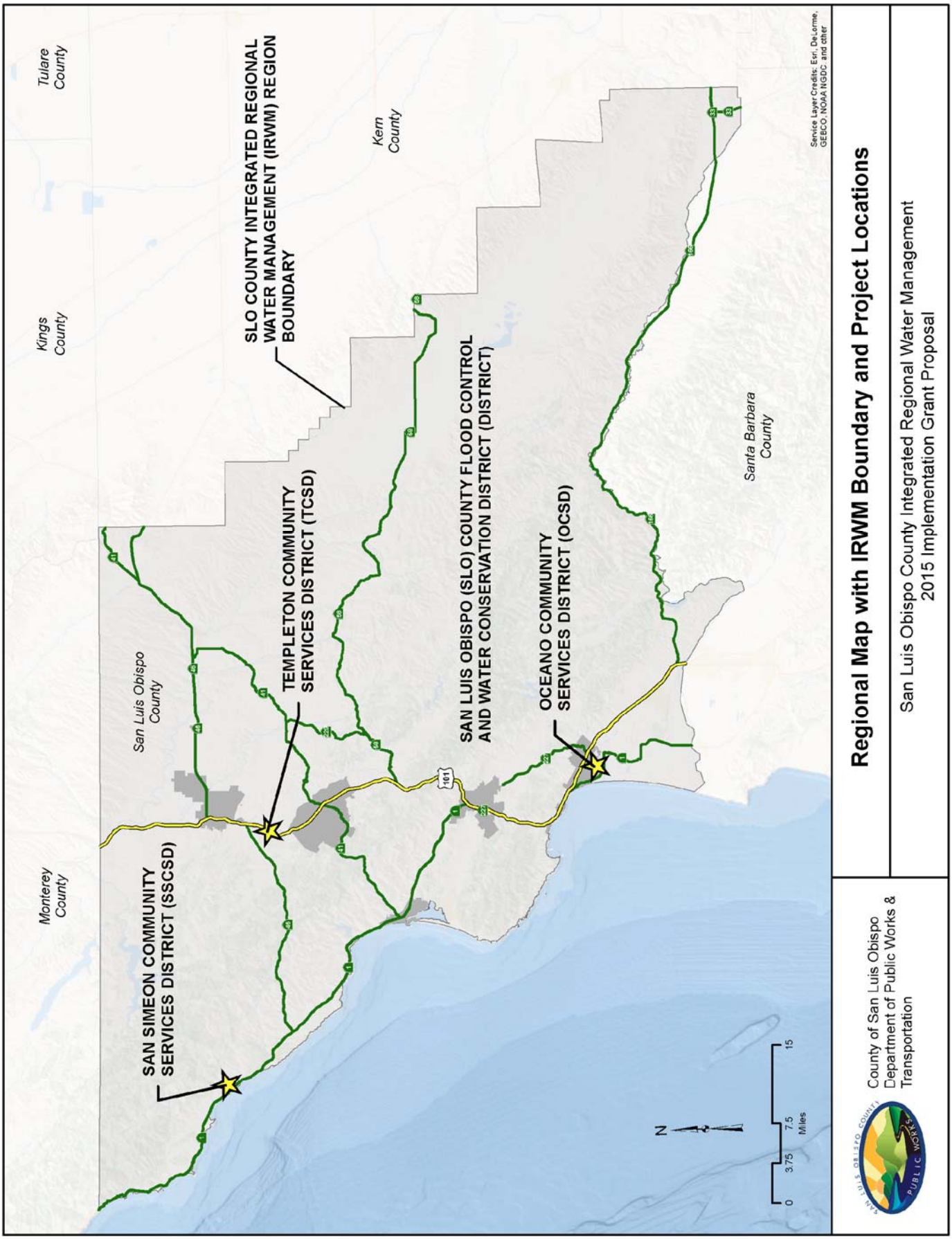
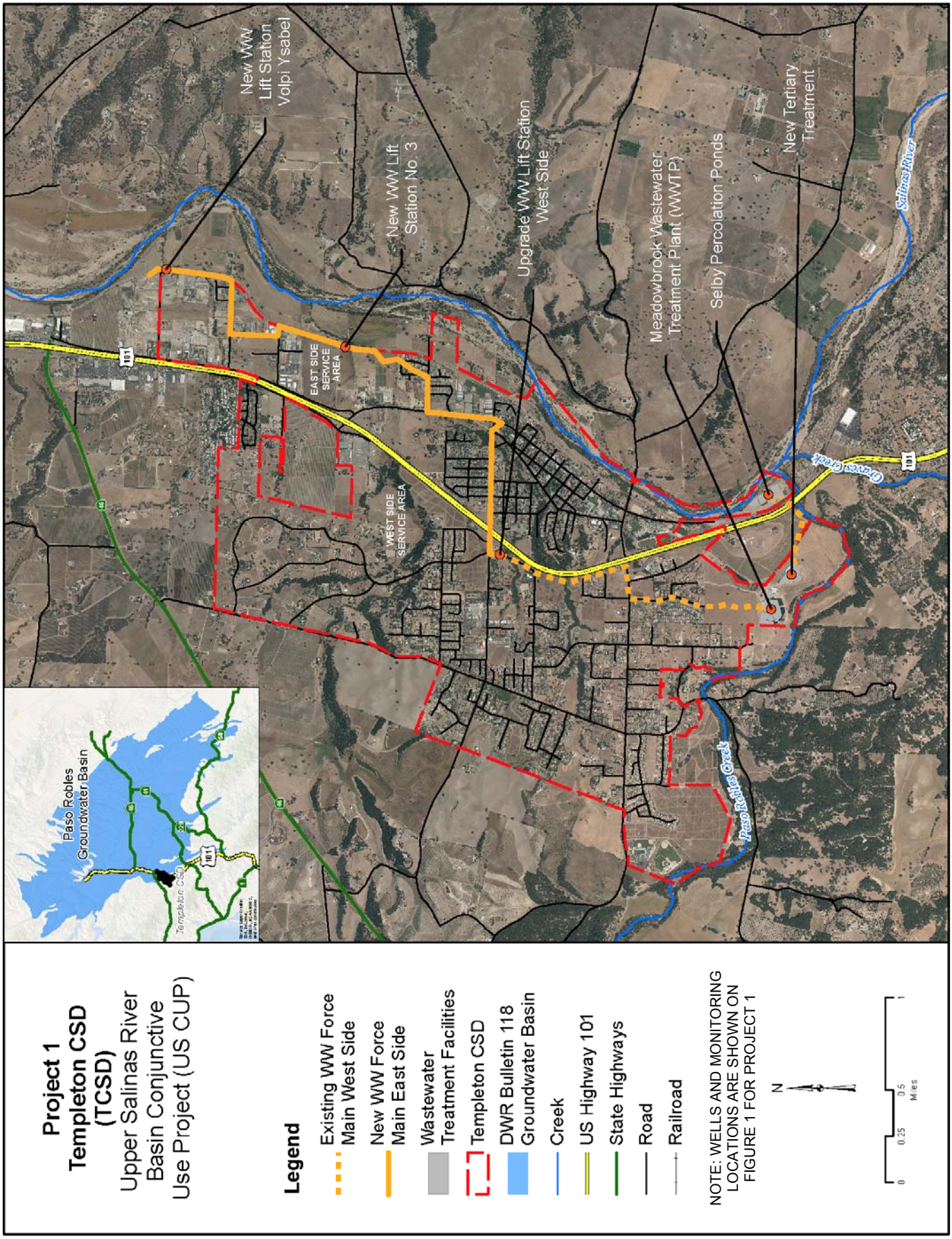
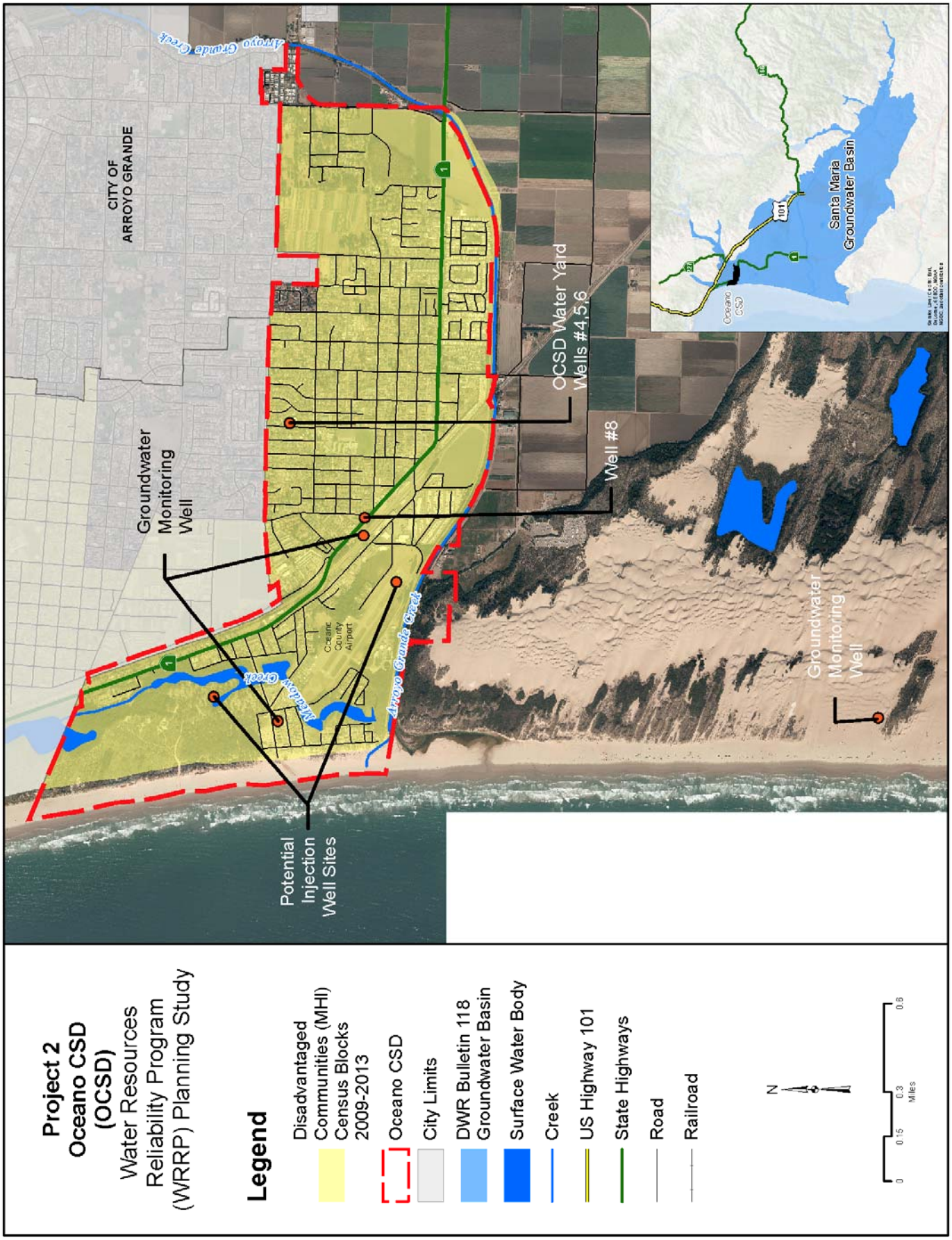
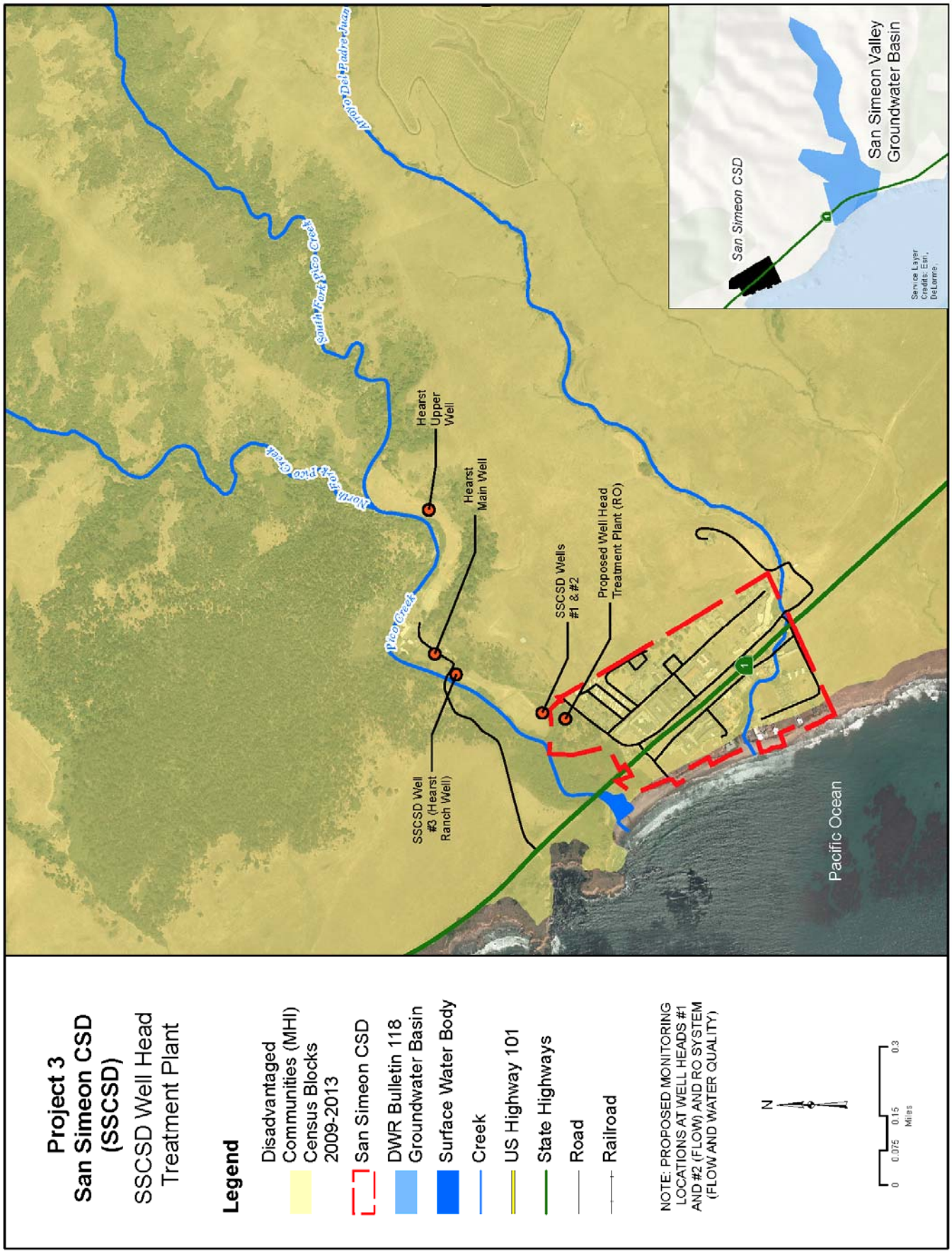
Table 4 - 2015 IRWM Grant Solicitation Project Summary Table				
IRWM Project Element		TSCD - US CUP	OCSD - WRRP(1)	SSCSD - WHTP
IR.1	Water supply reliability, water conservation, and water use efficiency.	Yes	Yes	Yes
IR.2	Stormwater capture, storage, clean-up, treatment, and management.		Yes	
IR.3	Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands.			
IR.4	Non-point source pollution reduction, management, and monitoring.		Yes	
IR.5	Groundwater recharge and management projects.	Yes	Yes	
IR.6	Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users.	Yes		Yes
IR.7	Water banking, exchange, reclamation, and improvement of water quality.	Yes	Yes	Yes
IR.8	Planning and implementation of multipurpose flood management programs.			
IR.9	Watershed protection and management.			
IR.10	Drinking water treatment and distribution.			
IR.11	Ecosystem and fisheries restoration and protection.			
Note: (1) Oceano's Water Resources Reliability Program (WRRP) Study, being conducted by the Oceano Community Services District (OCSD), a disadvantage community (DAC), consists of three components: a Reclaimed Water Injection Well Program, a Low Impact Development (LID) Plan, and a Leak Detection and Management Plan.				


