Prado Basin, and potential impacts to Santa Ana Sucker fish habitat in the SAR. The LSAR is sediment starved, which has caused:

- Erosion and channel incising in the LSAR;
- Riparian habitat loss within the LSAR due to channel incising and erosion;
- Increased coastal and beach erosion due to loss of sediment from the coastal systems;
- Lower infiltration rates in the soft bottomed reaches of the LSAR. This is caused by the coarsening/armoring that occurs to river bottom sediments when insufficient replacement sediment flows into the system.

In response to the adverse effects of the sediment transport interruption created by Prado Dam the Orange County Water District (OCWD), in cooperation with USACE, is proposing a SMDP. The proposed SMDP would mechanically remove sediments from Prado Basin and re-entrain them in a controlled manner into LSAR flows.

The overall benefits of moving sediments from Prado Basin to the Lower Santa Ana River on a long-term basis include:

- *Long-term flood control.* Slowing or stopping the filling of Prado Basin will sustain storage capacity beyond the design life of the flood control project. Increasing sediment concentrations in LSAR water in a controlled manner will reduce “sediment starved” conditions and reduce the risks of incising and bank erosion.
- *Water supply enhancement*. Preventing further loss of storage in the Prado Basin and increasing the infiltration rates in the LSAR by adding sediments to the river will increase local water supplies and reduce reliance on imported water.
- *Preservation of Infrastructure*. Reducing scour by restoring sediment flow in the river will preserve infrastructure within and adjacent to the LSAR. Preventing further filling of Prado

Basin with sediments will preserve upstream infrastructure and reduce the need for further bridge or dam raisings as well.

- *Habitat restoration and enhancement*. Preventing sediment accumulation in Prado Basin benefits natural resource habitat within the basin. As sediments accumulate, the hydraulic gradient and water depths change, which alters habitat types. For example, habitat for the Santa Ana Sucker fish would benefit from reduced sediment accumulation in Prado Basin and an increased hydraulic gradient upstream of Prado Basin. Restoring sediment flow that would otherwise be impeded by Prado Dam will allow LSAR riparian habitat to remain established and expand to other sections of the river from Prado Dam to the Weir Canyon Road crossing. These LSAR areas are currently sediment starved. The sediment will provide base material for the growth of vegetation along the banks and bed of the river, which will support numerous species of flora and fauna.
- *Beach sand replenishment*. Allowing sediment, particularly sands, to move from the upper watershed to the lower watershed will restore sands to the coastal littoral zone where it will then naturally replenish beaches and coastlines in the Southern California Bight.
- *Recreation*. Enhancing and preserving habitat both in the Prado Basin and in the SAR will improve the recreational experiences in both locations and maintain a high quality of life for Southern California residents and visitors.

This demonstration project will provide valuable information that will be used to:

- Assess the feasibility of long-term sediment management by removing sediment from Prado Basin and re-entraining that sediment in a controlled manner in LSAR flows.
- Develop design and operating criteria for a long-term sediment management program for Prado Basin.
- Determine what effects sediment management will have on:
  - Sediment aggradation and erosion in the LSAR and Prado Basin;
  - Water quality in the SAR
  - Infiltration in the soft bottomed reaches of the LSAR;
  - Riparian habitat within the LSAR;
  - Wetland and other habitat within Prado Basin;
  - OCWD water diversion and groundwater recharge operations; and
  - Sediment accumulation within Prado Basin.

To develop this demonstration project, the following steps were taken:

1. Literature was researched and reviewed regarding how other agencies have attempted to restore sediment balance to a dammed watershed. (Section 5.0)
2. Regional data was reviewed to assess the rates of sediment accumulation in Prado Basin and what quantity of sediment would need to be managed during a demonstration to collect meaningful data regarding long-term feasibility and performance.

3. A geotechnical investigation was undertaken at Prado Basin to assess physical and chemical characteristics of the sediment.
4. Site topography, basin characteristics, channel characteristics, sediment characteristics, flow records, and dam release and operational records were studied to develop input parameters for hydrologic, hydraulic, and sediment transport models, both within Prado Basin, and downstream of Prado Dam in the LSAR.
5. MIKE21C was used to simulate inflows of water and sediments into Prado Basin before and after sediment removal was completed during the SMDP. This provided information regarding where and what sizes of sediments would re-accumulate within Prado Basin, what changes would occur to water velocities within Prado Basin and what the resulting effects would be, and what upstream effects might be observed during and after the SMDP.
6. HEC-RAS was used to simulate flows of water and sediments in the LSAR below the dam before and after sediment removal from the basin and re-entrainment in the dam release flows. Controlled re-entrainment was modeled during the SMDP under a range of typical release rates from Prado Dam. This provided information regarding sediment aggradation and erosion that might be observed during and after the SMDP in the LSAR. It was also used to establish re-entrainment criteria such as percent solids for re-entrainment and a minimum flow rate for re-entrainment to achieve sediment transport past points in the LSAR during a release event.
7. Prado Dam and OCWD water diversion and groundwater recharge operations were evaluated to assess when sediment removal and re-entrainment activities could take place and what constraints should be established for sediment removal, processing, and re-entrainment activities to prevent interference with Prado Dam, USACE, and OCWD water diversion and groundwater recharge operations.
8. Engineering analysis of detailed alternatives for removing sediments from Prado Basin and re-entraining them into LSAR flows were evaluated for their engineering feasibility, their relative costs, their relative impacts on environmental factors, including air, traffic, biological resources, cultural resources, water quality, hazardous waste, recreation, public health and safety, noise, water rights, and visual resources. From this analysis a most feasible alternative was selected and is presented as a conceptual design and operations plan.
9. Four detailed alternatives were evaluated:
    a. Detailed Alternative I: Remove sediments from Santa Ana River alignment within the basin using an excavator, truck the sediments to a sediment storage location just downstream of the dam outlet works, and re-entrain into the LSAR using hydraulic jetting without a chute (**Error! Reference source not found.**).
    b. Detailed Alternative II: Remove sediments from Santa Ana River alignment within the basin using a scraper, haul the sediments with the scraper to a sediment storage location just downstream of the dam outlet works, and re-entrain into the LSAR using a conveyor system (**Error! Reference source not found.**).

c. Detailed Alternative III: Remove sediments from Santa Ana River / Temescal Wash "V": alignment within the basin using hydraulic dredging, pump the sediment slurry to two sediment storage locations, one just downstream of the dam outlet works and one further downstream on the LSAR, and re-entrain into the LSAR by mechanically placing the sediments in the river with sediment moving equipment such as bulldozers (**Error! Reference source not found.**).

d. Detailed Alternative IV: Remove sediments from Santa Ana River alignment within the basin using hydraulic dredging, pump the sediment slurry to a sediment storage location just to the east of the dam spillway, and re-entrain into the LSAR by slurry pumping the sediment (Figure 1-1) from the impoundment to a location downstream of the dam outlet works.

Conceptual plans for the most feasible alternative are provided in Appendix F. The most feasible alternative (Figure 1-1) evaluated includes:

- Over 2 to 5 years remove 250,000 to 500,000 cubic yards (yd^3) (190,000 to 380,000 m^3) of sediment from Prado Basin. 250,000 to 500,000 yd^3 of removal and controlled re-entrainment would be necessary to collect meaningful data regarding feasibility, impacts, and design criteria for a long-term sediment management program.

- Removing the sediments from an alignment along the Santa Ana River within Prado Basin. MIKE21 modeling suggests that this alignment receives the greatest amount of sediment, particularly sand input and provides the greatest opportunity to sediment accumulation once removal occurs. This alignment is expected to capture the greatest amount of sand, which is optimal for re-entrainment. Additionally, among the alignments evaluated, this alignment impacts the least amount of high value habitat and, instead, impacts more non-native habitat including *Arundo donax*, of which removal is beneficial.

- Using hydraulic dredging techniques for sediment is optimal. This option provides the greatest operational flexibility and efficiency and lowest overall impacts when compared to other alternatives. It is also expected to result in lower dredging costs.

- Dewatering and temporarily storing sediments at a location to the southeast of Prado Dam. This location is of sufficient size to accommodate sediment handling and temporary storage prior to re-entrainment. It avoids various resources, including biological and cultural.

- Slurrying and re-entraining sediments at a point downstream of the energy dissipation structure on the Prado Dam outlet structure within the LSAR at a rate that will result in 1% solids in LSAR water. HEC-RAS modeling suggests that re-entraining at 1% solids would be optimal for LSAR sediment transport. Re-entraining when release flows are at appropriate levels and stopping re-entrainment prior to when flows subside so that fine grained sediments can pass the OCWD rubber dams (located approximately 11 and 14 miles downstream of Prado Dam) before they are re-inflated or settle in the reaches of the LSAR above the OCWD rubber dams. The OCWD rubber dams are typically deflated at flows greater than 2,000 cubic feet per second (cfs) (56.6 cubic meters per

second (cms)) with it partially inflated or deflated at flows between 500 cfs (14.2 cms) and 2,000 cfs (56.6 cms).

The preliminary analysis completed in this 60% engineering analysis suggests that the SMDP is a feasible demonstration project that can be completed with available technology and without negatively affecting Prado Dam, USACE, or OCWD operations. Additional analysis will be completed as part of the development of the 100% engineering analysis. This will include:

- HEC-RAS simulations of the 100 year or maximum design event in the LSAR after the SMDP has re-entrained the 500,000 cy (380,000 cm) of sediments to assess flood risks.
- Quantitative environmental impact assessments as part of a formal Environmental Assessment/Environmental Impact Report (EA/EIR) to be completed.
- Completion of the performance monitoring plan for the SMDP.
- Further engineering and design of the most feasible alternative for the SMDP.

1.0 Introduction

The purpose of the demonstration project is to evaluate sediment removal in the Prado Basin and re-entrainment of sediment into the LSAR to reverse the long-term scour trend attributed to the reduction in sediment delivery downstream of Prado Dam. The completed demonstration project will provide data, conclusions, and recommendations that examine the feasibility of a long-term program for ongoing sediment management for Prado Basin within the operating constraints of the USACE flood control operational requirements, which are described in Section 2.4.2.

This report focuses on issues related to sedimentation behind Prado Dam, located in Southern California's largest watershed created by the Santa Ana River. This report provides an analysis of practical methods to implement a SMDP for the reservoir upstream of Prado Dam known as Prado Basin. This report is a 60% engineering analysis of different methods of demonstrating how sediment removal and re-entrainment may perform.

Dams provide many benefits to society. They reduce flood risk, store water for supply, and allow electricity to be generated. However, the construction of a dam results in negative impacts as well. Once a dam is constructed, it interrupts natural sediment transport processes in a river system. Sediment movement is important for river and habitat health.

Most natural stream sediment systems are in balance where accumulations of sediment occur in the stream and its tributaries until such time as a flushing flow from larger flow events move that sediment into downstream reaches. In coastal systems, this sediment is also required for shore and near shore beach sand replenishment. The sediment produced by the river replenishes beaches and shorelines as wave action moves these sediments along the shoreline. Dams preclude sediment movement and deteriorate stream conditions in a number of ways: sediment flux from upstream of the dam accumulates behind the dam, sediment supply to the reach below the dam is reduced and the magnitude and frequency of flood flows that would mobilize the sediment are also reduced. The reduction of reservoir volume from accumulated sediment results in reduced capacity, which reduces the effectiveness for flood control, water supply and power generation. The reduction of sediment supply to the shoreline can alter the dynamics of the shoreline and potentially increase shoreline erosion.

The traditional solutions to these problems are to raise the dams, line the rivers downstream of the dams, and import sand from quarries or ocean dredging operations to replenish beaches and shorelines. Raising the dam inundates greater areas, taking up more property which modifies or destroys habitat. Lining the river downstream of the dam changes the river from a living system to a hardened channel with little or no habitat value. Natural river functions and the local biodiversity become diminished due to lost riparian habitat. Mining sand from quarries or ocean dredging to replenish beaches and shorelines is expensive and requires continuous maintenance activities, and can have severe environmental impacts.

Rivers with healthy sediment balances can have greater infiltration capacities than dammed rivers. The loss of sediment loads from a river system can increase the armoring, packing, and bulk density of remaining sediments in the downstream river reaches. This armoring reduces the effective pore throat diameters of those sediments, which reduce their permeability, and

lower the rate at which water infiltrates through them. Thus, damming a river can potentially have the effect of reducing recharge to a groundwater basin downstream of the dam.

1.1 Study Purpose, Scope, and Current Conditions

1.1.1 Study Purpose and Scope

The purpose of this study is to explore practical and beneficial methods to restore important sediment migration upstream of Prado Dam to habitats and beaches downstream. OCWD is proposing a demonstration of feasible sediment management techniques in which between 250,000 and 500,000 yd^3 (191,250 and 382,500 m^3) of material would be removed from Prado Basin and re-entrained into the LSAR flows downstream of Prado Dam in a measured and controlled manner. This demonstration project would be used to collect essential data regarding the feasibility of similar long-term sediment management techniques. Section 4 of this report outlines a preliminary performance monitoring program for the SMDP. The demonstration would be consistent with the primary flood risk management functions of Prado Dam and the LSAR. The demonstration project would examine alternatives to counteract the altered sediment transport processes created by Prado Dam. The SMDP would provide data and experience as to the best methods to aid in ecosystem restoration within Prado Basin and downstream of Prado Dam. From the demonstration, the following will be learned:

- Where sediments migrate to and how quickly they migrate there after being entrained into the LSAR downstream of Prado Dam, this information can be used to achieve more complete calibrations of future sediment transport models,
- How quickly areas where sediments are removed refill with sediments and what grain size distributions refill those areas,
- How riparian habitat in the portions of the LSAR improve after sediment introduction,
- The engineering and operational requirements to move sediments from Prado Basin into the LSAR downstream of Prado Dam,
- How the operation enhances habitat in Prado Basin,
- How quickly sediments can effectively be moved from Prado Basin to the LSAR,
- How hydraulic changes within and downstream of Prado Basin due to sediment management activities, address flooding potential, and
- Cost effectiveness of the solution.

The demonstration project is expected to last from 2 to 5 years with continued monitoring for some time thereafter depending on the amount of precipitation in any one year. The demonstration project's intent is to remove a fixed quantity of sediment from Prado Basin and re-entrain it in LSAR flows in a measured and controlled manner to obtain meaningful data regarding long-term operations.

This report presents a series of modeling, research, and engineering evaluations that have been conducted to develop the demonstration project that would achieve the data collection

objectives without causing immitigable impacts to the river system, the dam, the basin system, habitat, wildlife, or people.

1.2 Current Conditions

Prado Dam was constructed in 1941 by the USACE. The dam is located east of the State Route (SR-) 71 and north of SR-91 within Riverside County, California.

The design of Prado Dam and the Santa Ana River Mainstem project accounts for sediment accumulation with respect to flood control over the lifetime of the project. Sediment accumulation has not impacted the design life of the flood control project.

The USACE and OCWD work closely to utilize Prado Dam for the dual purpose of flood control and water conservation. The USACE works in cooperation with OCWD to release water that OCWD in turn diverts from the Santa Ana River for infiltration into the groundwater basin downstream of Prado Dam. When water levels behind the dam rise above 498 ft msl in the winter (151.7 meters (m)), 505 ft msl in the spring (153.9 m), the USACE will release water for flood control purposes in accordance with the operating rules for the dam.

The USACE currently follows Plan A of their Interim Water Control Plan that identifies three pools for the operation of the dam: debris pool, buffer pool, and flood-control pools. Within the buffer pool 490-498 ft msl (149.3-151.7 m) during flood season and 498-505 ft msl (151.7-153.9 m) during non-flood season, different operations occur depending on the season. The USACE coordinates releases with OCWD during the flood season (October 1 through February 28).

When water levels are below 498/505 ft msl (151.7/153.9 m), the USACE releases water at rates that OCWD can divert and infiltrate into the groundwater basin through in the downstream reach of the Santa Ana River and adjacent spreading grounds.

Since 1941, data suggests that at least 25,000 af (31 million m^3) of storage below 505 ft msl (153.9 m) has been lost due to sediment accumulation behind the dam. If the storage loss continues unabated at this rate of about 360 af/year (0.44 million m^3/year), ultimately all water conservation storage will be lost. Eventually, the design life of the flood control project will be reached and the dam's flood control capacity reduced. Without sediment management the Prado Basin will continue to aggrade, resulting in large financial and environmental impacts to raise the dam after the dam's design life is reached or perform mass sediment removal. Further raising of the dam and construction of higher dikes and levees around the reservoir may be limited in the future due to physical and social constraints.

Partially due to sedimentation trends, River Road Bridge was raised in 2009. Sedimentation in the vicinity of the bridge was reducing the available cross sectional area under the bridge, thereby restricting the flow of water and increasing he buildup of debris on the bridge abutments.

The sediment accumulation in Prado Basin has altered high value wetland habitat to lower value dry-land habitat and, in some locations, has provided fertile ground for *Arundo donax* invasion, which further degrades the habitat.

The Santa Ana Regional Interceptor (SARI) line carries waste brine from inland areas to the Pacific Ocean (Ninyo & Moore, 2009). This SARI line is critical for maintaining salt balances in

the Inland Empire region as brackish groundwater is extracted and desalted, and wastewater is recycled and desalted. Channel degradation in the LSAR has increased the risk of damage to the line. Interruption of this disposal option for inland water treatment facilities would have significant financial and environmental impacts.

In the soft bottom portions of the LSAR, scour continues, uncovering the SARI line in places, causing destruction of habitat, degradation of water quality, and reduction of infiltration capacity (Golder, 2009). The degradation and, in some reaches, elimination of riparian habitat has reduced or eliminated the presence of endangered or threatened species from the LSAR watershed.

In addition to the above issues, shorelines and beaches in Orange County are replenished with imported sand annually. Although already reduced at the shorelines and beaches, the full impacts of interrupted sediment transport in the LSAR has yet to be fully realized. Without restored sediment transport, the LSAR will continue to be depleted of sediment, and natural shoreline replenishment will decrease.

A sediment management solution is needed to prevent further loss of storage behind the dam, destruction of infrastructure, destruction and loss of habitat within the river, loss of infiltration capacity within the river, and loss of shoreline. It is essential that a comprehensive sediment management solution be developed that restores sediment balance to the Santa Ana River system from Prado Dam downstream to the ocean.

The site lies adjacent to the eastern flank of the Santa Ana Mountains within the Peninsular Range Geomorphic Province of California (California Geological Survey, 2002). The Peninsular Range Geomorphic Province is a physiological area that extends from the San Gabriel Mountains in the north to Baja California in the south. The province is characterized by northwest trending mountain ranges and alluvial-filled basins separated by similarly oriented faults. The site is just adjacent to the Elsinore Trough, which is a northwest-trending fault-controlled depression (graben) associated with the Elsinore Fault Zone (EFZ) (Appendix C, Figure 3).

The climate of the Santa Ana Region is classified as Mediterranean. The climate is characterized by warm, dry summers and cool, moist winters. Average annual precipitation ranges from about 12 inches (in) (0.3 m) near the coast to about 18 in (0.46 m) in the inland valleys. In the higher mountains, cool summers and cold winters prevail. Average annual precipitation can exceed 40 in (1.0 m) in some of the higher mountains. Most precipitation occurs between October and April (USGS, 2000), but in some years the rainy season may begin as early as September and (or) end as late as June.

Precipitation in the region is generally limited to the winter months – October through April. The Santa Ana River flow usually mimics this water cycle, increasing in the winter in response to periodic storms and decreasing in the summer. This seasonal flow cycle is augmented by year-round base flow in the river resulting from urbanization in the upper watershed, including discharges from wastewater treatment plants.

1.3 Study Participants and Agency Coordination

The project proponent is OCWD. The participating agency and Federal lead agency for National Environmental Policy Act (NEPA) is the USACE. The USACE owns much of the land on which the demonstration project will take place. As operator and manager of Prado Dam, the USACE is responsible for evaluating requests to use federal land in Prado Basin and to determine whether such requests (1) are compatible with the federal project, laws, regulations, and policies and (2) when such use will be in the interest of the federal government and/or public. The USACE may consider and permit non-federal use of federal land pursuant to 10 U.S.C. 2667 and 16 U.S.C. 460d. If permitted, the project would examine alternatives to counteract the altered sediment transport processes created by Prado Dam. It would provide data and experience as to the best methods to aid in ecosystem restoration within Prado Basin and below Prado Dam.

In addition to OCWD as the project proponent and USACE as the participating agency, several other agencies have jurisdictional authority over aspects of the project and therefore OCWD will coordinate with them. Table 1-1 lists the agencies and their specific interests.

Table 1-1 Agencies Interests

Agency	Interest and Information Required
USACE	Owns and operates Prado Dam and is responsible for work in waters of the U.S. under section 404 of the Clean Water Act. They will require a 404 permit in addition to a permit to conduct operations on federal lands. They will be the lead NEPA agency and will be interested in all impacts associated with the project and that those impacts are mitigated. They will be very interested in effects on dam operations for flood control, effects within Prado Basin and effects to the downstream LSAR. Will likely require that the project be engineered to have no impacts on dam operations or flood risk at the dam or in the LSAR.
Riverside County Flood Control District	Owns and is responsible for maintaining Santa Ana River upstream of the Orange County/Riverside County frontier and mitigating flood risk for Riverside County. An encroachment permit will be required from this agency to conduct operations in the Santa Ana River.
Orange County Flood Control District	Owns and is responsible for maintaining Santa Ana River downstream of the Orange County/Riverside County frontier and mitigating flood risk for Orange County. An encroachment permit will be required from this agency to conduct monitoring activities in the portions of the Santa Ana River.
California Regional Water Quality Control Board	Regulates water quality in Prado Basin and the Santa Ana River. A 401 certification will be required from this agency to allow operations to occur within the Santa Ana River.
California Department of Fish and Game	Regulates biological resources in California and is responsible for regulating work in stream beds. A 1601/1602 streambed alteration agreement will be required from this agency. Biological impacts within Prado Basin and the Santa Ana River will be of primary interest to this agency.
Department of the Interior U.S. Fish and Wildlife Service	Regulates federally listed species and federal biological resources. No permits will be required from this agency, but through the NEPA process, they will have input into how the project will be completed. Biological impacts within Prado Basin and the Santa Ana River will be of primary interest to this agency.
Federal Emergency Management Agency (FEMA)	FEMA provides federal assistance during emergencies, including flood emergencies. As such, FEMA establishes criteria for management of flood control systems to reduce risks of flooding, which makes participating communities' property owner's eligible for the national flood insurance program. FEMA's primary interests in the SMDP will be changes to the flood risks. FEMA requirements for encroachment, placement of fill, or any other modifications or impacts to the flood control system will apply, either through the local agency's flood plain use permits or directly if such permits do not include FEMA requirements.
Multiple Agencies Responsible for Western Riverside County Multiple Species Habitat	The Multiple Species Habitat Conservation Plan (MSHCP) Conservation Area is composed of a variety of existing cores, proposed cores, extensions of existing cores, linkages, constrained linkages and non-contiguous habitat blocks. The project area is included within existing Core A, which is defined as areas that contain a block of habitat of appropriate size, configuration, and vegetation characteristics to generally support the life history

Table 1-1 Agencies Interests

Agency	Interest and Information Required
Conservation Plan	requirements of one or more Covered Species. Existing Core A consists of Prado Basin and the Santa Ana River. It is located in the southwest region of the MSHCP Area and is comprised largely of public/quasi-public lands owned by a variety of entities, but it also contains a small number of privately-owned lands.

1.4 Study Objectives, Constraints, and Opportunities

1.4.1 Objectives

1.4.1.1 Long Term Sediment Management Objectives

There are numerous desirable benefits of a sediment management system in Prado Basin:

- *Long-term flood control.* Slowing or stopping the filling of Prado Basin will sustain storage capacity beyond the design life of the flood control project. Increasing sediment concentrations in LSAR water in a controlled manner will reduce "sediment starved" conditions and reduce the risks of incising and bank erosion.
- *Water supply enhancement*. Preventing further loss of storage in the Prado Basin and increasing the infiltration rates in the LSAR by adding sediments to the river will increase local water supplies and reduce reliance on imported water.
- *Preservation of Infrastructure*. Reducing scour by creating a healthy natural sediment balance in the river will preserve infrastructure within and adjacent to the LSAR. Preventing further filling of Prado Basin with sediments will preserve upstream infrastructure and prevent the need for further bridge or dam raisings as well.
- *Habitat restoration and enhancement.* Preventing sediment accumulation in Prado Basin sustains current habitat balance within the basin. As sediments accumulate, the water depths change, which alters habitat types. Maintaining a natural sediment balance will allow LSAR riparian habitat to remain established and expand to other sections of the river from Prado Dam to the Weir Canyon Road crossing. These LSAR areas are currently sediment starved. The sediment will provide base material for the growth of vegetation along the banks and bed of the river, which will support numerous species of fauna.
- *Beach sand replenishment*. Allowing sediment, particularly sands, to move from the upper watershed to the lower watershed will restore sands to the coastal littoral zone where it will then naturally replenish beaches and coastlines in the Southern California Bight.
- *Recreation.* Enhancing and preserving habitat both in the Prado Basin and in the SAR will improve the recreational experiences in both locations and maintain a high quality of life for Southern California residents and visitors.

1.4.1.2 Sediment Management Demonstration Project Objectives

The SMDP is being developed in this engineering analysis to meet specific evaluation and data collection objectives that will allow agencies to determine if mechanical sediment

management is feasible and how best to design a sediment management program for Prado Basin. Specific learning objectives for the SMDP include:

- Verify modeling results regarding where and to what extent sediments will accumulate within the LSAR.
- Verify Prado Basin modeling results regarding re-deposition within sediment removal areas, upstream effects of sediment removal activities, and debris flows following sediment removal activities.
- Determine the feasibility of mechanically moving sediments from Prado Basin to the LSAR.
- Determine effects on OCWD operations, if any, due to increased sediments in the LSAR.
- Assess water quality impacts, if any, due to the sediment management activities.
- Determine the costs and cost/benefits of sediment management using mechanical means.

These demonstration project objectives are learning objectives that are necessary prior to moving forward with a full scale sediment management solution. The demonstration project is a study that is critical for the success of a sediment management program for Prado Basin.

1.4.2 Constraints

The following constraints are to be adhered to during the demonstration project:

- Prevent sediment buildup that may cause increased flood risk due to the newly re-entrained sediment in the LSAR by managing sediment entrainment rates and quantities based on the modeled and observed sediment depositions.
- Prevent impacts to dam operations by preventing debris flows above those that currently occur and by scheduling sediment removal from Prado Basin, transport to the LSAR, and sediment re-entrainment activities around dam operating criteria such as flood control releases when water surface elevations exceed 498/505 ft msl (151.8/153.9 m).
- Manage equipment to prevent impacts to dam operations.
- Avoid interference with existing and planned flood control construction and SARI relocation/protection projects.
- Keep sediment removal activities a sufficient distance from the dam by managing sediment transport activities to avoid impacts to the dam.
- Prevent significant impacts to water quality through water quality monitoring and management.
- Prevent unmitigated impacts to habitat by siting sediment removal, transport, and handling activities away from sensitive habitat, minimizing takings, and mitigating takings if they occur.

- Prevent impacts to groundwater recharge operations by timing the introduction of sediments into the river in a manner that allows OCWD to divert water with lower sediment concentrations.
- Maximize a complete sediment horizon in the river by developing strategies to re-entrain more sand, than silts and clays.
- Comply with noise, construction timing, air, dust, visual impact, and other ordinances as required by law.
- Ensure consistency with planned regional bike and equestrian trail improvements, and authorized recreation uses.
- Minimize traffic disruptions on access roads by engineering appropriate road crossings where necessary and staging operations to avoid traffic impacts.
- Mitigate operational constraints on the USACE.

1.4.3 Opportunities

There are a number of opportunities that can be realized from moving sediments from Prado Basin to the LSAR. The demonstration project provides substantial opportunities for learning how to best move sediments and what sediment movement activities would be feasible given other resource management requirements of Prado Basin and the LSAR.

1.4.3.1 Demonstration Project Opportunities

Based on the objectives and constraints, there are a number of opportunities to be realized from this demonstration project. The purpose of the demonstration is to learn whether the proposed approach to managing sediments is feasible, can be executed safely, and will improve the health of the basin and river systems.

The following learning opportunities will result from this demonstration project:

- *Engineering.* Can perpetual sediment management be accomplished? Will available technologies achieve the objectives? What will it cost?
- *Geotechnical*. Is there potential that continual operations could impact the dam?
- *Sediment Movement*. What are the minimum flow rates required to introduce sediments into the river to ensure sediment transport? What is the appropriate re-entrainment sediment concentration to be introduced into the river to accomplish the desired benefits? What are the appropriate re-entrainment sediment sizes to accomplish the desired benefits? To what extent will sediment accumulate in the LSAR, where will it accumulate, and to what depth? How long will deposited sediment remain in the river? Will sediment accumulation pose an additional flood risk? Will the proposed project require additional maintenance? Will increased amounts of sediment be discharged to the ocean as a potential source for natural beach replenishment? Will the augmented sediment change the composition of the bed material in the recharge reach and improve its infiltration characteristics? Will sediment erosion be reduced or increased within affected reaches of the river?
- *Flooding*. Will flood risks be increased upstream and downstream of Prado Dam?

- *Operations*. Can sediments be introduced in a manner and rate that will provide the desired benefits, without impacting dam release or water extraction operations? Is it necessary to change operating rules for flood control, diversion and groundwater recharge operations? Can sediment re-entrainment be managed to minimally affect current downstream maintenance requirements?
- *Environmental*. To what extent will habitat restoration and enhancement occur due to removal of sediment from Prado Basin and its introduction into downstream river flows? How much additional diversity can be accomplished? Are there any significant water quality impacts associated with sediment management?
- *Cost Effectiveness*. How can costs be minimized by finding operational efficiencies where possible? Are there opportunities to minimize the number of mobilizations, the number of times material is handled, and can more cost-efficient technologies be used where all else is equal?

The opportunities for learning are substantial. Preliminary evaluation suggests that this demonstration project will show that ongoing sediment management in Prado Basin is feasible and can be accomplished without impacting dam operations or the environment.

1.4.3.2 Long Term Sediment Management Opportunities

Should the demonstration project show what our preliminary analysis suggests, then there are numerous benefits from ongoing sediment management in Prado Basin. These benefits include:

- Improving sediment balance in the LSAR;
- Increasing infiltration rates;
- Creating conditions where habitat in the LSAR and Prado Basin become enhanced through natural processes;
- Increasing sediment loads to the coastal processes to replenish beach sands;
- Reducing the loss of water storage in Prado Basin and restoring some lost capacity;
- Extending the life of the flood control project beyond its design life;
- Reducing further incising of the LSAR, thus stabilizing the river and preventing further losses of infrastructure, habitat, or real estate;
- Slowing increases in water surface elevations in Prado Basin that would require upstream infrastructure modifications, thus lengthening the useful life of upstream infrastructure; and
- Improving sustainable management and use of the infrastructure and preventing future raises of Prado Dam.

1.5 Prior Studies and Reports

There have been some studies conducted on the Santa Ana River and Prado Basin. Sedimentation behind dams has been studied at various locations around the world. Projects have been implemented, primarily in Japan and parts of Europe, to attempt to manage and

control sedimentation behind dams, facilitate flushing and pass through of sediments during release periods, and better understand how to design dams and reservoirs to minimize sediment trapping. In the United Staes, there have been a few dam removals where downstream impacts of sediment loads were studied and evaluated prior to and after dam removal.

Below is a list of documents reviewed as part of this engineering analysis. This is not an exhaustive list of all work conducted to date on sediment issues associated with dams. However, it includes the primary recent studies and literature reviews that are most relevant to the issues associated with Prado Basin and the solutions that have been attempted elsewhere for similar issues. Note that specific references were also reviewed as part of the geotechnical investigation and modeling studies that are presented in the appendices. The results of these studies are used for this engineering analysis.

American Society of Civil Engineers (ASCE); 2008; “ASCE Manuals and Reports on Engineering Practice – No. 110; Sedimentation Engineering, Processes, Measurements, Modeling, and Practice”; ed. by Garcia, Marcelo H.; ISBN-13:978-0-7844-0814-8; ISBN-10:0-7844-0814-9.

City of Corona; 2003; “California Drainage Master Plan;” April 2003.

Engineering and Hydrosystems Inc.; 2007; Santa Ana River Bed Sediment Gradation Characterization Study Phase I.

Engineering and Hydrosystems Inc.; 2008; Santa Ana River Bed Sediment Gradation Characterization Study Phase II.

Golder Associates; 2009; Santa Ana River Bed Sediment Gradation Characterization Study, Phase III.

Golder Associates; 2001; Pre-Feasibility Study for Managing Sediment in Prado Reservoir, Golder Associates, Inc. 2001.

Jonas, Meg; 2010; “Santa Ana River Basin Regional Sediment Management Strategy;” River Engineering Brach, Coastal and Hydraulics Laboratory USACE ERDC; 22 March, 2010.

Kantoush, Sameh A; 2008; Experimental Study on the Influence of the Geometry of Shallow Reservoirs on Flow Patterns and Sedimentation by Suspended Sediments;” Thèse No 4048; École Polytechnique Fédérale De Lausanne; Pour L'obtention Du Grade De Docteur Ès Sciences; PRÉSENTÉE Le 25 Avril 2008.

Kantoush, Sameh A; Sumi, Tetsuya; Kubota, A; 2010a; “Geomorphic Response of Rivers Below Dams by Sediment replenishment Technique;” River Flow 2010 – Ditrich, Kill, Aberle, & Geisenhainer (eds); Bundesanstalt fur Wasserbau ISBN 978-3-939230-00-7; 2010.

Kantoush, Sameh A; Sumi, Tetsuya; Kubota, Akira; Suzuki, Takamasa; 2010b; “Impacts of Sediment Replenishment Below Dams on Flow and Bed Morphology of River;” First International Conference on Coastal Zone Management of River Deltas and Low Land Coastlines; 6-10 March, 2010.

Kearney Foundation, 1996; Background Concentrations of Trace and Major Elements in California Soils; Kearney Foundation Of Soil Science Division Of Agriculture And Natural Resources University Of California; ed. by Deborah Silva; University of California Riverside;

Loiseleux, T., Doppler, D. Gondret, P., and Rabaud, M.; 2004; "Incipient Grain Transport and Pattern Formation at A Sand Surface Sheared By A Continuous Laminar Flow. Part I: Weak Bed Slope. Erosion Dominated Regimes;" Marine Sand Wave and River Dune Dynamics – 1 & 2 April 2004 - Enschede, the Netherlands.

Ninyo and Moore; 2009; "Geotechnical Design Evaluation Santa Ana Regional Interceptor (SARI)/ Repairs to the Unlined Reinforced Concrete Pipe (RCP)/ Reaches IV-A and IV-B, San Bernardino and Riverside Counties, California;" November.

Okano, Masahisha; Kikui, Mikio; Ishida, Hiroya; Sumi, Testuya; 2004; "Reservoir Sedimentation Management by Coarse Sediment Replenishment Below Dams;" Proceedings of the Ninth International Symposium on River Sedimentation; October 18-21, 2004; Yichang, China.

Palmieri, Alessandro; Shah, Farhed; Annandale, George; Dinar, Arial; 2003; Reservoir Conservation: The RESCON Approach; World Bank, Washington DC.

Richmond, Jams A; Magoon, Orville; Edge, Billy; 2007; "Where's the sand? Reduction in the Delivery of Sediment to the Coastlines;" Proceedings of Coastal Zone 07; Portland, Oregon; July 22 to 26, 2007.

USACE; 1988; Santa Ana River: Design Memorandum No. 1, Phase II GDM on the Santa Ana River Mainstream including Santiago Creek, Volume 3, Lower Santa Ana River.

USACE; 2009; Non-Recreational Outgrant Policy, March 2009.

United States Geological Survey (USGS); 2000; Stormflow Chemistry in the Santa Ana River below Prado Dam and at the Diversion Downstream from Imperial Highway, Southern California, 1995–98; Water-Resources Investigations Report 00-4127; Sacramento, CA; 2000

Warrick, J.A. and Rubin, D.M.; 2007; Suspended-sediment rating curve response to urbanization and wildfire, Santa Ana River, California, Journal of Geophysical Res., Vol. 112, pp1-15.

From these researchers and project developers, several key findings are applicable to this project. They are noted below:

- Palmieri et al. (2003) established a methodology for identifying technically feasible and economically optimal reservoir sedimentation management methods. The case studies they considered consistently indicate that sustainable management of reservoirs through reservoir sedimentation management is the most economical method for managing dams and their reservoirs.

- Reservoir geometry affects sediment trapping within the reservoir. Kantoush (2008) and Loiseleux et al. (2004) found that reservoir geometry that resulted in asymmetrical flow and a low number of eddies resulted in greater flushing and less trapping than reservoir geometry that resulted in symmetrical flow and a large number of eddies.

  They found that when water flowed through a reservoir via a channelized system to the reservoir outlet, and where there were stagnant areas where no great momentum exchange occurred with the channelized flow, then the suspended sediments passed through the reservoir via the channelized flow before settling could occur. They identified geometric

shapes that stimulated this type of flow through a reservoir and developed factors that could be applied to modify reservoir bottoms to stimulate this type of flow.

The converse would follow – that reservoir geometry can be established that will result in trapping of sands within engineered zones that can be extracted and entrained for benefit to downstream riparian processes.