Tulare County
Kings County
Kern County
Monterey County
San Luis Obispo County
Santa Barbara County
SLO COUNTY INTEGRATED REGIONAL WATER MANAGEMENT (IRWM) REGION BOUNDARY
SAN SIMEON COMMUNITY SERVICES DISTRICT (SSCSD)
TEMPLETON COMMUNITY SERVICES DISTRICT (TCSD)
SAN LUIS OBISPO (SLO) COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (DISTRICT)
OCEANO COMMUNITY SERVICES DISTRICT (OCSD)
101
Service Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC and other
N
0 3.75 7.5 15
Miles
Regional Map with IRWM Boundary and Project Locations
San Luis Obispo County Integrated Regional Water Management
2015 Implementation Grant Proposal
County of San Luis Obispo
Department of Public Works &
Transportation


Project 1
Templeton CSD
(TCSD)
Upper Salinas River
Basin Conjunctive
Use Project (US CUP)
Legend
Existing WW Force
Main West Side
New WW Force
Main East Side
Wastewater
Treatment Facilities
Templeton CSD
DWR Bulletin 118
Groundwater Basin
Creek
US Highway 101
State Highways
Road
Railroad
NOTE: WELLS AND MONITORING
LOCATIONS ARE SHOWN ON
FIGURE 1 FOR PROJECT 1
N
0
0.25
0.5
1
Miles
Paso Robles
Groundwater Basin
Templeton CSD
101
New WW
Lift Station
Volpi Ysabel
New WW Lift
Station No. 3
Upgrade WW Lift Station
West Side
Meadowbrook Wastewater
Treatment Plant (WWTP)
Selby Percolation Ponds
New Tertiary
Treatment
EAST SIDE
SERVICE
AREA
WEST SIDE
SERVICE AREA
Paso Robles Creek
Salinas River
Cuyama Creek


Project 2
Oceano CSD
(OCSD)
Water Resources
Reliability Program
(WRRP) Planning Study
Legend
Disadvantaged Communities (MHI) Census Blocks 2009-2013
Oceano CSD
City Limits
DWR Bulletin 118 Groundwater Basin
Surface Water Body
Creek
US Highway 101
State Highways
Road
Railroad
N
0
0.15
0.3
0.6
Miles
Potential Injection Well Sites
Groundwater Monitoring Well
CITY OF ARROYO GRANDE
Arroyo Grande Creek
Meadow Creek
Oceano County Airport
Groundwater Monitoring Well
Well #8
OCSD Water Yard Wells #4,5,6
Oceano CSD
Santa Maria Groundwater Basin
101


Project 3
San Simeon CSD
(SSCSD)
SSCSD Well Head
Treatment Plant
Legend
Disadvantaged Communities (MHI) Census Blocks 2009-2013
San Simeon CSD
DWR Bulletin 118 Groundwater Basin
Surface Water Body
Creek
US Highway 101
State Highways
Road
Railroad
NOTE: PROPOSED MONITORING LOCATIONS AT WELL HEADS #1 AND #2 (FLOW) AND RO SYSTEM (FLOW AND WATER QUALITY)
N
0 0.075 0.15 0.3
Miles
Pacific Ocean
SSCSD Well #3 (Hearst Ranch Well)
Pico Creek
North Fork Pico Creek
South Fork Pico Creek
Arroyo Del Padre Juan
Hearst Upper Well
Hearst Main Well
SSCSD Wells #1 & #2
Proposed Well Head Treatment Plant (RO)
San Simeon CSD
San Simeon Valley Groundwater Basin
Service Layer Credits: Esri, DeLorme

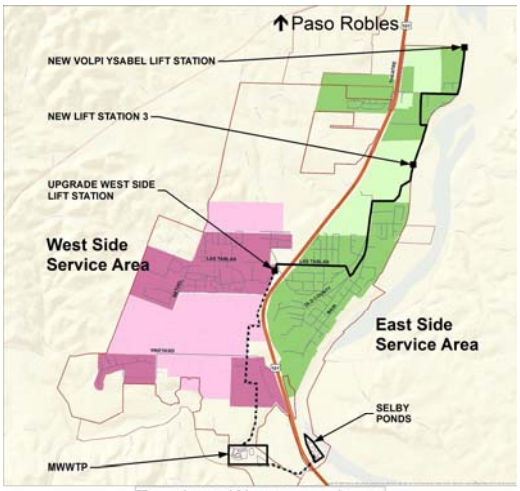
PROJECT 1 - TEMPLETON COMMUNITY SERVICES DISTRICT - UPPER SALINAS RIVER BASIN CONJUNCTIVE USE PROJECT (US CUP)

1. PROJECT DESCRIPTION

Implementation Project: Upper Salinas River Basin Conjunctive Use Project (US CUP).
Implementing Agency: Templeton Community Services District (TCSD).

Brief Description: The TCSD US CUP facilities will capture 60% of currently unutilized wastewater flows to develop 242 AFY of a new drought tolerant water supply.

TCSD is located on the Central Coast of California in the Atascadero Sub-basin. The TCSD service area is a water deficient community in need of a new, drought resistant water supply to meet seasonal and projected annual demands. Current projections indicate a potential supply shortage during summer months starting as early as 2020. The US CUP is a drought responsive project that helps prepare against the long-term effects of drought by capturing a new, sustainable wastewater supply that would otherwise be lost to the basin. The project makes use of the natural processes of wastewater treatment and infiltration into the underflow of the Salinas River where it is later retrieved and distributed to water users. By off-setting the use of the basin's groundwater supply, the project will extend the supply and availability of the groundwater in dry years.



Templeton Wastewater Areas

TCSD serves a population of just under 7,000. At this time, the District is capable of meeting the seasonal average daily water demands through extractions from ten deep groundwater wells and three river wells. However, projections indicate that demand could exceed supplies shortly after 2030. Additionally, the region could experience seasonal shortages as early as 2020. In 2013, roughly 50% of the supply came from deep wells underlying the District, 40% from surface water sources and 8% from the TCSD wastewater retrieval program. In order to work towards meeting the supply demands of the community, TCSD purchased 250 AF of raw water to be imported via a pipeline projects. TCSD began receiving its 250 AF of water which was intended to provide a supply buffer, however, when a leak was discovered in the pipeline, this water was not received for nine months until the repairs were completed. The US CUP facilities will reliably provide the supply buffer and projected needs of the community through utilization of a wastewater supply currently lost to the basin.

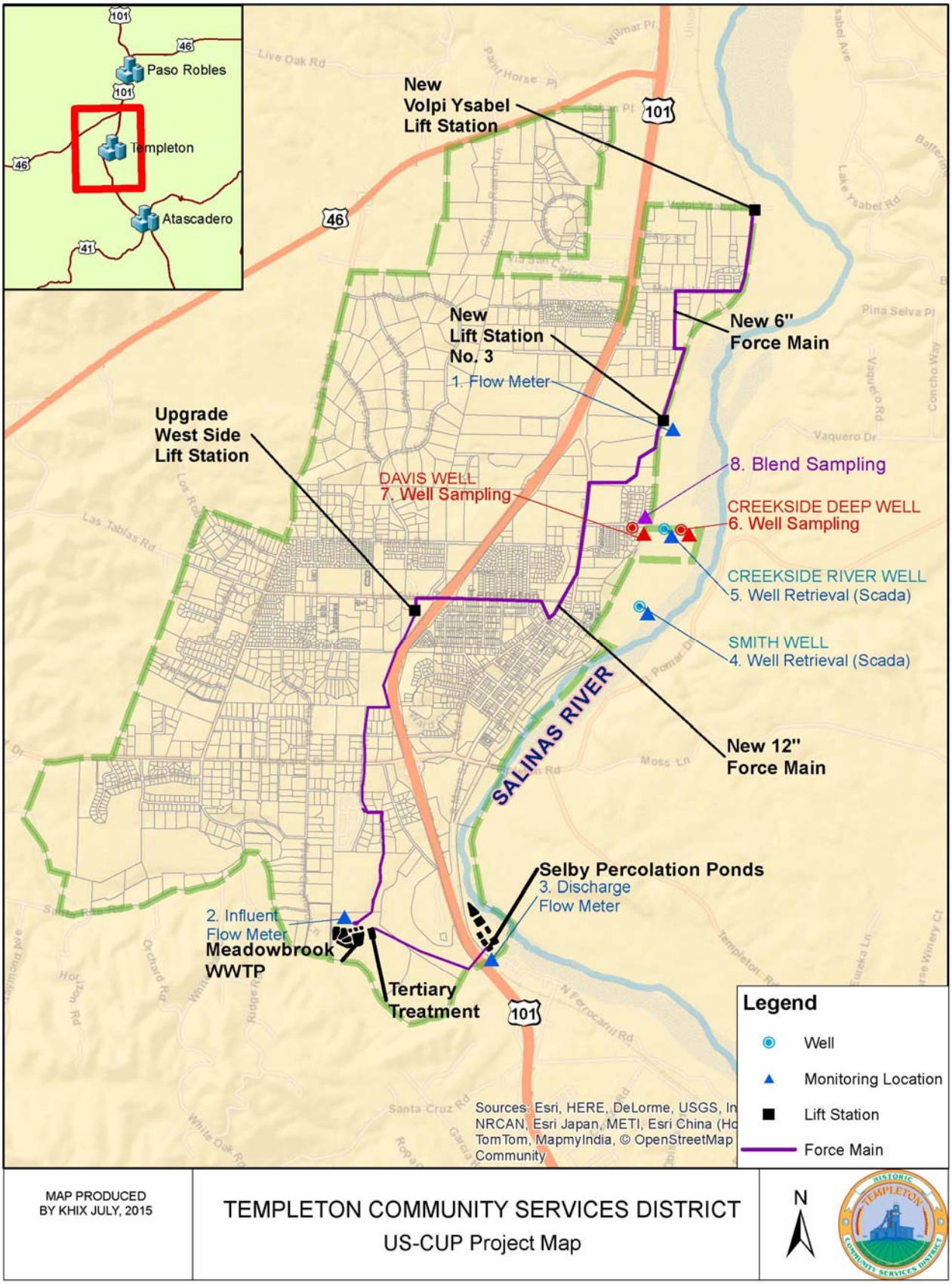
As shown, the service area is bisected by Highway 101, with two distinct wastewater areas. The west side area flows, approximately 150,000 gpd, are treated at TCSD Meadowbrook WWTP (MWWTP) where it undergoes secondary treatment and is discharged into infiltration ponds where it percolates into the underflow of the Salinas River to be subsequently retrieved by TCSD wells downstream, contributing 165 AFY to the region's supplies. However, the east side area flows, approximately 220,000 gpd, are sent to the Paso Robles WWTP for treatment and disposal and are lost to the basin. **The US CUP facilities will redirect all of the wastewater generated in the east side area to the MWWTP, thereby increasing the supply by an additional 242 AFY.** This represents roughly 26% of the area's total annual supply and will reduce dependence on the stressed groundwater basin. Additionally, use of this new water supply will reduce reliance on groundwater containing arsenic that requires blending to meet regulatory standards. Since the new water will be used before groundwater, the amount of arsenic introduced into the distribution system will be less.