- Kantoush et al (2010a and b) found that check dams (small sediment control dams) installed in upstream ends of reservoirs were effective sediment traps for coarse-grained sediments (gravel, cobbles and boulders) and had been field-proven in a number of reservoirs in Japan. Additionally, they found that techniques of placing bulk sediment mechanically removed from a reservoir in downstream rivers would result in eventual erosion and movement of the sediment downstream but that the movement would not be consistent and would be dependent on the magnitude of flows released from the dam. They also found that under certain conditions islands would form downstream that would migrate downriver with different release events.
- Okano et al. (2004) found that turbidity would increase downstream of dams where sediment was being transported during high flows, but would decrease after high flows. He also found that biological integrity of the stream as monitored by microorganisms and macroinvertebrates would return rapidly following release events.
- Richmond, et al. (2007) found that the damming of rivers in the west is the most likely leading cause of coastal erosion occurring in the western United States.
- Jonas (2010) found that the sediment bypass project being evaluated in this engineering analysis has merit and should be considered and, if implemented, monitored on a number of levels. She found that this sediment bypass would be the first attempted in the U.S., but could be modeled somewhat over sediment bypass projects conducted in Japan and China. In particular, she noted the importance of monitoring grain size distribution of bypassed sediments, aggradation at different reaches of the Santa Ana River, and changes in degradation in the Santa Ana River in addition to the monitoring of habitat or other impacts of the project. She felt that detailed review of relevant case studies was necessary to guide the design of this demonstration project.
- Golder (2001) found that not managing sediment in Prado Basin (non-sustainable management) is the least desirable management option from an economic point of view. The pre-feasibility study found that sustainable management of Prado Basin is economically desirable. Potential sediment management techniques include flushing and mechanical removal of sediment. Flushing is less desirable due to the established vegetation. Mechanical removal of sediment is deemed technically feasible. The report recommended further economic and technical evaluation.
- Engineering and Hydrosystems (2007 and 2008) and Golder Associates (2009) found that degradation in the LSAR was occurring and resulting in reduced infiltration capacity in the recharge reach.
- ASCE (2008) confirmed the impacts described in this report attributed to dams and presents a comprehensive body of knowledge for modeling, monitoring, and assessing sediments

movement to improve river health and reduce sedimentation in dams. Authors within the guidance manual present work done in Japan as cited by Kantoush and others as well as work conducted in the United States, albeit at smaller scales than that done in Japan. The findings are consistent with other researchers. They cite studies describing how to model and monitor sediment movement through river systems and how to modify reservoir geometry to encourage sediment flushing. The modeling techniques presented in the ASCE document were utilized in this engineering analysis to model the influent flows to Prado Basin following sediment removal to evaluate re-deposition phenomena and upstream hydraulic phenomena and to model downstream sediment transport to assess aggradation and degradation processes in the Santa Ana River.

Based on these findings from review of literature, this engineering analysis evaluates how best to facilitate movement of sediments from the Prado Basin to the downstream reaches of the Santa Ana River. Several options are evaluated from engineering feasibility and overall impact perspectives. The selected option is proposed for the next step in developing the project, which is a field demonstration with a limited quantity of sediment. Monitoring techniques are proposed to collect the data necessary to evaluate the effectiveness of moving sediments from the Prado Basin, where they become trapped, to the LSAR.

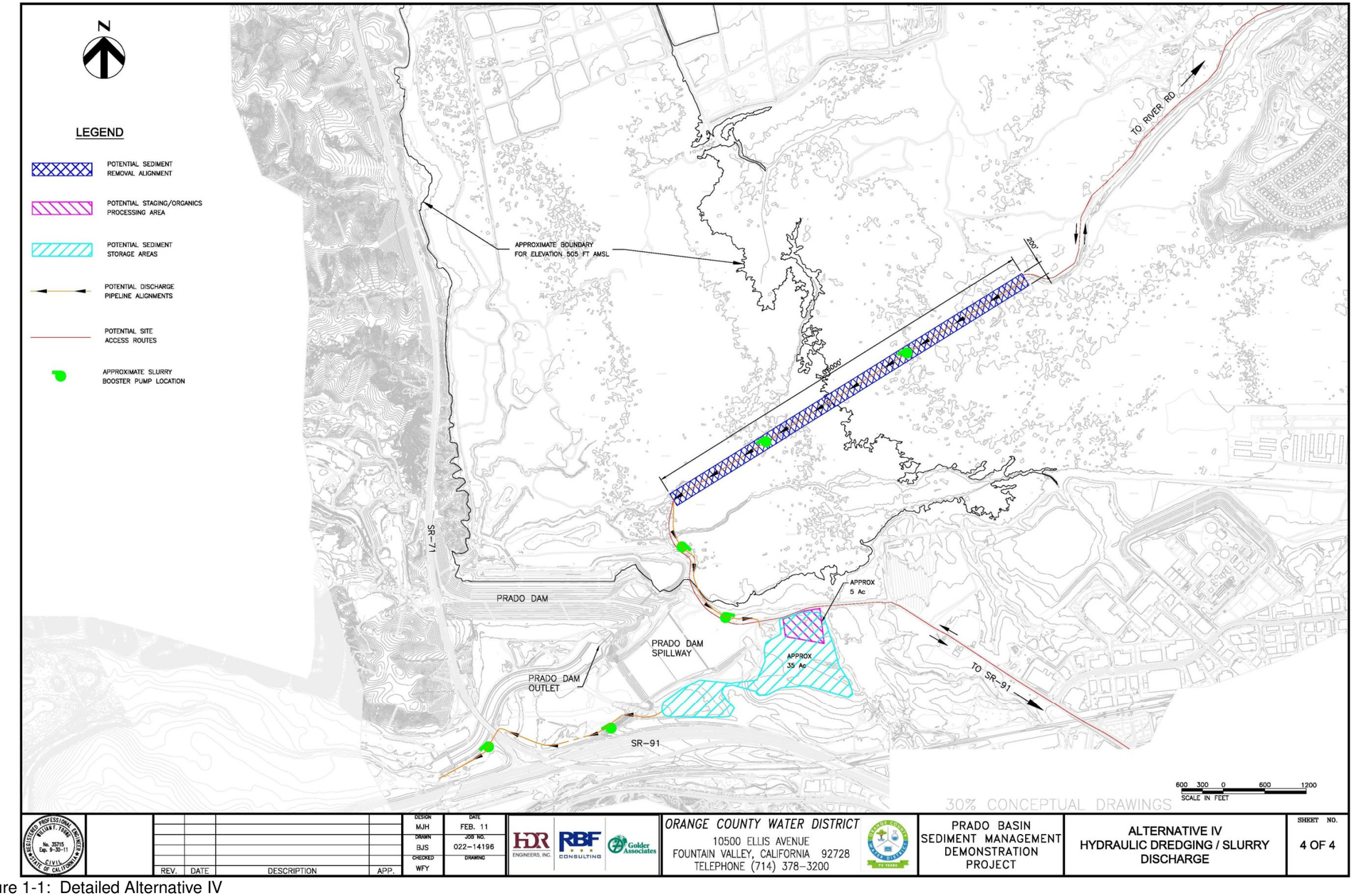


Figure 1-1: Detailed Alternative IV

Page Intentionally Blank

4.0 Selected Plan

4.1 Plan Description

Of the four alternatives that were analyzed, Alternative IV was selected as the most feasible alternative for the SMDP. The following is a detailed description of the unit processes that comprise Alternative IV (Figure 1-1) and the reason for selection. Some preliminary drawings of Alternative IV are provided in Appendix F.

Sediment Removal Alignment: Santa Ana River

The sediment removal alignment will follow the Santa Ana River thalweg approximately 6,000 ft (1828.8 m) upstream and 100 ft (30.5 m) to each side. The Santa Ana River provides favorable sediments (more sands and less silts) for downstream re-entrainment as well as a constant source of sediment replenishment. During biological assessments of the area (Appendix D), it was found that there is more non-native, invasive vegetation that exists along the Santa Ana River's thalweg. As such, clearing and grubbing efforts along this alignment will result in the removal of more non-native vegetative species as opposed to native species than the other identified sediment removal alignments.

The preferred alignment, Alternative IV, indicates a potential area much larger than required. The intention is to modify the alignment by shifting as much as 300 ft north or south within this area during construction to maximize the removal of non-native, invasive vegetation. The SMDP will be permitted with the regulatory agencies to include the 300 ft buffer; this will allow the alignment to be shifted during construction without major delays in the schedule. The remainder of the identified area will remain in its native state. This alignment will also include a 300 ft (91.4 m) minimum vegetative buffer to be left in place at the downstream beginning of the removal alignment in an effort to decrease impacts from floating debris to the dam's outlet structure.

Sediment Removal/Transport Method: Hydraulic Dredging/Slurry Discharge Line

Hydraulic dredging provides the greatest number of advantages and least number of disadvantages when compared to dry excavation or other dredging methods. It allows controlled and rapid removal of sediments, minimal air, noise, and traffic impacts, and direct movement of sediments to the LSAR during appropriate times.

The hydraulic dredging operation of the SMDP will entail the use of two dredgers working simultaneously within the sediment removal alignment. The dredging operation will commence at the upstream portion of the removal alignment and continue downstream with the dredgers moving in a transverse manner. By operating in this fashion headcutting and amount of draft for the dredger can be controlled. Each dredger will be capable of agitating the retained sediment and pumping the slurry at a rate of approximately 3,500 gpm (13,248 lpm). The slurry will be pumped downstream to the sediment storage location via a 12 in (0.3 m) discharge line

attached to each of the dredgers. Four slurry booster pumps will be used for each discharge line. This is due to the elevation difference between the sediment removal alignment and the sediment storage location [approximately 45 ft (13.7 m)] and the length that the slurry needs to travel [approximately 9,000 ft (2743.2 m)]. Using two dredgers, the dredging operation will continue for approximately ten hours per day, seven days per week for five months if there is no work stoppage. This five month timeframe will allow for the removal of 500,000 yd^3 (328,500 m^3). If so desired, the project timeframe can be extended by reducing the number of dredgers.

Sediment Storage Location: D

Sediment storage location D is located northeast of the Prado Dam spillway along the south side of the existing access road. This location is favorable because it has already been disturbed by other activities, thus reducing net impacts to habitat. It is comprised of approximately 60 acres (24.3 hectares) that will be further sub-divided into three dewatering basins, one dry sediment storage area and a water retention basin. Each dewatering basin will be approximately 6.5 acres (2.6 hectares), have a storage depth of 3 ft (1 m), 1 ft (0.3 m) of freeboard and be able to contain approximately 32,000 yd^3 (24,480 m^3) of sediment (roughly one week worth of dredging). The dredgers will pump the slurry into each basin and allow it to settle and dewater. While the preceding basin is dewatering, the next basin will be filled with slurry. Once the sediment dried, it will be moved via heavy equipment to the dry sediment storage area and await re-entrainment. At this time, it is assumed that the slurry will dewater daily. The runoff from the dewatering basins will be collected in a surface reservoir downstream of the basins and serve as the water source for eventual re-mixing with the dried sediment for transport downstream. The process will repeat itself until the end of the SMDP.

Sediment Re-entrainment Method: Slurry Pumping

Dried sediments placed within the storage area will be re-constituted using the water that was captured during the dewatering process. Slurry pumping allows the greatest amount of control during re-entrainment of sediments into LSAR flows. Bulk placement of sediments creates the risk that sediments will accumulate and not be transported until later time periods, which can interfere with water extraction and infiltration operations by OCWD.

Sediment re-entrainment will occur immediately downstream of the energy dissipater located at the end of the concrete outlet channel via a 12-in (0.3 m) or larger discharge line. A movable system will be used to evenly distribute the sediment into the release flows. Because of the elevation difference between the sediment storage location and the re-entrainment location, approximately 95 ft (29.0 m) and the length that the slurry needs to travel via the discharge line, approximately 5,600 ft (1,706 m), three slurry booster pumps are required. The rate and times of entrainment will depend on the outlet flows released from Prado Dam. Higher flows will be targeted for re-entrainment as this will aid in redistributing the sediment in the LSAR. Additionally, re-entrainment during higher flows (greater than 1,000 cfs) presents less of an impact to OCWD recharged operations.

As sediment re-entrainment operations are performed the LSAR will be closely monitored for excessive sedimentation patterns. If excessive sedimentation starts to develop, then re-entrainment rates and procedures will be altered to assist in mitigating any issues. Additional

information on sediment tracking and performance monitoring can be found in Section **Error! Reference source not found.** of this report.

Conclusion

The most feasible alternative should remove and re-entrain of the sediment within a reasonable timeframe, depending on precipitation and dam releases. Further engineering will be conducted during the final version of this engineering analysis to size and select equipment for the demonstration project. Alternative IV employs the least amount of heavy equipment when compared to the other identified alternatives, resulting in lower air and noise impacts, and disturbs the least amount of native species, both vegetative and animal. The cost, although slightly higher than Alternative III, is significantly lower than the other two alternatives and within the range of accuracy from the class four opinion of probable cost.

4.2 Plan Implementation

This preliminary implementation plan will be updated with further engineering conducted during the completion of this engineering analysis. Preliminarily, implementation is anticipated to be as follows below.

Schedule

Clearing and Grubbing

Clearing and grubbing activities for the SMDP will commence on September 15, 2014 beginning with the access/haul routes followed by the sediment removal alignment. Vegetation located below elevation 494 ft msl (150.6 m) within these areas will need to be removed first as the USACE will begin to store water behind Prado Dam up to this elevation for water conservation purposes. It is anticipated that clearing and grubbing activities will take approximately 3.5 months to complete.

Sediment Removal

Sediment removal operations will begin once the clearing and grubbing is complete. The dredging operation will commence at the upstream portion of the removal alignment and continue downstream with the dredgers moving in a transverse manner. Using two dredgers, the dredging operation will continue for approximately ten hours per day, seven days per week for five months if there is no work stoppage. This five month timeframe will allow for the removal of 500,000 yd^3 (382,500 m^3) of sediment. Adjustments can be made to working hours and/or number of dredgers to increase or decrease the sediment removal timeframe.

Sediment Storage

As previously mentioned, three dewatering basins, one dry sediment storage area and a water retention basin will be constructed within the designated storage area. Each dewatering basin will have slurry pumped into the basin and allow it to dewater and settle. Once the sediment has dried for one week, it will be moved via heavy equipment to the dry sediment storage area and await re-entrainment. Since the sediment storage will take place simultaneously with dredging operations, the dredging operation timeframe of approximately five months will apply.

Sediment Entrainment

Dried sediments placed within the storage area will be re-constituted using the water that was captured during the dewatering process. The rate and times of re-entrainment will depend on the outlet flows release from Prado Dam.

Anticipated Lessons Learned

The purpose of this demonstration project is to collect data that will be used to assess the feasibility of, and determine the appropriate design for, a long term sediment management program for Prado Basin. This demonstration project will provide valuable information. A few of the anticipated lessons to be learned are:

- How to best manage debris during operations;
- Rate at which the slurry will dewater;
- Production rates that can be achieved with available technology;
- How basin bottom geometry can select for sand re-introduction;
- Where sediment will aggrade and for how long in the LSAR, dat will be used to develop a calibrated HEC-RAS model that can be used to analyze long term sediment management;
- What operational requirements are necessary to optimize sediment recharge, water capture and diversion, and flood control; and
- What improvement will occur to the LSAR recharge areas and habitat.

Project Map

Geographical Location and Surrounding Work Boundaries

- Main purpose is flood control
- Water conservation is additional beneficial use

Project G: San Sevaine Ground Water Recharge Basin (Inland Empire Utilities Agency)

Part One – Introduction

The San Sevaine Basins were originally constructed for flood control but are now operated for multiple purposes including groundwater recharge under a Four Party Agreement between San Bernardino County Flood Control, Chino Basin Watermaster, IEUA, and Chino Basin Water Conservation District. Millions of dollars have been spent on improvements to the basins by the Four Parties. The basins are used to recharge imported water, stormwater and recycled water in a conjunctive use program. IEUA performs the actual operation and maintenance of the basins for recharge purposes in cooperation with the Flood Control District. There are five, soft-bottomed basins located in series along San Sevaine Channel, comprising about 93 acres with the potential to recharge up to 8,500 AFY of recycled water. However, as the facility currently operates, recycled water is delivered to the lower basin, Basin 5, which has a lower infiltration rate compared to the upper basins, enabling a current recharge of approximately 500 AFY.

In order to fully realize the valuable potential of the basin, it is proposed to build approximately 5000 feet of pipeline to deliver water (recycled and stormwater) to the upper basins, which have higher infiltration rates. The project includes: (1) small pump station that could pump either recycled water or stormwater to the upper basins; (2) 2,000-foot pipeline from basin 5 to basin 3; (3) geophysical investigation to determine if poor infiltration rates in basin 5 can be improved; (4) flow control and internal berms toRoute water between basin 1 and basin 2 and keep a minimum amount of water depth throughout the summer to help with vector control; (5) internal berms in basin 5 to deepen water and alternate wet and drying cycles to control insect issues.

The project is expected to increase recharge by approximately 4,500 AFY of recycled water, 500 AFY of stormwater, and provide a 10% increase in imported water recharge for conjunctive use. The project is also expected to solve the vector control problems caused by the continuous inflow of dry weather nuisance runoff in the summer. The dry weather runoff causes vegetation growth and provides mosquito habitat. The project will construct berms to provide a conservation pool of water that is deep enough to stock with mosquito fish. This will prevent the need for “emergency maintenance” in the summer which could be destructive to wildlife. The project will also provide more water to the basins year-round which has the incidental benefit of increasing open water and shoreline habitat for waterfowl.

Goals and Objectives

The objective of this project is to increase the infiltration of recycled water and stormwater in the San Sevaine Basins. The expected benefits include 4,500 AFY of recycled water recharge and 500 AFY of stormwater recharge. The recharge program allows water banking in the groundwater basin to meet multiple demands and different hydrological conditions on a consistent basis. The basins are used for recharge of imported water as well as stormwater and recycled water in a synergistic conjunctive use program. The goal is to make cost-effective improvements in basin design and infiltration characteristics that will increase the conjunctive use of all three types of water. Up to a 10% increase in imported water recharge (120 AFY) is a realistic objective for the project. Improved vector and insect control is another objective.

The project is needed to improve the infiltration capacity of San Sevaine Basin 5, capture additional recycled water and stormwater in San Sevaine Basin 3, and make basin improvements that will enhance vector control. These additional improvements are needed in order to fully realize the benefit of the $50 million of capital already expended by the Four Parties (Flood Control, Water Conservation District, Watermaster and IEUA) on the Chino Basin Recharge Facilities Improvement Projects. Any additional groundwater recharge that is accomplished is a significant benefit to the entire watershed. During periods of drought, this additional water that is stored in the ground for future needs is imperative in meeting current and future water demands. All of the water that is recharged has a positive effect on the salt balance of the watershed because the recharge is occurring at the upper end of the watershed in the

alluvial fan, where stormwater quality and recycled water quality are the best. This offsets the pumping of highly saline water from the bottom end of Chino Basin, so it improves water quality, removes salt from the basin, and achieves hydraulic control for Orange County. The vector control aspect of the project is needed to prevent the spread of West Nile Virus.

The project is part of the Regional Recycled Water Implementation Plan (RWIP) adopted in November of 2005. The RWIP promoted a strategy to utilize recycled water to the maximum extent practicable in order to:

- Reduce dependency of the Chino Basin water users on imported State Water Project water;
- Offset groundwater pumping that exceeds the Basin's safe yield;
- Improve groundwater quality in the Basin by integrating the desalter program, the recycled water program, and the recharge program into one Optimum Basin Management Plan.
- Increase the number of times that a drop of water in the Santa Ana Watershed is used before it reaches the ocean.
- Promote resource-efficient, multiple-purpose use of flood control basins.

The San Sevaine project helps meet all of the above goals. The project also provides a reliable water supply by reducing dependence on imported water; banking water underground to meet demand in all hydrologic conditions; and increasing use of recycled water. It enhances the environment by providing open-water and shoreline habitat for birds. Regional integration is achieved through stakeholder collaboration on the Chino Basin Recharge Master Plan Update and the Four Party Agreement. It promotes sustainable water solutions by linking land and water use and by reducing energy consumption and greenhouse gas production. It manages rainfall as a resource by integrating flood control and other benefits. It restores some of the rainfall percolation capacity that has been lost due to urbanization and hard-paving channels. It protects the quality of rainfall that runs off the mountains by percolating it underground before it has a chance to pick up contaminants from agricultural areas and it provides soil-aquifer treatment for urban nuisance runoff.

Project List

The main components of the project are summarized below:

Project Description	**Project Cost**	**Design Completion**	**Bid**	**Construction Completion**
San Sevaine Improvements	$2,500,000	Summer 2013	Fall 2013	Fall 2014

1. The San Sevaine Improvements project consists of the design and construction of approximately 5,000 feet of pipeline and a pump station with the ability to either pump stormwater and/or recycled water to the upper basins, which have higher infiltration rates. The project will also include geophysical investigations to determine if infiltration rates can be improved and flow control and internal berms to aid with vector control and maximizing basin operation by alternating wet and dry cycles.

Integrated Elements of Projects

The Regional Recycled Water Program is the result of collaborative efforts of IEUA's member agencies (Chino, Chino Hills, Fontana, Montclair, Ontario, Upland and Cucamonga Valley Water District). A Three Year Business Plan was developed cooperatively in 2007 to strategically develop an implementation plan to increase the reuse of recycled water cost effectively and efficiently. The San Sevaine Improvement Project is needed to realize the full potential of the basin. The Chino Basin groundwater recharge program results from the collaboration and execution of the four party agreements between IEUA, Chino Basin Water Master, San Bernardino County Flood Control and the Chino Basin Water Conservation District. The main goals of the program are to increase stormwater, recycled and imported water recharge to improve water supply reliability, decrease imported water demand, and improve groundwater quality. The goals of the recharge plan could not be met reliably without this project.

Completed Work

Per the Project Solicitation Package, the grant award date is October 01, 2013. The project is currently in the pre-design phase, no environmental compliance efforts have been completed. The following work activities are expected to be complete prior to the grant award data: 1) final design, and 2) CEQA/NEPA and other environmental compliance protocols will be completed prior to the projects bid date. Refer to the Project List section for additional information regarding the project schedule.

Existing Data and Studies

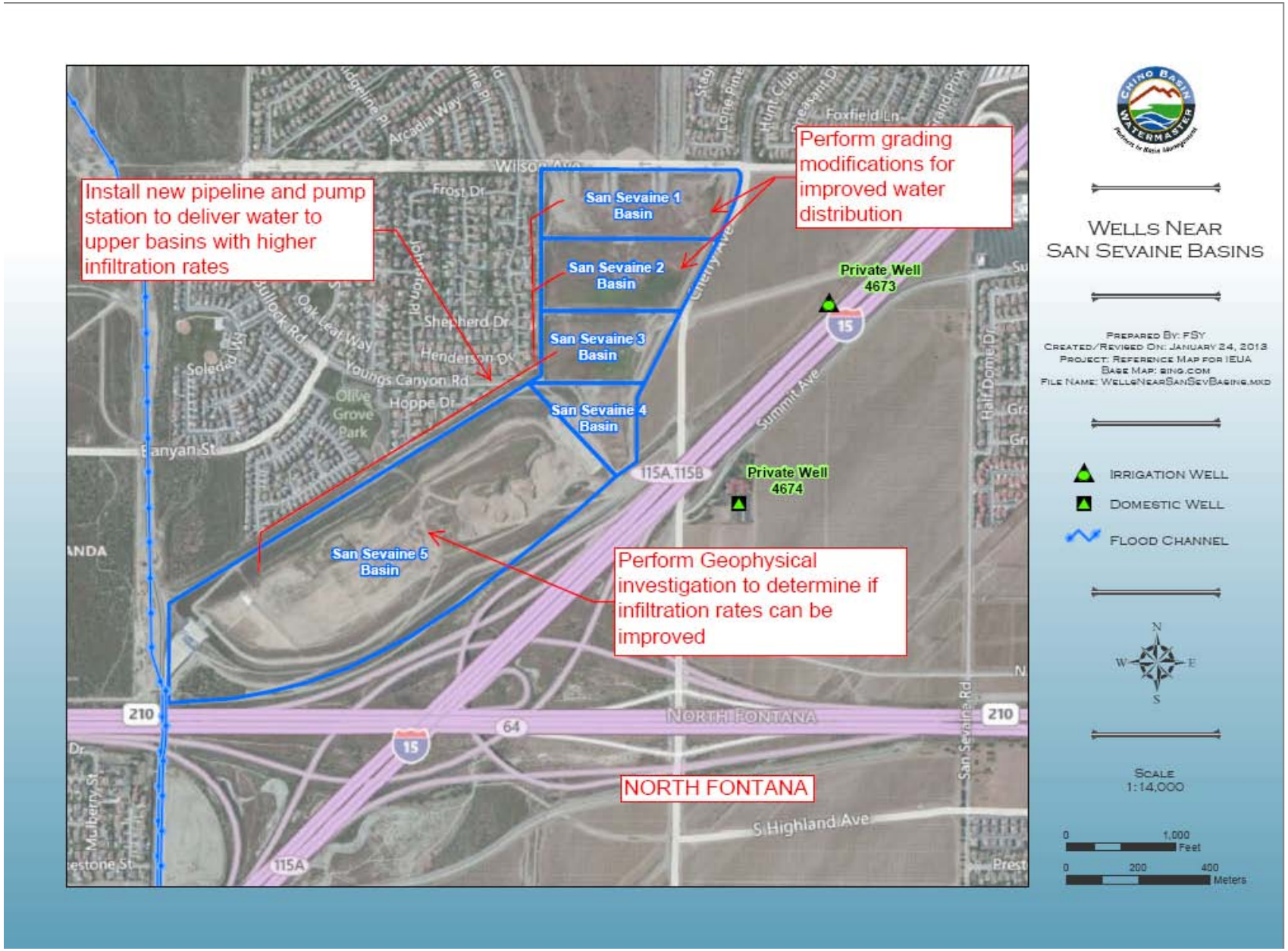
The Chino Basin Watermaster is a consensus-based organization facilitating development and utilization of the Chino Groundwater Basin. The Watermaster consists of various entities pumping water from the Basin including cities, water districts, and water companies, agricultural, commercial and other private concerns. The Watermaster manages the Chino Groundwater Basin in the most beneficial manner and to equitably administer and enforce the provisions of the Chino Basin Watermaster Judgment Case No. RCV 51010. The Watermaster is progressively and actively implementing the Basin's Optimum Basin Management Program which includes extensive monitoring, further developing recharge capabilities, storage and recovery projects, managing salt loads, developing new yield such as reclaimed and storm water recharge and continuing to work with other agencies and entities to enhance the Basin and ensure a continuing water supply for the long-term beneficial use of the Region.

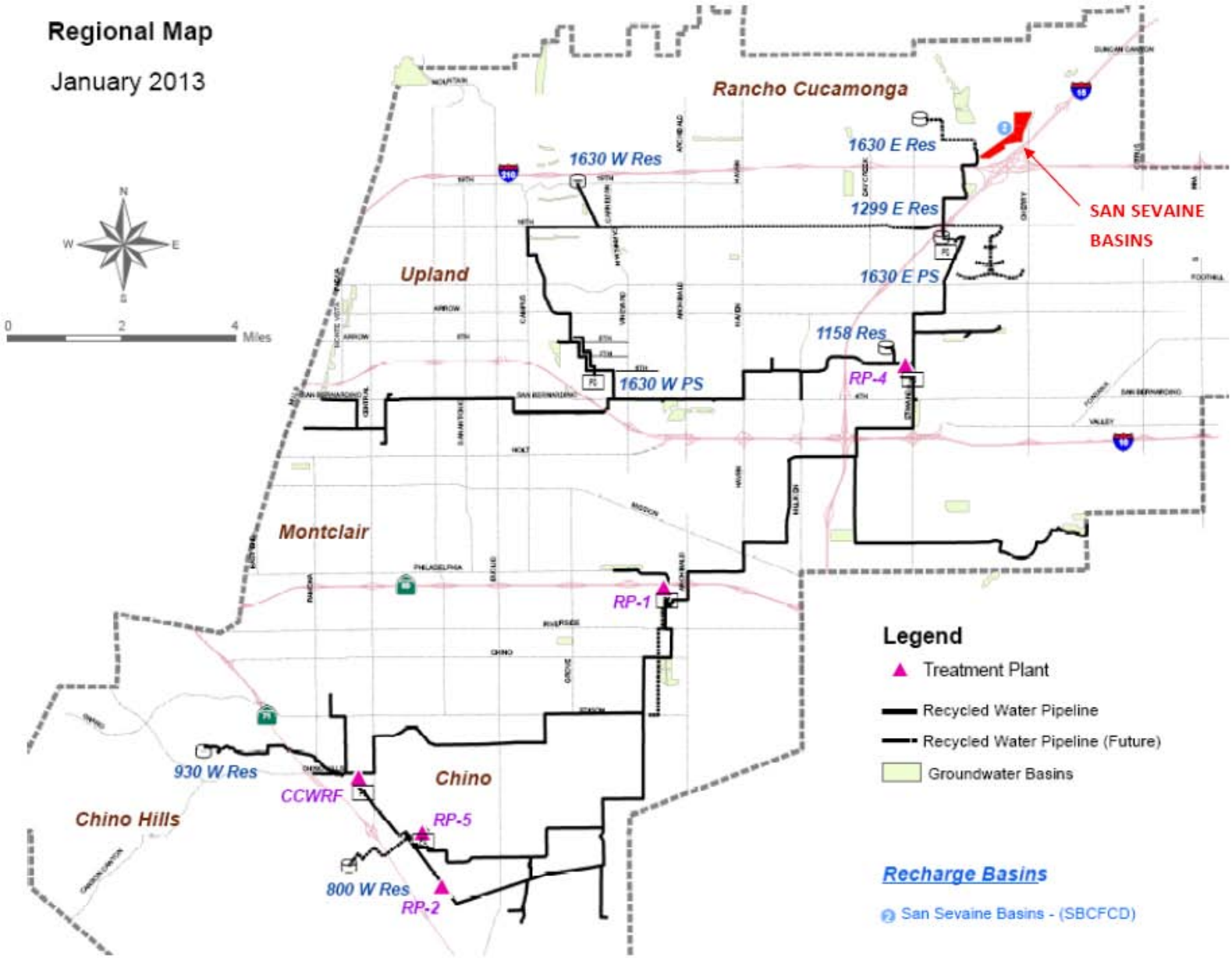
Inland Empire Utilities Agency (IEUA) completed the Recycled Water System Feasibility Study (Feasibility Study) in 2002. The Feasibility Study is the Facilities Planning Report for IEUA's Recycled Water System, based on which Capital Improvement Projects for the Recycled Water Distribution System was developed. Since then, IEUA updated the Feasibility Study with the Regional Recycled Water Implementation Plan (RWIP) in 2005. The RWIP provides an updated overview of the recycled water supplies, existing and estimated recycled water demands, and a recommended regional backbone system to distribute recycled water throughout its service area. IEUA initiated the Three Year Business Plan (Business Plan) in 2007 to accelerate the implementation of the RWIP.

Previous studies performed justifying the project site location, feasibility, and technical methods are as follows:

- 2001 Chino Basin Optimum Basin Management Plan
- 2002 Regional Recycled Water Feasibility Study
- 2002 Ground Water Recharge MOA Four-Party Agreement
- 2005 Regional RW Implementation Plan
- 2007 Three Year Business Plan
- 2010 GWR Master Plan Update

Project Map


Install new pipeline and pump station to deliver water to upper basins with higher infiltration rates
Perform grading modifications for improved water distribution
Perform Geophysical investigation to determine if infiltration rates can be improved
NORTH FONTANA
San Sevaine 1 Basin
San Sevaine 2 Basin
San Sevaine 3 Basin
San Sevaine 4 Basin
San Sevaine 5 Basin
Private Well 4673
Private Well 4674
Wilson Ave
Frost Dr
Foxfield Ln
Arcadia Way
Shepherd Dr
Henderson Dr
Youngs Canyon Rd
Hoppe Dr
Oak Leaf Way
Bullock Rd
Olive Grove Park
Banyan St
Summit Ave
Cherry Ave
Half Dome Dr
San Sevaine Rd
S Highland Ave
Mulberry St
NORTH FONTANA
15
210
64
115A
115B
WELLS NEAR SAN SEVAINE BASINS
PREPARED BY: FSY
CREATED/REVISED ON: JANUARY 24, 2013
PROJECT: REFERENCE MAP FOR IEUA
BASE MAP: BING.COM
FILE NAME: WELLSNEARSANSEVBASINS.MXD
IRRIGATION WELL
DOMESTIC WELL
FLOOD CHANNEL
N
W
E
S
SCALE 1:14,000
0
1,000 Feet
0
200
400 Meters


Regional Map
January 2013
Rancho Cucamonga
Upland
Montclair
Chino
Chino Hills
1630 W Res
1630 E Res
1299 E Res
1630 E PS
1158 Res
1630 W PS
RP-4
RP-1
930 W Res
CCWRF
RP-5
800 W Res
RP-2
SAN SEVAINE BASINS
0 2 4 Miles
Legend
Treatment Plant
Recycled Water Pipeline
Recycled Water Pipeline (Future)
Groundwater Basins
Recharge Basins
San Sevaine Basins - (SBCFCD)

Project Timing and Phasing

Subject project is not part of a multi-phased project complex.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
Deliverables: Review of all costs for compliance and preparation of invoices and reporting deliverables as required in the contract.

Task 2: Reporting
Deliverables: Submission of quarterly, final, and post completion reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

Easements or right of ways will be required from the san Bernardino Flood Control District. Mitigation land will be procured if required depending upon disturbance impacts to the existing San Bernardino Kangaroo Rat habitats near the project site. However, at this time, IEUA is not aware of any required mitigation.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Pre-Design Assessment and Evaluation
Deliverables: Technical studies, historical data trends, and exploratory excavation plans.

Task 5: 30%, 50%, 85% and Final Design
Deliverables: Completion of project plans and specifications at the final level.

Task 6: Environmental Documentation
Deliverables*:* Approved and adopted CEQA and historical preservation documentation.

Task 7: Construction Contracting
Deliverables: Advertisement for bids; pre-bid contractors meeting; evaluation of bids; award contract

Budget Category (d): Construction/Implementation

Task 8: Construction

- Subtask 8.1 Construction Contractor Mobilization and Site Preparation
- Subtask 8.2 Project Construction
- Subtask 8.3 Start-up and Performance Testing
- Subtask 8.4 Project Acceptance

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 9: Environmental Compliance/Mitigation/Enhancement
At this time, IEUA is not aware of any required mitigation.

Budget Category (f): Construction Administration

- Subtask 10.1 Construction Project Management
- Subtask 10.2 Labor Compliance Program
  - Deliverables: Submission of Certified Payroll, site interviews, certification of compliance

Budget Category (g): Other Costs

- Subtask 12 Permitting

Deliverables: San Bernardino County Flood Control District Permit to Construct. Section 1602, 401, 402, 404, etc. if plan determines they are required.

Project H: Corona/Home Gardens Well Rehabilitation and Multi-Jurisdictional Water Transmission Line Project (City of Corona)

Part One - Introduction

The City of Corona Department of Water and Power (DWP) is partnering with the Home Gardens County Water District (District) to replace two inactive, non-potable, ground water wells. They are located on Grant Street in the unincorporated area of Home Gardens, which is adjacent to the City of Corona. The District does not have the ability to treat the high-nitrate, non-potable groundwater which is produced at the site. DWP, however, owns and operates a comprehensive well-collection system just two miles away. The District has agreed to provide an easement to allow DWP to replace the existing wells through an agreement that will benefit both agencies. The DWP will replace the non-functioning wells and construct over 11,000 feet of 12-inch pipeline from the well site to its existing well-collection lines in Corona. A nitrate-removal system will be installed and the well water from the Home Garden site will be blended with DWP's existing well-water collection system. The blended water will meet the regulatory standards of the Environmental Protection Agency and the California Department of Health Services. The District will also benefit from the pipeline through a water-purchase agreement that is currently being negotiated between DWP and the District.

This project provides a long-term, sustainable solution for increasing reliable, quality water. The DWP estimates the rehabilitated wells will produce 1,600 acre feet per year (AFY), which equates to enough water for 10,000 people.

Goals and Objectives

Goal 1: Reduce reliance on imported water/ improve water reliability.
The District has two inactive wells that need to be replaced. The water produced at this site requires nitrate removal. With funding, this project will replace the wells, install nitrate removal systems and construct pipelines to transport the water to DWP's water-distribution system. The District will then purchase water from DWP through a negotiated reduced price. It is a multi-jurisdictional approach that benefits both parties. This project will generate 1,600 AF of water annually by pumping and treating water from the currently inactive wells, thereby reducing reliance on imported water.

Goal 2: Improve water quality.
DWP will treat the water from the rehabilitated wells, reducing nitrate levels to meet EPA water quality standards**.**

Goal 3: Improve integration/coordination to access untapped water resources.
DWP and the District are combining their assets to accomplish goals with a multi-jurisdictional approach, which allows for the use of a valuable local water resource. The synergy of this partnership is greater than either partner could accomplish independently.

Goal 4: Help restore California's ecosystem.
This project will help reduce California's reliance on Bay-Delta waters. Roughly 51% of DWP water is imported from outside sources, including the Sacramento-San Joaquin Delta. This is the West Coast's largest estuary and home to more than 22 species of fish including the Delta smelt. The Delta smelt is a key indicator species for ecosystem health. In 2004 it was found to be on the edge of extinction. From migrating salmon and water fowl to endangered plants and mammals, the Bay-Delta's ecosystem will benefit from reduced drain on its waters.

Goal 5: Reduce greenhouse gas emissions.
The use of local groundwater in lieu of State Water Project water will reduce the volume of greenhouse gas emissions by a factor of 3.39. By utilizing local groundwater in lieu of State Water there will be a reduction of 1,029 tons of carbon dioxide, 85.92 pounds of methane, and 22.96 pounds of nitrous oxide released into the atmosphere annually. These pollution reductions will occur by reductions in the amount of energy that would have been used to pump this same amount of imported water over the Tehachapi Mountains and into Southern California.

Purpose and Need

The purpose of this project is to allow two separate agencies, DWP and the District, to combine their individual assets to efficiently utilize local water resources in Southern California. Without rehabilitation of the wells or pipelines to transport the water to a treatment facility, the water will remain unused.

As a result of their combined efforts, this project will produce 1,600 AFY of water that was previously untapped and unavailable. To put this in perspective, the District has roughly 800 metered connections for a population of close to 3,000 people. It is estimated that 1,600 AFY equates to the annual water consumption for 10,000 people. This water supply is estimated to provide enough water for 100% of the District's metered population through 2030 plus additional water for 7,000 people in Corona. Without this project, this water will continue to go unused.

Integrated Project Elements

Utilizing the existing well site and connecting its water resources to DWP's system is a cost effective way to procure a local water source. This project truly is an example of synergy; the whole is greater than the sum of its parts. Together, DWP and the District are in a position to help supply critical water resources to ensure water reliability in the region. This project will benefit both the City of Corona and the disadvantaged community in the Home Gardens district by allowing for the transfer of water between both entities through rehabilitating a well site and new connection lines.

By extension, the region will benefit from the synergies of water-resource planning and sharing between these adjacent agencies. The multi-jurisdictional water line and new local water source can be used to resolve water-related shortages, emergencies or maintenance interruptions from imported water sources. Local agencies need more water supply alternatives for dealing with drought reductions and cutbacks in the allocated use of Colorado River and State Water Project supplies. This project puts both Home Gardens and the City of Corona one step closer to being water independent.

Completed Work

The following work is expected to be completed prior to the grant award date:

Preliminary Engineering/Feasibility Study: Completion by June 2013:
The Corona DWP has hired an engineering firm to complete a preliminary engineering and feasibility study. The study will take into consideration the nitrate-removal system which will need to discharge into the City of Corona's sewer.