	Without US CUP	With US CUP
WW Captured	168 AFY	414 AFY
WW Retrieved	165 AFY	407 AFY
Percent Supply	11%	26%

The District has long been planning this project and all of the planning, feasibility, and environmental studies are complete. In 2008, the District expanded the MWWTP treatment facilities to 600,000 gpd and is ready to receive the additional wastewater flows from the East Side wastewater area captured with this project. The US CUP will complete the remaining construction components needed to deliver and utilize a new water supply that would otherwise be lost to the sub-basin. The infrastructure improvements needed are the construction of two new lift stations and approximately 12,600 feet of force main to capture and redirect East Side flows to the west side collection system. From there, additional upgrades needed to convey the flows to the MWWTP include upgrading the West side Lift Station, upgrading the MWWTP headworks, and finally the addition of tertiary treatment to the MWWTP treatment process to improve the infiltration capacity at the Selby Ponds.

2. PROJECT MAP

Figure 1 - CSD Upper Salinas River Conjunctive Use Project Map



3. PROJECT PHYSICAL BENEFITS

The TCSD service area is a water deficient community that relies heavily on groundwater that contains high levels of arsenic. The area is in need of a new, drought resistant water supply to meet seasonal and projected annual demands and reduces demand on the groundwater with high arsenic levels. US CUP will provide the following primary and secondary physical benefits to meet the water supply needs in the area:

- **Primary Benefit - New Water Supply**: US CUP will produce 242 AFY of a new, drought tolerant water supply beginning 28 months after the project is on line. The amount of new water will increase over time as population increases and throughout the life of the project.
- **Secondary Benefit – Reduced Arsenic**: US CUP will reduce blended arsenic levels below 5 ug/l, May through November when the deep wells are required to meet supply demands beginning 35 months after the project is on line. The amount of arsenic reduction will increase over time as population increases and throughout the life of the project.

Annual Project Physical Benefits - Benefit A (Primary)

Project Name: Upper Salinas River Basin Water Conservation/Conjunctive Use Project

Type of Benefit Claimed: New Water Supply and conservation of groundwater

Units of the Benefit Claimed: 242 ac-feet per year beginning 28 months after construction and increasing proportionately with population growth thereafter

Anticipated Useful Life of Project (years): 40 years

(a)	(b)	(c)	(d)
Physical Benefits			
Year	**Without Project**	**With Project**	**Change Resulting from Project**
			(c) – (b)
2015	0		
2016	0		Project Under Construction
2017	0		Project Under Construction
2018	0		All Project Components Complete
2019	0		Infiltration Travel Time
2020	0		Infiltration Travel Time
2021	0	242 ac-ft	Water Retrieval begins after 28 mos.
2022	0	244 ac-ft*	
2023	0	247 ac-ft*	
2024 - 2050	0	249 ac-ft +	Increases at 1% +/- per year through build out.

Comments: * Amount of water gained will increase proportionately with population increase and commercial growth in Templeton. 1% growth through build out used for illustration per 2013 Water and Wastewater Master Plan Update.

Annual Project Physical Benefits - Benefit B (Secondary)

Project Name: Upper Salinas River Basin Water Conservation/Conjunctive Use Project

Type of Benefit Claimed: The reduction in amount of groundwater pumped from Creekside Deep well containing arsenic will provide improvement in water quality of delivered water by reducing amount of groundwater pumped from deep wells containing arsenic.

Units of the Benefit Claimed: Reduction in arsenic concentration in micrograms per liter (ug/L) from the water supply pumped from Creekside Deep well which contains high levels of arsenic requiring blending with another District well

Anticipated Useful Life of Project (years): 40 years

(a)	(b)	(c)	(d)
Physical Benefits			
Year	**Without Project**	**With Project**	**Change Resulting from Project**
			(c) – (b)
2015	6 – 8 ug/L		
2016	6 - 8 ug/L		Project Under Construction
2017	6 - 8 ug/L		Project Under Construction
2018	6 - 8 ug/L		All Project Components Complete
2019	6 - 8 ug/L		Infiltration Travel Time
2020	6 - 8 ug/L		Infiltration Travel Time
2021	6 - 8 ug/L	3 - 5 ug/L	Water Retrieval at Creekside Deep after 35 months
2022	6 - 8 ug/L	3 - 5 ug/L	3 ug/L (average) reduction in arsenic
2023	6 - 8 ug/L	3 - 5 ug/L	3 ug/L (average) reduction in arsenic
2024- 2050	6 - 8 ug/L	3 - 5 ug/L	3 ug/L (average) reduction in arsenic

Comments: Arsenic value based on the water blend of Creekside River well with Creekside Deep Well. Increased water retrieval beginning 3 years after the project comes on line, requires less water from the Creekside Deep well, and lowers arsenic blended water to an average below 5 ug/L.

4. TECHNICAL ANALYSIS OF EACH PHYSICAL BENEFIT CLAIMED

Project Need

The TCSD service area is a water deficient community that relies heavily on groundwater that contains high levels of arsenic. As documented in the 2013 Water and Wastewater Master Plan Update and depicted in Figure 2 below, seasonal water restrictions could lead to a supply shortage during the summer months starting as early as 2020 (upper range). Additionally, annual demands are projected to exceed current supplies at build out.

As documented in the California Department of Public Health (CDPH) Drinking Water Permit dated June 12, 2008, the Creekside Deep Well initially tested for arsenic around 27 ug/L, which exceeds the maximum contaminant level of 10 ug/L. Weekly testing by the District regularly shows arsenic levels above 10 ug/L and above (Figure 3). To meet the drinking water standards, TCSD must blend the water to reduce arsenic levels before it may enter the distribution system. The US CUP project will provide a greater volume of new water supply that will be used to blend and reduce the arsenic levels below state limits.

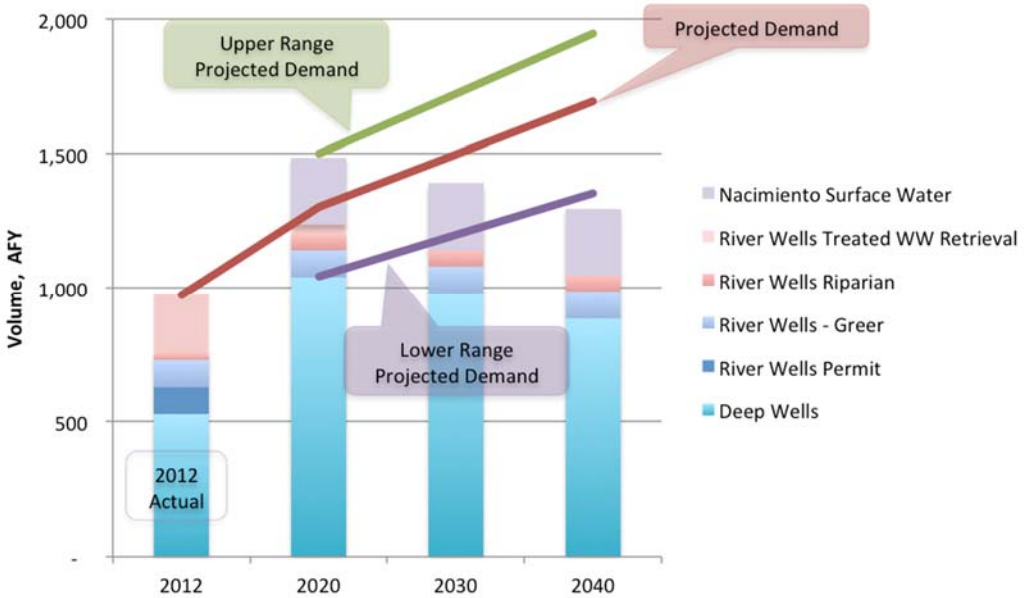


Figure 2 - Summer Operating Scenario with Existing Supplies

	2012		2013		2014	
District Wells Containing Arsenic	**Volume (ac-ft/year)***	**Arsenic Max. (ug/l)**	**Volume (ac-ft/year)***	**Arsenic Max. (ug/l)**	**Volume (ac-ft/year)***	**Arsenic Max. (ug/l)**
Creekside Deep Well (Supplies 30% of the total deep groundwater production.)	188	16	233	14	154	15
Davis Well**	0	42	0	42	0	42

* Note that this deep well is used primarily May - November to meet customer demands.
** This well has not been used since 2008, however, it is tested regularly for emergency readiness.

Figure 3 Arsenic in Groundwater Supply Wells

Without Project Conditions

Without US CUP, the District will continue to rely on its existing arsenic contaminated groundwater wells and could face seasonal water supply shortages as early as 2020.

Existing Facilities and Supplies

TCSD operates and maintains 13 wells in the Atascadero Basin to produce its water supply. The Atascadero Basin aquifer contains two primary water-bearing geologic units: the Paso Robles formation, and the Salinas River alluvial gravels. TCSD has 10 deep, percolating groundwater wells located in the Paso Robles Formation (referred to as 'deep' wells) and 3 wells in the underflow from the Salinas River alluvial gravels (referred to as the 'river' wells).

Ten (10) Deep Wells
The District extracts percolating groundwater from ten active wells. FUGRO recently completed a study of the District's deep aquifer supply capability and concluded that a perennial yield of 1,200 AF may be used as an operational guide. This includes an annual average of approximately 160 AF per year used by rural and private pumping outside of District's municipal pumping. For water supply purposes, a safe yield of 1,040 AFY may be considered for the 10 deep wells. The most critical groundwater well, the Creekside Deep well, produces 30% of the District's groundwater and contains arsenic which requires blending to meet state standards. This water is available year round, however these wells are used primarily to meet summer demands.

Three (3) River Wells
The District has three river wells that divert water from the Salinas River underflow. The District relies primarily on two river wells, the Smith River well, and the Creekside River Well. The third well, the Platz River well, is primarily a standby emergency well.

Water rights Permits, License, and Riparian Agency Agreements for Riparian Water
The District has several water rights for diversions of water from the Salinas River underflow. Water Rights Permit 8964 authorizes a maximum of 500 AF from October 1 through March 30. Permit 20785 authorizes the diversion of 1.5 cfs from April 1 through May 15, if there is a "live stream" flowing in the Salinas River, and the quantity of water diverted under both Permits combined cannot exceed 500 AF. The District also holds Water Rights License 4829, often referred to as the Greer License. This License permits water diversion from the Salinas River underflow from April 1 through October 15 for a maximum of 102 AF. The District also has several riparian rights agreements by which it provides water to customers through its system and pumps the same amount of water from the underflow.

Treated Wastewater Retrieval
Treated wastewater percolated into the underflow of the Salinas River at the Selby percolation ponds may be retrieved, less 2%, 28 months later at the Smith River Well, or 35 months later at the Creekside River Well. At the current average discharge of 150,000 gpd, this provides an additional 164 AF of water available annually. Due to the locations of the two wells, all of the water discharged at the Selby ponds can be retrieved during the summer pumping season from April through October.

The Addition of Nacimiento Water
The District purchased an annual allocation of 250 AF of water from the Nacimiento Water Project (NWP). This raw water is currently being discharged into the Selby percolation ponds where it will percolate into the underflow and be available for retrieval downstream at the Smith River Well 28 months later or at the Creekside River Well 35 months later. Retrieval of the water at the Smith Well and Creekside Well will net approximately 241 AF annually. The discharge of Nacimiento water may continue at the Selby site as long as the percolation ponds have capacity to receive the discharges and will continue until the this Project is completed. At the present time, the Nacimiento water location supplements the water supply during the peak summer season and provide some additional source capacity for the District.

As described, TCSD water supplies are distinctly grouped into two water seasons due to both demand, and water availability based on water rights. The summer season extends from April 1 through September 30, and the winter season starts on October 1 and extends through March 30. TCSD water use peaks in July and August when outdoor use is greatest and it can be over three times winter water use, underscoring the importance of evaluating the summer and winter season demands separately in addition to overall annual demands. See Figure 4 below.

At this time, TCSD is capable of meeting the seasonal average daily water demands of the District. TCSD also is able to meet the MDD requirements set forth in the California Waterworks Standards. This is defined as the day with the highest usage during the past ten years. The 10 year historical MDD is 2.97 MGD and occurred on July 2, 2007. The District is required to meet this MDD at all times and is required to do so with its highest capacity source off-line. The District can currently meet this criterion with the Platz 4 Well off line. However, as additional water connections are made and demands increase as projected, the source capacity will be insufficient unless a second water source is added as early as 2020.

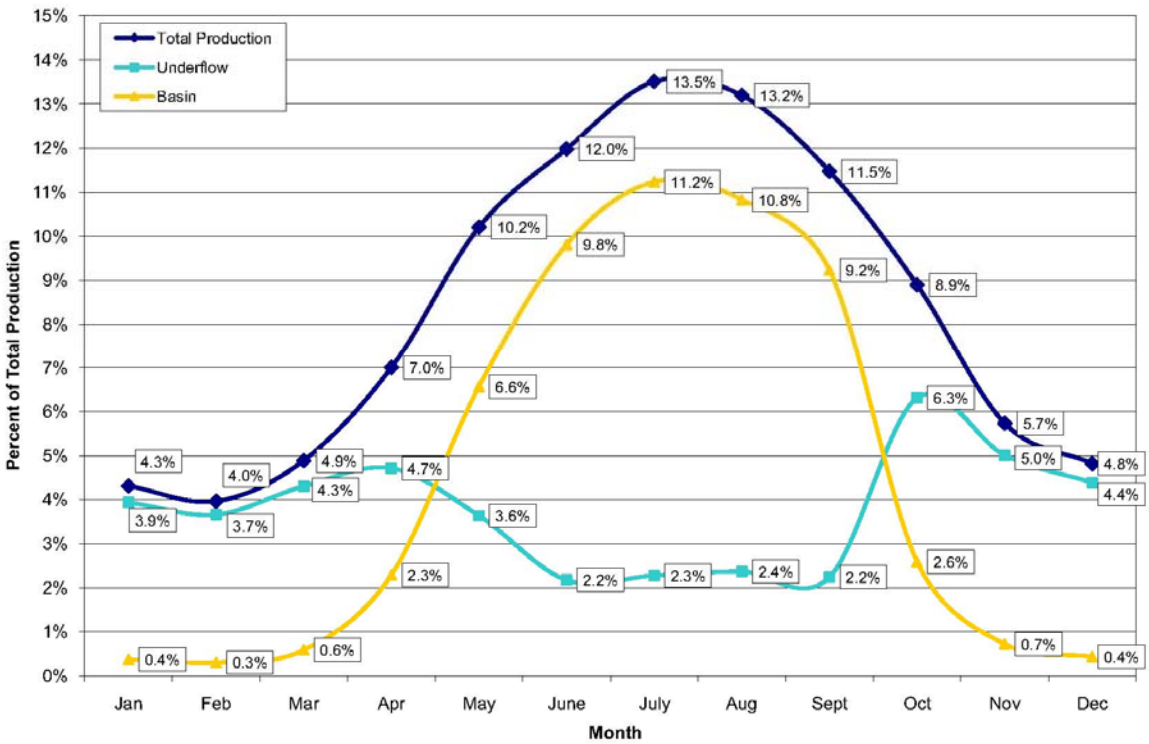


Figure 4 - Monthly Groundwater Production as a Percentage of Total Annual Production
From Well Field Assessment, prepared by FUGRO Consultants, Inc., dated August 2012

Recent Conditions

In 2013, 48% of the supply came from the 10 deep wells, 43% from the 3 river wells, plus 9% from the wastewater retrieval program, as depicted in the first pie chart in Figure 5.

TCSD began discharging Nacimiento water in June 2011, which was then available at the Smith River Well and Creekside River Well in 2014. In 2014, 36% of the supply came from the 10 deep wells, 42% from the 3 river wells, 8% from the wastewater retrieval program, and 14% from the Nacimiento retrieval, as depicted in the second pie chart in Figure 5.

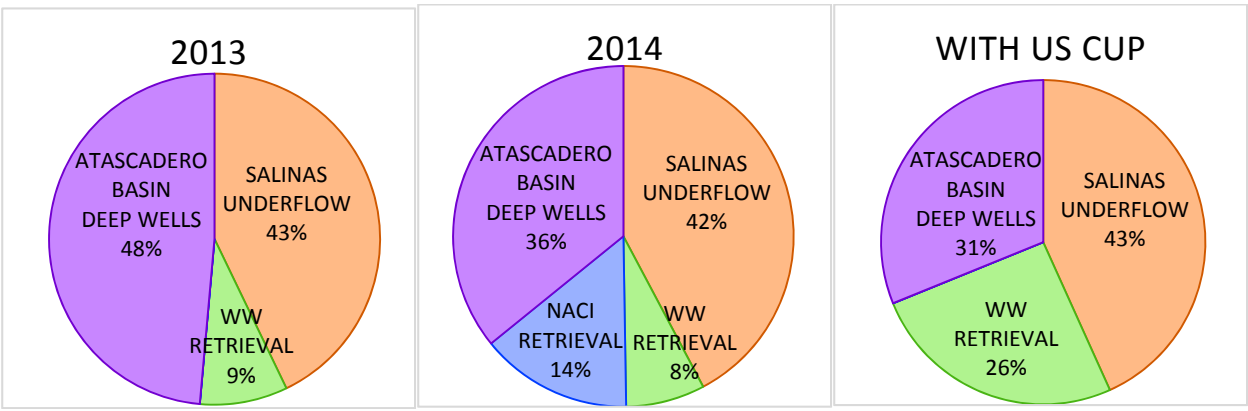


Figure 5 - TCSD Historic and Project Water Use

Unfortunately, the Nacimiento supply was interrupted for 9 months when a leak was discovered in the pipeline. Due to the method of discharge and retrieval, TCSD will experience a water shortage in 2016 due to the interrupted delivery. Additionally, since the Nacimiento water is an imported water source, it is not drought resistant and could be reduced or halted in the event of an extreme drought.