Drilling Test Wells: Completion by June 2013:
DWP will drill test wells to verify the water quality and volume. Upon completion of the testing and with satisfactory results, final design of the wells and pipelines will begin.

CEQA – Completion by October 2013:
A Mitigated Negative Declaration is anticipated for the installation of pipelines.

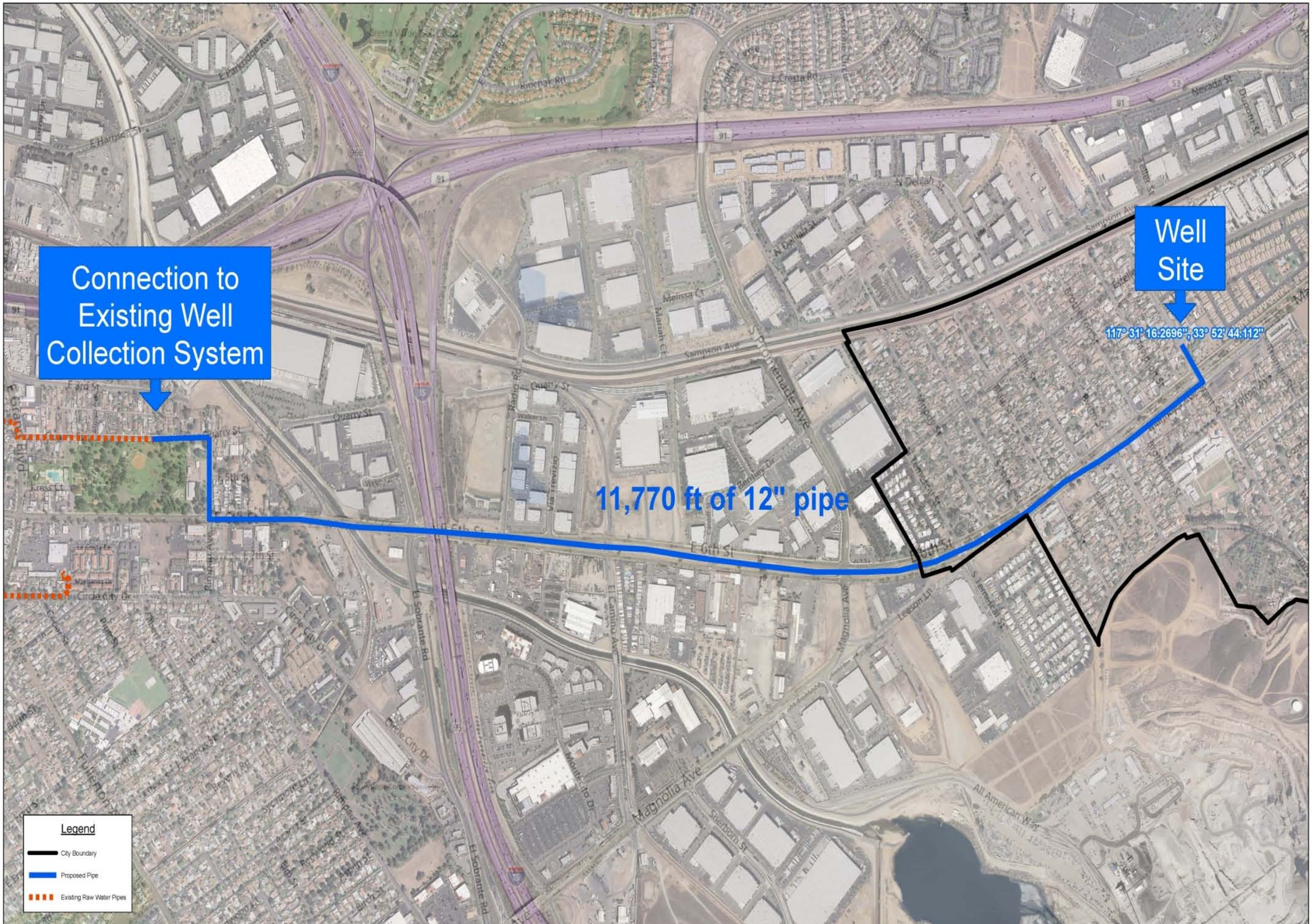
Easement and Water Rate Agreement: Completion by June 2013:
The Corona DWP and Home Gardens Water District will execute an agreement for an easement for DWP to operate the replacement wells. A contract will be executed to allow for Home Gardens Water District to obtain water from DWP at a negotiated rate.

Existing Data and Studies

Project-specific studies are currently underway to verify the feasibility of drilling the replacement wells (test wells) and also to confirm the best routing and connection point for the Home Gardens pipeline to join the DWP system.

The project is aligned with overarching water reliability goals for Southern California. Water reliability is one of the main objectives outlined in Western Municipal Water District's (WMWD) 2010 Urban Water Management Plan. The proposed project will lessen Corona DWP's reliance on State Water Project and Colorado River Water provided by WMWD and also the Metropolitan Water District (MWD). Currently, these imported water sources comprise more than one half of the water utilized by Corona DWP. Re-establishing a local water source has important benefits in the event of a water emergency thereby decreasing outage times and ensuring customers have reliable water access.

Project Map



City of Corona

Department of Water and Power
755 Corporation Yard Way
Corona, CA 92880

0 250 500 1,000 Feet

N W E S

City of Corona

Home Gardens Pipeline
Preliminary Analysis
January 28, 2012

Project Timing and Phasing

Drilling of the replacement wells and pipeline construction are scheduled to occur concurrently. Requests for Proposals (RFPs) for both the replacement well and pipeline construction are scheduled to be issued in September 2013. The funding plan calls for Proposition 50 funds to provide for the drilling of the replacement wells and Proposition 84 IRWMP funds are proposed to provide for the pipeline construction. DWP will provide funds or in-kind contributions for all other tasks including project administration. Construction is set to begin by February 2014 and end by **June 2014**.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration

The City of Corona Department of Water and Power (DWP) staff will provide administrative oversight for the project. Activities will include reviewing grant agreements and contracts, attending meetings, maintaining grant and project files, preparing and processing requests for reimbursements, preparing updates for executive management and the City Council, ensuring grant agreement compliance, coordinating any audit requests and/or examination of records by SAWPA, the State of California, or independent auditors, and maintaining all records for at least three years after the project is closed out. These items will be contributed in-kind by the City.

Deliverables: Preparing Request for Reimbursements, Reconciling Invoices to Reimbursement Requests, Maintaining Project Files, Grant Agreements, Audit Reports, Memos to the File, City Staff Reports, etc.

Task 2: Labor Compliance Program

The City of Corona DWP staff will provide all required Labor Compliance Program information to DWR. This will be contributed in-kind by the City.

Deliverables: Submission of Labor Compliance Program.

Task 3: Reporting

The City of Corona DWP staff will provide reports to DWR on a quarterly basis and at the completion of the grant. This will be contributed in-kind by the City.

Deliverables: Submission of quarterly, final, and post completion reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

Task 4: Easement

DWP will obtain an easement for the Home Gardens well site in order to drill and operate the replacement wells.

Deliverable: Easement.

Budget Category (c): Planning/Engineering/Environmental Documentation

DWP has contracted for preliminary engineering and planning which is currently underway.

Deliverable: Feasibility and Preliminary Engineering Studies, Concept Designs, Environmental Documentation.

Task 5: Assessment and Evaluation

The Corona DWP has hired an engineering firm to complete a preliminary engineering and feasibility study. This Preliminary Engineering and Feasibility Study will be completed by March 2013. The study will include alternative analysis of two potential alignments for the new pipeline to connect the wells to the existing DWP system. The study will take into consideration the nitrate removal system which will need to discharge into the City of Corona's sewer. The study will include cost estimates and well testing data to verify the quality and quantity of the water produced by the replacement wells.

Deliverables: Preliminary Engineering and Feasibility studies.

Task 6: Final Design

Final Design and Technical Specifications for both the replacement wells and pipelines will be complete by **October 2013**.

Deliverables: Completion of project plans and specifications at the final level.

Task 7: Environmental Documentation

A CEQA analysis is underway with a Mitigated Negative Declaration anticipated. The Corona City Council is expected to adopt the CEQA determination by **May 2013**.

Deliverables*:* Approved and adopted CEQA documentation.

Task 8: Permitting

An encroachment permit for the Right of Way will be required from Riverside County, and the wells will require a California Department of Public Health (CDPH) permit. These permits will be obtained by January 2014.

Deliverables: County Encroachment Permit and CDPH well permit.

Budget Category (d): Construction/Implementation

Task 9: Construction

Subtask Task 9.0: Construction Contracting

DWP will issue Requests for Proposals (RFP), evaluate proposals, and award contracts in accordance with the City of Corona Purchasing Policy and Procedures.

Deliverables: RFP; evaluation of proposals; award contracts.

Subtask 9.1 Mobilization and Site Preparation

Civil site work will be conducted at the well site and along the pipeline route with site clean-up and preparation.

Subtask 9.2 Project Construction

1. Install approximately 11,770 linear feet of 12-inch pipeline valves and tie-ins to connect Home Gardens groundwater wells to DWP water system. A standard "cut and cover" method will be used to install the new pipeline underneath asphalt roadways. The pipeline installation will also require boring underneath railroad tracks and underneath Caltrans right of way.
2. Install nitrate removal system.
3. Drill replacement groundwater wells at Home Gardens site. Occurs concurrently with pipeline construction.

Subtask 9.3 Performance Testing and Demobilization

DWP will oversee testing of well performance, nitrate removal, water quality, and pipeline integrity. DWP will oversee all clean up and demobilization of construction.

Deliverables: 11,770 linear feet pipeline, 2 ground wells, nitrate removal system.

Budget Category (e): Environmental Compliance/Mitigation Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

DWP anticipates a Mitigated Negative Declaration for the project. Minor mitigation measures will likely be included to reduce air pollution and minimize construction impacts to water quality. DWP will also ensure safe handling of any mineral or archeological objects should they be found on the well construction site or pipeline pathway. Traffic calming measures will also be implemented to allow for the installation of pipeline underneath the asphalt roadway.

Deliverables: Mitigated Negative Declaration and Mitigation Monitoring Plan.

Budget Category (f): Construction Administration

Task 11: Construction Administration

DWP will oversee the construction administration of the project, which includes monitoring all construction work, conducting on-site inspections throughout construction process, hosting weekly progress meetings with construction foreman and project engineers, reviewing invoices and approving payments for work, ensuring compliance with the Mitigation Monitoring Plan, ensuring compliance with any prevailing wage regulations, testing all components, communicating periodically with SAWPA, and ensuring for the safety of the work site as required by law, etc.

Deliverables: Meeting minutes, inspection checklists, invoices, checks and payments.

Budget Category (g): Other Costs

As stipulated by SAWPA, $300,000 shall be set aside in grant funds that directly benefit the disadvantaged community of Home Gardens. This funding will be provided as a credit to Home Gardens Water District in the Water Purchase Agreement.

Construction services such as contracting for inspections is included in this category.

Budget Category (h): Construction/Implementation Contingency

Any unforeseen cost overruns will be covered by DWP.

Project I: Enhanced Stormwater Capture and Recharge along the Santa Ana River (San Bernardino Valley Municipal Water District)

Part One - Introduction

This project consists of improving existing facilities owned and operated by the San Bernardino Valley Water Conservation District and constructing new facilities which will increase the amount of stormwater that can be captured and recharged along the Santa Ana River up to 80,000 acre-ft in a single year and 500 cubic feet per second instantaneous flow.

Goals and Objectives

The project is intended to meet the specific goals and objectives for the Santa Ana River recharge basins as defined in the Upper Santa Ana River Watershed Integrated Regional Water Management Plan (IRWMP). The IRWMP, completed in 2007, was generated under the guidance of a Technical Advisory Group (TAG), consisting of 13 water management agencies, San Bernardino County Flood Control District and other stakeholders within the Upper Santa Ana Watershed. The overarching water management objectives in the IRWMP are: (1) water supply reliability improvement, (2) water quality protection, and (3) ecosystem restoration and environmental improvement.

This project will provide the following benefits to the Cities and surrounding communities of Valley District and Western including San Bernardino, Colton, Loma Linda, Redlands, Rialto, Bloomington, Highland, East Highland, Mentone, Grand Terrace, and Yucaipa, San Bernardino, Colton, Loma Linda, Redlands, Rialto, Bloomington, Highland, East Highland, Mentone, Grand Terrace, Yucaipa, Corona, Norco, Riverside, Box Springs, Eagle Valley, Lake Elsinore, Lee Lake and Temecula:

- Increased utilization of local storm water
- Increased water supply reliability
- Improved water quality

The specific goals for these facilities are the ability to capture and recharge up to 80,000 acre-feet in a single year at a maximum instantaneous flow rate of 500 cfs.

Purpose and Need

This project will improve water supply reliability by increasing the utilization of local stormwater resources and the high quality of the local stormwater will also benefit water quality. This additional stormwater capture may also result in reduced reliability of the State Water Project.

Project List

Project	Description	Status	Implementing Agency
CEQA Compliance		Complete	SBVMWD
Environmental Permitting	Secure required permitting	10%	SBVMWD
Property Acquisition	Approximately 12 vacant areas will need to be procured	40%	SBVMWD
Construction of Facilities	The project consists of the improvements necessary to capture and convey up to 80,000 acre-feet of stormwater in a single year at a rate of 500 cfs.	60%	SBVMWD
Startup			

Integrated Project Elements

The stormwater captured by this project and recharged into the groundwater basin can be pumped by nearly all of the retail water agencies within the San Bernardino Valley Municipal Water District. Some of the water will also be pumped by partners in Riverside and can be delivered to regional infrastructure including the Metropolitan Water District of Southern California Inland Feeder and the State of California (East Branch Extension of the State Aqueduct.

Completed Work

- CEQA completed July 2012
- 60% Design Submittal completed September 2012
- Appraisals for property acquisition to be completed in February 2013

Existing Data and Studies

- *Basis of Design Report*, August 2011
- *Upper Santa Ana Watershed Integrated Regional Water Management Plan*, November 2007

Project Map

See attached Project Area Map titled "SBVMWD Att 3-Workplan-Project Area Map.pdf"

Project Timing and Phasing

The Enhanced Stormwater Capture and Recharge along the Santa Ana River project is a standalone project.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

N/A - Grant funds are not requested for any Direct Project Administrative Costs related to this project.

Budget Category (b): Land Purchase/Easement

N/A - Grant funds are not requested for any Land Purchase/Easement costs related to this project.

Most of the property needed for this project is owned by one of the partners in this project, the San Bernardino Valley Water Conservation District. Approximately 12 pieces of vacant land will need to be procured. Plats and legals have been prepared. Property appraisals are currently underway.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

N/A - Grant funds are not requested for Planning/Design/Engineering or Environmental Documentation costs related to this project.

Task 4: Assessment and Evaluation
Basis of Design Report - completed, August 2011
60% Design Submittal – completed September 2012
Property Appraisals – to be completed February 2013

Task 5: Final Design
Final Design Submittal – First quarter 2013

Task 6: Environmental Documentation
CEQA completed July 2012

Task 7: Permitting
Permitting in progress

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting
Not Applicable.

Task 9: Construction:

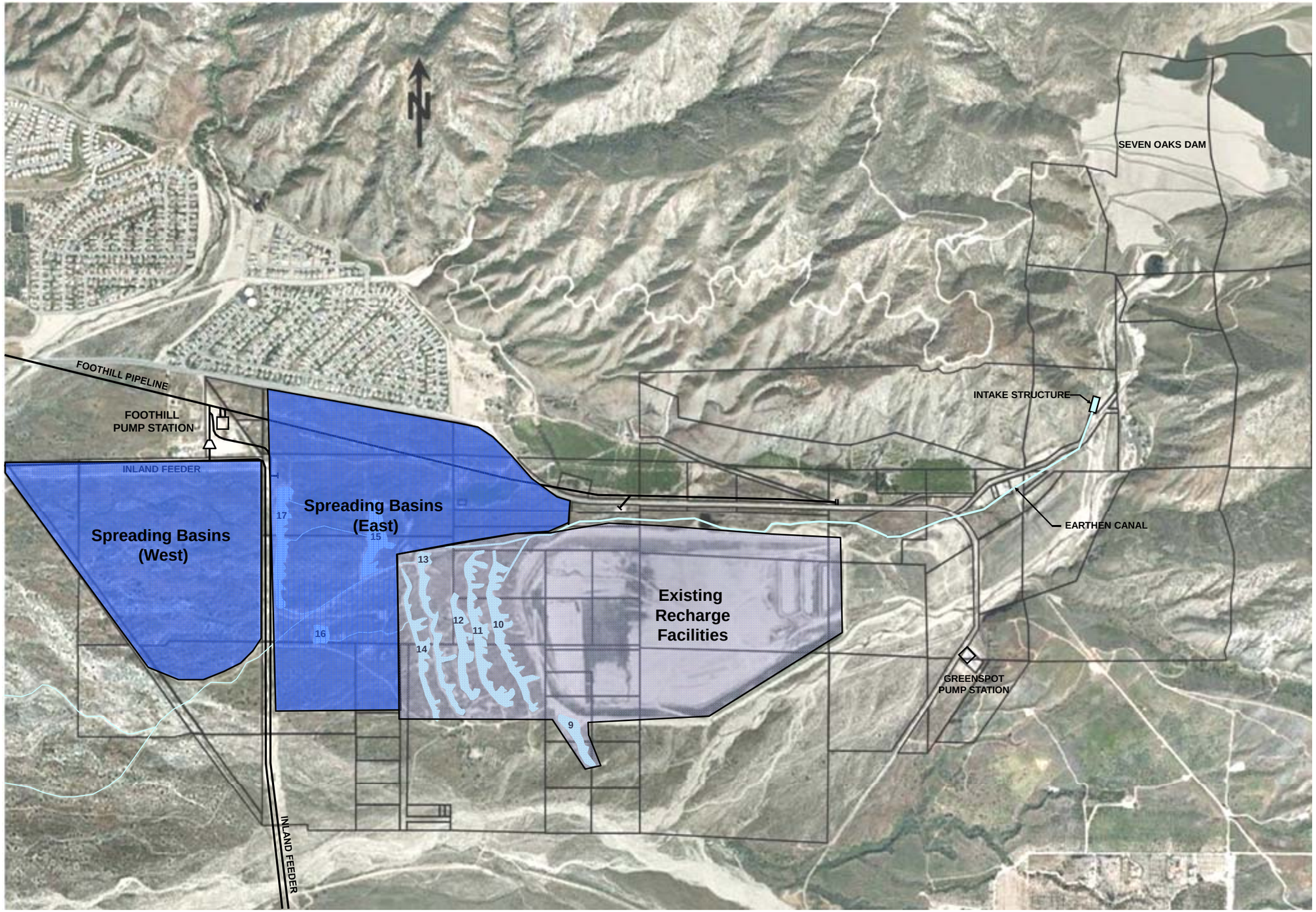
- **Subtask 9.1 Mobilization and Site Preparation** During this phase of work, the contractor will begin to move personnel and equipment to the site. The contractor will also perform other tasks in preparation for construction.
- **Subtask 9.2 Project Construction** During this phase of work, the contractor will construct the facilities and concurrence. The actual sequence of the work will vary based upon the time of year that the notice to proceed is given and environmental and operational constraints.
- **Subtask 9.3 Performance Testing and Demobilization** During this phase, Valley District and its partners will test the newly constructed facilities and appurtenances to ensure they function properly. Once satisfied, Valley District and its partners will take delivery of the project and the contractor will demobilize from the site.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement
Environmental mitigation and compliance will be a part of the permitting process. Valley District and its partners are committed to environmental compliance for this project.

Budget Category (f): Construction Administration

Task 11: Construction Administration
This phase of the work consists of contractor oversight and will continue throughout the entire construction period.



BLACK & VEATCH
building a world of difference™
ENERGY WATER INFORMATION GOVERNMENT

San Bernardino Valley Water District
Enhanced Recharge Facilities

Project Area

Revision No.	Date

FIGURE 1-1

Project J: Regional Residential Landscape Retrofit Program (Inland Empire Utilities Agency)

Part One - Introduction

Project Description

The proposed project will improve water management and result in quantifiable water savings and reductions in energy consumption through water conservation, by evaluating residential landscape efficiency and retrofitting approximately 600 single family residential landscapes that currently use high water consuming devices, with high efficiency ones. Devices identified for retrofits include weather based irrigation controllers and high efficiency sprinkler nozzles. This program is estimated to have an average annual water savings of approximately 1,000 acre feet (AF), with an estimated lifespan of 10 years. Total water savings over the lifespan of this project is anticipated to be 6,000 acre-feet. IEUA relies heavily on imported water from the Metropolitan Water District of Southern California (MWD). Average energy consumption for imported water is 2,689 kWh/AF and the water conserved through this program is estimated to reduce average annual energy consumption by 2,689,080 kW/h. This project intends to target the highest residential water users within the single family customer classification that are located within IEUA's service area over a three year period.

The proposed program saves water through outdoor surveys and retrofits of landscape devices. The target audience is residential customers that fall within the top ten percent of the associated retail water providers' customer base. Retrofits include the installation of smart controllers and high efficiency sprinkler nozzles where the resident approves the changes.

This program will provide a more reliable water supply and promote sustainable water solutions through reducing the need to import additional water supplies and maximizing water use efficiency, leveraging existing funding opportunities, building regional partnerships with local retail agencies and meeting multiple goals across geographic and water resources service areas.

Goals and Objectives

This project proposes to save 1,000 AF per year, reaching approximately 600 residents who fall within the top 10% tier of residential water use. This program targets larger lot sizes that have a potential to save a great deal of water from inefficient irrigation and over-watering (minimum of 1 AF per site). The Program will also educate customers where costs of resources do not greatly impact them and tiered rate structures have minimal impact on their water use decision-making. Reaching those customers through education and retrofits will result in increased landscape efficiency and water use reductions, regardless of their ability to pay for their use.

Purpose and Need

More than 65% of residential water use occurs outdoors with many residents believing their highest water use occurs indoors. There is a great need for public education on water use habits and to assist them with ways to achieve reduction. With many residential customers lacking the knowledge required to make more efficient landscape modifications and upgrades, this program would make available and provide the education and resources needed to achieve reductions in outdoor water use, while also serving as a demonstration to friends, relatives and neighbors on efficient landscape options.

The numerous benefits resulting from the implementation of this program align with IEUA's approved Water Use Efficiency Business Plan and are listed below:

- Assists in meeting compliance with the California Water Conservation Act of 2009 (Senate Bill X7-7);
- Assists in meeting compliance with Assembly Bill 1420 – Mandatory Demand Management Measures;

- Assists in meeting compliance with the California Urban Water Management Planning Act;
- Aligns with IEUA's core water use efficiency programs identified in reaching water savings goals.

The implementation of this program assists IEUA's retail member agencies in meeting regional water use efficiency goals and targets for water supply reliability, and comply with the Water Conservation Act of 2009 (SBX 7-7).

The region surrounding the Santa Ana River Watershed is the fastest growing area in the United States. The Watershed's current population of 5.3 million is projected to increase by 2 million over the next 25 years. Most of that projected population growth is anticipated to occur in the Inland Empire region, which directly impacts IEUA's water supply and delivery. IEUA currently serves a population of 850,000; the most populous cities are the cities of Fontana (190,356), Rancho Cucamonga (178,904), and Ontario (174,536). Over the past five years, the cities which have experienced the most rapid annual growth were Fontana (15%), Montclair (6%), and Chino Hills (6%). The most recent population boom within IEUA's service area witnessed an increase of 150,000 residents between 2000-2007. Although the recent recession has slowed the pace of the population increase, IEUA projects an increase of almost 330,000 people within its service area over the next 25 years, with an average annual growth rate of 1.4%.

Of great concern to IEUA is how these population figures and increases affect the water use profile of the residential water sector. The increase in population has historically signaled an increase in development and outdoor water use. The majority of housing in the Inland Empire is detached, single-family homes. According to IEUA's 2010 Business Plan, single family homes within our service area can use up to 66% of their water outdoors; this is due, in part, to large lot sizes and the ubiquitous planting of cool weather turf grass. The lot sizes in the Inland Empire are larger than in any metropolitan area in the state, with the average residential lot size of 10,176 square feet and the average yard size (lot minus the building footprint) is 8,858 square feet; this is in comparison to the average residential lot sizes of other major metropolitan areas, the Sacramento region (9,159 sq. ft.), coastal areas of Los Angeles and San Diego counties (9,076 sq. ft.), and the San Francisco Bay Area (7,697 sq. ft.). Currently, single-family homes within the IEUA service area use 49% of the IEUA water supplies, while multi-family homes use 9.1%; this translates into 110,751 acre-feet used by single-family homes and 18,319 acre-feet used by multi-family homes (numbers based on 2008 totals).

IRWM Goals

This program will provide a more reliable water supply and promote sustainable water solutions through reducing the need to import additional water supplies and maximizing water use efficiency, leveraging existing funding opportunities, building regional partnerships with local retail agencies and meeting multiple goals across geographic and water resources service areas.

As the regional wholesale supplier of water for the area, IEUA has assumed the role of coordinating the region's activities and programs to reduce demand. IEUA has worked closely with its member agencies to facilitate the installation of thousands of water saving devices in the region. IEUA member agencies, whose direct contact with retail customers is crucial to the implementation of water use efficiency measures, have co-funded these efforts with IEUA and taken a proactive approach in educating and working with their customers to conserve water.

Regional Principles identified by IEUA and its member agency partners consist of the following strategies:

- Promote Water Resource Management
- Develop and Implement Regional Programs
- Build Member Agency Cooperation and Collaboration.
- Develop Incentive-Based Programs

Project List

The Regional Residential Landscape Retrofit Program is the only specific project included in this work plan and does not require a design plan for immediate implementation. IEUA is the lead agency implementing the program on behalf of its eight member agencies and the retail agencies included in the regional program partnership include

the cities of Chino, Chino Hills, Ontario, and Upland, Cucamonga Valley Water District, the Fontana Water Company, Monte Vista Water District, and San Antonio Water Company.

Integrated Elements of Projects

The Regional Residential Landscape Retrofit Program benefits multiple agencies and communities across the Chino Basin and provides an efficient and streamlined program for multiple jurisdictions and their customers. The Program leverages funding to augment costs for all program partners and participants.

Conserving water for this region is vital. Without efforts to reduce water use, the need for water would exceed availability of imported supplies and local supply would not meet the full demand. By implementing conservation programs, such as the one proposed, the steady demand can be offset and better managed. During times of drought, emergencies or supply restrictions, the region can pull from imported supplies, if necessary. However, without conservation, the local demand would continue to far out-weigh the availability, thus increasing the need for additional imported water supplies to the region.

Over the last drought that ended in 2011, and environmental restrictions on the State Water Project supplies, local demand remained constant due to a diversification of water supplies. However, as agencies were very successful in managing local sources, the results have left much of our local supplies depleted. Water use reduction efforts that address long-term changes, especially through outdoor water use management and education, will make those emergency efforts to conserve more effective and allow us to manage the limited supplies more efficiently.

This program would help offset approximately 2.0% of total demand. This offset is substantial. With an overall goal of reducing demand by 20% to meet the Water Conservation Act of 2009, this project serves a core element of an overarching, larger program that will help us achieve that goal, and sustain it for the long-term through implementing programmatic changes to water use patterns.

Completed Work

The work associated with the Regional Residential Landscape Retrofit Program does not require any environmental compliance documents and therefore is not applicable. Upon grant contract execution, this program can begin the implementation phase immediately. Work that has been completed within IEUA's service area prior to the grant award date on a Pilot Program that includes the retrofit of 306 residential sites receiving high efficiency device upgrades of weather based irrigation controllers and high efficiency sprinkler nozzles.

Existing Data and Studies

Water usage within IEUA's service area for FY2011/12 was 229,518 acre-feet of imported and local water supplies. This provides all the water supply for a population of approximately 850,000 people. Imported water supplies are received through the State Water Project (via Metropolitan Water District of Southern California). The amount of groundwater pumping varies from year to year based on the Chino Basin safe yield. Recycled water is conveyed from IEUA's recycled water treatment facilities and varying amounts of surface water are available from year to year based on local mountain snowpack and rising upgradient groundwater levels. A summary of IEUA's water supply for FY2010/11 is as follows:

Table 2 – Summary of IEUA's Water Supply

Water Source	Quantity of Supply (AF)
Chino Groundwater	62,150
Other Groundwater	41,788
Recycled Water	18,641
Surface Water	39,905
Desalted Water	14,203
Imported Water	52,831
Total Water Supplied Annually	**229,518**

The project identified within this work plan will result in up to 1,000 acre-feet per year of a reduction in potable water use and a corresponding reduction of up to 1,000 acre-feet per year of imported water from northern California. All potable water not pumped from the Chino Basin will later be pumped and beneficially reused as a new local water supply.

The 1,000 acre-feet per year of savings is estimated from the landscape upgrades of residential sites. The estimated water savings for this program is based on a program completed by Three Valleys Municipal Water District (TVMWD). The project was completed and the savings has been compiled that demonstrate significant water use savings for the targeted residential water customers who participated. The water savings are quantifiable through the examination of water use records pre- and post-survey/retrofits. All participating customers must agree to allow their water agency to review their water use records and report that water use accordingly.

SURVEY ONLY	**SURVEY & SPRINKLER RETROFIT ONLY**	**SURVEY & CONTROLLER RETROFIT ONLY**	**SURVEY & SPRINKLER & CONTROLLER RETROFITS**	**PRE-SURVEY WATER USE (average per month-gals.)**	**AFTER SURVEY WATER USE (average per month-gals.)**	**AVERAGE SAVINGS per SITE per BILLING CYCLE (gals.)**
16				118,053	109,203	8,850
	4			128,526	94,721	33,805
		23		90,593	52,462	38,131
			24	116,080	83,415	32,665

As shown in the table above, the average water savings per residential site, per month is 28,363 gallons. With these averages alone, the savings represents 1.04 acre-feet of water saved per residential site per year. However, the savings increases substantially when looking at larger lot sizes and higher water users. The TVMWD pilot program used data from the sites upgraded in the Walnut Valley Water District and City of La Verne service areas. The discrepancy in lot sizes makes an obvious difference. The residential sites in the Walnut Valley Water District's service area saved approximately 2.3 acre feet per year, per residential site and the City of La Verne's savings was 0.30 acre-feet per residential site per year. The discrepancy between the average gallons saved is due to lot size differences. Overall, the percentages for each of the service areas results in an average savings of 26%.

Considering that our goal is to survey and upgrade at least 600 sites, the estimated water reduction may result in more than 6,000 acre-feet of water saved over a ten year period. This is a target figure, and is a conservative estimate. TVMWD's experience with this program showed that lot sizes made the biggest impact in time and budget. We will have a better idea of the lot sizes that meet the top 10% of residential water users when the program is funded.

An average of 2.3 acre-feet/year saved (WVWD) and 0.30 acre-feet/year (La Verne) = 1.3 acre-feet/year per residential site.

To determine the 10-year projected water savings, we have used a conservative figure of melding both the Walnut Valley Water District's and City of La Verne's average monthly water savings associated with this program, to come up with a composite figure of 1.3 acre-feet per year, per site, or a 26% reduction in monthly water use.

The ten year lifespan of savings is what the California Urban Water Conservation Council (CUWCC) and the Metropolitan Water District of Southern California (MWD) use to determine the savings for this type of program and landscape retrofits.

Project Map

The Inland Empire Utilities Agency (IEUA) is a water wholesaler whose service area includes the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, Upland, and unincorporated areas of San Antonio Heights and Alta Loma. IEUA Headquarters are located at 6075 Kimball Avenue in the City of Chino, California. IEUA occupies a 242 square mile area in the southwestern corner of San Bernardino County. Please see the map below for regional proximity and service area.

Project Timing and Phasing

Estimated Project Schedule	Month Due
Development of Financing	
Funding Award / Execute DWR Agreement	Sep-Oct 2013
Category (a): Direct Project Administration	
Task 1: Administration/Management Mobilization Landscape contractor secured Retail water agencies identify top residential water users. Project Management Invoice reconciliations and payment processing DWR Reporting and data management	Oct 2013 Nov 2013- Sept 2016
Category (d): Construction/Implementation	
Task 2: Landscape Site Evaluations Schedule customer appointments Perform site evaluations	Nov 2013 -April 2016
Task 3: Site Retrofits Schedule site retrofits Retrofit devices Customer follow-up appointments	Nov 2013 -Sept 2016
Task 4: Monitoring and Reporting Water use monitoring Customer technical assistance	Nov 2014-Sept 2019

Part Two – Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration/Management

- Mobilization
- Retail water agencies will identify their highest residential water users.
- Retail agencies will contact their top 10% water users and explain the program.
- Project Management
- Invoice reconciliations and payment processing
- Reporting and data management

Budget Category (b): Land Purchase/Easement

Not Applicable.

Budget Category (c): Planning/Engineering/Environmental Documentation

Not Applicable.

Budget Category (d): Construction/Implementation

Task 2: Landscape Site Evaluations

- Retail agencies refer participants to approved landscape contractor to schedule an appointment.
- Landscape contractor performs site evaluation
- Completed evaluation report is provided to participant with new irrigation schedule
- Participant approved for eligibility
- Participant approves irrigation equipment upgrades

Task 3: Site Retrofits

- Landscape contractor purchases and installs equipment
- Landscape contractor provides participant education and training on new equipment
- Landscape contractor provides water conservation educational materials to participant on behalf of program partners.
- Landscape contractor provides two post retrofit site visits for each completed site to ensure that all equipment is in proper working order and irrigation system is efficient

Task4: Monitoring and Reporting

- IEUA to provide program participant water use monitoring for the three year grant period, submit data in final report and IEUA to continue to monitor savings for an additional 1-3 years post project
- IEUA to provide program participant technical assistance as needed

Project K: Canyon Lake Hybrid Treatment Process (Lake Elsinore & San Jacinto Watersheds Authority)

Part One – Introduction

Multi-jurisdictional Total Maximum Daily Load (TMDL) coordination efforts have been underway since August 2000, coordinated and administered through the Lake Elsinore & San Jacinto Watersheds Authority (LESJWA). The Santa Ana Regional Water Quality Control Board (Regional Board) adopted the Nutrient TMDLs on December 20, 2004; the Nutrient TMDLs became effective on September 30, 2005, after EPA approval. The existing TMDL stakeholders formally organized into a funded TMDL Task Force in 2006, and the Project proponents are integral members of the TMDL Task Force. The proposed Project would improve water quality in Canyon Lake by reducing lake water nutrient concentrations and internal cycling thereby reducing the growth potential for algae and the occurrence frequency of low dissolved oxygen and ammonia toxicity conditions.

Goals and Objectives

The proposed Project is an important step the Project proponents are taking toward improving water quality in Canyon Lake. The Project goal is to complete five alum applications to the entire lake, as specified in Part 2d of this Work Plan. The objective of the Project is to improve water quality to meet response targets contained in the TMDL for chlorophyll-a, dissolved oxygen, and ammonia toxicity. Recent modeling of the potential water quality benefits from the proposed alum additions to Canyon Lake estimated a sharp decline in chlorophyll-a concentration throughout the lake, eliminating the impairment related to algae (see Attachment 7). Also, reductions in the frequency of low DO and ammonia toxicity were determined to occur as a result of the proposed alum additions.

Purpose and Need

The proposed Project would improve water quality in Canyon Lake for recreational use, aesthetics, and aquatic ecosystem health. Currently, algal blooms occur multiple times throughout the year, which make the water appear green and dirty. The algae then decay and contribute a substantial sediment oxygen demand to the lake bottom, which depletes dissolved oxygen needed by fish. Anoxic conditions at the sediment water interface increase free reactive phosphorus and ammonia flux rates from sediments to pore water and from pore water to the overlying water column. Occasionally, ammonia releases are large enough the create conditions of toxicity per the CTR hardness based standard. The Project will reduce lake water nutrient concentrations and internal cycling and thereby reducing the growth potential for algae and the occurrence frequency of low dissolved oxygen and ammonia toxicity conditions.

In addition, each of the Project proponents is required to comply with the TMDL requirements, which are contained within their respective NPDES discharge permits or Conditional Waiver of Agricultural Discharges (CWAD) with the Regional Board. The proposed Project will help meet these regulatory requirements for the Project proponents.

Project List

The proposed Project involves five distinct alum additions to Canyon Lake. The date and approximate application amounts are shown in the table below:

Date	**Main Body Application (kg dry alum)**	**East Bay Application (kg dry alum)**	**Total Application (kg dry alum)**
September 2013	140,000	50,000	190,000
February 2014	70,000	50,000	120,000
September 2014	140,000	50,000	190,000
February 2015	70,000	50,000	120,000
September 2015	140,000	50,000	190,000

Integrated Elements of Projects

The modeling used to determine an appropriate amount of alum to be added to Canyon Lake was predicated on a projection of future watershed load reductions. Future watershed loads reductions are expected from the transition of agricultural land to other uses (General Plans from watershed cities), from State of California new air quality regulations for NOx emissions (State Implementation Plan, South Coast Air Quality Management District), and from specific BMPs proposed for implementation within the San Jacinto River watershed by MS4 Permittees in the watershed, as documented in the Comprehensive Nutrient Reduction Plan for Lake Elsinore and Canyon Lake and by members of the Western Riverside County Agricultural Coalition, as documented in the Agricultural Nutrient Management Plan for Lake Elsinore and Canyon Lake (http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/elsinore_tmdl.shtml).

Overflows of the Railroad Canyon Dam during moderate and wet hydrologic year types cause runoff in the San Jacinto River to reach Lake Elsinore. Lake Elsinore also has a TMDL for nutrients and nutrient related impairments. The Lake Elsinore TMDL contains a load allocation for overflows from Canyon Lake. Therefore, reduced nutrient concentrations in ambient water in Canyon Lake will also reduce historical loading from Canyon Lake to Lake Elsinore.

Completed Work

CEQA analysis and documentation supporting a mitigated negative declaration is complete for the proposed Project (Tom Dodson and Associates, 2013). Two key studies were used to support this determination; jar tests (Noblet et. al., 2012) and laboratory aluminum toxicity tests (GEI Consultants, 2013) and are summarized below:

- A Jar Test Study on the Use of Alum for Turbidity and Nutrient Removal in Canyon Lake, CA. Water samples were collected from four stations at Canyon Lake on August 27, 2012, two locations in the Main Body and two locations in the East Bay. Samples from the main body of the lake (8 L) were collected from below the thermocline (i.e., in the hypolimnion). Samples from the east bay were taken at approximately 1 meter depth as the lake at these locations was not stratified. Jar tests were performed on the collected samples using 1.0 L samples, on a six stirrer Phipps and Byrd programmable jar test apparatus (Figure 1). Jar test were performed as follows: The appropriate amount of 10,000 ppm alum stock was added to each sample, and flash mixed at 220 rpm for 1.25 minutes, then followed by flocculation at 25 rpm for 30 minutes. The samples were then allowed to settle for 2-3 hours until all of the floc had fully settled. Before and after treatment samples were measured for pH, temperature, turbidity, conductivity, dissolved aluminum concentration, total organic carbon (TOC), total nitrogen and total phosphorus.