The sustainability and quality of the deep aquifer, the seasonal limitations of the river underflow, the reliability of the imported Nacimiento supply, and the projected increased demands, all underscore the TCSD need to develop a clean drought tolerant water supply. US CUP will increase the wastewater retrieval quantity from the current 164 AF to 407 AF annually. This will represent roughly 26% of total annual supply and will reduce the amount of groundwater from the deep wells from 48% of annual supply, to 31% when the NWP is offline, as depicted in the third pie chart in Figure 4. All of the water sources considered together are needed to meet current and projected demands and water quality improvements.

Without Project Conditions

There are no other projects planned in lieu of the US CUP. This is the only project that can capture and utilize the existing wastewater flows currently lost to the basin. Without this project, the east side wastewater area flows (220,000 gpd) will continue to be sent to Paso Robles for treatment and disposal and the same amount of water will be lost to this basin (242 AFY). As demands grow, deep groundwater wells will be used more heavily and depleted more quickly, straining the water supply during drought years. Additionally, TCSD may experience seasonal shortages as early as 2020 and could fall out of compliance with the MDD standards.

	Without US CUP	US CUP	With US CUP
WW Captured	168 AFY	246 AFY	414 AFY
WW Retrieved	165 AFY	242 AFY	407 AFY
Percent Supply	11%	15%	26%

Additionally, without this project, the District will continue to rely on deep groundwater wells that are affected by high arsenic levels. The highest producing deep groundwater well, which produces 30% of the District's groundwater from the Atascadero deep aquifer, contains arsenic above 10 ug/l and must be blended with other sources to reduce the arsenic level to a safe limit. Without this project, a new supply without arsenic will not be introduced to the system for blending and TCSD will have to rely on the groundwater resources with a higher level of arsenic.

Estimating Physical Benefits

The US CUP facilities will redirect all of the wastewater generated in the east side area to the MWWTP, thereby increasing the supply by an additional 242 AFY. As shown in Figure 6, the new supplies allow TCSD to meet projected demands beyond 2030, at least 10 years beyond the projections without the project.

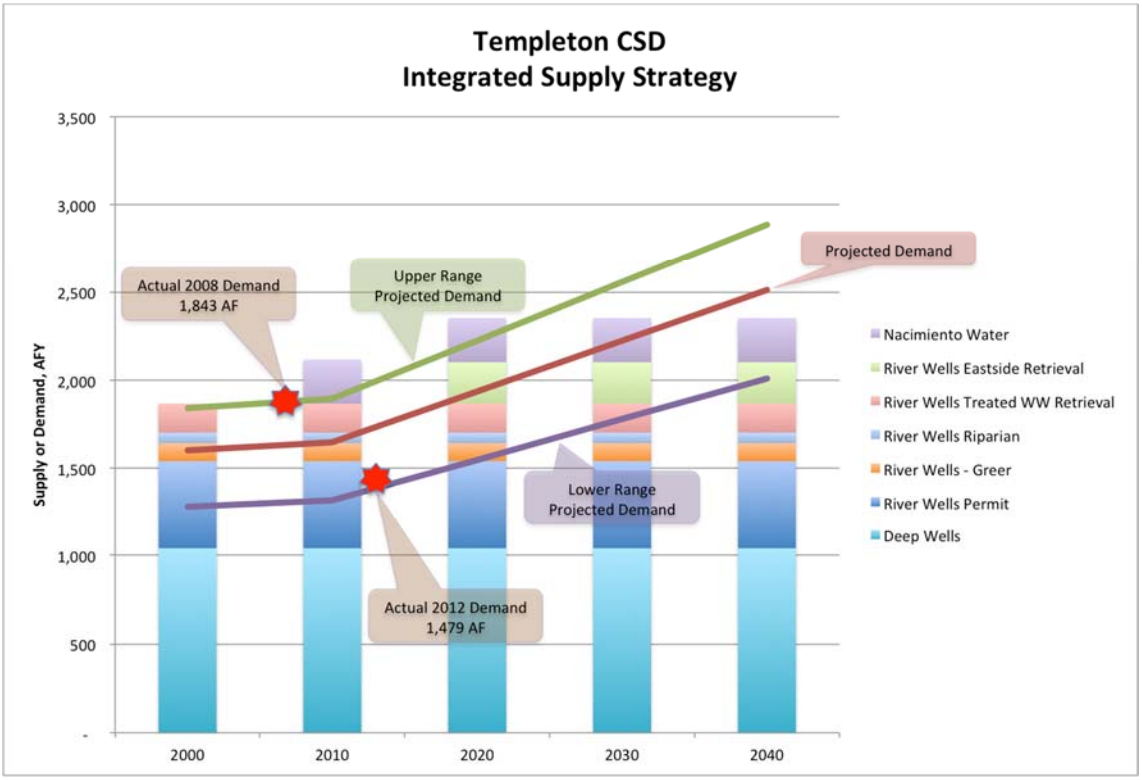
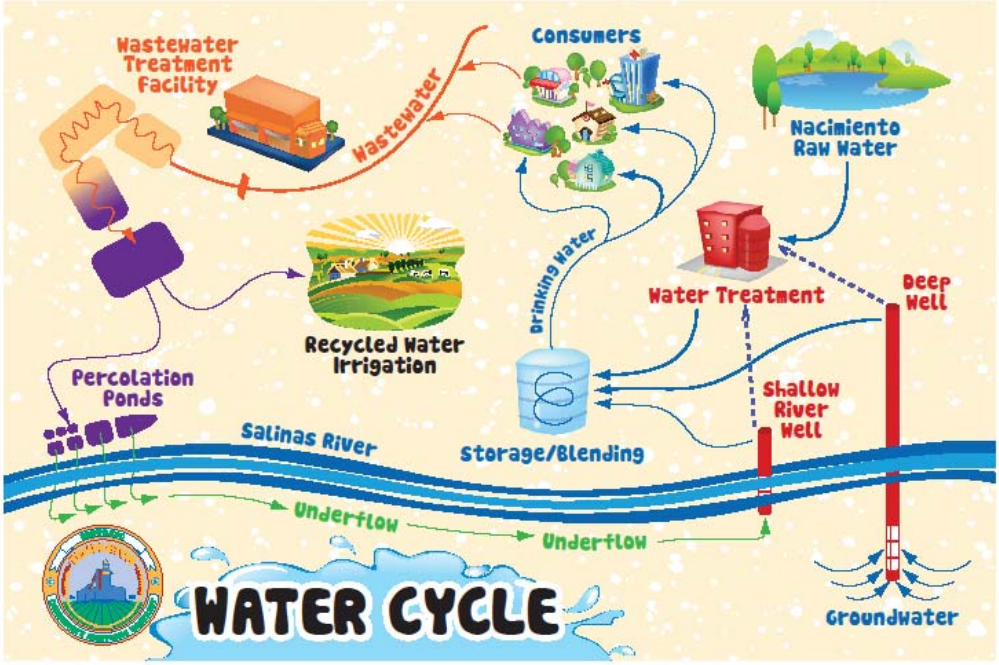


Figure 6 - Projected Supply Vs. Demand

The physical benefits of this project were derived through scientific study and evaluation, dating back to a 1997 hydrogeologic study and followed by the numerous studies described herein. Most recently in 2012, TCSD prepared a

detailed Wastewater Study, which evaluated alternatives for the existing wastewater treatment system. The main purpose was to evaluate the continued discharge of wastewater to the City of Paso Robles versus treatment at the TCSD Meadowbrook WWTP (MWWTP). The study concluded that the best long term, cost effective alternative is to utilize the MWWTP for percolation at the Selby ponds for retrieval from the Smith River Well and the Creekside River Well. Since that recommendation, TCSD has worked towards development of the US CUP facilities and is now ready for implementation.



The project recommendation was based on data and conclusion reached in numerous evaluations and studies. The method for estimating and justification for the benefits claimed are described in the following section for each step of the project from capturing the wastewater through retrieval of the water.

Estimating Available Wastewater Supplies

The volume of available wastewater was estimated by looking at the average metered flow currently being sent to Paso Robles for treatment and disposal. As shown in the Figure 7, the TCSD service area is bisected by Highway 101, with two distinct wastewater areas. The west side area flows, approximately 150,000 gpd, are treated at TCSD Meadowbrook
WWTP where it undergoes secondary treatment and is discharged into infiltration ponds where it percolates into the underflow of the Salinas River to be subsequently retrieved by TCSD wells downstream, contributing 165 AFY to the region's supplies. However, the east side area flows, approximately 220,000 gpd, are sent to the Paso Robles WWTP for treatment and disposal and are lost to the basin. The US CUP facilities will redirect all of the wastewater generated in the east side area to the MWWTP, thereby increasing the supply by an additional 242 AFY.

The wastewater will increase with population, as documented in the Master Plan growth projections. The quantity of new water that will become available will increase with population growth and be a very sustainable and renewable supply. Based on the 2013 Water and Wastewater Master Plan, the future wastewater flows are anticipated to grow at approximately 1% per year. The wastewater flows generated in the east side area are expected to grow from the current 220,000 gpd to build out flows of 400,000 gpd. Over the life of this project, the new water supply will add 240 AF the first operational year and increase up to 440 AF per year as the east side area builds out.

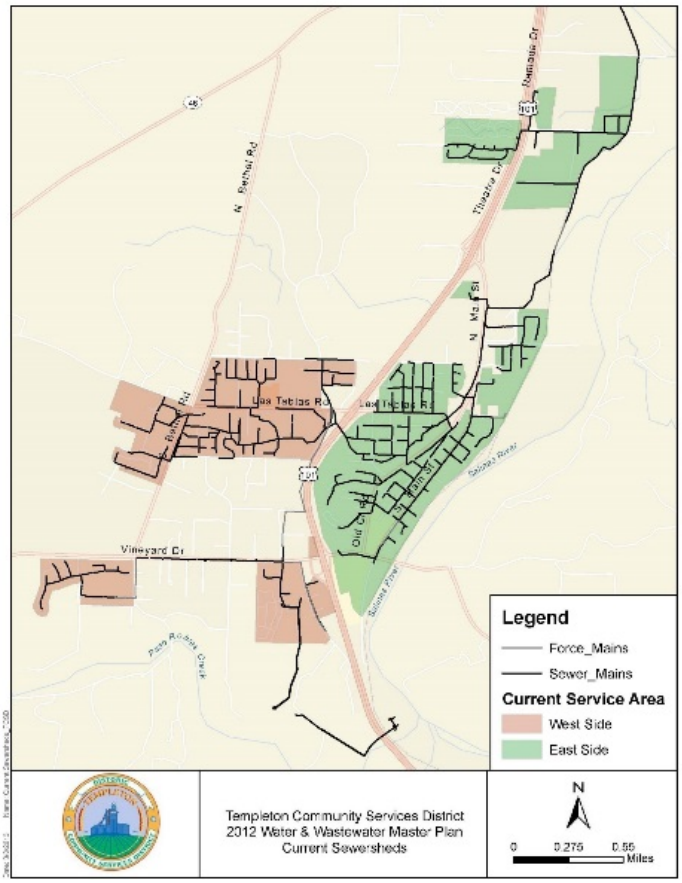


Figure 7 - TCSD Service Area

Treating Available Wastewater Supplies
The MWWTP Facility has the capacity to treat 600,000 gpd. In 2008, the District completed a 300,000 gpd expansion of the MWWTP, increasing the capacity of the plant to 600,000 gpd. TCSD already has the permitted capacity to treat 600,000 gpd of wastewater at its MWWTP per existing WDR Order No. R3- 2007-0029. Therefore, no new permits for the MWWTP are required.

Infiltrating the Treated Wastewater Supplies
The 1997 Hydrogeologic Investigation and Percolation Pond Feasibility Study of the Selby Site investigated the infiltration capacity of the site, the hydraulic connectivity to the Salinas River underflow, and the residence time of the infiltrate water, concluding that the Selby site was ideally located and suitable for infiltration ponds. This 1997 study formed the basis for the District's planned method of indirect use of this renewable water supply. TCSD purchased the site and completed construction of the infiltration ponds. TCSD has been operating the Selby infiltration pond system for the west side area wastewater flows since July 2002 when construction of the ponds was completed. Based on the west side wastewater area flows, an average of 165 AFY has been discharged. TCSD already has the permit to discharge the treated wastewater at the Selby Ponds, inclusive of the redirected 220,000 gpd, per existing WDR Order No. R3- 2007-0029. In 2005, TCSD added two new one acre infiltration ponds to the Selby site to increase the capacity to infiltrate the eastside flows. This capacity is accounted for in the 2007 permit and therefore, no new permits for the Selby Ponds are required. The District tracks the amount of water infiltrated into the Selby ponds each month with a flow meter located on the pond site, before the discharge ponds.

Recovering the Treated Wastewater Supplies
Based on the 1997 study which detailed the hydrogeologic studies of the infiltration site and the Salinas River Channel, TCSD is able to retrieve 98% of the water it infiltrates. The study provided a detailed evaluation of infiltration capacity of the specific site, its connectivity to the Salinas River Underflow and the characteristics of the Salinas River as a conveyance channel for retrieval of the treated wastewater downstream. The study also investigated the residence time and subsurface flow velocity to the TCSD downstream Smith River well based on the aquifer characteristics of the Salinas river alluvial system. There are two wells that the District uses to retrieve this water. Due to the unique characteristics of the Salinas River channel the 'travel time' to the wells is well documented. The water first becomes available at the Smith well 28 months after discharge, and any water not retrieved there may be retrieved further downstream at the Creekside River well an additional 7 months later, or 35 months from discharge.

The 98% retrieval at the TCSD wells are confirmed in a professional opinion letter by a hydrogeologist dated January 11, 2005. The letter describes the TCSD discharge activities at the Selby ponds, the travel time of 28 months from discharge to the Smith River well, and the small conveyance loss of 2% due to the highly impermeable bedrock material underlying the Salinas River underflow channel. The conveyance losses from the Selby ponds to the Creekside River well are expressed in a second letter dated February 5, 2011, after the Creekside River well was added to the District system.

Beginning in 2005, 98% of the total discharge has been retrieved at downstream wells. The amount of water retrieved from each river well is documented and the quantity of each source is tracked in a spreadsheet. SCADA records record the run time and flow rate of each well on a 24 hour basis and the volume of water available is calculated on a monthly basis and well production adjusted accordingly.

TCSD has long planned to add the remaining 60% of the wastewater flows from the east side area and the wastewater treatment plant was expanded in 2008 to accommodate the additional wastewater flows from this project. The existing facilities have the capacity to treat and discharge the new flows from this project. Once the surface water treatment facility is on line, it will act as a second water source and will allow TCSD to count all its wells when calculating source capacity in addition to have a more reliable and clean water supply during the peak use months.

Required New Facilities and Actions
US CUP has four distinct components that make up the entire project (see Figure 8):

1. Construct East Side Force Main and Lift Station Project (ESFM Project).
2. Upgrade the West Side Lift Station to accommodate future flows.
3. Install new Headworks at the MWWTP.
4. Optimize the MWWTP and add tertiary treatment.

The four interrelated project components will be coordinated under the direction of the District Engineer, who will provide project management and facilitate the completion of various components of the US CUP. In addition, the District is working with a single engineering consultant for the design and engineering of the force main and lift stations for both the east and west side area to maintain a high level of consistency.

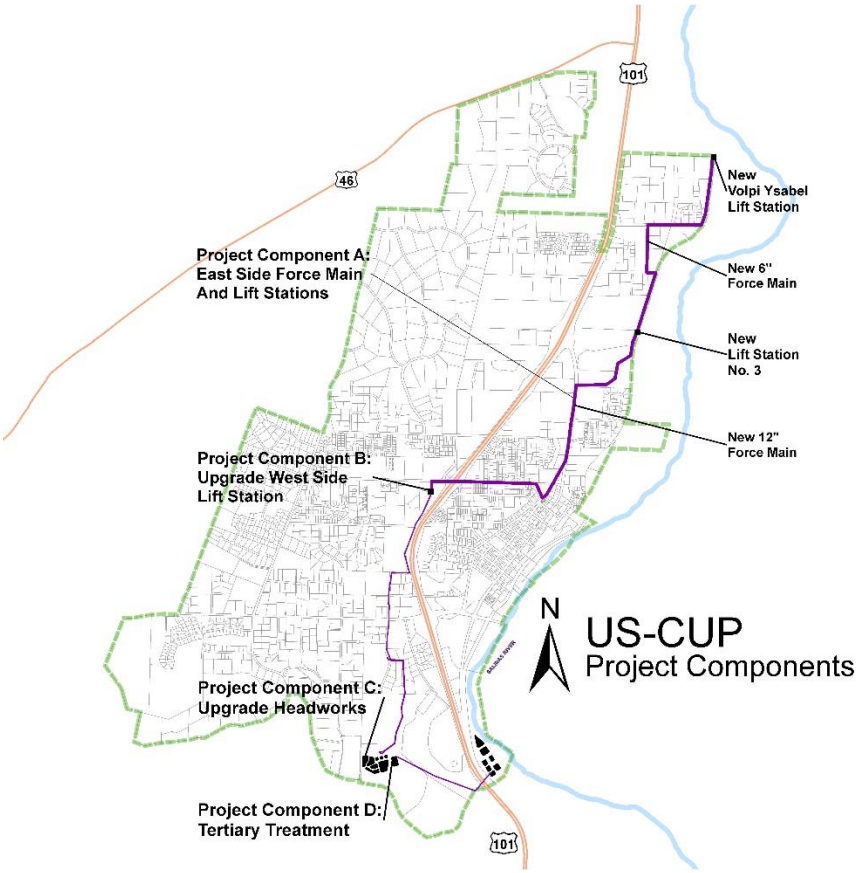


Figure 8 - US CUP Project Elements

Construct East Side Force Main and Lift Station Project (ESFM Project)