- Toxicity Testing for Proposed Alum Applications. Depth integrated water column samples were collected from Canyon Lake on February 12, 2013 for assessment of chronic alum treatment water effects with six dilutions in each treatment. Results showed no chronic toxicity in all treatments up to a dose of 40 mg/L alum.

Existing Data and Studies

Water quality monitoring has been conducted at four stations in Canyon Lake from 2007 to 2012. These data are used to evaluate compliance with the TMDL, and were used to develop the dosage and schedule of alum applications.

Many studies have been performed to evaluate in-lake BMP alternatives for Canyon Lake. The key studies that influenced the decision to use alum applications as the initial in-lake BMP approach over other alternatives were results from management scenario simulations using the DYRESM-CAEDYM model by Michael Anderson in 2012. The following provides a brief summary of these model applications:

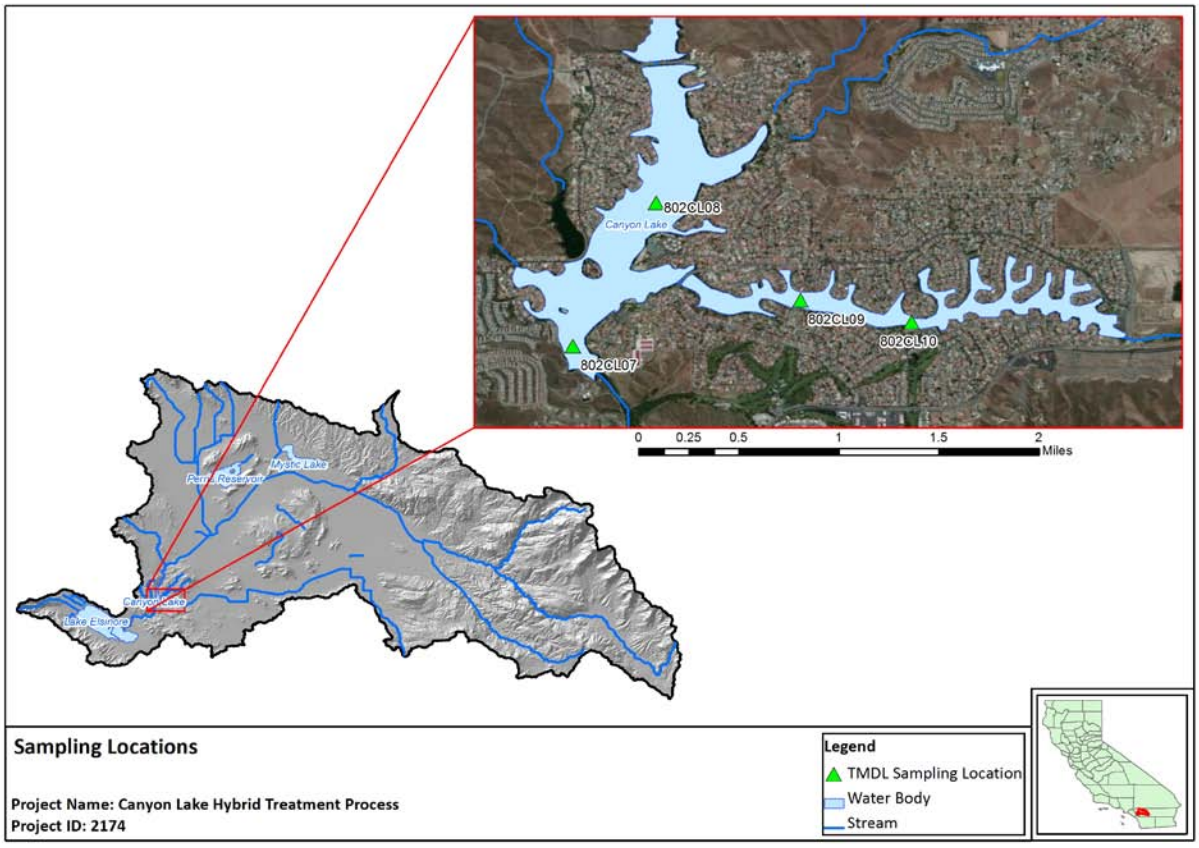
- Evaluation of Long-Term Reduction of Phosphorus Loads from Internal Recycling as a Result of Hypolimnetic Oxygenation in Canyon Lake: This study showed that a Hypolimnetic Oxygen System (HOS) will not provide sufficient nutrient reduction in years with above average rainfall to

achieve response target for chlorophyll-a. Thus, HOS alone is not sufficient to achieve compliance with the TMDL for all entities.

- Evaluation of Alum Phoslock, and Modified Zeolite to Sequester Nutrients in Inflow and Improve Water Quality in Canyon Lake. This study evaluated the potential water quality benefit that could be achieved with chemical additional alternatives. The DYRESM-CAEDYM results showed that a reduction in dissolved orthophosphate at the lake inflows from ~0.35 mg/L to 0.20 mg/L would shift the lake to P-limitation and reduce average annual chlorophyll-a to below the final numeric target of 25 ug/L.
- Predevelopment Condition Assessments for Canyon Lake and Lake Elsinore. To estimate the controllability of water quality in Canyon Lake and Lake Elsinore, the DYRESM-CAEDYM model was run for a scenario with external loads reflective of a completely undeveloped watershed. This scenario showed chlorophyll-a consistently below the water quality objectives. For DO, exceedences of the water quality objectives were estimated to occur as much as 50 percent of the time in Canyon Lake. Thus, a completely undeveloped watershed would not comply with the DO numeric target, as stated in the TMDL. The MS4 Permittees plan to modify the TMDL numeric target at the next reopener of the TMDL, to allow for exceedences of the DO water quality objective within the hypolimnion as would be expected if the watershed were completely undeveloped.
- Predicted Water Quality in Canyon Lake with In-Lake Alum Treatments and Watershed BMPs. This study task involved simulation of the water quality response to proposed watershed BMPs and in-lake alum additions included in the CNRP. Results showed that the final numeric target for chlorophyll-a is expected to be achieved with the proposed Project. For DO, the results show that the interim (epilimnion) DO target is expected to be achieved within the top 3 meters of the water column and significant progress toward the final (hypolimnion) target. These results are the primary basis for the Canyon Lake compliance demonstration presented in Section 3 of the CNRP and AgNMP.

Project Map

The Project Map below shows the geographical location and surrounding work boundaries for the proposed alum applications.



Project Timing and Phasing

The proposed Project is the first step that the proponents are taking toward improving water quality in Canyon Lake. Over time, through the monitoring program, data will be developed to evaluate the effectiveness of the Project. Project proponents will prepare a trend analysis for the response targets and nutrient levels in Canyon Lake by November 30, 2018. Based on the outcome of this analysis, the Proponents will make recommendations for additional BMPs and a schedule for deployment of those BMPs for Regional Board approval. At the completion of the Project, the effectiveness will be evaluated to determine whether continued application of alum would be sufficient to meet water quality response targets in the TMDL for chlorophyll-a, DO, and ammonia toxicity. If these targets are effectively treated by the proposed alum applications, then alum applications will be continued and no supplemental Projects will be necessary. Conversely, if exceedences of one or more of these targets continue to occur, then supplemental BMPs will be considered for implementation. Studies by Michael Anderson show that the proposed alum applications are expected to effectively treat chlorophyll-a. However, the benefit of increased DO and reduced ammonia are less certain. Hypolimnetic oxygenation, aeration, or other potential solutions may be needed to directly address these response targets in a second phase of the Project.

Part Two: Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
SAWPA will perform the following administrative activities; administer contracts with design engineers and construction contractors, perform Project accounting and perform Project reporting.
Deliverables: Preparation of invoices and other deliverables as required.

Task 2: Labor Compliance Program
SAWPA will retain a consultant to perform labor compliance services including labor compliance program administration, meetings with contractors and subcontractors, review and monitoring of certified payroll records for payment of the proper prevailing wage rate, conduct regular random audits of the certified payroll reports and conduct field inspections to confirm proper jobsite postings, interview workers to confirm water rate classification
Deliverables: Submission of Labor Compliance Program

Task 3: Reporting
SAWPA shall prepare and submit quarterly, annual and final reports as specified in the Grant Agreement.
Deliverables: Submission of quarterly, annual and final reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

Not applicable

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
Assessment and evaluation of the proposed Project has been completed by the CL/LE TMDL Task Force and in studies conducted to support the development of the CNRP and AgNMP. Design criteria for the proposed alum application were determined based on modeling and data analysis contained within these planning documents.

Task 5: Final Design
The final design of the alum application involves the selection of a dosage, schedule, and method of application. Attachment 7 provides a summary of the key scientific basis supporting the proposed dosage and application schedule for the proposed Project. The final design of the proposed alum applications will also involve a complete set of specifications for the proper handling, storage, and application of the alum material. These specifications will be requested from the selected contractor performing the work.

Task 6: Environmental Documentation

CEQA documentation is currently under preparation to support a mitigated negative declaration for the proposed Project. The Project does not disturb any land; however one concern with the use of alum in lakes is the possible effects on aquatic life. There is potential for acute or chronic aluminum toxicity to aquatic life in surface waters (e.g. zooplankton) that receive the initial dose of alum. Studies of aluminum toxicity from similar source waters show that this is not a likely condition, especially considering the low dose proposed for Canyon Lake. Jar tests performed at each of the Canyon Lake compliance monitoring stations provided an approximation of the dissolved aluminum that may be present in the water column immediately following the alum application. With dissolved aluminum concentration ranging from 200-600 ug/L, acute or chronic toxicity is not expected. However, to ensure that the alum additions in Canyon Lake are safe for aquatic life, the Permittees first step to implement the CNRP involved conducting toxicity tests using ambient water from different parts of Canyon Lake prior to alum addition. These tests found no impact to aquatic life from the proposed alum additions, which was used to support the CEQA documentation for a mitigated negative declaration.

Task 7: Permitting

Project requires no permits.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

In June 2013, implementation of the Project will be advertised for bidding by LESJWA. LESJWA will hold a pre-bid meeting and respond to questions from contractors, open and review bids for completeness, and award the Project. Depending on the status of grant funds and acceptance of CEQA documents by DWR, a notice to proceed for alum application could be issued by August 2013, so that the proposed application in September of 2013 could be performed as scheduled.

Deliverables: Advertisement for bids; pre-bid contractors meeting; evaluation of bids; award contract

Task 9: Construction

- **Subtask 9.1 Mobilization and Site Preparation**

This task involves the delivery of liquid alum to temporary material storage areas in different parts of Canyon Lake, as well as setup of temporary storage containers at sites near the lake shore for use in reloading the application vessel with liquid alum material. The storage will require secondary containment for proper spill prevention. The application vessel controls must be prepared to ensure the proper delivery of alum to the lake surface.

- **Subtask 9.2 Project Construction**

The Project implementation involves spreading of alum from the application vessel to the lake surface to ensure an even dosage of alum for the entire water column. The application vessel cannot hold all of the liquid alum that must be spread over Canyon Lake; therefore, it will be necessary to return to the storage location several times per day to restock the alum. It is expected to take 7-10 days of continuous operation to complete a single alum application event. The proposed Project includes five alum application events in September 2013, February 2014, September 2014, February 2015, and September 2015.

- **Subtask 9.3 Performance Testing and Demobilization**

The Project proponents will develop an effective monitoring plan to evaluate the performance of the alum applications. Of particular interest will be the amount of nutrient stripping that is achieved, immediate changes in pH and dissolved aluminum, long term improvement to impairments of elevated chlorophyll-a during algal blooms and the frequency of low dissolved oxygen concentrations. Effectiveness data will be compared with model estimates from prior to alum applications to evaluate whether the proposed dosage and schedule was appropriate.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

There will be some environmental mitigation measures required based on the CEQA documentation, which include:

- Provide for secondary spill containment around the temporary alum storage sites.
- Continuous monitoring of pH in the area of alum application

Budget Category (f): Construction Administration

Task 11: Construction Administration

The Project proponents will hire a consultant to provide field inspections during the alum application and perform quality assurance and quality control. LESJWA will negotiate for alum application oversight services with the consultant prior to the first alum application in September 2013. The Project proponents' goal of hiring a consultant to perform alum application oversight is to ensure complete application on schedule, within budget, and in accordance with plans, specifications, and requirements of local, state, and federal regulations.

Project L: 14th Street Groundwater Recharge and Storm Water Quality Treatment Integration Facility (City of Upland)

Goals and Objectives

The City of Upland's proposed project is shovel-ready. It employs an integrated, regional approach to enhance water quality, increases aquifer recharge, and improves flood protection, directly benefiting the City as well as other water producers locally in the Santa Ana watershed.

Over the past 75 years, there has been a considerable amount of development in the City and open land has significantly decreased. This change magnified runoff flows, small to medium storm events causing wide spread flooding along residential and arterial streets. The City has been constructing drainage facilities to primarily convey flows away from streets with no emphases on conservation and water quality.

As a result, the City expanded the Upland Basin in the southwest corner of the City to provide flood protection and recharge of rain water. It was constructed for a 100-year storm, back to back events, with approximately 200 ac-ft of "dead" storage. It is capable of more recharge than it is currently being utilized for. The storm drain system that captures and conveys flows to the Upland Basin needs to be expanded to maximize its capacity usage and, most importantly, to provide adequate flood protection to the west side of the City.

After much study, the 14th Street Groundwater Recharge and Storm Water Quality Treatment Integration Facility project is identified as critical to achieve the above objective. Due to its up-gradient position, in serving with the Upland Basin as a "collecting" basin or hub, it will relieve the "bottle neck" in the City's drainage system. Based on rainfall data of the last 10 years, it is estimated that 400 ac-ft/year to be captured from the (flooded streets) and conveyed to the 14th St. basin, which will serve as a recharging point upstream of the Upland Basin while collecting and conveying "overflow" rainwater to the Upland Basin.

The proposed project is critical not only to the City's drainage management, but also to the region's watershed. To name a few, flood protection, recharge, water quality improvement, mitigation of urban runoff pollution, expansion of local supplies, imported water usage reduction, and protection of loss of lives and properties due to severe storms.

Purpose and Need

Due to high quality of storm water captured in the upper basin, the recharge will enhance the groundwater supply and water quality, thus mitigating the salt-laden groundwater issue in the lower parts of the watershed. Upon completion, the project will complement the City's comprehensive approach to water resources management goals, specifically:

• Improving water reliability and reducing imported water dependency;
• Improving water quality by capturing/recharging high quality runoff in upper basin;
• Managing rainfall by reserving it as water supply;
• Reducing greenhouse gas by reducing energy required to transport imported water;
• Providing a cost effective means to increase supply;
• Providing future expandability by allowing future recycled water recharge;
• Preventing run-off pollutants harmful to downstream agencies' supplies or wetland;
• Providing a means for natural groundwater treatment; and
• Efficiently integrating water management measures with land use.

Project List

The proposed project's estimated cost is approximately $5.5 million, consisting of constructing:
• A 23 ac-ft retention basin to collect upstream storm water for flood control, water quality treatment and recharge; and

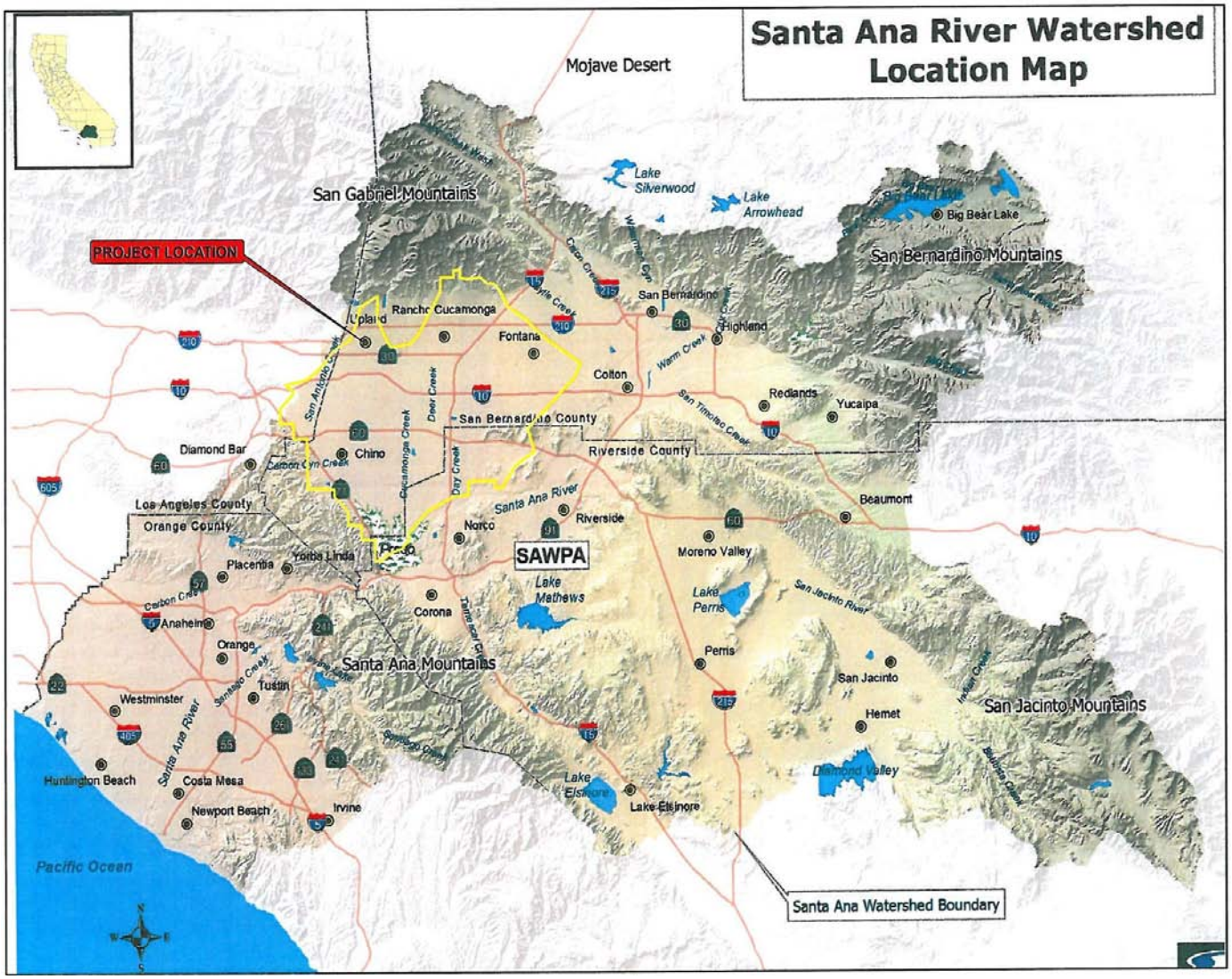
• Approximately 4,800 ft of storm water pipelines, ranging from 24 -inch to 42-inch, to connect the proposed basin to existing storm drains and nearby pits, creating a system capturing and conveying storm water in a controlled fashion.

The project offers flexibility in water resource management (flood control and recharge). Additionally, green space can be added to the existing nearby park to function as a bioswale. It will provide ample opportunities for public water conservation education.

Proposed Storm Drain
Existing Storm Drain
Proposed Basin

Exhibit A
Storm Water Collection Integration Project

N
No to Scale



Completed Work

The City has advanced this proposed project by having the below completed:

• Hydrological study identifying the estimated rainfall to be captured by the proposed project:
• Water Quality/Facility Study of the proposed 14th St. basin;
• Site geotechnical investigation study;
• Land acquisition/verification (project site belonging to the City);
• Design of the 14th St. basin and required storm drain lines; and
• Environmental clearance (CEQA/NEPA) documents.

Project Timing and Phasing

The proposed project is a standalone project that will be fully implemented after its completion without subsequent project. It will be operated in conjunction with the existing Upland Basin to fully capture rainstorm for recharge.

The City proposes to complete it within 5 years; however, based on experience, the City staff confidently can complete it within 3 years. If awarded by the Proposition 84 Integrated Regional Water Management Round 2

Grant, the project will be executed by the City Capital Improvement Project group who comprises of full-time engineers performing construction contract work for the City. The next steps will be:

- Preparing construction contract and bid documents;
- Advertising project and selecting contractor;
- Awarding project by the City Council and issuing notice to proceed; and
- Proceeding to construction phase.

Integrated Project Elements

The proposed project will assist in decreasing the amount of flooding that occurs along the northwest section of the city as well as alleviating the existing storm drain systems and basins downstream of the project.

Currently, the existing storm drain system along Mountain Ave. just north of the rail road tracks captures and conveys storm runoff to the 8th St. Basin situated in the southeast corner of the City. The system was design and constructed to capture and convey 25 year storm frequency events based on a tributary area of 520 acres, with the addition of the proposed project the tributary area will be reduced by approximately 220 acres.

The 8th St. Basin is owned and operated by the County of San Bernardino Flood Control District, according to District staff the 8th Street Basin cannot handle large storm events (100-year storm frequency events) and has requested that the City explores the possibility of reducing the amount of rainstorm flows to the 8th Street basin by constructing additional basins upstream of the existing 8th St. Basin.

The proposed 14th St. Basin project will reduce the tributary area by approximately 220 acres reducing the amount of flows to the 8th St. Basin.

In addition by allowing storm flows to be captured and conveyed much higher in the aquifer (Chino Basin) the water quality is improved by increasing the quality of the water that enters the aquifer. The additional rainstorm flows into Chino Basin will reduce the salt content that currently exists within the Chino Basin and is a benefit to the region.

Project M: Customer Handbook to Using Water Efficiently in the Landscape (Western Municipal Water District)

Part One - Introduction

The Santa Ana Watershed Project Authority (SAWPA) watershed covers 2,650 square miles with a population of six million people. The region primarily covers the hot southern California Inland Empire stretching from the San Bernardino Mountains to the Orange County coast. Life in the region is dependent upon water for commerce, agriculture, quality of life and a healthy environment. A major use of water goes to maintain a healthy local environment, including landscapes at schools, parks, homes, right-of-ways and around businesses. Those landscapes cool the urban and suburban built space, clean the air of pollutants (carbon sequestration), enhance property values, and provide habitat for local wildlife. The landscape in the SAWPA watershed is key to the quality of life paid for by local residents.

However, landscapes in the SAWPA region use a significant amount of water, perhaps as much as 60% of the total urban water demand. This handbook is designed to acknowledge the value of home and commercial landscapes, and motivate the owners and managers of landscapes to, (1) understand the water requirements of their landscapes, (2) manage those landscapes within the State guidelines for water use efficiency, and (3) change landscapes to fit the local climates while maintaining property values, wildlife habitat and environmental quality with less water.

This work plan details the process for completing a comprehensive handbook on landscape water use efficiency. The effort will utilize the latest in University of California research on landscape plant materials, design, irrigation equipment and maintenance, limiting the use of chemicals that can enter into the non-target environment, and the benefits of an efficient landscape in the watershed. It will also draw expertise from leaders in the landscape world, at public agencies, and the private sector. Just as important is how the handbook will be organized and presented to captivate, motivate and incentivize readers to look at their landscapes in a new way. The handbook will build a sense of responsibility for the end-user to manage their landscape efficiently. It will provide tools to assist with changing the end-user's landscape to use less water and eliminate water runoff that harms the watershed and costs every water user.

Goals and Objectives

The goal of the customer handbook is to educate users on how to be water efficient in the landscape, and to reduce overall watershed water use by 7,240 AF per year.

The overall objective is to produce an engaging, credible, useful, easy to understand and practical guide to water efficient landscaping in the SAWPA watershed. It is envisioned that this guide and its recommendations will be useful for at least a decade and beyond. It will be made accessible to residents, businesses and the landscape industry via the Internet, through water agency promotion, regional events and through mass-market retailers.

Specifically, the handbook will be an education tool that will relate water efficient landscapes with the major issues facing the SAWPA watershed including water runoff, water quality, water supply and water costs to end users. It will educate users about the efficient water management of **existing** landscapes, how to create a water efficient landscape at a **new** site, and how to **retrofit existing** landscapes for increased water efficiency.

Purpose and Need

- Provide reliable water supply by reducing dependency on imported water resulting from using water efficiently.
- Preserve and enhance the environment by reducing or eliminating non-point source pollution run-off from urban landscapes
- Promote sustainable water solutions: Less water equates to less embedded energy use.

- Attain water quality standards in fresh and marine environments by reducing or eliminating non-point source pollution run-off.
- Provide economically effective solutions. This project is an inexpensive way to reach the entire watershed to promote efficiency and all of its benefits.
- Improve regional integration and coordination. All participating stakeholders throughout the watershed will be engaged with a simple collaborative project that will increase collaboration and communication between themselves.
- Manage rainfall as a resource. Inform customers how rainfall affects the landscape and maximize its use.

Integrated Elements of Projects

The main purpose of this project ties in perfectly with two other recommended projects. Both IEUA's Regional Landscape Retrofit Program (#2168) and MWDOC's Commercial, Industrial, Institutional Performance-based Water Use Efficiency Program (#2284) need an education component that this project will fulfill. Retrofit projects are only successful if the end user knows how to best use their new equipment and understands the importance of its correct use.

Completed Work

A basic outline of the handbook has been developed identifying chapters and content. Rough drafts of the first chapters will be started prior to the award of the grant.

Existing Data and Studies

A number of studies have been completed by local water agencies and the University of California Cooperative Extension. They demonstrate that not only does utilizing the latest in water efficient technology and devices save water and prevent runoff, but so does simply educating users to use water efficiently.Some of these studies include:

- Burger, D. W., J. S. Hartin, D. R. Hodel, T. A. Lukaszewski, S. A. Tjosvold, and S. A. Wagner. 1987. Water use in California's ornamental nurseries. Cal. Ag. 41(9, 10): 7-8.
- Hartin, J.S. 2007. Conserving Water and Improving Plant Health in Large Southern California Landscapes
- Haver, D.L. (2008, March). Mitigation of pesticides in urbanized environments. Riverside, CA, Santa Ana Regional Water Quality Control Board.
- Hodel, D. R. 1986. Drought tolerance of selected non-irrigated trees. Landscape & Irrigation 10: 66-69.
- Hodel, D. R. 1992. Guidelines for irrigating plants in the landscape accurately and economically. University of California, Cooperative Extension, Los Angeles. 10 pp.
- Metropolitan Water District of Orange County. 2008. Smart Timer and Edgescape Evaluation Study
- Metropolitan Water District of Orange County. 2004. Residential Runoff Reduction Study
- Oki, L. and D.L. Haver (2011, March). Evaluating Best Management Practices (BMPs) Effectiveness to Reduce Volumes of Runoff and Improve the Quality of Runoff from Urban Environments Final Report. California State Water Resources Control Board, Sacramento, CA.
- Pittenger, D. R., D. R. Hodel, D. A. Shaw, and D. B. Holt. 1992. Determination of minimum irrigation needs of non-turf groundcovers in the landscape. Technical completion report to the University of California, Water Resources Center, Project No. UCAL-WRC-W-741. 24 pp.
- Pittenger, D. R. and D. R. Hodel. 1992. Minimum irrigation of landscape groundcovers. HortSci. 27(6): 82.
- Hodel, D. R. 1994. Quantify accurate irrigation schedules with ET data. Cal. Lands. Feb.: 23-25, 56.
- Pittenger, D. R., W. E. Richie, and D. R. Hodel. 1997. Performance and quality of landscape tree species under two irrigation regimes, pp. 2-32 *in*: R. L. Green, V. A. Gibeault, D. R. Pittenger, and W. E. Richie (eds.), Turfgrass and Landscape Irrigation Studies Progress Report 1998-1999. University of California, Riverside.
- Pittenger, D. R., D. A. Shaw, D. R. Hodel, and D. B. Holt. 2001. Responses of landscape groundcovers to minimum irrigation. J. Environ. Hort. 19: 78-84.
- Shaw, D. A., P. F. Zellman, V. A. Gibeault, J. S. Hartin, J. M. Henry, D. R. Hodel, J. Kabashima, and D. R. Pittenger. 1992. Landscape irrigation system evaluation and scheduling for southern California. University of California, Riverside. 36 pp.

Project Map

Figure 1 is attached as the project map. The entire Santa Ana Watershed is part of this project.

Project Timing and Phasing

The customer handbook project will be completed in one phase beginning in October 2013 and completed by June 2016.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Project Administration

Western Municipal Water District (Western) will prepare purchase orders and track invoices for the Department of Water Resources (DWR) that contain the consultant's costs and associated documentation in a format consistent with DWR requirements.

Project administration costs are not included as a budget item. The tasks that would normally incur administration costs are a normal part of Western's staff duties. Western will not be seeking reimbursement.

Deliverables: Invoices and other associated deliverables as required.

Task 2: Labor Compliance Program

Not applicable.

Task 3: Reporting

a. Prepare Quarterly Progress Report
   Western will prepare quarterly progress reports in a format consistent with DWR needs. Each report will: summarize the work done prior to the current reporting period, describe the work done in the current period compared to what was anticipated for this period, elaborate on the technical/cost/schedule challenges during the current period and provide solutions, and, describe work expected to be accomplished in the subsequent reporting period.
b. Prepare Final Progress Report
   Western will submit five copies of the Final Report. The Final Report will summarize the work it took to create the handbook along with the challenges and rewards of producing such a document, and any other information pertinent to the project and requested by the DWR.
c. Annual Performance Report
   Western will submit annual performance reports as specified in the Grant Agreement.

Reporting costs are not included as a budget item. The tasks that would normally incur reporting costs are a normal part of Western's staff duties. Western will not be seeking reimbursement.

Deliverables: Quarterly, final and post completion reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

Not applicable.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation

Not applicable.

Task 5: Project Design and Bid Solicitation Project

1) Secure Purchase Orders – Obtain proposals and create purchase orders for writers, graphic artist, photographer, video editing, printing, etc.

2) Refine Content - Convene authors and contributors to discuss content, solidify sections and agree with a process for submission, review and edits. This is a major undertaking to insure that this handbook includes the qualities that make the end product engaging and useful for the end user with the ultimate goal of helping the watershed. This task is scheduled to take three months. It is also recognized that refining the content can change as more information and data is uncovered, and the schedule reflects refinement of the content as research proceeds. The final content will be solidified within six months of the starting date. Current contents include:

    a) The Watershed

        i) What is the watershed and how does it relate to your home, business and quality of life?
        ii) Why you should care about your water use and your watershed
            (1) Water reliability
            (2) Water quality
            (3) Water supply
            (4) Environmental quality and runoff
        iii) Characteristics, climate zones, and diversity of the watershed
            (1) Where does the water you use come from?
            (2) Where does the water you use go in the landscape?
                (a) To the plant
                (b) Runoff – Environmental effects

    b) The Landscape
        i) Evaluating your landscape, your water use, your water cost
    c) Soils
        i) Start from the ground up, evaluate your soil
            (1) How does your water get to the plants
            (2) Soil water relationships
            (3) Using fertilizers, compost, amendments
            (4) Mulch for efficiency
    d) Irrigation
        i) Matching plants and irrigation (hydrozoning)
        ii) What do you have (turn each irrigation station on)?
            (1) Do you see runoff in a few minutes?
            (2) Do you see dry spots?
            (3) Are sprinkler nozzles the same or different?
        iii) Irrigation scheduling - How to use your timer for plant water needs and keeping water costs down?
        iv) Maintaining the irrigation system
        v) Finding leaks
        vi) How to read a water meter
        vii) Design considerations
    e) Plants for your local climate
        i) Plant water needs
        ii) Plant uses (aesthetics, shade, fire retarding, slope protection, etc.)
        iii) Plant care (planting, nutrients, water, pruning, frost, pests, etc.)
    f) Designing a water efficient landscape for a new site
        i) Starting from scratch
        ii) Example design ideas
    g) Retrofitting the existing landscape for water efficiency
        i) Reducing your water costs
        ii) Lower maintenance costs
        iii) Improve the local environment
    h) Where to go for more information

3) Research Chapters - Each of the initial chapter topics have a basis in science to support the content. That scientific research will be gathered and reviewed before turning the basic information into user-friendly steps and actions. The goal is to have defensible support for any recommendation as most people have many different notions of proper landscape care. The content and research overlap in the timeline schedule and will proceed as topics are confirmed. A list of research articles or links will be provided in the handbook appendix.

4) Write Chapters - Led by the University of California Cooperative Extension, the chapters will be drafted with the understanding that they are intended for the average person or water user. The timeline for writing chapters is 12 months.

5) Edit Content - Each chapter will be reviewed by landscape experts at local agencies and in the landscape industry. The timeline is estimated to be 10 months.

6) Design Graphics - Designing graphics and video content to bring information to life in the handbook will take an estimated four months.

7) Edit Graphics – Each chapter will be reviewed for its appeal to the common user with a goal of creating a highly engaging handbook. This will take three months.

8) Publish - Putting the final product into a PDF format for the SAWPA agencies is the final step in producing the product.

Deliverables: Completed handbook as PDF document that will be widely distributed through the websites of SAWPA stakeholders with a small quantity (5,000) in printed format.

Task 6: Environmental Documentation
Not applicable.

Task 7: Permitting
Not applicable.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting
Not applicable.

Task 9: Construction
Not applicable.

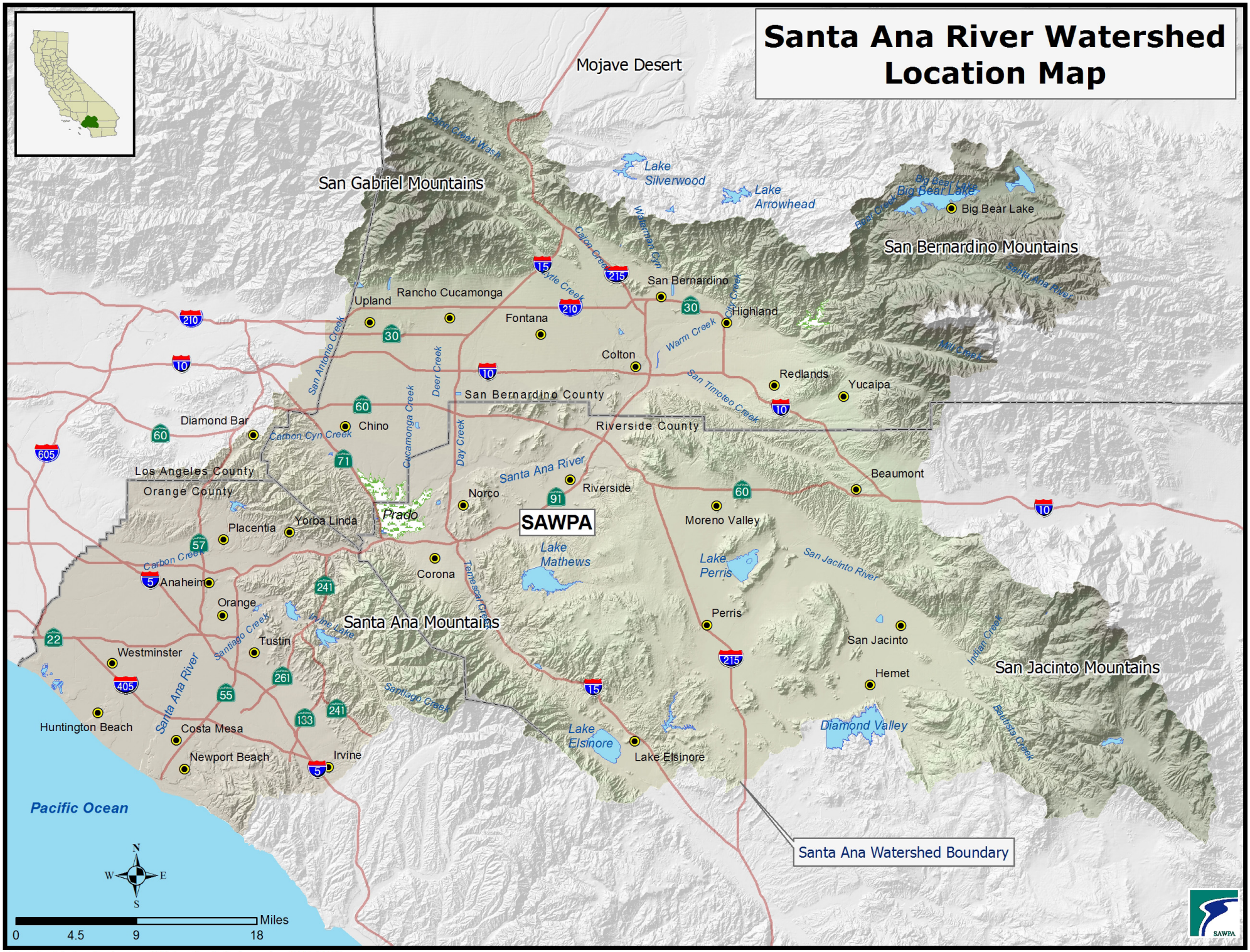
Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement
Not applicable.

Budget Category (f): Construction Administration

Task 11: Construction Administration
Not applicable.

Santa Ana River Watershed Location Map



P:\projects\standard_maps\Watershed_1_A.mxd SW-1150

Project N: Vulcan Pit Flood Control and Aquifer Recharge Project (City of Fontana)

Part One - Introduction

Goals and Objectives

The City's goals and objectives for the project are to improve flood protection and to enhance water conservation and water quality through groundwater recharge and stabilize water rates.

The project is designed to provide 100-year flood protection. In fact, the volume of the basin portion of the project will be nearly twice as large as required for flood control, due primarily to earthwork and other site conditions, adding additional space for greater conservation. It will effectively recharge greater quantities of runoff during wet years. The project will effectively provide 100 -year flood protection the SCRRA commuter rail corridor.

Conveyance facilities will capture storm water from a tributary area of 2,400 acres and deliver it to the proposed basin for recharge. The project will contribute to recharge needed in MZ3. Further, conveyance facilities will be constructed to deliver recycled water from IEUA's regional system to the basin site allowing for recharge of it to supplement the storm water; water that is currently lost to the Santa Ana River and ultimately the Pacific Ocean . Lastly, recycled water conveyance system is closely located to an imported water pipeline (Rialto Feeder) turnout; by modifying the recycled water conveyance system, imported water may be delivered to the site.

The project will recharge quality water that will be additionally treated by natural filtration. These water supplies will be blended with existing impaired groundwater effectively improving overall groundwater quality.

Fontana Water Company, a private company, is subject to replenishment assessments for water produced from the Chino Basin. These additional costs are included in water rates. The project's delivery of water will be documented and those amounts that qualify will offset replenishment assessments resulting in rate payer benefits of which are primarily DAC's.

Purpose and Need

The purpose of the project is to improve flood protection, enhance water conservation and quality, and stabilize local water rates. The need for the project is well documented. First, as shown by FEMA flood mapping, the areas downstream of the project are subject to flooding including SCRRA's commuter rail. Even during moderate storm events, flooding in the project area creates disruptions to commuter rail traffic. Such has been documented by various correspondences to the City from SCRRA. Secondly, Management Zone 3 (MZ3) of the Chino Basin is in need of additional recharge facilities to mitigate potential "material physical injury". Additionally, water quality contamination beyond the maximum contaminate levels defined by the Department of Public Health have appeared in Fontana Water Company wells located hydraulically downstream of the project site. Lastly, Fontana residents are subject to the highest domestic water rates in the entire Inland Empire area.

Project List

The Vulcan Basin Flood Control and Aquifer Recharge Basin is a stand-alone project consisting of drainage conveyance facilities, recycled water conveyance facilities, and flood control facilities at the basin. See Attachment 3-2 for a project map.

Integrated Elements of Project

The City has assembled project partners that are regional; Inland Empire Utilities Agency (IEUA) and San Bernardino County Flood Control District (SBCFCD). Further, the City and its partners are actively engaging in discussions with the Chino Basin Watermaster (Watermaster) to assist with development of basin implementation projects including the Vulcan Flood Control and Aquifer Recharge Project. Further, the City is a part of SAWPA's

IRWM Plan. As presented above, the project clearly meets multiple watershed goals and objectives and enhances water resources.

With the City's partners, a variety of funding sources will be used to construct the project. Should funding be acquired through this program, it will supplement the existing funding sources that have already proven to be economically cost effective. The City has received grant funding through the State's Stormwater Flood Management Round 1 program and is matching (50%) those amounts with local funding including City, SBCFC and IEUA funding sources.

Completed Work

The City has completed preliminary engineering and a topographic survey to verify that the site will meet project needs for flood protection and groundwater recharge. In addition, the City is in the process of preparing the Project's geotechnical assessment report to determine slope stability and percolation rates, and the environmental assessment report to determine project mitigation requirements.

Existing Data and Studies
Phase 1 & 2 environmental assessments have been completed for the basin site. The conclusion of these documents indicates that the site can be developed as proposed with appropriate mitigation. In addition, the City has completed preliminary site engineering analysis to verify site adequacy for basin improvements, including but not limited to, volume estimates to verify adequate flood control and recharge volumes. The existing pit far exceeds minimum requirements.

Project Map

A detailed Project Map is included as Attachment 3-2.

Project Timing and Phasing

The project is a standalone project and does not include any phasing. The project will tie into existing regional flood control systems (West Fontana Channel, Banana Basin, Hickory Basin, and San Sevaine Channel) and will be fully functional as intended upon its completion.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Project Administration
The City, assisted by professional consultants, will administer the project. Project administration will include project management and coordination. Administration includes execution of agreements with consultants and contractors at various stages related to the project. In addition, administration will include processing of invoices with consultants and contractors as well as State invoicing. Deliverables include invoices, supporting documents (e.g. consultant invoices, contractor payments, etc.), and other documents as required by DWR. The City will prepare all required quarterly, annual and final reports in accordance with grant agreement specifications. All reports will be delivered to the State.

Task 2: Labor Compliance
The City will retain labor compliance assistance from a local firm to verify Davis- Bacon prevailing wage requirements. A payroll summary report will be prepared and submitted to the State.

Budget Category (b): Land Purchase/Easement

Task 3: Land Purchase/Easement
The City will acquire 58.21 acres of land for construction of the basin. The City has reviewed extensive documents related to site conditions including a Phase 1 and 2 Environmental Assessment Reports to verify that existing

site conditions can be mitigated. In addition, the City has begun property appraisal activities. Upon completion, the City intends to submit an offer to the owner for acquisition.

All appraisal and related acquisition documents will be provided to the State as required.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation

The City has already completed a preliminary evaluation of the basin site and found it to exceed volume needed for flood control attenuation. The proposed project will provide additional volume for aquifer recharge of recycled water.

In addition to the preliminary engineering analysis already completed, the City will complete a precise hydrology and hydraulic analysis to confirm flood control volume requirements, inlet and outlet structure capacity requirements, and storm routing conditions.

Both technical studies will be provided to the State for review.

Task 5: Project Design and Engineering

After the precise hydrologic and hydraulic analysis is complete, the City will prepare contract documents for construction. The contract documents will include drawings, specifications and estimates for construction of the basin, drainage system, and recycled water conveyance system. To prepare the documents, a series of steps will be performed as follows:

- **a.** **Records Research** - the City will research utility and survey records for the site and for the alignments that the drainage and recycled water systems will follow.
- **b.** **Design Surveys** - the City will collect field topographic data for the site and conveyance alignments.
- **c.** **Base Construction Drawings** - using the data assembled during records research and field surveys, base construction drawings will be prepared.
- **d.** **Preliminary Design** - using the base drawings, preliminary design for the basin and conveyance alignments will be prepared. It will include grading of the basin, alignment selection for the conveyance facilities, and structure design. The design will be consistent with technical study requirements presented above.
- **e.** **Coordination with Agencies** - after the preliminary design is complete, the City will provide drawings to agencies that have an interest in the project and agencies that will be impacted by construction. Including verification that existing facilities are mapped correctly and should relocations be required that all are accurately specified.
- **f.** **Geotechnical Investigation** - site conditions at the basin site and along the alignments will be performed to assess site conditions and to present construction requirements including material suitability, gradations and processing, compaction, and other requirements.
- **g.** **90% Design** - 90% contract documents (plans, specifications, and estimates) for the basin and conveyance facilities will be submitted for consideration to the State.
- **h.** **Final Design** – final contract documents (plans, specifications, and estimates) will be completed and submitted for consideration to the State.

Task 6: Environmental Documentation

Public works projects are subject to environmental compliance processing in accordance with California Environmental Quality Act (CEQA). The City has completed the initial study check list to determine significance of potential environmental impact that the project may create. Upon completion, the City planning staff selected a comprehensive environmental impact report (EIR) process. The City is in the process of completing the EIR and will endeavor to have its compliance documentation approved and adopted by the City's council. Final CEQA documents will be delivered to the State.

In addition to CEQA, the project will be subject to environment assessment related to remediation of the basin site. The report will be submitted to the State and to the Regional Water Quality Control Board to permit recharge into the basins; see Task 10 for further information. Vulcan, the current land owner, has already

completed a series of environmental reports identifying remediation requirements; which will be provided to the State, as requested, once obtained by the City. All site conditions will be remediated during grading as required by the Regional Board.

Task 7: Permitting

Permits anticipated for project include right-of-way encroachment permits from the City, from the County of San Bernardino, from the San Bernardino Associated Governments, and a Regional Water Quality Control Board Permit. In addition, the project will require NPDES compliance processing. Upon acquisition of permits, copies will be submitted to the State.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

As required by State law, the City will publically bid the project including advertising it in the local publications as well as the Green Sheet. Proof of advertisement will be provided to the State. In addition, the City will hold a pre-bid conference for all contractors interested in bidding the project and respond to all inquiries in written format. The City will open bids at a selected time and will determine the responsible lowest bidder. Staff will recommend to the City's Council award of the project to same. Upon award, staff will advise the contractor of award and request contract execution. Upon completion of the contract execution, the City will request that the contractor perform all activities in accordance with the contract documents. They include submittal review, preconstruction conference attendance, etc. All activities will be documented and copies will be submitted to the State.

Task 9 Construction

The selected contractor will perform all work on the project as follows:

Subtask 9.1 Mobilization and Site Preparation

Mobilization and site preparation include mobilizing grading and trenching equipment and site clearing of vegetation and debris for off-site disposal.

Subtask 9.2 Storm Water Conveyance Facilities

Construction of the storm water facilities includes trenching, shoring, installing approximately 5,200 linear feet of storm conveyance channel and related structures including inlet connections, manholes, bedding, backfill and compaction and all related work.

Subtask 9.3 Recycled Water Conveyance Facilities

Construction of the recycled water conveyance facilities includes trenching, shoring, installing of approximately 17,900 linear feet of pipeline and related appurtenances, connection to existing recycled waterline, bedding, backfill and compaction and all related work.

Subtask 9.4 Remediation Grading and Earthwork

Construction of the basin begins with remediation grading of approximately 440,000 cubic-yards including undocumented fill excavation/screening/ processing and slope stabilization. Once the remedial grading is complete basin construction will begin including precise grading, processing, and compacting, and disposing of materials at the basin site and all related work.

Subtask 9.5 Inlet and Outlet Facility Construction

Construction of the two basin inlets includes inlet headwall and energy dissipating structures. Construction of the two basin outlet facilities includes approximately 300 linear feet of 48" RCP for the low flow outlet, emergency spillway and energy dissipating structure (approximately 170 feet long by 36 feet wide reinforced concrete structure), and all related work.

Subtask 9.6 Basin Monitoring Systems

Construction of the basin monitoring systems will include instillation of water level elevation meters and groundwater quality meters (lysimeter) and all related work.

Subtask 9.7 Performance Testing and Demobilization

The recycled water pipeline will be pressure tested to ensure that it does not contain any leaks. The drainage systems and the basin will be visually inspected to verify contract compliance. All cast in-place concrete structures will include concrete cylinder testing to verify compliance with performance specifications.

Demobilization includes removal of all equipment used for construction, surplus project materials, spoils, and construction debris. All conveyance sites will be required to be returned to preconstruction conditions.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

Environmental mitigation requirements will be determined during Task 6. All Environmental Compliance/Mitigation/Enhancement will be completed in compliance with the findings and/or Mitigation Monitoring Program. The City will ensure that construction will be completed in accordance with the approved mitigation requirements. The environmental compliance report will be submitted to the State for review.

Budget Category (f): Construction Administration

Task 11: Construction Administration

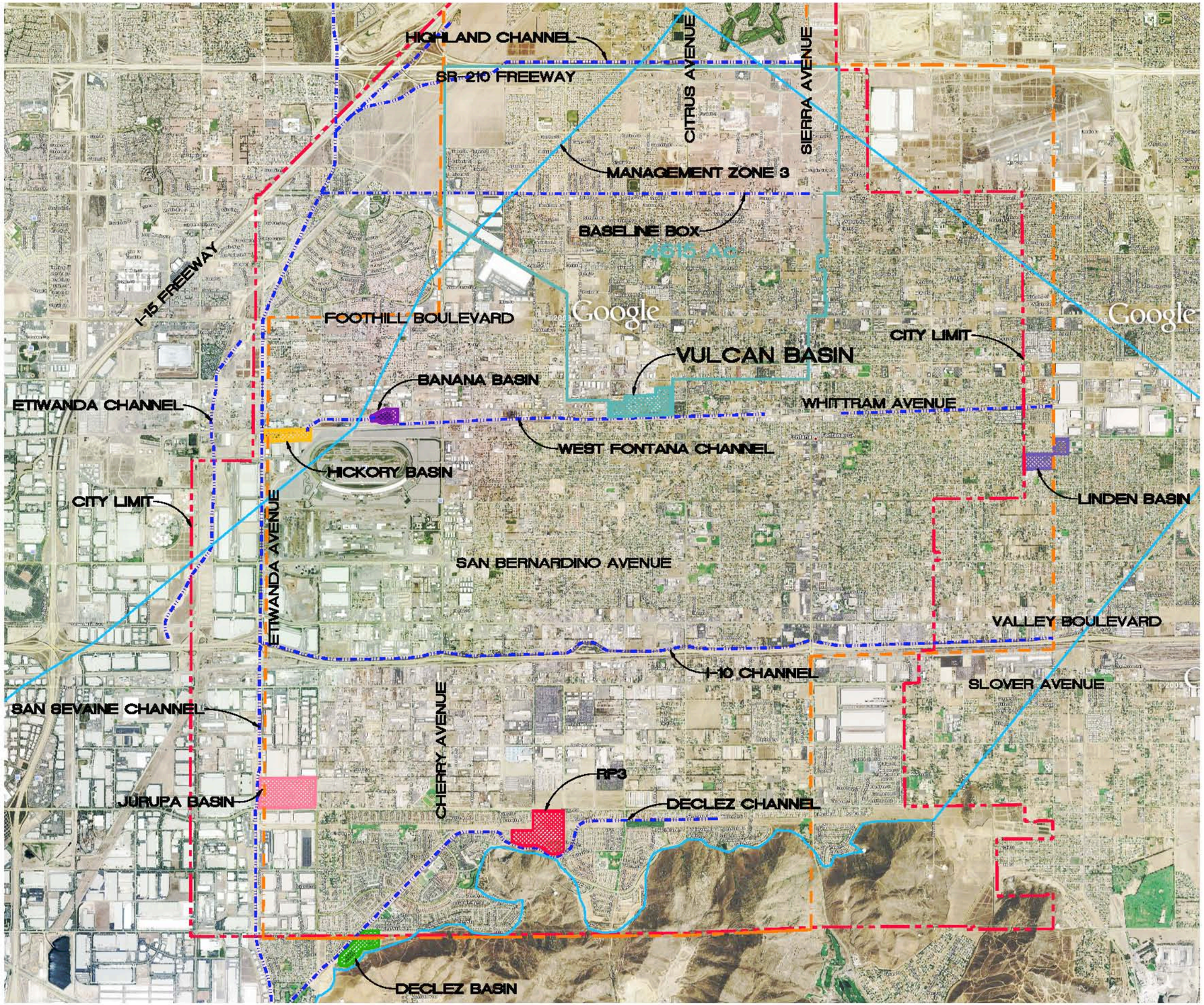
The City will perform all construction administration duties to verify that construction is being completed in accordance with the contract documents. Administration includes management, construction staking, geotechnical engineering, environmental compliance testing, and inspection.

Budget Category (g): Other Costs

Not a part of this work plan

Budget Category (h): Construction/Implementation Contingency

A construction/implementation contingency of approximately $_____ is estimated for this Project. The City is aware that they must spend the entire amount so as not fall below their match funding requirement.



LEGEND:

- CITY/SPHERE OF INFLUENCE LIMIT LINE
- DRAINAGE CHANNEL
- FWC SERVICE LIMIT LINE
- CHINO GROUNDWATER BASIN LIMITS (MZ-3)

GRAPHIC SCALE

2000 0 1000 2000 4000 8000

(IN FEET)

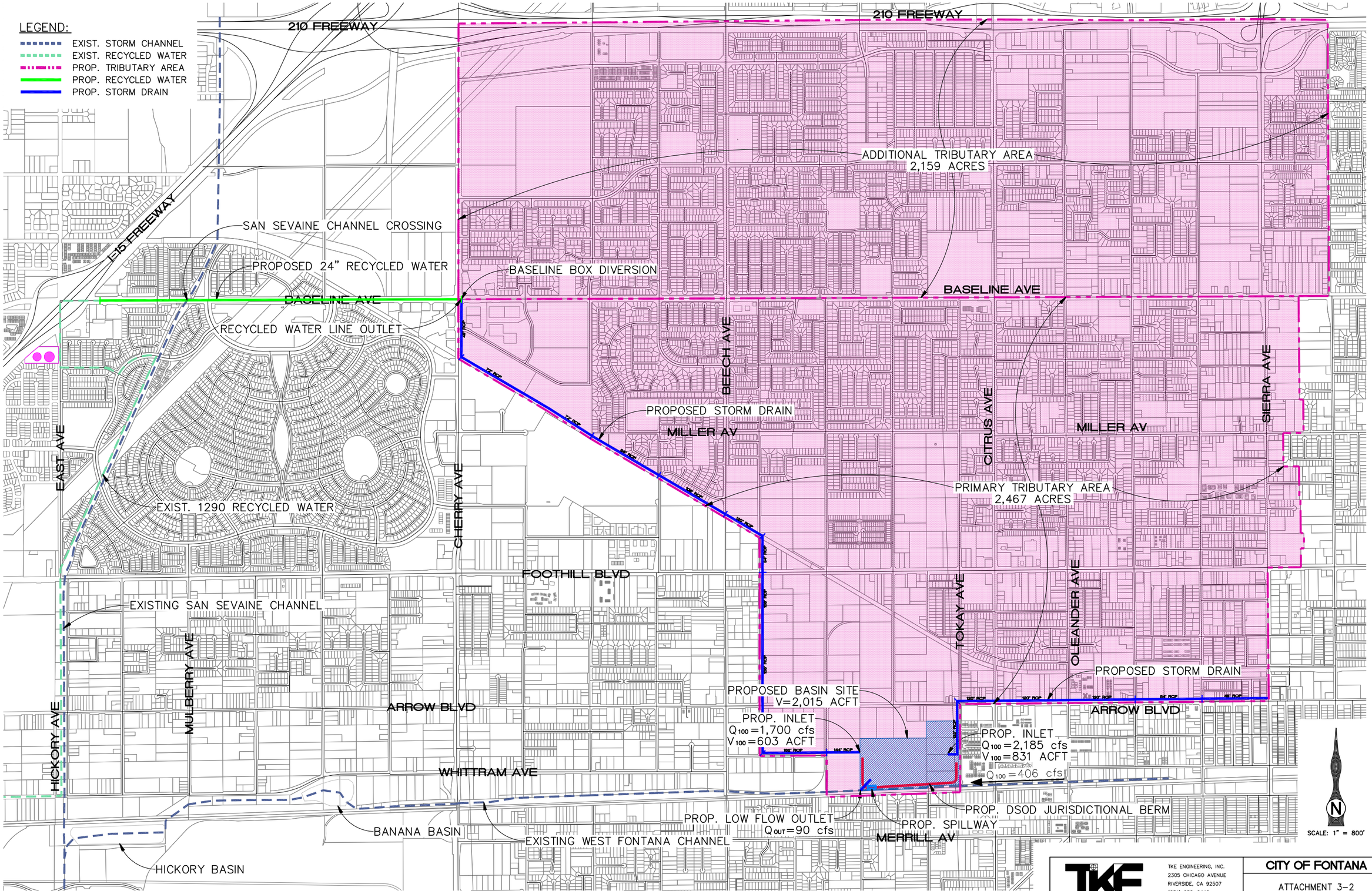
1 INCH = 2000 FEET

TKE ENGINEERING, INC.
2305 CHICAGO AVENUE
RIVERSIDE, CA 92507
(951) 680-0440
FAX: (951) 680-0490

CITY OF FONTANA

ATTACHMENT 3-1
REGIONAL MAP

S:\CADD\101-38 Fontana Recycled Water Program\Proposal\Fon 84 (G2)\Fontana_Att03_(G2_WorkPlan_02b)02.dwg



TKE ENGINEERING, INC.
2305 CHICAGO AVENUE
RIVERSIDE, CA 92507
(951) 680-0440
FAX: (951) 680-0490

CITY OF FONTANA

ATTACHMENT 3-2
PROJECT MAP

S:\CADD\101-38 Fontana Recycled Water Program\Proposition 84 IG2\Fontana_Att03_IG2_WorkPlan_03of03.dwg

Project O: Francis Street Storm Drain and Ely Basin Flood Control and Aquifer Recharge Project (City of Ontario)

Part One – Introduction

Goals and Objectives

The City's goals and objectives for the project are to improve flood protection and to enhance water conservation and water quality through groundwater recharge.

The project is designed to provide 100-year flood protection. The existing regional basin facilities, known as the Ely Basins, are ideal for additional excavation for aquifer recharge given their large surface area, relatively shallow existing depth (30 feet), and existence of adequate inlet and outlet facilities. The volume of the existing Ely Basins will be increased by 310 acre-feet to effectively recharge greater quantities of runoff during storm events.

Conveyance facilities will capture runoff from a tributary area of 956 acres and deliver it to the basins for recharge. The project will recharge quality water that will be additionally treated by natural filtration.

Purpose and Need

The purpose of the project is to improve flood protection, enhance water conservation and improve water quality. The need for the project is well documented. Flooding along Francis Street occurs during moderate flood events. Automobiles have been photographed in flood waters greater than 2 feet in depth. These conditions create a risk to public safety. Furthermore, rather than continuing to allow this valuable water resource to be lost to the Chino Basin, the City has incorporated improvements to the Ely Basins to conserve these resources for the benefit of the region. The Facilities will capture and convey runoff currently to the existing basins, wherein this flow will be recharged, assisting with regional water management. Additionally, the project will prevent impacts to business and residential areas.

Project List

This is a stand-alone project consisting of drainage conveyance facilities and expansion of existing basin facilities. See Attachment 3-2 for a project map. The storm drain conveyance system has 90% design completed and preliminary engineering has been completed for the basin expansion.

Integrated Elements of Project

As previously mentioned, the project is a stand-alone project and the City is partnering with Inland Empire Utilities Agency (IEUA) and the San Bernardino County Flood Control District (SBCFCD) to construct and maintain the improvements. The project will provide regional benefits by enhancing recharge in the Chino Basin for the benefit of all water producers. The project is included within Chino Basin Water Master's Recharge Master Plan.

Completed Work

The City has completed preliminary engineering of the basin site to verify that the site will meet project objectives. In addition, the City has completed the hydrology and hydraulics report and 90% design of the storm drain conveyance facilities.

Existing Data and Studies

As mentioned above, the City has completed the hydrology and hydraulics report a report and 90% design of the storm drain conveyance facilities, which can be submitted to the State upon request.

Project Map

A project location map is enclosed as Attachment 3-2.

Project Timing and Phasing

The project is a standalone project and does not include any phasing. The project will tie into existing regional flood control systems and will be fully functional as intended upon its completion.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Project Administration
The City will administer the project. Project administration will include project management and coordination. Administration includes execution of agreements with consultants and contractors at various stages related to the project. In addition, administration will include processing of invoices with consultants and contractors as well as State invoicing. Deliverables include invoices, supporting documents (e.g. consultant invoices, contractor payments, etc.), and other documents as required by DWR.

Task 2: Labor Compliance
The City will retain labor compliance assistance from a local firm to verify Davis-Bacon prevailing wage requirements. A payroll summary report will be prepared and submitted to the State.

Task 3: Reporting
The City will prepare all required quarterly, annual and final reports in accordance with grant agreement specifications. All reports will be delivered to the State.

Budget Category (b): Land Purchase/Easement

Not Applicable.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
The City has already completed a preliminary evaluation of the existing Ely Basins and found them to be sufficient for expansion needed for additional recharge volume. Additionally, the City has completed precise hydrology and hydraulic analysis for the storm drain system to confirm flood control volume requirements, inlet and outlet structure capacity requirements, and storm routing conditions. The technical study will be provided to the State for review.

Task 5: Project Design and Engineering

The City will prepare contract documents for construction. The City has already completed 90% design of the storm drain facilities; however final design, specifications, and estimates are still needed. The contract documents will include drawings, specifications and estimates for construction of the basin and related drainage system. To prepare the documents, a series of steps will be performed as follows:

- **a.** **Records Research** - the City will research utility and survey records for the basin site. This task is already complete for the conveyance alignment.
- **b.** **Design Surveys** - the City will collect field topographic data for the basin site. This task is already complete for the conveyance alignment.

c. **Base Construction Drawings** - using the data assembled during records research and field surveys, base construction drawings will be prepared for the basin. Base construction drawings for the storm drain are already complete.

d. **Preliminary Design** - using the base drawings, preliminary design for the basin. It will include expansion grading of the basin and structure design. The design will be consistent with technical study requirements presented above.

e. **Coordination with Agencies** - after the preliminary design is complete, the City will provide drawings to agencies that have an interest in the project and agencies that will be impacted by construction. We will request that they verify that existing facilities are mapped correctly.

f. **Geotechnical Investigation** - site conditions at the basin site will be performed to assess site conditions and to present construction requirements including material suitability, gradations and processing, compaction, percolation, and other requirements.

g. **90% Design** - 90% contract documents (plans, specifications, and estimates) for the basin, in addition to the already completed storm drain contract documents, will be submitted for consideration to the State.

h. **Final Design** - final contract documents (plans, specifications, and estimates) will be completed and submitted for consideration to the State.

Task 6: Environmental Documentation

Public works projects are subject to environmental compliance processing in accordance with California Environmental Quality Act (CEQA). The City will first complete the initial study check list to determine significance of potential environmental impact that the project may create. Upon completion of the check, a determination will be made by City planning staff that will either result in a negative declaration, a mitigated negative declaration, or a comprehensive environmental impact report (EIR). Whichever process is required, the City will endeavor to complete it and have its compliance documentation approved and adopted by the City's council. Final CEQA documents will be delivered to the State.

In addition to CEQA, the project will be subject to environment assessment related to expansion of the basin site. The report will be submitted to the State and to the Regional Water Quality Control Board to permit recharge into the basins; see Task 10 for further information.

Task 7: Permitting

Permits anticipated for project include right-of-way encroachment permits from the City, the County of San Bernardino, and a Regional Water Quality Control Board Permit. In addition, the project will require NPDES compliance processing. Upon acquisition of permits, copies will be submitted to the State.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

As required by State law, the City will publically bid the project including advertising it in the local publications as well as the Green Sheet. Proof of advertisement will be provided to the State. In addition, the City will hold a pre-bid conference for all contractors interested in bidding the project and respond to all inquiries in written format. The City will open bids at a selected time and will determine the responsible lowest bidder. Staff will recommend to the City's Council award of the project to lowest bidder. Upon state authorization, staff will advise the contractor of award and request contract execution. Upon completion of the contract execution, the City will verify that the contractor perform all activities in accordance with the contract documents. They include submittal review, preconstruction conference attendance, and construction progress meetings. All activities will be documented and copies will be submitted to the State.

Task 9: Construction

The selected contractor will perform all work on the project as follows:

Subtask 9.1 Mobilization and Site Preparation

Mobilization and site preparation include mobilizing grading and trenching equipment and site clearing of vegetation and debris for off-site disposal.

Subtask 9.2 Storm Water Conveyance Facilities

Construction of the storm water facilities includes trenching, shoring, installing approximately 8,500 linear feet of storm conveyance channel and related structures including inlet connections, manholes, bedding, backfill and compaction and all related work.

Subtask 9.3 Basin Earthwork

Construction of the basin begins with excavation of approximately 500,000 cubic-yards including precise grading, and disposing of materials at the basin site and all related work.

Subtask 9.4 Basin Monitoring Systems

Construction of the basin monitoring systems will include instillation of water level elevation meters and groundwater quality meters (lysimeter) and all related work.

Subtask 9.5 Performance Testing and Demobilization

The drainage systems and the basin will be visually inspected to verify contract compliance. All cast in-place concrete structures will include concrete cylinder testing to verify compliance with performance specifications.

Demobilization includes removal of all equipment used for construction, surplus project materials, spoils, and construction debris. All conveyance sites will be required to be returned to preconstruction conditions.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

Environmental mitigation requirements will be determined during Task 6. All Environmental Compliance/Mitigation/ Enhancement will be completed in compliance with the findings and/or Mitigation Monitoring Program. The City will ensure that construction will be completed in accordance with the approved mitigation requirements. The environmental compliance report will be submitted to the State for review.

Budget Category (f): Construction Administration

Task 11: Construction Administration

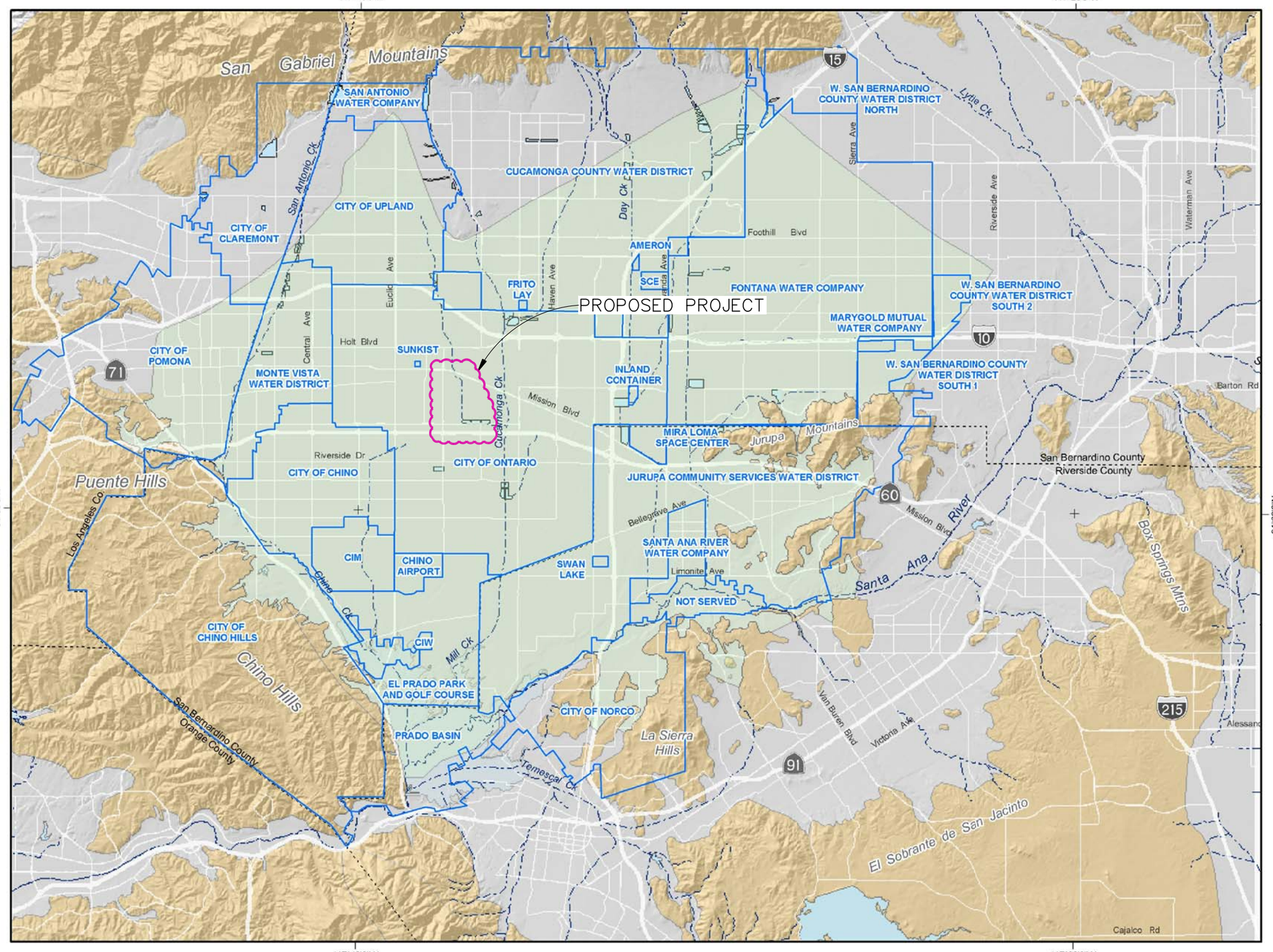
The City will perform all construction administration duties to verify that construction is being completed in accordance with the contract documents. Administration includes management, construction staking, geotechnical engineering, environmental compliance testing, and inspection.

Budget Category (g): Other Costs

Not a part of this work plan

Budget Category (h): Construction/Implementation Contingency

A construction / implementation contingency of approximately $1,280,000 is estimated for this Project. The City is aware that they must spend the entire amount so as not fall below their match funding requirement.

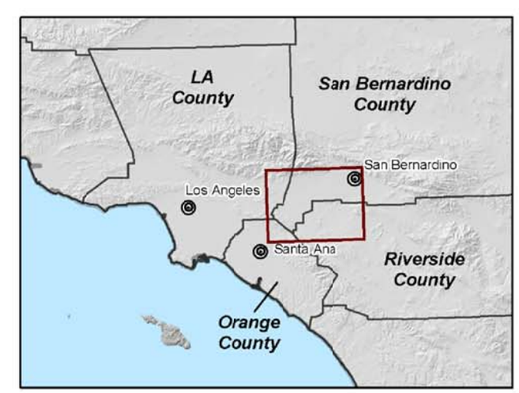


Main Feature

- Water Service Area Boundaries
- Chino Basin

Other Features

- Flood Control and Conservation Basins
- Unconsolidated Sediments
- Consolidated Bedrock



Produced by:

WE WILDERMUTH ENVIRONMENTAL, INC.
415 N. El Camino Real
San Clemente, CA 92672 Suite A
949.498.9294
www.wild-environment.com

Author: AEM/CKM
Date: 20030616
File: figure_4-6.mxd

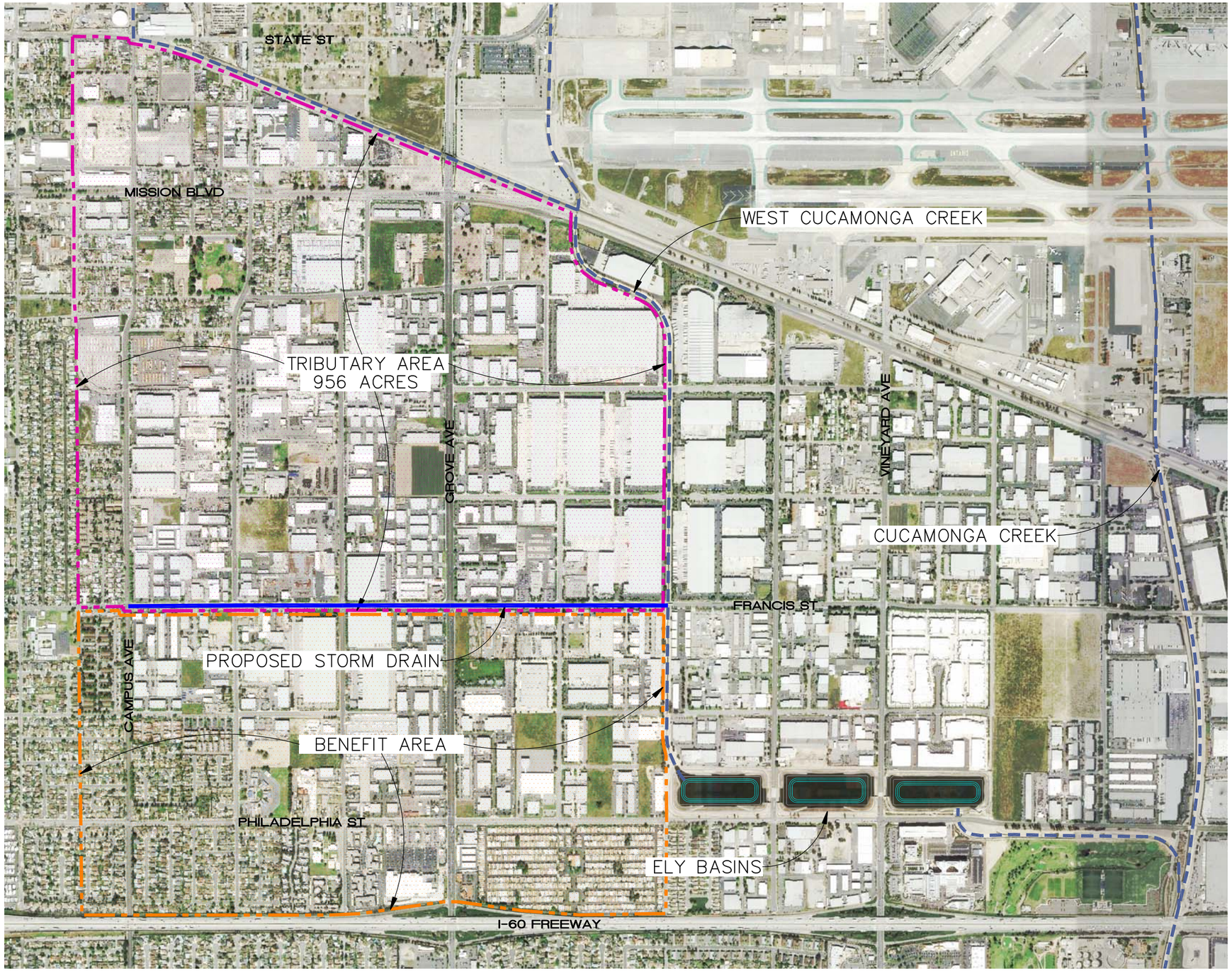
0 1 2 3 4 Miles
0 2 4 6 KM

TKE ENGINEERING, INC.
2305 CHICAGO AVENUE
RIVERSIDE, CA 92507
(951) 680-0440
FAX: (951) 680-0490

CITY OF ONTARIO

ATTACHMENT 3-1
REGIONAL MAP

S:\CADD\134-01 Francis Street Drainage System\Ontario_Att03_IG2_WorkPlan_02of03.dwg



LEGEND:

- EXIST. STORM CHANNEL
- PROP. TRIBUTARY AREA
- PROP. STORM DRAIN

N

SCALE: 1" = 600'

TKE ENGINEERING, INC.
2305 CHICAGO AVENUE
RIVERSIDE, CA 92507
(951) 680-0440
FAX: (951) 680-0490

CITY OF ONTARIO

ATTACHMENT 3-2
FRANCIS STREET STORM DRAIN
AND ELY BASIN PROJECT

S:\CADD\134-01 Francis Street Drainage System\Ontario_Att03_JG2_WorkPlan_03of03.dwg

Project P: Commercial/Industrial/Institutional Performance-Based Water Use Efficiency Program (Metropolitan Water District of Orange County)

Part One – Introduction

MWDOC proposes to develop and provide lead agency services for a holistic Commercial, Industrial, Institutional (CII) Performance-Based Water Use Efficiency Program (Program). As the lead agency, one of MWDOC's roles will be to provide administrative services for the multi-level partnerships associated with the Program. The main task of the Program will be to provide monetary incentives to CII sites including large-landscapes (LL) properties (landscapes $\geq$ 1 acre) based on volumetric water savings to customers within the watershed. The Program will yield benefits to multiple agencies within the Orange County SAWPA area while building on existing water use efficiency programs. The Program water savings goal is 450 AFY.

Goals and Objectives

The Program targets CII and LL sites, encouraging the reduction of water use by offering incentives based on volumetric water savings to customers within the watershed. At CII sites, projects will result in water reduction through comprehensive process improvements (e.g. on-site industrial process reuse) and/or rebate incentives for the replacement of high water using devices for water efficient devices (e.g. standard toilet for a high-efficiency toilet). At LL sites (landscapes greater than one acre), comprehensive landscape projects may include any combination of the following components: the replacement of non-functional turfgrass with climate-appropriate, non-invasive, California-Friendly landscapes or permeable surfaces, conversion of high-water-using spray heads to rotating nozzles, upgrade of conventional irrigation timers to weather-based-irrigation-controllers, or smart timers, and irrigation management services.

This Program is designed to encourage implementation through financial incentives available for the performance-based water use efficiency projects. Incentive payments from MWDOC are only offered to CII and LL sites successfully implementing long-term improvements. The incentive rate for comprehensive projects is $195 per acre-foot of water saved, with a savings life up to ten years. The incentive rate for rebate devices will follow the Metropolitan Water District of Southern California (MWD) regional rebate rates. Incentives may not exceed engineering, equipment, and construction costs.

To provide multi-level partnerships for administration within OC's entire SAWPA area with Program benefits yielded by multiple agencies while building on existing water use efficiency programs. The Program water savings goal is 450 AFY. This will be achieved by targeting the following individual project-type goals: 75 AFY for CII comprehensive process improvements, 170 AFY for CII rebate incentive improvements, and 205 AFY for comprehensive LL projects.

The Program application will include: 1) Complete description of the proposed project; 2) Cost estimate for the proposed project improvements; 3) An engineering report or vendor proposal (for comprehensive CII/LL improvements); 4) A process schematic with meter locations shown or comparable monitoring methodology (for comprehensive CII/LL improvements); and 5) Current water use, water savings estimate and, where appropriate, wastewater discharge savings estimates.

Purpose and Need

• Program will result in water savings and runoff reduction, yielding improved water reliability and reduction on the reliance on imported water within the watershed. Statewide benefits, include off-sets to Bay-Delta pumping, build on existing water use efficiency programs implemented in Orange County, and provide support for the implementation of Best Management Practices (BMPs).

• Program is consistent with the water use efficiency and watershed management goals contained in the California Water Plan, TMDLs, CALFED Bay-Delta objectives, AB 32, and local land use planning. The Program protects

surface, groundwater, and ocean quality by reducing dry weather runoff and pollution from existing landscapes; employing landscape water use techniques that promote the infiltration and beneficial use of water; and reducing treated CII wastewater discharged into the ocean. The Program promotes region-wide utilization of BMPs that are appropriate to non-point source (NPS) pollutants to prevent potential pollutants from entering municipal storm drain systems and aquatic ecosystems during wet/dry weather.

• The Water & Energy Efficiency Program for CII Customer Classes in Southern CA report, published by USBR (April 2009), recommended offering integrated water and energy efficiency programs, as well as engineering support, to CII sectors. During a review of sanitation district wastewater flow data, Industrial sectors were identified as having large potential for water savings.

• According to the State Water Resources Control Board, there is more dry weather runoff in the storm drains than stormwater runoff. Landscape attributed dry weather runoff reduction and NPS pollution reduction are anticipated to be greater than 50%, as documented in MWDOC's Residential Runoff Reduction (R3) Study. Reduced urban runoff also benefits water quality within OC's creeks and streams. The R3 Study found that a reduction in total pollutant migration could be achieved by reducing total dry season urban runoff (MWDOC and IRWD 2004).

Project List

Project Title	Implementing Agency	Project Abstract	Status of Implementation / Percent Completion of Design
CII Performance-Based Water Use Efficiency Program	Municipal Water District of Orange County (MWDOC)	The Program targets Commercial/Industrial/Institutional and Larger Landscape sites, encouraging the reduction of water use by offering incentives based on volumetric water savings to customers within the watershed. To provide multi-level partnerships for administration within OC's entire SAWPA area with Program benefits yielded by multiple agencies while building on existing water use efficiency programs. The Program water savings goal is 450 AFY.	MWDOC is ready to begin its project immediately. Upon award MWDOC will submit a CEQA categorical exemption.

Integrated Elements of Projects

MWDOC currently implements a variety of regional commercial, industrial, and institutional water use efficiency programs. This CII/LL Performance-Based Program will build on existing programs that have included the Water Smart Industrial Water Program, Water Smart Hotel Program, So Cal WaterSmart Program (f.k.a. Save Water Save A Buck), and various landscape programs. These programs are complementary and work collaboratively to achieve maximum landscape water conservation results.

This Program provides multi-level partnerships within the SAWPA IRWM area, including the sub-watershed basins, with benefits yielded by cities, water districts, community, and the environment. The Program builds on established regional integration and coordination with multiple goals across geographic ad water resource services. Implementation of this Program is consistent with the Landscape BMP (formerly BMP No. 5) and the CII BMP (formerly BMP 9). The Program is consistent with the water use efficiency and watershed management goals contained in the California Water Plan, TMDLs, CALFED Bay-Delta objectives, AB 32, and local land use planning. The Program protects surface, groundwater, and ocean quality by reducing dry weather runoff and pollution from existing landscapes; employing landscape water use techniques that promote the infiltration and beneficial use of water; and reducing treated CII wastewater discharged into the ocean. The Program promotes region-wide utilization of BMPs that are appropriate to non-point source (NPS) pollutants to prevent potential pollutants from entering municipal storm drain systems and aquatic ecosystems during wet/dry weather.

The Program encourages appropriate source of water, reduces water discharge to storm drain and sanitation districts, increases onsite infiltration, and decreases non-beneficial use, leading to supply reliability of imported water dependency. MWDOC, in collaboration with its retail water agencies established the OC 20x2020 Regional

Alliance as part of MWDOC's 2010 Regional Urban Water Management Plan, where all retail agencies benefit from pooling their water use efficiency investments.

Completed Work

MWDOC will file a Categorical Exemption under Section 15304 – MINOR ALTERATIONS TO LAND (Class 4), and Categorical Exemption under Section 15301 – EXISTING FACILITES (Class 1), and MWDOC filed a Categorical Exemption under Section 15306 INFORMATION COLLECTION–(Class 6) with the County of Orange in October of 2006. This Program does not involve construction. The Program does involve data collection and resource evaluation of CII/LL water use and will result in water saving process change recommendations and engineering assistance for businesses and institutions. Financial incentives are provided for businesses who implement recommended changes. The Program's activities do not result in a serious or major disturbance to an environmental resource. None of the exceptions to categorical exemptions set forth in CEQA Guidelines Section 15300.2 are applicable. The proposed Project does not include land disturbance, therefore NEPA will not be required.

Existing Data and Studies

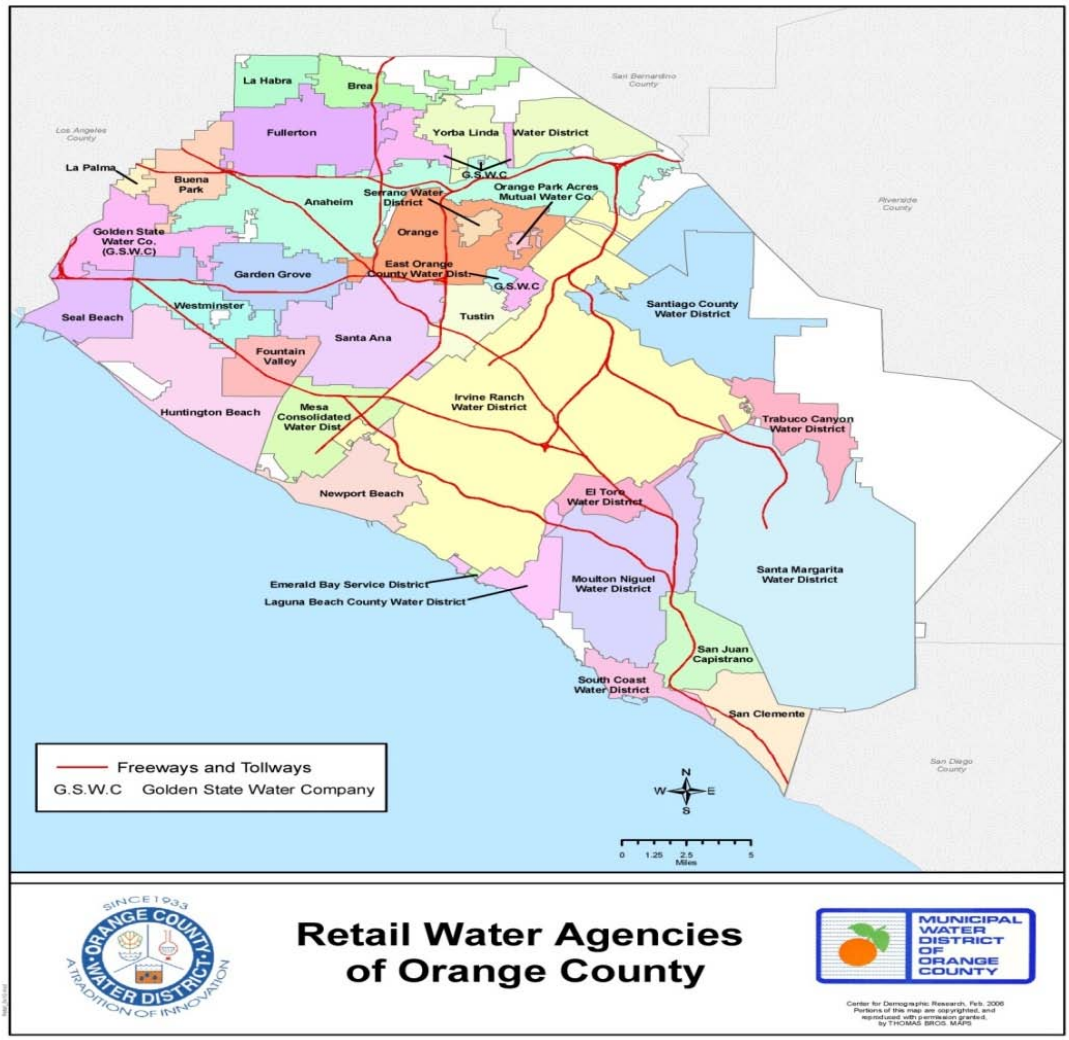
A variety of reports and studies have been produced or referenced to support implementation of the proposed Program. In 2009, USBR completed a five volume report called the Water Energy Efficiency Program (WEEP) for CII Customer Classes in Southern California. The WEEP Study confirmed that integrated resource management programs can foster gains in water and energy efficiency among targeted CII sectors. This report recommended offering integrated water and energy efficiency programs, as well as engineering support, to CII sectors. During a review of sanitation district wastewater flow data, CII sectors were identified as having large potential for water savings in Orange County. Primary recommendations for improvement include: Equipment upgrades (i.e., replacing existing equipment with new equipment characterized as more water or energy efficient); Operating and maintenance practices to ensure that site equipment is used as intended and consistent with load demands; Design, expand, or change new or existing processes and facilities to achieve greater levels of water and energy efficiency in building designs and manufacturing related activities. MWDOC is currently evaluating our Hotel (audit and incentive) Program, which has been implemented within Orange County since 2008 and which achieved 107% of the water savings goal of 453acre-feet per year (AFY). The proposed CII and School Program would utilize the success of and build upon the Hotel Program process. CII water demands make up a significant percentage of total demand within the MWDOC service area.

As recommended by the California Urban Water Conservation Council's (CUWCC) Potential BMPs, the Program is developed as a holistic approach to landscape water use efficiency that provides incentives and technical resources, with monitoring and reporting of water use. According to the State Water Resources Control Board, there is more dry weather runoff in the storm drains than stormwater runoff. Landscape-attributed dry weather runoff reduction and NPS pollution reduction are anticipated to be greater than 50%, as documented in MWDOC's 2004 Residential Runoff Reduction (R3) Study. Reduced urban runoff also benefits water quality within local creeks and streams. The R3 Study found that a reduction in total pollutant migration could be achieved by reducing total dry season urban runoff. To further test the feasibility of landscape programs, MWDOC has successfully implemented a standalone residential and commercial non-functioning turfgrass removal program since November 2010 that has resulted in more than 436,600 ft^2 of turf removed and replaced with California Friendly plantings. To date 39 sites have participated, with an additional 82,800 ft^2 of turf removal pending, yielding an average of approximately 13,800 ft^2 per site. Utilizing this experience and data derived from these programs, MWDOC has applied historical participation statistics to calculate the proposed numbers for this Program.

An additional benefit associated with holistic landscape projects is the emphasis on proper irrigation. Replacement of a standard irrigation controller with a weather-based irrigation controller (a.k.a. smart timer), standard pop-up spray heads with water efficient rotating nozzles, or the complete removal of irrigation at the conversion site can achieve quantifiable and sustained water savings in urban landscapes, specifically in commercial landscapes throughout Orange County, California. Through a 2012 statistical evaluation of past programs conducted on rebate program participants, MWDOC has measured water savings of more than 27% at commercial accounts, averaging 727 gallons per day (gpd) per installation of a smart timer (with respect to weather normalization) and additional 1 to 4 gpd per rotating nozzle.

Project Map

This Program will be available throughout Orange County's entire SAWPA Integrated Regional Water Management (IRWM) area. This includes the cities of: Anaheim, Brea, Buena Park, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, La Habra, La Palma, Newport Beach, Orange, Santa Ana, Seal Beach, Tustin, Westminster; along with the following water districts: East Orange County, Irvine Ranch, Golden State, Mesa, Orange County, Serrano, and Yorba Linda.



Retail Water Agencies of Orange County

Project Timing and Phasing

The Project's schedule will be driven by Tasks 2 through 6. Each task's requirement will occur according to the proposed Project schedule table below.

Proposed Program Schedule/Task	Time Frame
Scope of work completed and agreement executed. Task 3 - Categorical Exemption Filing Task 5 - Marketing Material designed (w/ Reclamation's logo) and printed. Task 5 - Change order established with URS and Mission RCD to include Program inspections. Tasks 4 & 5 - Participation procedures developed.	Month 1 - 2
Task 5 - Disseminate marketing materials throughout Program term. Task 5 - Perform pre/post inspections of site interventions. Task 5 - Perform quality control site inspections on device installation inspections. Task 4 - Implement rebate incentive portion of the Program. Task 4 - Issue rebates to qualified participants.	Month 2 - 33
Task 2 - Semi-annual invoicing, reporting, and deliverables sent to Reclamation.	Month 3 - 34
Task 6 - Convene Program advisory group to initiate statistical evaluation.	Month 32
Task 6 - Provide selected statistician with Program data and monitor progress, including reviewing draft and final Program evaluation report.	Month 33 - 36
Task 2 - Final reporting and deliverables sent to Reclamation.	Month 36

Part Two - Proposed Work Tasks

Proposed Work

a. **Work to be performed:**
b. **Procedures for grant reporting:** As lead agency, MWDOC will be responsible for the development and submittal of all required reporting. Progress reports will be submitted on a Quarterly basis including the associated invoice for the reporting period. Quarterly reporting, at a minimum, will include, a task by task report on progress achieved within the reporting period and from the start of the project; a written narrative that supports the requested funding and details all activity, by task, for the quarter; a description of the estimated benefits to date; quarterly projections for all future work to be completed; the DWR invoicing document; all required backup documents; challenges and how they were overcome; any customer satisfaction issues; and any modifications made to the Program. As part of the final reporting, MWDOC will also submit a bound version of the statistical evaluation of the water savings, the CII-PB Program database, and all photographic examples of the work performed. The Final Report will also document implementation of the project including the number of sites, number of one-to-one devices installed; total square footage or turfgrass removal; marketing methods and associated performance; results of the water savings evaluation; and lessons learned.
c. **Procedures for coordination with partner agencies that may receive funding from grant including contracts, MOUs, other formal agreements:** MWDOC will develop a standardized Program Rebate Application form for execution by each of the Program participants in order to formalize their participation in the Program. The Application will detail the criteria by which each site qualifies for participation in the Program's Terms and Conditions. The Application will be used to specify the process improvement, number of devices, or square footage which will result in the amount of matching funds and the allocation of grant funds of each individual Program site.
d. **Standards – Construction, health & safety, laboratory analysis, or accepted classifications methods that will be used for implementation:** Any process improvements or device upgrades will be in accordance with CII BMPs as recommended by the California Urban Water Conservation Council. In 2009, cities throughout Orange County updated their Landscape Ordinances in response to Assembly Bill 1881. This update established a Maximum Applied Water Allowance (MAWA) of 70% of the local evapotranspiration rate for all new commercial landscapes larger than 2,500 square feet. The proposed

project will demonstrate this design standard to community residents by replacing existing turf intensive landscapes with landscapes that meet or exceed the new MAWA.

e. **Performance measures and monitoring plans:** The performance measure that will be used to determine the effectiveness of the project will be a robust, regression based, statistical water savings evaluation of pre- and post-participation water use information. This evaluation will include weather normalization of pre and post retrofit water use.
f. **Status of land acquisition and rights-of-way:** Not Applicable. The proposed project does not include land or rights-of-way acquisition.
g. **All necessary permits and status:** The Municipal Water District of Orange County will not be required to obtain permits to implement the proposed project however, participants receiving rebate incentives administered through the Program, to facilitate landscape improvements, may require a landscape permit. Adherence to local permitting requirements will be a condition of receiving rebate incentives.
h. **Status of preparation and completion of requirements to comply with CEQA/NEPA, including mitigation requirements (There is a tribal notification requirement that must be included in this task):** MWDOC will file a Categorical Exemption under Section 15304 – MINOR ALTERATIONS TO LAND (Class 4), and Categorical Exemption under Section 15301 – EXISTING FACILITES (Class 1), and MWDOC filed a Categorical Exemption under Section 15306 INFORMATION COLLECTION– (Class 6) with the County of Orange in October of 2006. This Program does not involve construction. The Program does involve data collection and resource evaluation of CII/LL water use and will result in water saving process change recommendations and engineering assistance for businesses and institutions. Financial incentives are provided for businesses who implement recommended changes. The Program's activities do not result in a serious or major disturbance to an environmental resource. None of the exceptions to categorical exemptions set forth in CEQA Guidelines Section 15300.2 are applicable. The proposed Project does not include land disturbance, therefore NEPA will not be required.
i. **Deliverables to DWR for assessing progress and accomplishments, such as Quarterly and Final Reports:** As lead agency, MWDOC will be responsible for the development and submittal of all required progress reporting. As part of the final reporting, MWDOC will also submit a bound version of the statistical evaluation of the water savings, the CII-PB Program database, the project improvement verification forms, and all photographic examples of the landscape improvement work performed.
j. **Any other tasks applicable to the project and not listed above:** Not applicable.
k. **Most recent plans and specifications should be referenced, including page or sheet numbers, in the Work Plan and copies must be submitted:** Not Applicable.

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration

MWDOC will act as lead agency for implementation of this project. MWDOC staff has more than 35 combined years of experience implementing a variety of in-door and out-door water use efficiency projects in Orange County.

- **Subtask 1.1 – Execute DWR Agreement**

  Working with the SAWPA, MWDOC will review, provided comments, and execute the DWR Agreement.

- **Subtask 1.2 – Administration**

  MWDOC will manage the day-to-day implementation of this project from start to finish. This will include the following: coordination with DWR and the County of Orange on all Grant agreement issues; coordination with the retail water agencies and cities within the SAWPA IRWM, establishing the participation requirements; establishing the CII-PB Program eligibility criteria; monitor the quality of work performed by the rebate and inspection contractors throughout the term of the project; coordinate all promotional material with the cities; prepare and submit reporting to DWR, SAWPA, and all participating funding partners; monitor and analyze the expected water conservation benefits; and develop and submit the water use evaluation and final project reports.

Deliverables; Preparation of invoices and other deliverables as required.

Task 2: Reporting

- **Subtask 2.1 – Quarterly Reporting**
  MWDOC will prepare quarterly reports describing CII-PB Program implementation for the appropriate reporting period. Quarterly reporting, at a minimum, will include, a task by task report on progress achieved within the reporting period and from the start of the project; a written narrative that supports the requested funding and details all activity, by task, for the quarter; a description of the estimated benefits to date; quarterly projections for all future work to be completed; the DWR invoicing document; all required backup documents; challenges and how they were overcome; any customer satisfaction issues; and any modifications made to the project.

- **Subtask 2.2 – Final Reporting**
  MWDOC will also prepare a Final Project Report documenting implementation of the project including the number of sites, number of one-to-one devices installed; total square footage or turfgrass removal; marketing methods and associated performance; results of the water savings evaluation; and lessons learned.

Deliverables: Submission of quarterly, final and post completion reports as specified in the Grant Agreement

Budget Category (b): Land Purchase/Easement

Not Applicable

Budget Category (c): Planning/Engineering/Environmental Documentation

Not Applicable

Task 3: Environmental Documentation

- **Subtask 3.1 – Categorical Exemption Filing**
  Upon award MWDOC will submit a Categorical Exemption under Section 15304 – MINOR ALTERATIONS TO LAND (Class 4), and Categorical Exemption under Section 15301 – EXISTING FACILITES (Class 1). This project is an implementation project for existing and developing Urban Areas. Tasks include purchase and installation of landscape irrigation and plant material improvements on urban landscapes. Activities for this project do not involve any new construction and there will be no disturbance to the environment, therefore, this project meets the standards for Categorical Exemption.

Deliverables: Approved and adopted Categorical Exemption filling

Budget Category (d): Construction/Implementation

Task 4: Construction

Prior to starting the site improvements, MWDOC will develop and implement Subtasks 1 – 5 as listed below. Subtask 6 and 7 will be implemented once the individual landscape renovations begin.

- **Subtask 4.1 – Eligibility Criteria**
  The first item MWDOC will develop at this stage in the project will be the eligibility criteria that will guide each participant in implementing their individual landscape improvement projects.

- **Subtask 4.2 – Project Application**
  MWDOC will develop a standardized Program Rebate Application form for execution by each of the Program participants in order to formalize their participation in the Program. The Application will detail the criteria by which each project site qualifies for participation in the Program's Terms and Conditions. The Application will be used to specify the process improvement, square footage, and/or

number of devices with will result in the amount of matching funds and the allocation of grant funds of each individual Program site.
MWDOC will evaluate each Application and those that meet the eligibility criteria of the CII-PB Program. Those projects that qualify will be given a project 'Notice to Proceed' document.

- **Subtask 4.3 – Technology List**
  Eligible CII one-to-one device improvements will comply with the So Cal Water Smart device lists; while, comprehensive process improvement projects will follow site specific engineering recommendations. Landscape improvement work that will be performed at each qualified site will include at a minimum the replacement of all non-essential turf grass with California Friendly or native plant species; the installation of weather-based self-adjusting irrigation 'smart' timers, and/or the conversion of high-volume overhead spray irrigation to low-volume irrigation rotating spray nozzles.

- **Subtask 4.4 – Issue Incentives for Landscape Renovations**
  Once all project has been fully implemented, and the post-improvement verification has been performed, and the site passes all final participation criteria, MWDOC proposes to provide, through a rebate format payment, an incentive of:

- **Subtask 4.5 – Participant Database**
  MWDOC will compile a database of all relevant data. This data at a minimum will include: site, city, and contact information; site improvement data that will capture the work performed at each site; the make, model and quantity of the one-to-one water efficient devices installed; the Grant and Matching funds expended at each site; and all relevant dates and check numbers.

Deliverables: Memorandum of Understanding for each participating city; Eligibility Criteria; Project Application; A list of the Approved Technologies; Final Participant Database

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Not Applicable

Budget Category (f): Construction Administration

Task 5: Construction Administration

MWDOC will perform installation verification inspections to ensure site improvements are completed. This will include taking photographs of the improvements and the collection of onsite post –improvement data.

- **Subtask 5.1 – Program Marketing**
  Program marketing materials will be developed for distribution and promotion. All Program marketing materials will include the DWR logo.

- **Subtask 5.2 – Site Photographs**
  Project photographs will be taken at participating site**s**

- **Subtask 5.3 – Verification Forms**
  Using a combination of MWDOC, personnel acting on behalf of MWDOC, and/or retail water agency/city Staff, project implementation verifications will be performed to visually inspect, measure, and verify all project guidelines have been met. The information will first be collected on site verification forms and then databased in the project database.

Deliverables: Marketing Materials, Project Photographs

Budget Category (g): Other

Task 6: Assessment and Evaluation

- **Subtask 6.1 – Benefit Analysis**
  An evaluation of the stated water use efficiency benefits will be conducted to determine the effectiveness of the project will include a robust, regression based, statistical water savings evaluation of pre- and post- water use information. Up to 5 years of pre-water use history and a minimum one-year of post site improvement water use history will be obtained from the participating water agency. Once the water use information is obtained, the data will be unit, capita, and/or weather normalized and scrubbed in order to analyze the results.

Deliverables: Water Use Efficiency Technical Evaluation Report

Project Q: Peters Canyon Channel Water Capture and Reuse Pipeline (City of Irvine)

Part One - Introduction

Goals and Objectives

The goal of the Peters Canyon Channel Water Capture and Reuse project (Reuse Pipeline) is to improve nitrogen and selenium water quality within Peters Canyon Channel. This goal will be achieved through capturing and permanently diverting discharges of selenium and nitrogen-laden surface and groundwater from four locations: the Caltrans Groundwater Treatment Facility, Como Channel, Valencia Storm Drain and Edinger Circular drain. Captured flows will be transported through an underground pipeline to the Orange County Sanitation District (OCSD) Fountain Valley facility via the Main Street Trunk Sewer for treatment and subsequent discharge to the Orange County Water District (OCWD) Groundwater Replenishment System (GWRS). The flows will ultimately be reused through infiltration in either injection wells to create a seawater intrusion barrier or OCWD's percolation basins in Anaheim.

Purpose and Need

Total Maximum Daily Loads (TMDLs) for both selenium and nitrogen are in place for the Newport Bay watershed including Peters Canyon Channel (it should be noted, the project proponents are currently in compliance with their permitted discharges and this project is not required for compliance, but will provide significant additional environmental benefit). Historically, a naturally occurring geologic marsh known as *Cienega de las Ranas* or Swamp of the Frogs covered the project area. During geologic time naturally occurring selenium from the surrounding foothills was collected and immobilized in this marshy lowland, which stretched from Upper Newport Bay over 8 miles upstream to approximately Red Hill Avenue in the City of Tustin. Today, this area is no longer a marsh, but selenium-laden groundwater exfiltrates into surface water drainages where it may create a biological risk for birds and fish throughout the watershed. Groundwater in the area also contains high levels of nutrients from historic agricultural activities.

The Project will address discharges from three permanent roadway dewatering locations and two stormdrains within the Peters Canyon Channel subwatershed of the Newport Bay watershed. Two dewatering locations, which discharge into Como Channel, (Culver Road at the BNSF railway and Jeffrey Road at the BNSF railway) are operated by the City of Irvine, and one location (Caltrans Groundwater Treatment Facility (GWTF)) is operated by Caltrans. These dewatering activities are maintained to keep roadways free of seeping groundwater. The proposed pipeline will also capture flows from two stormdrains which lie beneath Edinger Avenue (Edinger Circular Drain) and Moffett Drive (Valencia Stormdrain). Groundwater infiltrates these drains and carries high levels of selenium and nitrogen to the channel. By diverting these four flows (Como Channel, Caltrans GWTF, Edinger Circular Drain, Valencia Stormdrain) to OCSD with subsequent transfer to OCWD GWRS, the pipeline project will reduce selenium loadings by 258 lbs per year and nitrate loadings by 70,000 lbs per year. When constructed, the project will provide the largest selenium load removal in the Newport Bay watershed. 100% of the captured flows will be treated by OCSD and transfers to OCWD GWRS will be made through its current operation process.

Project List

A table of specific projects in the Proposal, including, an abstract of each project, the current status of each project in terms of percent completion of design, and implementing agencies.

Integrated Elements of Projects

The Peters Canyon Channel Water Capture and Reuse Pipeline is not integrated or related to any other project included in this application.

Completed Work

A concept feasibility and 15% design study has been completed for the Reuse Pipeline (Irvine Ranch Water District Peters Canyon Channel Water Capture and Reuse Pipeline Concept Feasibility Study, December 21, 2012). The concept feasibility report includes a description of the project concept, flow rates, water quality, hydraulic analysis, concept-level design, and preliminary capital and O&M cost estimates, It recommended a pipeline alignment after evaluating four potential alignments and evaluating their project costs, public impact and ease of construction.

Existing Data and Studies

A brief discussion of the data that have been collected and studies that have been performed that support the project(s) site location, feasibility, and technical methods. If necessary, include references to the page locations of the studies or reports that support the claims made in this discussion.

Public entities in the Newport Bay watershed have a long history of joint efforts to address sediment and water quality issues. In 1999 the Newport Bay Watershed Executive Committee was formed to evaluate sedimentation issues in Newport Bay. From 2003 to the present all nine watershed cities along with IRWD and the Irvine Company have participated in cooperative funding agreements for three Total Maximum Daily Loads (TMDL's) addressing 17 constituents. In 2004 the Nitrogen and Selenium Management Program was established to develop a comprehensive understanding of land management plan for selenium and nitrogen groundwater-related inflows in the watershed. Using the Newport TMDLs and NSMP partnerships as a foundation, the City of Irvine, City of Tustin, Orange County Flood Control District, Caltrans, IRWD and the Transportation Corridor Agencies (collectively, the Project Partners) began meeting in late 2011 to develop a regional solution for discharges from multiple parties to Peters Canyon Channel, a main tributary to San Diego Creek and Newport Bay. The proposed project was conceived in early 2012. Following is a list of previously completed reports directly related to the Reuse Pipeline project that have been incorporated into the December 21, 2012 concept study where appropriate.

Sources and Loads for Selenium in the Newport Bay Watershed Final Report, June 12, 2009, Nitrogen and Selenium Management Program Working Group
The report provides an analysis of the selenium sources to the watershed, and, as possible, presents the range of concentrations and loads from each source. The sources for the freshwater creek and wetland habitat within San Diego Creek watershed and for habitat within Newport Bay are depicted in the conceptual model diagrams (Figures 1 and 2, respectively). The pertinent information for Peters Canyon Channel subwatershed can be found in pages 11-38. The report can be accessed at: http://ocnsmp.com/pdf/Sources_and_Loads_12June2009.pdf

Time Schedule Order R8-2009-0069 BMP Strategic Plan, Newport Bay Watershed, January 1, 2011, County of Orange, et al.
The report outlines a phased approach for Nitrogen and Selenium Management Program stakeholders to assist in achieving nitrogen and selenium water quality objectives in the Newport Bay watershed. Diversion of surface flows/storm drain flows to the sanitary sewer is included in both Phase I – Evaluation and Optimization and in Phase II – Candidate Implementation Alternatives. The proposed alignment of the Peters Canyon Channel Water Capture and Reuse pipeline was not developed at the time of this report, but the report highlights that sewer diversion has been anticipated as an effective means to reduce nitrogen and selenium loadings within the watershed.

Lower Peters Canyon Wash Selenium Mass Balance Study, March 29, 2012, OC Watersheds Program, OC Public Works
Lower Peters Canyon Wash (PCW), the major tributary to San Diego Creek and predominant source of selenium load to the Newport Bay watershed, was monitored to establish flow and selenium mass balances. Field monitoring was carried out during dry weather condition from January to March, 2012, and included flow measurements and water quality sampling for all inflow points (upper PCW, major tributaries, all accessible storm drains, and some seeps) and a single outflow point (PCW atBarranca). The mass balance enabled evaluation of several hypothetical scenarios in which various combinations of side channels/storm drains are intercepted for treatment or diversion.

Irvine Ranch Water District Peters Canyon Channel Water Capture and Reuse Pipeline Concept Feasibility Study, December 21, 2012

The report analysis includes a description of the development of the proposed project concept, flow rates and water quality, hydraulic analysis, concept-level facility design, preliminary capital and O&M cost estimates and assumptions, and the recommended project alternative and implementation plan. The following studies were utilized in developing this report:

- Cienega GW Disposal System Pipeline Alignment Alternatives Cost Evaluation, RBF Consulting, August 27, 2012
- Cienega Disposal System Diversion Structures at Peters Canyon Channel, RBF Consulting, August 17, 2012.
- Caltrans PSR 12-0H450, December 7, 2007
- Irvine Ranch Water District, Cienega Selenium and Nitrogen Removal Project – Buried Facility Alternative Analysis, HDR, December 22, 2010.
- Irvine Ranch Water District Peters Canyon Channel Water Capture and Reuse Pipeline Concept Feasibility Study, December 21, 2012

Project Map

See Attached.

Project Timing and Phasing

The Peters Canyon Channel Water Capture and Reuse Pipeline is a stand-alone project, not part of a multi-phased project complex or a component of a larger project.

Part Two - Proposed Work Tasks

As stated above, the project is currently at the 15% design phase. Thorough details on future tasks, costs and schedule are currently unavailable, and are estimated in this document. It is anticipated that Prop. 84 funds will be utilized only in the construction phase (Category (d)) of the project and matching/other funding will be used for the following categories:

- Category (a): Direct Project Administration
- Category (b): Land Purchase/Easement
- Category (c): Planning/Design/Engineering/Environmental Documentation
- Category (e): Environmental Compliance/Mitigation/Enhancement
- Category (f): Construction Administration

Information for these categories provided below is included to give a sense of the project as a whole.

Budget Category (a): Direct Project Administration

Task 1: Administration
No Prop. 84 grant funds will be used for this task.
Irvine and the project participants will administer the project with assistance from consultants and construction management. Administration activities include, but are not limited to, plan and specifications review, review bid and contract documents, attend pre-bid conferences, review addenda as required, attend bid openings, review bids, prepare construction contracts for award, weekly project meetings, respond to requests for information, attend progress meetings, review pay requests, contractor contract administration, coordinate with project auditors, contract close-out , grant coordination, preparation of payment requests. IRWD administrative staff will prepare invoices and other deliverables as required.

Deliverables: Preparation of invoices and other deliverables as required.

Task 2: Labor Compliance Program
No Prop. 84 grant funds will be used for this task.
Irvine and the project participants will retain a third party to provide labor compliance services and develop a labor compliance program for the Reuse Pipeline project. The third party provider will develop a Labor Compliance Program that meets the requirements of the Labor Code and register the Reuse Pipeline project with the California Department of Industrial Relations.

Deliverables: Submission of Labor Compliance Program

Task 3: Reporting
No Prop. 84 grant funds will be used for this task.
Irvine and the project participants shall prepare and submit a project monitoring plan and provide quarterly, annual and final reports as specified in the Grant Agreement.

Deliverables: Submission of project monitoring plan, quarterly, annual and final reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

No Prop. 84 grant funds will be used for this task.
The Reuse Pipeline project's pipe alignment and diversion facilities will require easement or encroachment permits from a number entities including but not necessarily limited to the six identified in the December 21, 2012 concept study. As presented below, the first four entities identified are project participants while the remaining two are private entities. Additional project right-of-way investigations will be performed in the preliminary design phase for all project elements.

- Orange County Flood Control District Easement/Encroachment Permit
- Caltrans Encroachment Permit
- City of Tustin Easement/Encroachment Permit
- City of Irvine Easement/Encroachment Permit
- Moffett Meadows Partners Easement
- K. Hovanian at Park Lane, LLC Easement

Deliverables: Submission of all applicable easements obtained for the project construction.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Task 4: 30% Preliminary Design Report (PDR)
No Prop. 84 grant funds will be used for this task.
The December 21, 2012 concept feasibility report titled Irvine Ranch Water District Peters Canyon Channel Water Capture and Reuse Pipeline Concept Feasibility Study, represents a 15% project design that identifies the types of facilities, permitting and costs required to construct the Reuse Pipeline. The 30% Preliminary Design Report (PDR) will build upon the concept feasibility report by negotiating various permits and updating and verifying the flow and design criteria. It will include environmental research and technical studies required to prepare a CEQA and NEPA document for the project. In addition it will identify and negotiate various right-of-way agreements. The PDR will refine the design and cost estimates for each facility necessary to construct the Reuse Pipeline.

Deliverables: A Preliminary Design Report and a CEQA and NEPA Report.

Task 5: Final Design
No Prop. 84 grant funds will be used for this task.
Final Design will include three major submittals at the 60%, 90% and 100% completion level. The final design will includes such tasks as:

- Surveying, site topography, contours, horizontal and vertical controls, and existing utilities, property lines and rights-of-way
- A preliminary geotechnical investigation

- Documents to identify impediments to the planned alignment of the pipeline
- Review of geotechnical report
- Preparation and review of design drawings, including civil, hydraulic, process, architectural, structural, mechanical and instrumentation design for all project components
- Preparation and review of technical specifications
- Preparation and review of construction cost estimates at each stage of design completion
- Obtain permits, rights-of-ways and easements necessary for the project
- Review design drawings, technical specifications, and construction cost estimate for review at the 30 percent, 60 percent, and 90 percent completion stages
- Receive 100 percent final construction contract documents and engineer's estimate
- Prepare and review bid and contract documents

Deliverables: Completion of project plans and specifications at the 90 percent and final level.

Task 6: Environmental Documentation
No Prop. 84 grant funds will be used for this task.
The Reuse Pipeline project is subject to the environmental review process established by CEQA and, because Federal Funding may be provided by one project participant, NEPA. CEQA and NEPA environmental work will be conducted as part of the Preliminary Design.

Deliverables*:* Approved and adopted CEQA/NEPA documentation

Task 7: Permitting
No Prop. 84 grant funds will be used for this task.
Regulatory requirements for the Reuse Pipeline Project are expected to include the following:
- Orange County Sanitation District, special purpose discharge permit
- City of Tustin, encroachment and construction permits
- City of Irvine, encroachment and construction permits
- Caltrans, encroachment permit
- County of Orange, encroachment and construction permits

The proposed pipeline alignment and diversion facilities are primarily located within public rights-of-way owned by the project participants. Irvine and the project participants will confirm all right-of-way requirements as part of the Preliminary Design.

Deliverables: Copies of applicable permits

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting
No Prop. 84 grant funds will be used for this task.
Irvine and the project participants are expected to advertize, select and award a construction contract using a competitive bidding process for the Reuse Pipeline in the fall of 2014. The bid phase engineering services will include:
- Attend pre-bid conferences
- Interpret construction contract documents as needed
- Prepare addenda as required
- Attend bid openings and receive and review bids
- Prepare construction contracts for award

Deliverables: Advertisement for bids; pre-bid contractors meeting; evaluation of bids; award contract

Task 9: Construction
All Prop. 84 grant funds will be applied this task.

- **Subtask 9.1 Mobilization and Site Preparation**
  Construction crews will mobilize and prepare site for construction activities.

- **Subtask 9.2 Project Construction**
  The construction tasks are expected to include two main components: construction of transmission pipelines and construction of diversion facilities

  Construction of transmission pipelines
  The backbone of the Reuse Pipeline project consists of approximately 17,300 lineal feet of pressure pipeline. Based on the concept feasibility study (RBF, December, 21, 2012), the pipeline is expected to be located on the southerly side of Peters Canyon Channel beginning at Walnut Avenue, near the Caltrans' Ground Water Treatment Facility (GWTF). At Barranca the project is expected to cross Peters Canyon Channel just upstream of its confluence with San Diego Creek and be located on the northern side of the San Diego Creek Channel. At Main Street the pipeline will connect to OCSD's sewer where flows will be conveyed by gravity to OCSD Fountain Valley treatment facility and then to the OCWD Groundwater Replenishment System (GWRS). The pipeline is expected to range in size from approximately 8-inch to 14-inch diameter, and will convey approximately 1,650 gpm of flow at the OCSD connection point. Design flows will be finalized during the Preliminary Design Task.

  Construction of diversion facilities:
  Downstream of the Caltrans' GWTF connection there will be 3 diversions into the Reuse Pipeline from existing conveyance facilities located at Como Channel, Edinger Circular Drain and Valencia Storm Drain. Each diversion point will be located upstream of their confluence with Peters Canyon Channel and will include a wet well with two submersible pumps sized to accommodate the flow expected from each diversion point. Design flows will be finalized during the Preliminary Design Task.

- **Subtask 9.3 Performance Testing and Demobilization** Start-up Testing tasks will include the following facilities:
  - Transmission pipeline testing
  - Diversion facilities testing
  - Transmission pipeline testing

  As part of the Project, TDS and nitrates will be measured prior to discharging to OCSD's Main Street sewer. Flow will be monitored at the Caltrans GWTF inflow and each diversion point using IRWD's Supervisory Control and Data Acquisition (SCADA) system. Flow data will be collected and recorded in the system from each designated flow monitor. Flow monitors will continuously collect data which will be summarized into daily, monthly and annual reports.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

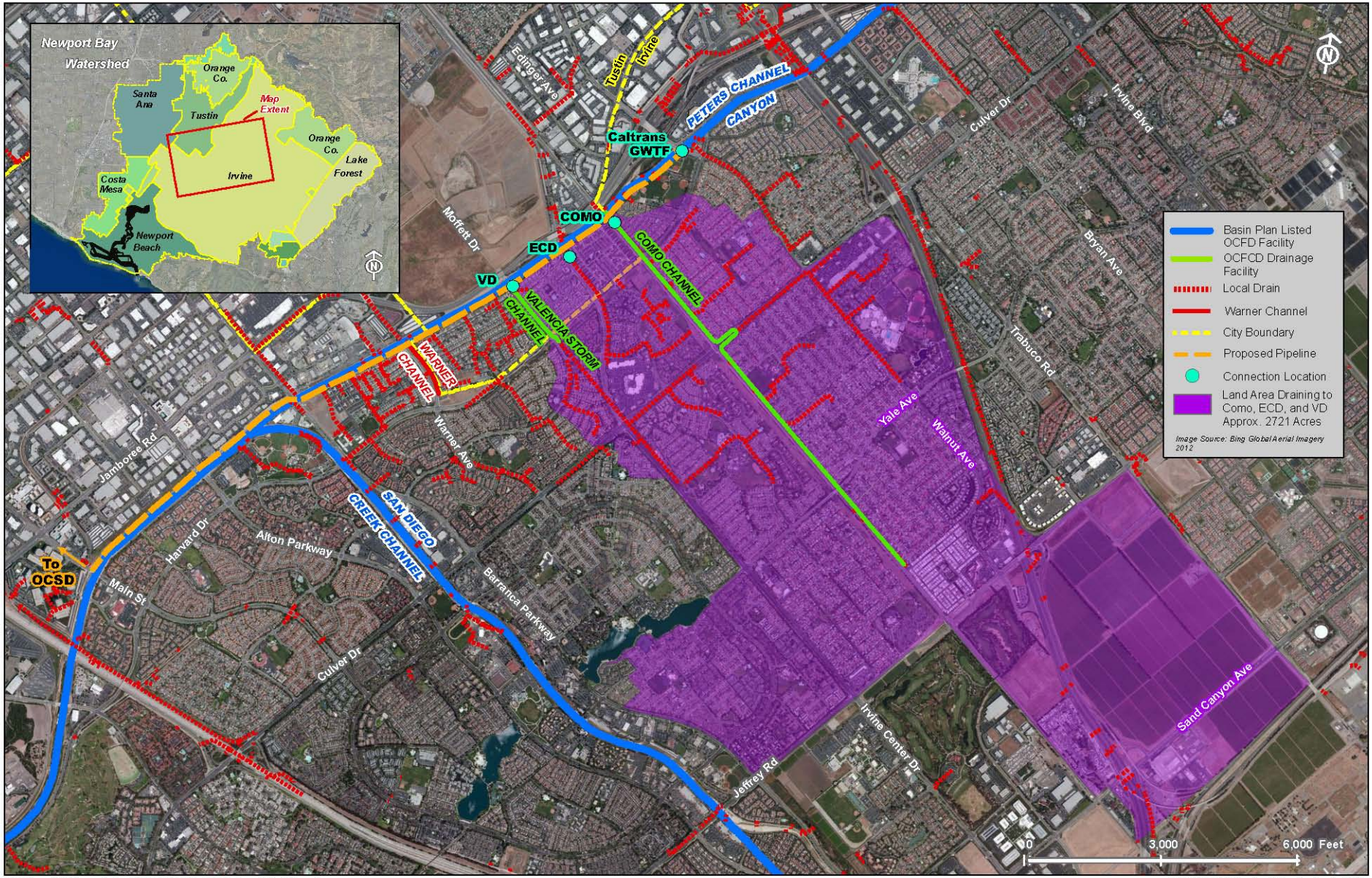
Task 10: Environmental Compliance/Mitigation/Enhancement :
No Prop. 84 grant funds will be used for this task.
The level of environmental mitigation/enhancement required for the project is unknown at this time, but is not anticipated to be significant due to the fact that the pipeline will be placed under an existing bike trail and not anticipated to impact any significant environmental resources. Any required mitigation will be identified once Task 6 Environmental Documentation is completed.

Budget Category (f): Construction Administration

Task 11: Construction Administration
No Prop. 84 grant funds will be used for this task.
Construction management tasks will include the following:
1. Contractor contract administration

2. Review contractor shop drawing submittals
3. Respond to requests for information
4. Attend progress meetings and review pay requests
5. Inspect construction
6. Perform materials testing
7. Prepare record drawings
8. Contract administration and close out
9. Coordinate with project auditors

Peters Canyon Channel Water Capture and Reuse Pipeline Site Map



S:\GIS\mxds2\Newport_Bay\NSMP\NSMP_OCTA_Grant_Sept12.mxd

OCPW OC Watersheds September 4, 2012

Project R: Soboba Band of Luiseño Indians Wastewater Project (Soboba Tribe)

Part One – Introduction

The Soboba Band of Luiseño Indians is a federally recognized Tribe as listed in the Department of the Interior's Federal Register. The Tribal land falls within the Santa Ana Watershed, in the Southeastern region. The Soboba Band of Luiseño Indians' reservation is where our proposed wastewater facility project will be located.
The Soboba Tribal land overlies two aquifers; the Intake Aquifer and the Canyon Aquifer, as well as four sub watersheds: Poppet Creek-San Jacinto River, Indian Creek, Laborde Canyon-San Jacinto River, and Bautista Creek.
The Soboba Band of Luiseño Indians' application is for Prop 84, round 2 funding for a Development Plan determining the feasibility of a centralized reservation waste water treatment facility to improve service to residents and increase effectiveness of the wastewater treatment process. Several benefits derived from the completion of a waste water management facility include a stabilized waste stream, high volume effluent available for reuse, the ability to address new contaminants in an efficient manner, increase the protection of the groundwater basin by allowing more control of treatment, greater separation of waste and the water table, and to provide a source of water suitable for recycling.

The Soboba Band of Luiseño Indians established a Memorandum of Understanding (MOU) with two local water districts, Eastern Municipal Water District (EMWD) and Lake Hemet Municipal Water District (LHMWD), to work collaboratively on water issues created by the Colorado Aqueduct. The Bureau of Indian Affairs has a trust responsibility with the Tribe and works collaboratively with the Tribe on water and other resource issues.
Soboba owns and operates a large capacity septic system and wastewater disposal is accomplished through the use of two 50,000 (fifty-thousand) gallon septic tanks with homes served by individual septic tanks. The potential for failure of the septic tanks and ground seepage of pathogens or pollutants to groundwater which affects drinking water (Soboba relies on wells) is detrimental to Soboba's health and well-being.

The wastewater treatment facility has the potential to offset the water usage of surrounding communities such as San Jacinto, Hemet, and others in the Santa Ana Watershed by using reclaimed water resources which will reduce the volume of groundwater removed from shared aquifers.

Goals and Objectives

To develop and implement a Development Plan (i.e. feasibility study) to evaluate the proposed waste management facility. A new wastewater management facility will allow the Tribe to better handle future development and population needs on the reservation while potentially freeing up potable water by replacing its usage with grey water in some areas.

IRWM Goals
The Project meets IRWM goals and objectives by promoting sustainable water solutions, investigation of methods to provide a reliable water supply through conservation or reuse, preserve and enhance the environment, ensure higher quality water on tribal lands, as well as improve integration and coordination with long and short range planning and benefits with other water agencies and organizations within the Santa Ana Watershed. The Agreement between the Tribe and the two local water districts—the Eastern and Lake Hemet Municipal Water Districts—will work cooperatively to restore and protect the health of the San Jacinto River groundwater basin upon which they all depend on this valuable resource.
The Soboba Band of Luiseño Indians is located within the Sana Ana Watershed Project boundaries at33.78°N, 116.89°W.

Purpose and Need

The purpose and need for this project is to improve the health and welfare of Soboba members and surrounding communities (San Jacinto and Hemet) by the reclamation of water -- taking a valuable and scarce resource and recycling it to greater use.

The feasibility study will address much needed water and sewer improvements that will impact members for generations to come and will improve the quality of life for citizens residing on and off the reservation within the Santa Ana Watershed). This project is the foundation of an opportunity to build the infrastructure necessary to own, operate and maintain the wastewater treatment facility.

The Soboba Wastewater treatment facility will address wastewater treatment and water reclamation inclusive of; cultural/archeological issues, environmental impact considerations, general regulatory considerations, effluent disposal options and limitations, discharge and recycling of wastewater to agricultural and other reuse of water after treatment. The Tribal lands and surrounding disadvantaged communities will be served properly by a wastewater treatment facility which will reduce reliance on tanks being pumped out with the risk of ground seepage and contamination.

Project List

The Soboba Band of Luiseño Indians will solicit bids according to our procurement policies for firm/consultants to work directly with the Tribal Council and consult with appropriate tribal government departments to determine site suitability design of a centralized wastewater treatment facility. The funds requested are to contract the services of an independent firm with an established/verifiable track record to produce a feasibility study in accordance with our grant. The study will also incorporate mitigation measures identified in the feasibility study to include pollution control measures and treatment methods to serve the current and future population of the Soboba Reservation

Integrated Project Elements

The Tribe has worked on water rights and water quality issues as our ground and surface water has been diminishing for the past eighty plus years. Tribal leaders have indicated their interest in and commitment to working collaboratively on addressing water issues that impact the Southern California region through signing of the water rights settlement.

Throughout the project, the Tribe will work collaboratively with partners that have been previously established and create other partnerships to facilitate the approach of management strategies that include; reduced water demand, increased and improved water quality and practice water resource stewardship. The Tribe will also facilitate communication and partnerships between water industry and land-use planning that has a holistic approach.

Completed Work

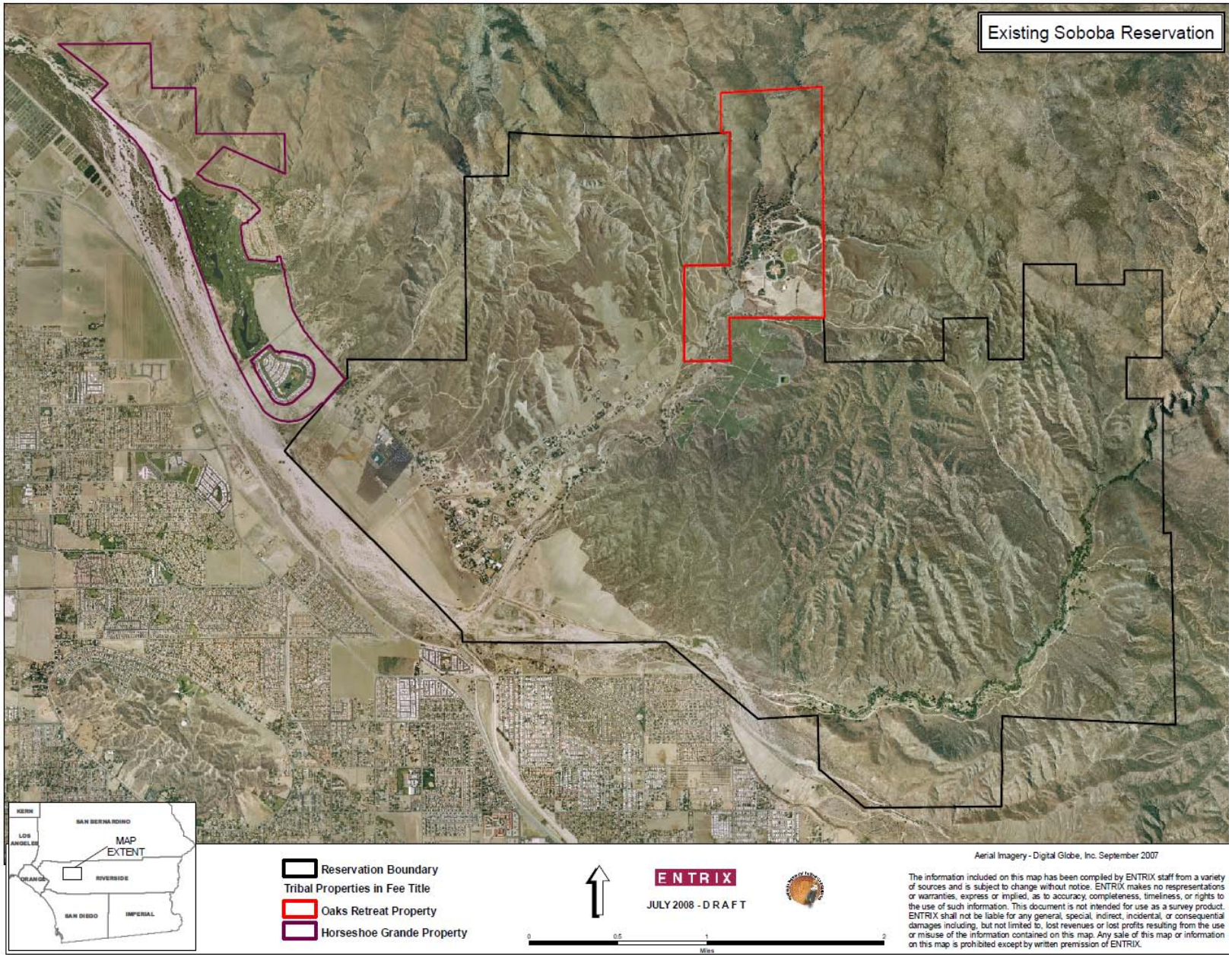
The Soboba Band of Luiseño Indians established a Memorandum of Understanding (MOU) with two local water districts: the Eastern Municipal Water District (EMWD) and Lake Hemet Municipal Water District (LHMWD) to work collaboratively on water issues created by the Colorado Aqueduct. The Agreement between the Tribe and the two local water districts– the Eastern and Lake Hemet Municipal Water Districts will work cooperatively to restore and protect the health of the San Jacinto River groundwater basin upon which they all depend on this valuable resource.

Existing Data Studies

There are no existing finalized studies done.

Project Map

The location of the possible waste management facility is yet to be determined. This is one of the many issues the development plan will answer or help answer. Enclosed is a map of the Soboba Reservation.



Aerial Imagery - Digital Globe, Inc. September 2007

The information included on this map has been compiled by ENTRIX staff from a variety of sources and is subject to change without notice. ENTRIX makes no respresentations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. ENTRIX shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written premission of ENTRIX.

Part Two - Proposed Work Tasks

SAWPA is recommending funding for a Development Plan (i.e. feasibility study) for a waste water management facility on the Soboba Band of Luiseño Indians' reservation. This project will require Soboba to solicit bids from contractors capable of conducting an in-depth analysis on various topics including but not limited to environmental, legal, and any practical issues that may arise as the study progresses. The complexity and true depth of the study cannot be estimated at least until presentations from contractors are made to the Tribe. After Soboba has chosen the appropriate contractor in accordance with the tribal constitution and pertinent tribal ordinances, the work tasks include providing the work necessary to facilitate the Development Plan.

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Administration
Kenneth McLaughlin, director of Soboba Public Works Department, will be in charge of seeking out bids from consultants to complete the development plan. As well as oversee the daily grant administration of Proposition 84 IRWM program grant. Kenneth McLaughlin will be the main contact with SWAPA and DWR with any correspondence or requests. Kenneth McLaughlin will complete the required progress reports and deliverables per the grant agreement. Erica Helms, Environmental Director, and David Montoya, in-house attorney, should also be copied on all correspondence.

Deliverables: Preparation of invoices and other deliverables as required.

Task 2: Labor Compliance Program
This section is not applicable to Soboba's Development Plan

Task 3: Reporting
Kenneth McLaughlin will prepare and submit the status of work, status of expenditures, and a summary of accomplishments and discussion of problems impacting or expected to impact performance within the project progress reports, annual report, and final project report as required.

Deliverables: Submission of required reports and post completed reports in compliance with the Grant Agreement.

Budget Category (b): Land Purchase/Easement

This section is not applicable to Soboba's Development Plan.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
The Development Plan will produce assessment and evaluation documentation.

Task 5: Final Design [Description of work]
The Development Plan will assist in determining the final facility design through assessing the feasibility of several site designs.

Task 6: Environmental Documentation
This section is not applicable to Soboba's Development Plan.

Task 7: Permitting
This section is not applicable to Soboba's Development Plan.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting
This section is not applicable to Soboba's Development Plan

Task 9: Construction
This section is not applicable to Soboba's Development Plan

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement
This section is not applicable to Soboba's Development Plan

Budget Category (f): Construction Administration

Task 11: Construction Administration
This section is not applicable to Soboba's Development Plan

Project S: Recycled Water Project Phase I (Arlington-Central Avenue Pipeline (City of Riverside)

Part One - Introduction

The Riverside Public Utilities Department (RPU) is a unique utility in the Southern California region in that it produces its water supply from local groundwater sources and as a strategic goal, wants to be water independent and reduce reliance on impetrated water. To accomplish this goal, RPU is evaluating ways to diversify its water supply by developing projects that promote sustainable water solutions and provide a reliable supply to the City and neighboring communities. As such, RPU has developed the Recycled Water Project Phase 1 ("Arlington/Central Pipeline").

The Arlington/Central Project adds value to the Santa Ana Watershed as it will reduce imported water and local groundwater demand and aligns with the Santa Ana Watershed Integrated Regional Water Management Plan known as "One Water One Watershed" ("OWOW") goals and objectives by:

- Promoting the use of recycled water and the Santa Ana Watershed goal to recycle and reuse 100% of the wastewater in the watershed,
- Improves water supply reliability in the region,
- Promotes a sustainable water supply solution,
- Economically benefits the region, and
- Promotes regional collaboration.

The Arlington/Central Project involves construction of approximately 44,000 linear feet ("LF") of 8-inch, 12-inch, 16-inch, and 24-inch diameter recycled water pipelines and a booster pump station. The Arlington/Central Project's general alignment is from the intersection of Arlington Avenue and Van Buren Boulevard, heading east along Arlington Avenue to the State Route ("SR")-91 freeway, thence north to Central Avenue where it will connect to the existing 8-inch recycled water pipeline on the east side of the SR-91 freeway along Central Avenue (see Project Map section for exhibit). The Arlington/Central Project promotes the expanded use of recycled water within a relatively short time frame (less than 5 years) and provides up to 8,600 acre-feet per year ("AFY") of new water supply to the region, which is broken down as follows:

- Up to 1,000 AFY for landscape irrigation to RPU customer adjacent or nearby the project alignment;
- Up to 2,600 AFY of supply to Western Municipal Water District ("WMWD") for landscape and groundwater recharge off-setting current groundwater production from the Riverside Basin; and
- An additional 5,000 AFY of water supply for groundwater recharge, comprised of is recycled water and diluent water.

Goals and Objectives

In addition to the following goals and objectives which are consistent with the OWOW Plan, the Arlington/Central Project is an essential element to RPU remaining water independent. The project provides critical infrastructure needed for RPU to begin utilizing recycled water.

- **Promoting the use of recycled water and the Watershed goal to recycle and reuse 100% of the wastewater in the watershed.** As a strategic goal, the OWOW Plan established a long-term goal to "recycle and reuse 100 percent of wastewater in the Watershed"[1]. This project is in alignment with the OWOW Plan by utilizing recycled water previously discharged into the Santa Ana River and potentially lost to the Pacific Ocean.
- **Improves water supply reliability in the region** by constructing an interconnection with WMWD thereby increasing their available non-potable supply for landscape and groundwater recharge uses. Furthermore, this interconnection will reduce RPU's pumping from the Riverside Groundwater Basin. Currently, WMWD relies on RPU to provide non-potable water pumped from the Riverside Groundwater Basin in order to supplement their non-potable system. The Arlington/Central Project will provide recycled water to WMWD thereby

reducing Riverside Groundwater Basin pumping demands. Additionally, RPU will convert existing potable water landscape users along the alignment thus reducing its potable water supply demand. The increase in available water supply to both agencies further reduces reliance on State Water Project ("SWP") supplies today and in the future.

- **Promotes a sustainable water supply solution** by maximizing recycled water uses within the region. Currently, under Order Number WR2008-0024, the Regional Water Quality Control Board approved the City of Riverside Wastewater Change Petition WW-0045 which permits the use of up to 41,400 AFY of recycled water from the City's Regional Water Quality Control Plant (RWQCP). To date, due to lack of infrastructure, the City supplies on average 290 AFY of recycled water. This project will provide the necessary infrastructure to supply recycled water to RPU, WMWD and other neighboring agencies. Furthermore, recycled water is a reliable source as wastewater treatment capacity will continue to expand. The treated effluent will either be discharged into the Santa Ana River or the recycled water system.
- **Economically benefits the region** by providing a low-cost alternative water supply to the region. The Arlington/Central Project will offset existing potable landscape demands with recycled water and provide the ability to recharge groundwater, thereby reducing WMWD's reliance on SWP and increases RPU's available local water supply further guaranteeing RPU water independence. Furthermore, with the continued increase in SWP costs, alternative low-cost local sources such as recycled water provide a regional economic benefit by ensuring water costs remain as low as possible.
- **Promotes regional collaboration** by providing a low-cost reliable water supply to both RPU and WMWD. Additionally, through collaboration with the City of Riverside's Public Works Department and the County of Riverside Transportation Department RPU made provisions to construct a recycled waterline pipeline within the newly expanded Van Buren Boulevard in all, the recycled water produced at the City's RWQCP will be available to WMWD and other neighboring agencies.

Purpose and Need

The purpose and need for the Arlington/Central Project is to provide a reliable, low-cost alternative water supply to the region. As a strategic goal, RPU wants to be water supply independent and this project is crucial to RPU's success. Projections show that by year 2020, RPU's water demands will exceed our available water supply. This project provides the infrastructure needed to utilize local reliable recycled water to offset potable water irrigation demands, as well as providing the infrastructure necessary for inter-agency collaboration for groundwater recharge efforts.

Project List

Project Title	Lead Agency	Cooperating Agencies	Percent Design Complete	Abstract
Recycled Water Project Phase 1 (Arlington/Central Pipeline)	City of Riverside Public Utilities	Western Municipal Water District and neighboring agencies.	10% Design	The project will construct a recycled waterline inter-tie connection between RPU, WMWD and other neighboring agencies.

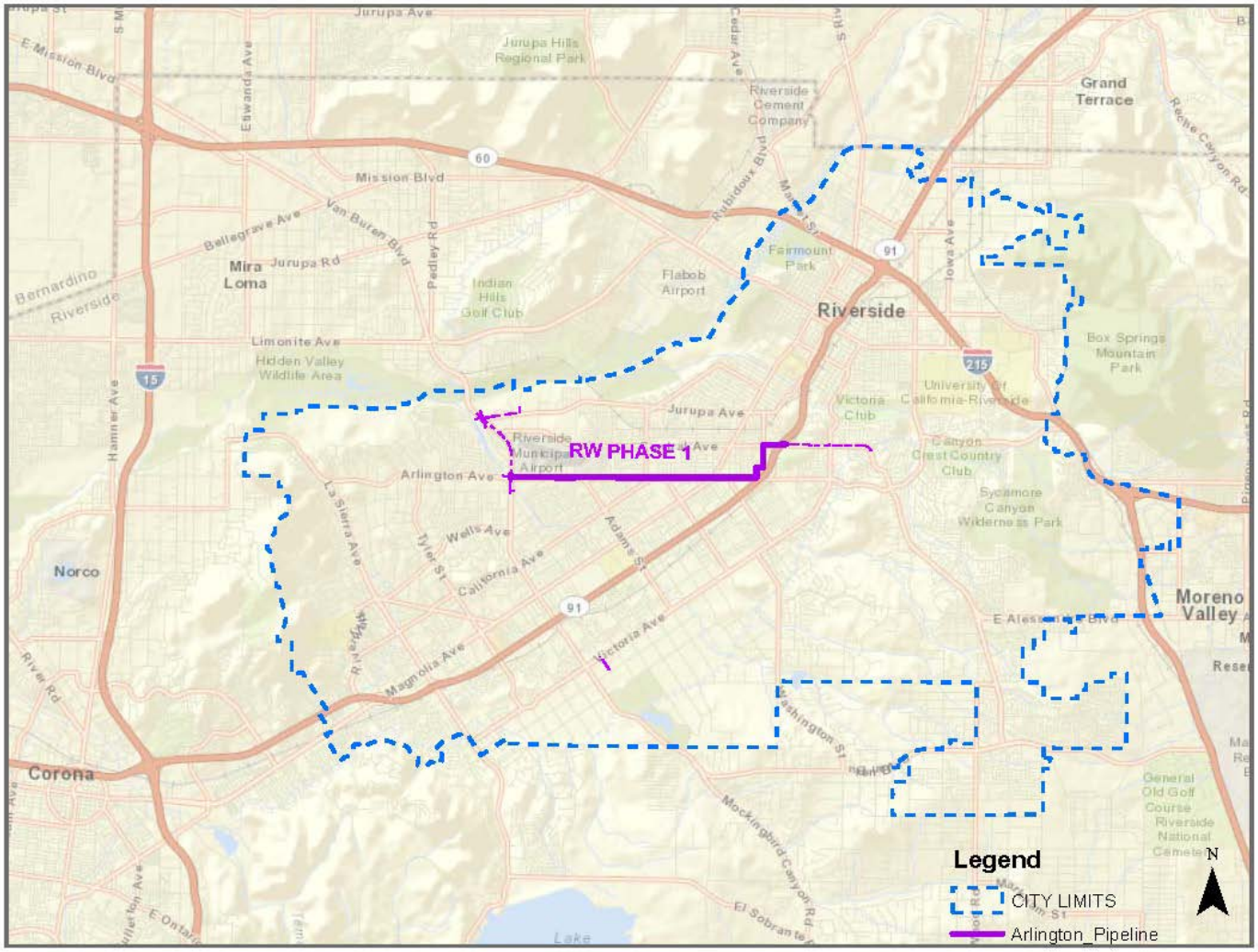
Integrated Elements of Projects

As uncertainties continue to impact the Colorado River and environmental regulations jeopardize the reliability of the SWP, projects that promote local collaborative water supplies become apparently more vital to the economic stability of the region. The Arlington/Central Project provides an economic, integrated approach to maintaining water supply reliability within the region. The project benefits both RPUWMWD and other neighboring agencies, as it provide the necessary infrastructure to facilitate the use of recycled water. The project provides both agencies with the opportunity to reduce potable demands by converting irrigation customers to recycled water. Furthermore, the inter-tie increases WMWD's access to recycled water which provides them the opportunity to further distribute recycled water south to Murrieta or within their Riverside service area.

The project also facilitates future planning efforts by RPU and WMWD for groundwater recharge. As drought conditions continue to impact local groundwater water levels, projects that facilitate the ability to augment natural groundwater recharge will greatly improve local water supply sustainability.

By extension, the increase in available local water supply to both agencies further reduces demands on the SWP and Colorado River for the region.

Regional Map



Completed Work

The following is a list and description of the work that has been completed or is expected to be completed prior to the grant award date.

<u>Recycled Water Facilities Plan</u>: In July of 2011, RPU, in contract with HDR Inc., finalized its Recycled Water Facilities Plan ("RWFP") which evaluated the necessary infrastructure to supply 10,083 AFY of recycled water city-wide. The RWFP incorporated approximately 172 miles of pipeline infrastructure, three booster pump stations, and two reservoirs at a cost of $544,000,000. The RWFP provided a basis for planning, conducted a market analysis, recycled water supply assessment, and a hydraulic analysis, evaluated potential groundwater augmentation and satellite wastewater treatment plant sites, recommended distribution system alternatives, and developed a capital improvement and program implementation plan. In the end, RPU determined the cost to implement a city-wide

plan was not economically feasible as it would drastically impact rate payers in the order of a $42 per month increase to the water bill and instead, developed an alternative plan as described below.

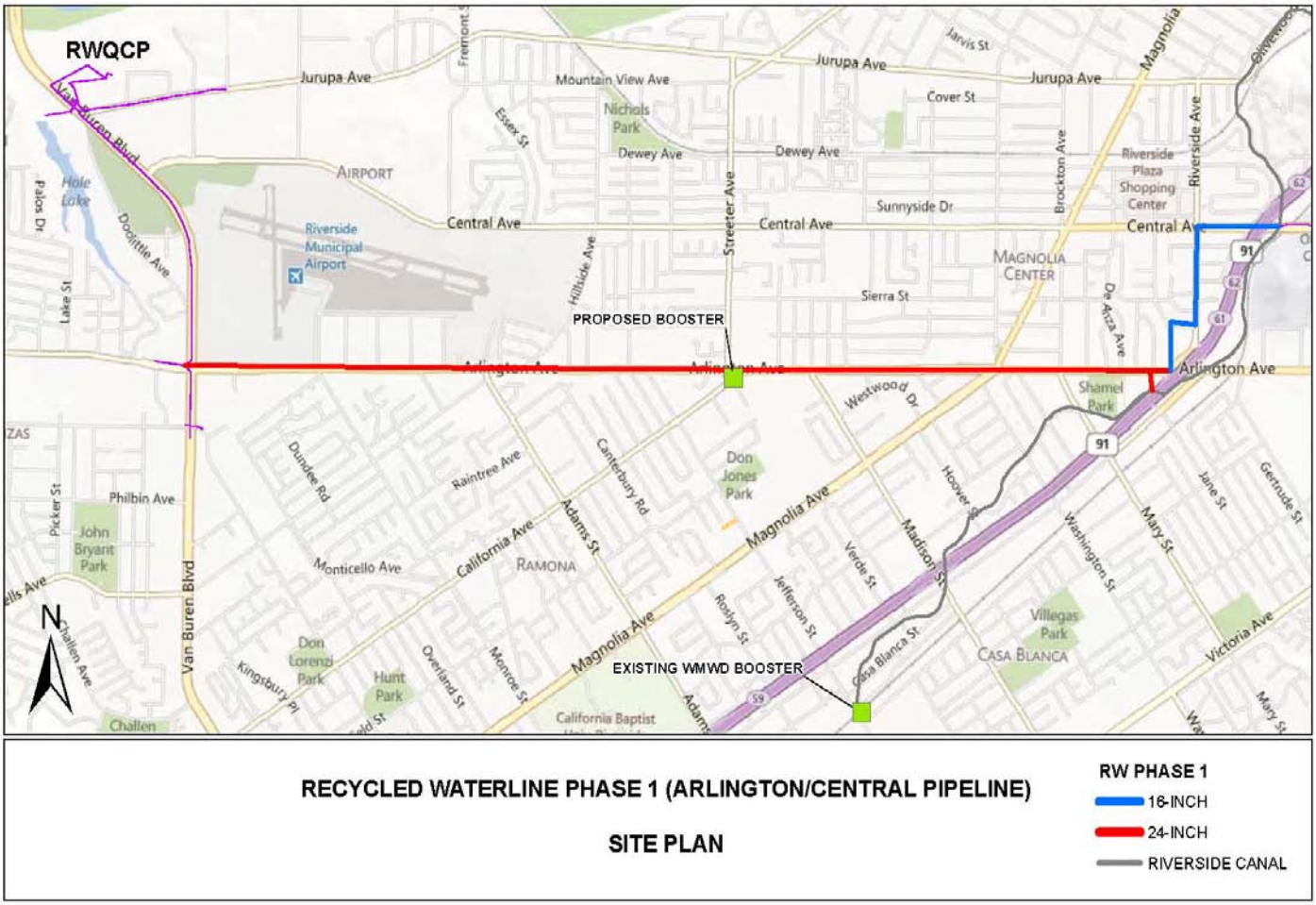
Recycled Water Program Outline: In early 2011, RPU staff utilized the Draft RWFP to develop an alternative recycled water system capable of increasing RPU's available water supply by 25,000 AFY. Staff's plan was formalized in the Recycled Water Program Outline ("RWPO") published in March of 2011. The RWPO evaluated a two phased approach with two main transmission lines; one along Arlington Avenue and Central Avenue with an inter-tie connection to WMWD and a second extending north along the Santa Ana River from the RWQCP to property RPU owns called Pellessier Ranch. The total project cost is estimated at $95,000,000 and consists of approximately 16 miles of transmission facilities.

Existing Data and Studies

The Arlington/Central Project constructs vital infrastructure necessary for RPU to access and distribute recycled water to its customers and provides an inter-tie connection with WMWD. In this project, RPU will be designing the necessary infrastructure to deliver approximately 6,100 AFY of recycled water to both RPU customers and WMWD. In order to deliver the supply, RPU conducted a hydraulic analysis as reported within the Draft Arlington/Central Project Planning Report which is anticipated to be finalized by April of 2014. The hydraulic analysis analyzed peaking factors due to watering windows, flow balancing between irrigation customers and delivery to WMWD, and pipelines sizing to ensure customer demands can be achieved with reasonable pipe velocity and pressure loss. Furthermore, the hydraulic analysis identified the need to construct a booster pump station thereby developing a two zone system. The lower zone, Zone 1, is served from the RWQCP's recycled water pump station and will have a hydraulic grade line between 925 and 975 feet. The upper zone, Zone 2, will be supported by an inline booster pump station capable of serving between 600 and 1,000 gallons per minute and will have a hydraulic grade line of 1,166 feet.

The inter-tie connection to WMWD will be served from Zone 1. The capacity of the connection will be capable of supplying WMWD with 5,100 AFY of recycled water supply. In order to supply the demand, RPU will be constructing a 24-inch pipeline up to the connection point.[2]

Project Map



RECYCLED WATERLINE PHASE 1 (ARLINGTON/CENTRAL PIPELINE)

SITE PLAN

RW PHASE 1
- 16-INCH
- 24-INCH
- RIVERSIDE CANAL

In addition to the above mainline infrastructure, RPU is evaluating distribution infrastructure needs in order to service individual landscape irrigation customers.

Project Timing and Phasing

The Arlington/Central Project is a stand-alone project proposed to be constructed in one phase. The project timing and phasing is broken down as follows:

- The project is currently in the planning phase which is anticipated to be complete by April of 2014, at which time RPU will issue the final planning report.
- In June of 2014, RPU will begin preparing the Request for Proposal for the design package. The design and bid solicitation process is expected to be completed by May of 2016.
- RPU anticipated completing the CEQA compliance documentation concurrently with design, with certification by October of 2015.
- Construction is expected to begin by September of 2016 and be completed by June of 2018.
- Following construction completion, RPU will finalize any Labor Compliance and progress reports and submit them to the Department of Water Resources ("DWR") by October of 2018.

Part Two: Proposed Work Tasks

Budget Category (a): Direct Project Administration

Task 1: Administration
RPU will perform the following administrative activities: administer contracts with design engineer and construction contractors, perform project accounting and reporting.

Deliverables: Preparation of invoices and other deliverables as requested.

Task 2: Labor Compliance Program
RPU will retain a consultant to perform labor compliance services.

Deliverables: Submission of Final Labor Compliance Program report.

Task 3: Reporting
RPU shall prepare and submit to DWR quarterly annual and final reports as specified in the Grant Agreement.

Deliverables: Submission of quarterly, final, and post completion reports as specified in the Grant Agreement.

Budget Category (b): Land Purchase/Easement

Not Applicable

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation
RPU has prepared several technical engineering reports evaluating the feasibility of a recycled water system within its service area. The most recent was the RWFP prepared by HDR Inc. The RWFP evaluated the feasibility of constructing a city-wide system capable of delivering 10,083 AFY of recycled water. The conclusion of the report estimated the infrastructure cost at approximately $544,000,000 which equates to a $42 per month rate increase to RPU customers. RPU staff believed there was a lower cost alternative and developed a two phase plan as outlined in the RWPO prepared by RPU staff. This RWPO outlined the potential customers, regional inter-tie connections, potential groundwater recharge locations, demand projections and preliminary alignment options. Additionally, once fully implemented, the RWPO will develop an additional 25,000 AFY of water supply. Staff further developed the Arlington/Central Project with the preparation of the Recycled Water Project Phase I (Arlington/Central Avenue Pipeline) Planning Report which is currently in draft form. The Planning Report furthers develops the project alignment, hydraulic constraints, inter-tie connection locations, backup supply options and project cost. Once finalized, a copy of the Planning Report will be provided to DWR.

Deliverables: Recycled Water Facilities Plan, HDR Inc (2011), Recycled Water Program Outline, RPU (2011), Recycled Water Project Phase I (Arlington/Central Avenue Pipeline) Final Planning Report, RPU (Date TBD)

Task 5: Final Design
RPU will prepare the design plans and specifications by either hiring a consultant or completing the efforts with in-house staff. RPU anticipates completing the final design plans by January 2016.

Deliverables: Final project plans and specifications.

Task 6: Environmental Documentation
RPU will hire an environmental consultant to prepare a CEQA compliance document for the project. RPU anticipates certifying the document by October of 2015.

Deliverables*:* Approved and adopted CEQA documentation

Task 7: Permitting
All permits for the project are anticipated to be received by September of 2016 which includes: Street Opening Permit from the City of Riverside Public Works Department, and Storm Water Pollution Prevention Plan application number from the Regional Water Quality Control Board.

Deliverables: Riverside Public Works Street Opening Permit and Regional Water Quality Control Board SWPPP application number.

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting
RPU will develop a Notice Inviting Bids, evaluate bids, and award a construction contract in accordance with the City of Riverside purchasing policy.

Deliverables: Notice of Inviting Bids, pre-bid contractors meeting, evaluation of bids, award contract.

Task 9: Construction

- **Subtask 9.1 Mobilization and Site Preparation**
  RPU's contractors will mobilize necessary equipment and acquire an adequate construction staging area near the project. Civil site work may be required at the staging yard.
- **Subtask 9.2 Project Construction**
  RPU will construct approximately 44,000 linear feet of recycled water pipeline including all appurtenances, water services, flow control and meter station, and a booster pump station.
- **Subtask 9.3 Performance Testing and Demobilization**
  Performance tests will be conducted according to the project plans and specifications, and special provisions provided to the contractor prior to commencement of construction. Once the project is completed and accepted by RPU, demobilization will occur.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement
RPU anticipates certifying the CEQA document by October of 2015 and will ensure all mitigation measures outlined within the documents are adhered to in accordance with the Mitigation Monitoring and Reporting Plan.

Budget Category (f): Construction Administration

Task 11: Construction Administration
RPU will oversee the construction administration of the project which includes:

- Contract administration
- Attending and scheduling pre-construction meetings
- Attending regular scheduled construction progress meetings
- Monitoring all construction work
- Conducting construction inspection activities
- Issue Notice of Completion
- Project close out
- Prepare labor compliance reporting documentation

---

[1] Santa Ana Watershed Integrated Regional Water Management Plan (2010)
[2] Recycled Water Project Phase I (Arlington/Central Avenue Pipeline) Draft Planning Report Version 2.0

Project T: Wilson III Basins Project and Wilson Basins/Spreading Grounds (City of Yucaipa)

Part One - Introduction

Wilson Creek is one of two regional drainage systems in the City of Yucaipa (the other being Wildwood Creek) that convey surface water runoff from the San Bernardino Mountains through the City. Oak Glen Creek is a major tributary to Wilson Creek and forms a confluence with Wilson Creek near 2nd Street within the proposed project site. The regional vicinity and watershed boundaries for the creeks are illustrated on Attachment 3-1 and Attachment 3-2 (attached). Wilson Creek is a regional channel that provides major flood control protection for a large part of the City, and is critical to the City's flood control plan. Wilson Creek currently has a limited capacity that is below the 100-year design flow rates in some areas which results in the potential for flooding within the City.

The Wilson III Basin Project was identified in the City's original Master Plan of Drainage (MPD) adopted in 1993, and in the latest update to the MPD approved in 2012. The basin is a proposed flood control facility designed to reduce the peak flow rates to the downstream Wilson Creek channel. This facility was identified as a high priority project to assist in reducing the flood risk in the City.

This project consists of two distinct sites (A and B) illustrated on Attachment 3-3 (attached) located along Wilson Creek in the City of Yucaipa and owned by San Bernardino County Flood Control District (SBCFCD). Site A, Wilson III Basin Project, is proposed within a 100-acre site. The conceptual planning proposes a project footprint that utilizes 50 acres of the site to construct a number of detention/recharge basins providing an excellent location for discharge and percolation of State project water for groundwater recharge in addition to new native water recharge. Second Street is currently a dirt road across the Wilson Creek channel bottom with access for agency use only. 2nd St. will function as an embankment for the detention/recharge basin west of the project. The recharge area will also function to preserve the native habitat of the area and function as a passive park for the community with walking trails, boulders, seat walls and educational signage at kiosk locations. Oak Glen Creek and Wilson Creek can readily be utilized for transport of State Water Project water to the site since outfalls are located upstream. Due to the project site locations, with tributaries that extend into the San Bernardino Mountains to elevations of 8,500 feet above sea level, the headwaters of the Santa Ana River Basin, they are a prime candidate for groundwater recharge.

The project will include SBCFCD, San Bernardino Valley Municipal Water District (Valley District), Yucaipa Valley Water District (YVWD) and Inland Empire Resource Conservation District (IERCD) as partners. The project sites are located in close proximity to the City's Community Park and the County's Yucaipa Regional Park making it an ideal location for expansion of and connection to existing master planned recreational trails which provide connectivity to Wildwood Canyon State Park. The 30-acre Site B, with highly productive spreading basins, is currently being used for State Water Project water spreading. The project will provide modifications to basin inlets, outlets, spillways and basin-to-basin drains enabling the facility to expand the capture of native and artificial waters for recharge of the aquifer. The inlet modifications will allow major storm flows, laden with sediment and debris, to bypass the spreading basin area, while allowing the lower and cleaner flows from Wilson Creek to enter into the basin for spreading purposes. There is an existing turnout pipeline adjacent to the site, in Bryant Street, used to discharge import water into the facility for recharge purposes. YVWD facility is nearby for recycled water discharge.

Studies performed by RBF Consulting provided a discussion of alternatives developed and evaluated for the Wilson III Basin and 2nd Street improvements. The results of the evaluation were presented to the Yucaipa City Council on January 28, 2013. Of six identified alternatives, Alternative 6 was chosen as the recommended project.

Goals and Objectives

The goal of this project is to provide multiple community benefits similar to the award-winning, multijurisdictional Oak Glen Creek basin project completed in February 2009. The project includes storm water and sediment control

along Wilson Creek and Oak Glen Creek, native and artificial groundwater recharge, improvement of water quality by reducing stream sediment loading, reduction of non-point source pollutants during storm events, environmental restoration and enhancements and enhanced multi-purpose trails for use by equestrians, pedestrians and bicyclists.

By recharging the native flows, the community will become more sustainable and less reliable on imported water sources, especially during times of disaster or emergency conditions. Although there will be initial impacts on plant species with construction, the implemented project will include meandering streams which will provide greater area for native plants on the channel slopes. Other mitigation measures will be implemented in conjunction with the project, such as invasive plant species removal which will ultimately provide higher quality riparian and coastal sage habitat.

Approximately 400 acres of residential and commercial property located along Wilson Creek below Yucaipa Blvd. are in a FEMA- designated 100-year flood zone which has historical flooding. In a major storm event (approximated at a 50-year event) that occurred in 1969, the Wilson Creek Channel was unable to contain the storm flows and subsequently flows went overbank and flooded an area of approximately 400 acres and impacted 180 homes and property with water and/or debris deposition as well as one elementary school and many roadways. Debris deposition was as much as 6 feet deep. This proposed basin would mitigate the flood potential for these properties, while still allowing some sediments to pass through during the lower level storm events, reducing contaminants in the watershed, and capturing some of the storm waters for recharge.

The proposed project includes enhancing existing spreading basins to capture native flow and a 200 acre-foot basin with a 12' permanent recharge pond which promotes the following objectives:

- Provides reliable water supply;
- Preserve and enhance the environment;
- Promote sustainable water solutions;
- Ensure high quality water for all users;
- Provide economically effective solutions;
- Improve regional integration and coordination;
- Manage rainfall as a resource;
- Preserve open-space and recreational opportunities;
- Maintain quality of life.

Purpose and Need

The purpose of the Wilson III Basins/Spreading Grounds proposal is flood attenuation and protection, and multi-functional benefits that promote regional goals and objectives as identified in the IRWMP.

Wilson and Oak Glen Creeks are ephemeral streams that generally have water flow during the rainy or wet season plus other minor amounts of local inflow to the creeks through ancillary flow from adjacent urban development. At the project site, Wilson Creek has a tributary drainage area of 3,021 acres (4.7 square miles) and an estimated 100-year flow rate of 5,070 cubic feet per second. Oak Glen Creek at this area as a tributary drainage area of 4,438 acres (6.9 square miles) and a 100-year flow rate of 4,862 cubic feet per second. The combined, clear water, flow rate at the confluence of the two creeks is 7,333 cubic feet per second.

In a series of storms that occurred in January and February 1969 (approximated at a 50-year event), the creek was unable to contain the flows with resultant out of bank flooding of approximately 400 acres with damage to over 180 homes, an elementary school and many roadways due to a combination of floodwaters and earthen debris deposition. Debris deposition was as much as 6 feet deep in some areas. Although many improvements have been made along the creek since 1969, the threat of flooding in the Dunlap area of the community still exists. Approximately 400 acres of residential and commercial property located downstream of these projects are located in the FEMA 100-year flood plain. Property owners are paying substantial annual flood insurance premiums that could be reduced or eliminated with the completion of the basin project. There are also many properties in the floodplain that are prevented from being developed due to the flood zone restrictions that will remain in place until such time as the flood risk has been removed.

Although the flood threat remains in some areas according to FEMA mapping (attached), the creek also affords opportunities for other important community benefits including groundwater recharge, environmental restoration and enhancements, recreational trails and jobs creation through land development. The two project sites identified herein when completed would not only provide a higher level of protection against future flood risk, but would also provide these other very important community benefits.

RBF Consulting has performed detailed studies for the hydrology and hydraulics of the Wilson Creek watershed, including the identification of flow carrying capacity deficiencies within the creek system. Their studies have concluded that the combination of existing and proposed basins on these creeks in combination with downstream channel improvements will result in significant reduction of flood flows, the capture of large quantities of sediment, and the reduction of flood risk in the community.

The Proposal addresses the adopted IRWM Plan's goals and objectives. Following is an excerpt from Wilson III Basins Project: Multi-Purpose Flood Control Basin Alternatives Analysis:[1]

Description

Alternative 6 – Wide Basin Footprint with 12' Permanent Recharge Pond and Wilson Creek Re-Alignment

Alternative 6 proposes a project footprint that utilizes 21.2 acres of the site. Alternative 6 includes a 60-foot wide bench with varied slopes and a 12' deep permanent pool. The raised roadway elevation of Sunny Side Street provides opportunity for flood attenuation upstream. The permanent pool provides an excellent location for discharge and percolation of the State project water for groundwater recharge in addition to new native water recharge. Oak Glen Creek and Wilson Creek can readily be utilized for transport of State Water Project water to the site since outfalls are located upstream. Alternative 6 also includes Eucalyptus Avenue, a future collector that runs east-west from 2nd Street to Bryant Street.

General Notes and Analysis Summary

The wide basin footprint encroaches into the lot to the north and provides the largest basin invert area out of all the alternatives. This larger invert provides more storage volume, thereby providing the most optimum groundwater recharge element and the potential for the most hydraulic efficiency. This alternative also works with the planning area concept of an environmental enhancement and groundwater recharge along Oak Glen Creek. Environmental enhancement would be accomplished through the removal of non-native species, and the replacement with native plant materials and the construction of a meandering low flow stream channel. The net area of enhancement would be increased compared with the other alternatives. The overall aesthetics of the Oak Glen stream corridor would be improved and include passive open-space and recreational trails. Naturalized groundwater recharge areas could be incorporated into the restoration areas. Riprap spillway channels would be constructed to convey flows within the confined section of Wilson Creek and Oak Glen Creek to the invert of the basin. The addition of Sunnyside Street provides additional traffic circulation benefit to the overall project.

Hydraulic Performance

The basin configuration for alternative 6 generally provides the largest basin footprint and storage volume of all the alternatives. The proposed basin meets the requirements identified in the MPD for the 100-year AMC II condition, given that the basin configuration above the 12-foot permanent pool is the same as Alternative 1. The basin storage capacity for the 100-year AMC II event is 240 acre-feet, which includes approximately 75 acre-feet of permanent storage.

[1] RBF Consulting, 2013. Wilson III Basins Project: Multi-Purpose Flood Control Basin Alternatives Analysis. Prepared by RBF Consulting, Irvine, California for the City of Yucaipa. January 2013.

Alternative 6 is designed in accordance with SBCFCD criteria, and provides adequate freeboard for the 100-year AMC III storm event. With the larger volume available for storage during flood attenuation, Alternative 6 provides the most efficient, and cost effective outlet. A secondary outlet is provided to pass the AMC III event without overtopping the 2nd Street roadway embankment. An outlet pipe is also provided to drain the permanent pond that includes a control valve and sluice gate. Basin inlet facilities are provided for both the Wilson Creek and Oak Glen Creek tributaries.

Groundwater Recharge

Alternative 6 includes 12-feet of groundwater recharge storage in the basin itself. Also Alternative 6 provides the most storage, at a volume of 71 acre-feet that can be safety captured and infiltrated by the basin. This storage is in addition to the required storage for flood attenuation and can therefore be maintained year around. Alternative 6 provides opportunity for additional storm water capture and infiltration along Oak Glen Creek. The additional capture and infiltration could be incorporated into the stream restoration component of the project, and would be part of the planning area concepts for the Wilson III site.

Multi-Functionality

This Proposal includes a combination of multi-purpose features that will provide a benefit to the environment and community. The project provides opportunity for stream restoration along Oak Glen Creek, and includes maintenance roadways around the basin and along Wilson Creek that can be used for recreational trails, and passive open-space parks and trails. The open water pond will provide the most benefit for water recharge. The area along Oak Glen Creek just upstream of the basin could potentially provide additional de-silting and flood attenuation opportunities. The extension of 2nd Street and the addition of Eucalyptus Avenue will improve traffic circulation and public safety by providing multiple ingress/egress for City's residence and/or emergency vehicles and personnel in the local vicinity. This alternative has the widest variety of multi-purpose facilities.

Operations and Maintenance

The basin and channel elements of Alternative 6 will require regular maintenance similar for each of the basin alternatives. The sedimentation levels in the basin will require monitoring and regular removal to maintain the ability to capture and recharge groundwater and for the primary flood control purposes. The Wilson Creek improvements will require regular inspection and maintenance as necessary.

Environmental

Alternative 6 will impact approximately 1.05 acres, and greater than 300 linear feet, of Corps jurisdictional waters. Since impacts exceed ½ acre, a Corps Individual Permit will be required for this alternative. Corps jurisdictional waters are shown as impacted on a project where any fill that occurs within the jurisdictional limits. Although the footprint of this project alternative is not the smallest, it has the least impact to the waters of the U.S. The restoration elements along Oak Glen Creek, as part of the planning area concept, could provide some mitigation to offset the environmental impacts.

Project Cost

The total project cost for the project is approximately $13,042,781 (with the construction portion estimated to be $9,654,423). The total cost includes the Environmental Impact Mitigation requirements. The environmental mitigation area is calculated at a ratio of 3:1 for the jurisdictional area within the project that is considered waters of the U.S. The estimated cost of environmental impact mitigation is $327,400.

The City of Yucaipa will utilize the $750,000 Proposition 84 funding toward project construction costs. The current approved FY 2012/2013 Capital Improvement Program (CIP) includes $970,000 in Drainage Facility Fee funds, $200,000 from the General Fund, the value of excess property from SBCFCD (estimated at $1.5 million) and $61,000 in 2010 TAB funds for a total of $2,731,000. The total available funding for the project, excluding the estimated value of the land is $1,231,000. Additional funding is being sought and is expected to be finalized,

including the $750,000 Proposition 84 funding before construction is started. The City Council is committed to move forward with the project and have it completed within the proposed schedule.

The City, in conjunction with other local partners including the San Bernardino County Flood Control District, Yucaipa Valley Water District, and the Inland Empire Resource Conservation District completed the construction of a three-basin project on Oak Glen Creek, immediately east of Bryant Street in 2009. These basins provide similar multiple community benefits as the project being proposed for this site and the City fully expects these same partners to contribute to this project.

The project has significant value to Yucaipa Valley Water District which during the period of September through December 2009, discharged and percolated 2,000 acre-feet of imported State project directly into the Spreading Basins and Oak Glen Creek Basins, which are located near the District's Regional Filtration Plant. The District reported that following this discharge period the depth to ground water in nearby wells decreased from 425 feet to 370 feet or a total decrease of 55 feet. The capture of winter storm flows during 2010 resulted in an additional 5 feet of change. In addition, 273 acre-feet of water was released from the Filtration Plant into Oak Glen Creek during 2010, while 4,603 acre-feet of water was recharged at the nearby Wilson Creek Basins/Spreading Grounds.

The Oak Glen Basins project received the APWA Project of the Year in 2011, affirming Yucaipa's ability in a leadership role to bring projects to successful conclusions.

In addition, the City, the Flood Control District, and the San Bernardino Valley Municipal Water District along with a pre-disaster mitigation grant from FEMA have jointly financed, and designed a similar multi-purpose basin project on Wildwood Creek that is at the end of construction in the southerly portion of the City, once again demonstrating that the City has the ability to deliver these types of regionally beneficial projects in partnership with other stakeholder agencies.

The City is currently underway on the development of a Specific Plan for the proposed Wilson Business Park, shown on the concept plan (Attachment 3-4). The Specific Plan will provide for a mixture of commercial and institutional development on approximately 40-50 acres, the development of the Wilson III Basin project, and the extension of 2nd Street across Oak Glen Creek, together with community amenities such as a multi-purpose trail network, institutional/office space, open space areas (habitat set-aside), and flood control facilities. Institutional and business development will provide employment opportunities for those living within the community. The City has undertaken a comprehensive approach to planning the land uses and public facilities of this unique land area to ensure a cohesive, integrated relationship of future uses within a highly visible corridor through the City.

Accordingly, the City of Yucaipa intends to seek partnerships and grant funding opportunities affiliated with economic development, to secure the necessary project completion funds.

Project List

This is a stand-alone project consisting of drainage conveyance facilities and expansion of existing basin facilities. See Attachment 3-2 for project location. The preliminary engineering has been completed for the basin expansion and the final design is underway.

Integrated Elements of Project

The project accomplishes many results such as flood control, recharge, ecosystem restoration, recreation, sediment control and economic growth through coordination with San Bernardino County Flood Control District (SBCFCD), Yucaipa Valley Water District (YVWD), San Bernardino Valley Municipal Water District (SBVMWD) and Inland Empire Resource Conservation District (IERCD). The project is part of the City's program to preserve thousands of acres of upper watershed habitat. The City is working with the State Floodplain Management program to preserve 17 ac upstream of the project. The City is partnering with YVWD that has been very proactive in watershed management and recently completed a connection to the brine line, reducing salt loading in the watershed. This is especially important at the upper reach of this watershed, for the benefit of downstream users and the low salt purified water will be recharged along with native water. SBCFCD will be transferring property to the City to be

used for the project through planned development that will subsidize project construction and O&M. YVWD and SBVMWD will be involved in the recharge component of the project.

The project meets IRWM goals and objectives by providing a reliable and high quality water supply through rainwater management with recharge, by preserving and enhancing the environment through revegetation and invasive plant removal, promoting sustainable water solutions by partnering with YVWD, SBVMWD, SBCFCD and IERCD to construct and maintain the project, accepting recharge of recycled/purified, low salt water, providing economically effective solutions by partnering with SBCFCD to transfer their property surrounding the project to the City (for a commercial venture suitable to stakeholders) providing project funds along with City, County, YVWD and SBVMWD funds (development taxes will help with ongoing maintenance cost), improving regional integration/ coordination by engaging stakeholders, preserving open-space and recreation with trails, meandering water ways and ponds (possibly open seasonally for fishing) and maintains quality of life by flood reduction in disadvantaged neighborhoods.

Completed Work

On August 13, 2012, City Council awarded a design contract to RBF Consulting, a Baker Company, (RBF) for the Wilson III Basin Improvements Project. The design contract included a phased approach to the design. The first phase included an alternatives analysis to evaluate and determine which basin and channel design would be the most feasible, appropriate and cost effective.

The Wilson/Oak Glen Creek Optimization Study prepared by RBF for the Master Plan of Drainage Update, analyzed multiple basin configuration options, basin locations, future channel improvements and locations of other existing and future basins within the watershed. Based on the findings of the study, a single inline (flow through) basin at 200 acre-foot in volume was found to be the most viable basin configuration from a hydraulic performance and efficiency perspective. This configuration was used as the basis for each alternative studied in the Wilson III Project Multi-Purpose Flood Control Basin Alternatives Analysis; however, in order to meet Flood Control Standard design parameters for specific basin design, the volume of the basin in each alternative is larger. With all of the different alternatives, material export from the basin is proposed to remain within the proposed 100-acre site. The various alternatives include keeping the export material on-site in an effort to reduce costs by eliminating the effort required to haul the material off-site and properly disposing the material. The alternatives include a more cost effective grading scenario as part of the analysis.

At its January 28, 2013 meeting the City Council reviewed the analysis and determined the preferred design as Alternative 6. As of February, 2012, the consultant is proceeding with the final design and completing the environmental review, final design plans and construction contract specifications for the project. Since Wilson and Oak Glen Creek are under the jurisdiction of the San Bernardino County Flood Control District, the final design phase work will include processing the design through the District for their review and approval, including their encroachment permits process.

Existing Data and Studies:

Following is a list of existing studies that have been completed relative to this Proposal:

1. Yucaipa Master Plan of Drainage Update by RBF Consulting, January 2012
2. Technical Memorandum Wilson/Pak Glen Creek Optimization Study by RBF Consulting, August, 2011
3. Alternatives Analysis Report, Wilson Creek Multi-Purpose Channel by Albert A. Webb Associates, September 2012
4. Wildwood Basin Final Hydrology Report by Albert A. Webb Associates, November 2009
5. Wildwood Basin Debris Yield and Sediment Impact Study by Exponent Inc., January 2009
6. Oak Glen Detention Basins Hydraulic and Sediment Transport Analysis by West Consultants, January, 2007

Project Map

A project location map is enclosed as Attachment 3-2.

Project Timing and Phasing

The project is a standalone project and does not include any phasing. The project will tie into existing regional flood control systems and will be fully functional as intended upon its completion. Refer to Attachment 5 for a project schedule.

An important component of the overall project timing and phasing is the land use alternative and Flood Control contribution of the property deemed surplus after the basin footprint is approved by Flood Control. The surplus property area still needs to be approved by San Bernardino County Flood Control District. This contribution of property will be utilized to help fund the basin construction.

Part Two - Proposed Work Tasks

Budget Category (a): Direct Project Administration Costs Budget

Task 1: Project Administration
The City will administer the project. Project administration will include City staff managing consultants, preparing reports for Council actions, reviewing and authorizing payments to consultants and contractors, processing payments, tracking the project budget, tracking the project schedule, scheduling and attending project meetings, preparing meeting minutes, coordinating with project, partners and resource agencies, reviewing reports and submittals, preparing necessary reports for funding as well as other duties necessary for the successful implementation of the project. Deliverables include invoices, supporting documents (e.g. consultant invoices, contractor payments, etc.), and other documents as required by DWR.

Task 2: Labor Compliance
The City will retain labor compliance assistance from a local firm to verify Davis-Bacon prevailing wage requirements. A payroll summary report will be prepared and submitted to the State.

Task 3: Reporting
The City will prepare all required quarterly, annual, final and post completion reports in accordance with grant agreement specifications. All reports will be delivered to the State.

Budget Category (b): Land Purchase/Easement

Task 4: Land Purchase
The City has hired an appraisal and is completing the CEQA document necessary for the transfer of land from SBCFCD to the City for the benefit of the project. This work will be completed prior to the design being complete. The property where the proposed project is located is owned by SBCFCD and will stay under their ownership after the project is complete. YVWD does own some property which the City will negotiate to acquire prior to the design being completed.

All appraisal and related acquisition documents will be provided to the State as required.

Budget Category (c): Planning/Engineering/Environmental Documentation

Task 5: Assessment and Evaluation
The City has already completed preliminary evaluation of the Wilson Creek including an update to the master plan of drainage, creek optimization studies, and alternative analysis. The City has approved the Wilson Creek conceptual plan and design is underway. The technical study will be provided to the State for review.

Task 6: Project Design and Engineering
The City will prepare contract documents for construction. The contract documents will include drawings, specifications and estimates for construction of the basin, recharge pond, channel modifications, inlet and outlet structures, trails, and related improvements. To prepare the documents, a series of steps will be performed as follows:

- **a.** **Records Research** - the City will research utility and survey records for the basin site.
- **b.** **Design Surveys** - the City will collect field topographic data for the basin site.
- **c.** **Base Construction Drawings** - using the data assembled during records research and field surveys, base construction drawings will be prepared for the basin.
- **d.** **Preliminary Design** - using the base drawings, preliminary design for the basin will be prepared. It will include basin earthwork and structure design. The design will be consistent with technical study requirements presented above.
- **e.** **Coordination with Agencies** - after the preliminary design is complete, the City will provide drawings to agencies that have an interest in the project and agencies that will be impacted by construction. We will request that they verify that existing facilities are mapped correctly.
- **f.** **Geotechnical Investigation** - site conditions at the basin site will be performed to assess site conditions and to present construction requirements including material suitability, gradations and processing, compaction, percolation, and other requirements. The geotechnical report will be submitted to the State.
- **g.** **90% Design** - 90% contract documents (plans, specifications, and estimates) for the basin will be submitted for consideration to the State.
- **h.** **Final Design** - final contract documents (plans, specifications, and estimates) will be completed and submitted for consideration to the State.

Task 7: Environmental Documentation
Public works projects are subject to environmental compliance processing in accordance with California Environmental Quality Act (CEQA). The City has already began the process of preparing the initial study check list to determine significance of potential environmental impact that the project may create. Upon completion of the check, a determination will be made by City planning staff that will either result in a negative declaration, a mitigated negative declaration, or a comprehensive environmental impact report (EIR). Whichever process is required, the City will endeavor to complete it and have its compliance documentation approved and adopted by the City's council. Final CEQA documents including: Air Quality, Greenhouse Gases, Biological Resources, Cultural Resources, Geotechnical Resources, Hazard and Hazardous Materials, Noise, Traffic, and Sensitive Species Surveys, will be delivered to the State.

In addition to CEQA, the project will be subject to environment assessment related to construction of the basin site. The report will be submitted to the State and to the Regional Water Quality Control Board to permit recharge into the basins; see Task 10 for further information.

Task 8: Permitting
Permits anticipated for project include right-of-way encroachment permits from the City, the County of San Bernardino, and a Regional Water Quality Control Board Permit. As mentioned previously, since impacts exceed ½ acre, a US Army Corps Individual Permit will be required for the recharge basin. Depending upon the evaluation of the Department of Dam Safety, the project may require a permit from their agency. Also, due to the nature of the project, the City will be obtaining Section 1602, 401 and 402 permits. Upon acquisition of permits, copies will be submitted to the State.

Budget Category (d): Construction/Implementation

Task 9: Construction Contracting
Once the plans, specifications and technical reports are approved by the City and SBCFCD and once all the required permits are issued, City staff will prepare an advertisement for bids, conduct a pre-bid contractors meeting, receive bids, review bids to determine the lowest responsible bidder, prepare a Council agenda report recommending award to the lowest responsive bidder, receive all necessary documentation from the contractor such as insurance, bonds

and signed agreements and notify the contractor of Council's action to award. Prior to the 90% final design, the City will advertise for construction management services and will hire a consultant to provide a constructability review and construction management services. All activities will be documented and copies will be submitted to the State. Deliverables include: advertisement for bids, pre-bid contractors meeting, evaluation of bids, and award contract

Task 10: Construction
City staff and construction manager will conduct a preconstruction meeting to go over all the project requirements, including regulatory requirements, environmental requirements, obtain submittals and ensure of proper notifications. Depending upon the time of year, a sensitive species survey will be done and then the site which is planned to be disturbed will be cleared of vegetation and then mass graded. City staff and construction manager will oversee construction work and conduct weekly progress meetings to ensure compliance with public contract regulations and the project schedule. The selected contractor will perform all work on the project as follows:

Subtask 10.1 Mobilization and Site Preparation
Mobilization and site preparation include mobilizing grading and trenching equipment and site clearing of vegetation and debris for off-site disposal.

Subtask 10.2 Basin Earthwork
Construction of the basin begins with mass grading of approximately 965,000 cubic-yards including placing of and compacting fill per plans, precise grading, and disposing of materials at the basin site and all related work.

Subtask 10.3 Inlet, Outlet, and Spillway Structures
Basin structure construction includes grading channel inlet connections to the recharge basin, constructing the basin outlet and recharge basin piping, construction of the recharge/detention basin spillway, erosion control measures, and all related work.

Subtask 10.4 Roadway Embankment
Construction includes grading and filling 2nd Street road embankment, roadway, erosion control measures, and all related work.

Subtask 10.5 Landscape, Irrigation, and Trails
After the basin and structure construction is complete, irrigation and vegetation systems will be constructed. Additionally, construction of hiking trails with tie-ins to existing trails, including installation of information kiosks.

Subtask 10.6 Performance Testing and Demobilization
City staff and construction manager will oversee the performance testing for the project including soils compaction testing, concrete strength testing, steel strength testing, soils gradation testing, asphalt gradation and compaction testing, rock size testing, and water discharge testing per NPDES requirements during rain storm events. The construction management team will provide a punch list and include the punch list generated by the SBCFCD. Final payment will be with-held in accordance with public contracting policy until final approval by the construction management team.

Demobilization includes removal of all equipment used for construction, surplus project materials, spoils, and construction debris.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 11: Environmental Compliance/Mitigation/Enhancement
Environmental mitigation requirements will be determined during Task 6. City staff and construction manager will ensure that the contractor's work is done in compliance with the environmental permit regulations. All requirements in the permits will be made a part of the specifications and pay items will be associated with work. A habitat conservation and monitoring plan, consistent with EIR requirements, will be developed as part of the permitting process which will show the mitigation that is required for the project along with any enhancement that will be allowed in lieu of offsite mitigation. Much of the enhancement work will be done as part of the construction work.

Offsite mitigation will be either be on City-owned conservation land which will be enhanced to offset the project "take" areas, or the City will buy into an approved mitigation bank. If City-owned conservation land is used, a survey will be conducted to differentiate it from the other conservation area and a separate bid process will be conducted for the enhancement work. All required reporting during and after the project is complete will be handled by City staff or consulting staff.

Budget Category (f): Construction Administration

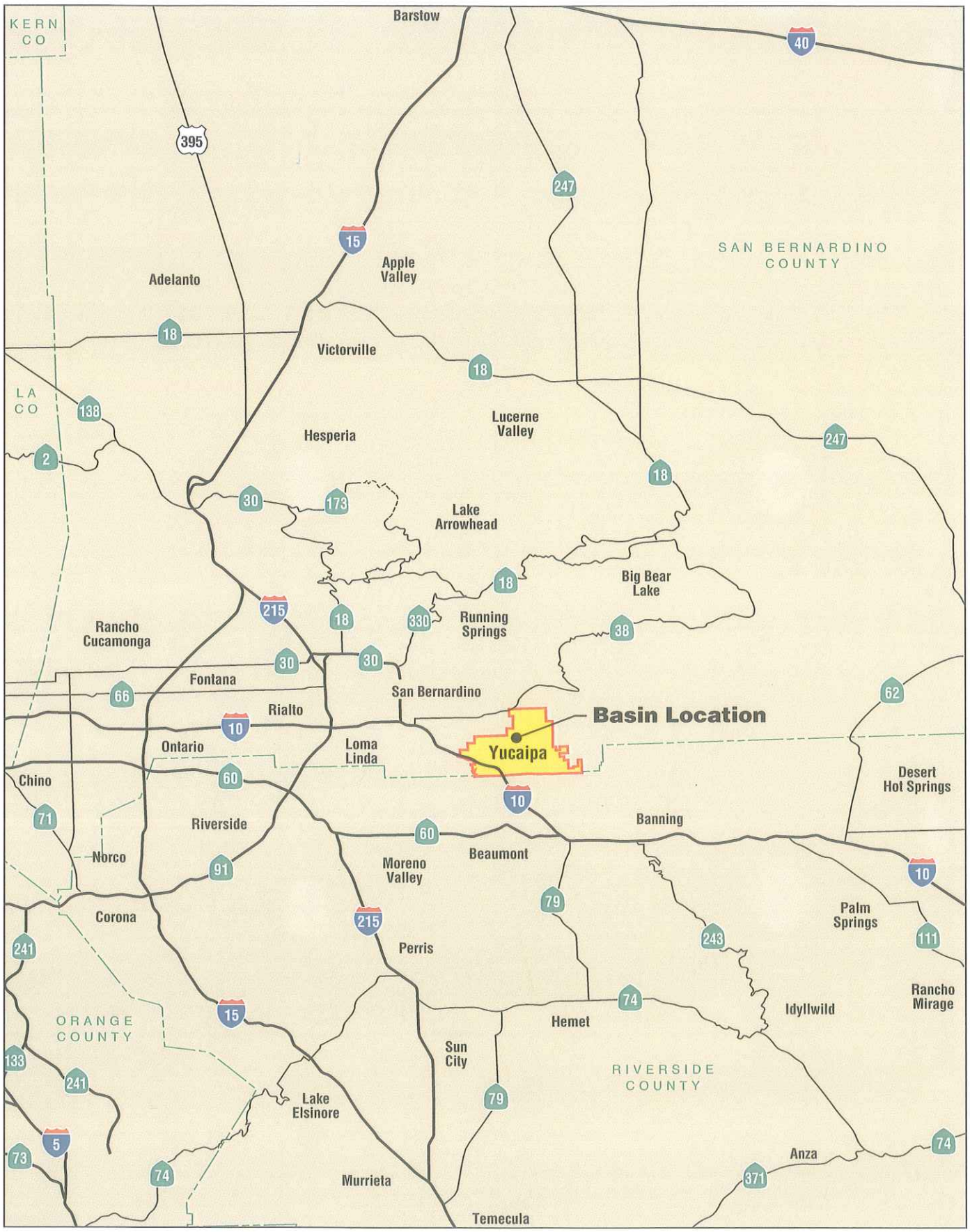
Task 12: Construction Administration
City staff and construction manager will both be involved in construction administration which will include daily inspection reports, weekly meetings, processing submittals including shop drawings, requests for information, extra work requests and change order requests, reviewing and approving invoices, tracking the project schedule, ensuring compliance with all regulatory and environmental requirements listed in the plans and specifications such as storm water pollution prevention plan, water quality management plan, traffic control plan. In the event that change orders require Council action, a Council agenda report will be prepared with recommendations. The project will closed out with a final report to City Council to authorize the recordation of the notice of completion and allow for the release of retention. A final grant close-out report will be prepared and sent to DWR. All paperwork related to the project will be kept for the required time frame.

Budget Category (g): Other Costs

Not a part of this work plan

Budget Category (h): Construction/Implementation Contingency

A construction / implementation contingency of approximately $1,366,915 is estimated for this Project. The contingency is not a part of the match funding and thus will not affect the match funding requirement.



RBF
A Baker Company

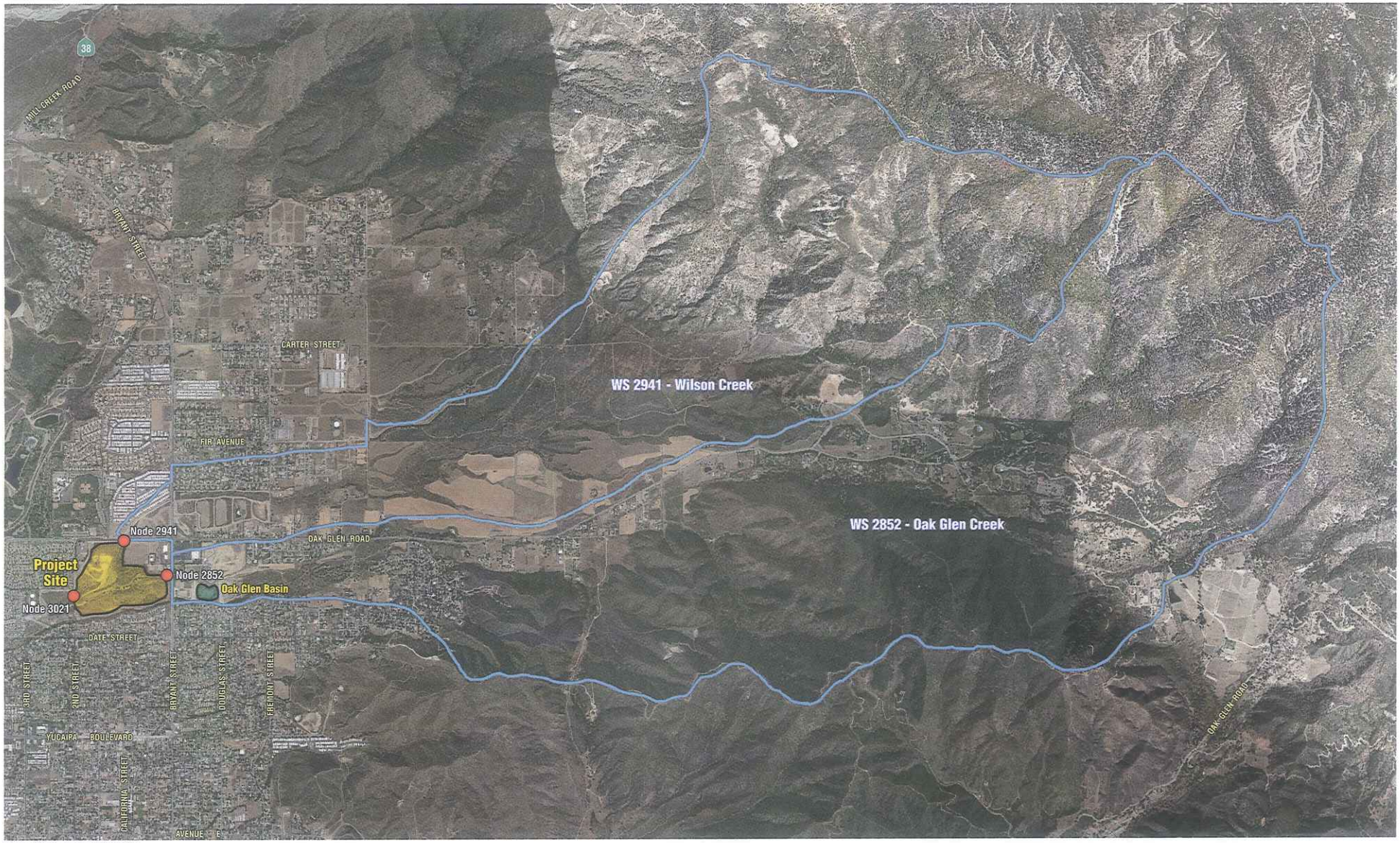
0 10 miles
APPROXIMATE

12/13/12 JN 130351-18822 MAS

WILSON III BASIN DESIGN ALTERNATIVES

Regional Vicinity

ATTACHMENT 3–1



Note: Points to match Table 3-1.

RBF
A Baker Company

not to scale

12/13/12 JN 130351-18622 MAS

WILSON III BASIN DESIGN ALTERNATIVES

Watershed Location Map

ATTACHMENT 3–2

RBF CONSULTING

0 125250 500 Feet

Source:

CITY OF YUCAIPA

Wilson Creek Optimization Study

ATTACHMENT 3–3

2011 WILSON III BASIN CONCEPTUAL SITE PLAN