The largest and most important project component is the East Side Force Main and the two associated lift stations (ESFM). TCSD proposes to re-route the treatment and disposal location of approximately 220,000 gpd of wastewater on average that was previously conveyed to the Paso Robles WWTP. The wastewater will be re-routed to the west side collection system and MWWTP for treatment and infiltration at the Selby Ponds. US CUP requires construction of new conveyance infrastructure (pipelines and pumps) in uplands and existing developed areas. The new pipeline alignment would run along approximately 2.9 miles connecting to existing TCSD facilities and pipelines (see Figure 8).

The Basis of Design memo was completed in 2013 and the construction plans and specifications are 30% complete. The plans will be 100% complete by the end of November 2015 and ready for public bid January 2016. The contract will be awarded on or before April 1, 2016. The duration of the construction contract is anticipated to be between 15 to 18 months. The lift station pumps for this project require a long lead time of 10 to 12 months, so the pump design submittals will need to be approved within the first 3 months of the construction contract. Construction of the 15,600 linear feet of force main will proceed simultaneously. The duration of the force main installation will be 12 to 15 months due to strict limitations on traffic control and lane closures that must be observed during construction. Once construction is complete, there will be an additional 3 months of start-up and testing of the overall District's force main system that will include the West Side Lift station discussed below.

The mitigated negative declaration for this wastewater rerouting project was adopted by the District Board on May 23, 2012.

Upgrade the West Side Lift Station to Accommodate Future Flows

The second project component is the West Side Lift Station upgrade. The West Side Lift Station will be upgraded to accommodate current and the increased future wastewater flows for the West Side. While current and future flow estimates that included the proposed return wastewater flows were considered in the original design of the West Side Lift Station, actual facility operations and equipment will need to be upgraded to meet returned wastewater flows and address new problems with solids and non-biodegradable products interfering with the pump operations.

The preliminary design and evaluation of this facility is complete and final engineering and construction documents will begin in January 2016, once the ESFM project is out for public bid. Design will be completed within 3 months and the construction documents will be prepared once the ESFM project goes out to bid. This component will go out for public bid April 2016 and the project will be constructed concurrently with the ESFM Project. The lift station pumps for this project are the same type as those for the ESFM lift stations and require a long lead time of 10 to 12 months. The pump design submittals will need to approved as the first order of business and this approval and manufacturing time frame will overlap with the submittals and orders from the ESFM project so that we can coordinate and verify the design and engineering of all new District Lift Stations pumps. The upgrade of the lift station will require that the west side lift station be rebuilt to accommodate the new self-cleaning basin design.

A Notice of Determination will be filed for this upgrade.

Install New Headworks at the MWWTP

While the first two project components are underway, TCSD will undertake the upgrade of the Headworks at MWWTP. The improvements described above will increase the amount of debris and inorganic material that end up at the MWWTP.

The MWWTP currently utilizes a manual bar screen to prevent large debris from entering the AIPS pond system. Staff must manually rake off debris such as sticks, rags, stones, grit, and sand that makes its way to the MWWTP. The bar screen is a hands-on operation and care needs to be taken to ensure that minimum exposure to the raw wastewater takes place. The addition of an automated bar screen would minimize the exposure of employees to potentially hazardous sharp objects in the wastewater, such as hypodermic syringes. Increasing the efficiency of the bar screening before the wastewater enters the first pond will mean more efficiency and increased safety of the staff.

The conceptual design is complete and a detailed Technical Memorandum specifying the design components recommended for the MWWTP Headworks has been completed for this component of the overall project. A new headworks will include mechanical screens, screening compactors, and pumps and will be designed to add a grit removal system at a later time. TCSD has already acquired the mechanical screen. The duration of the headworks improvement project is 3 to 4 months. At this time, it is anticipated that the headworks improvements will be done by TCSD staff over the course of the next 12 to 18 months and be in place prior to the completion of the new lift stations.
A Notice of Determination will be filed for this upgrade.

Optimize the MWWTP and Add Tertiary Treatment

The final project component is the addition of tertiary treatment to the Meadowbrook WWTP process. One of the most important steps taken in preparing for this project was to conduct a process evaluation at the MWWTP in order to optimize the Advanced Integrated Pond System's (AIPS) treatment. This was important in order to ensure that the best quality of treated wastewater effluent be discharged into the infiltration ponds. In coordination with Dr. Michael Richard, a recognized pond treatment expert, the TCSD AIPS microbiology was sampled over the course of two years, and several modifications to the process and maintenance procedures were implemented. Operational improvements at the MWWTP included taking one treatment train off line, adding internal piping for recirculation of storage pond back to the primary pond and internal piping necessary to bypass the storage ponds unless wet weather storage is needed. The aerators were initially restored to the original number and location within the primary and secondary treatment ponds. Based on some intermediate feedback, one of the aerators was turned around and relocated. Based on these modifications, an improvement in the discharge water percolation has been observed. However, since the system is a biological system and will be somewhat variable, additional filtration will be added to the end of the wastewater treatment process to improve the effluent quality further by reducing suspended solids in the effluent being discharged into the Selby infiltration ponds, and thereby increasing the percolation capacity.

The optimization of the WWTP is complete and the next step is design of the tertiary treatment system. Design will begin during the first year of construction of the overall US CUP Project. The District will work directly with vendors and an engineering consultant over the next 12 to 15 months to select the appropriate system, followed by pilot testing of the effluent being produced by the MWWTP once the first three project components are up and running.

A Notice of Determination will be filed for this project.

There are no required policy changes or operations agreements required to operate the existing or new facilities. The District has the ability to continue and expand operations necessary to complete this project. A significant project activity that has been completed was securing State Water Resources Control Board approval. TCSD secured the Wastewater Change Petition WW0065, which approved the change in the point of discharge, purpose of use, and place of use of treated wastewater. The approval was issued and signed on November 17, 2012.

Potential Adverse Effects

The District has completed the environmental review of each component of this project including the original percolation ponds and retrieval at downstream wells; the cessation of discharge to Paso Robles and the new discharge at MWWTP. One potential adverse effect associated with this project is the reduced flow at the Paso Robles WWTP discharge location. However, as evaluated and documented in the Mitigated Negative Declaration (MND), it was determined that the reduced discharge was such a small percentage of the total flow, that it was deemed insignificant and did not require mitigation.

Additionally, temporary construction related impacts are described in the MND along with the required measures necessary to mitigate the impacts to less than significant levels.

CEQA Documents Project: TCSD Upper Salinas River Basin Conservation/Conjunctive Use Project		
Year	**Type**	**Title: Description**
Wastewater CEQA		
1991	ND	1991 ND Development of Wastewater Treatment Plant: Negative Declaration for the acquisition of 96 ac for development of a Wastewater Treatment Facility.
1998	MND	1998 MND Wastewater Treatment Plant Expansion: Mitigated Negative Declaration for the expansion of the Wastewater Treatment Facility expansion from 43,000 gpd to 1.2 mgd.
2005	MND	2005 MND Percolation Pond Expansion: Mitigated Negative Declaration for the construction of two Selby Percolation Ponds.
2012	NOD	2012 NOD Flow Re-Routing Project: Construction of a 2.4 mile pipeline to re-route wastewater from Paso Robles WWTP to Meadowbrook WWTP.
2013	NOD	2013 NOD Flow Re-Routing Project Addendum: Addendum to 2012 NOD Flow Re-Routing Project.
Water Retrieval CEQA		
1992	ND	1992 ND Smith River Well Installation: Installation of a new river well and transmission pipeline.
2005	ND	2005 ND Smith Well Water Retrieval: Retrieval of treated wastewater at Smith River Well.
2006	MND	2006 MND Creekside Deep and River Wells: Acquisition of an existing groundwater well and construction of a new underflow river well.
2010	MND	2010 MND Addendum to River and Groundwater Wells: Addendum to 2006 MND Creekside Deep and River Wells.
2011	NOD	2011 NOD River and Groundwater Wells: Addendum to 2006 MND Creekside Deep and River Wells.

Long Term Drought Preparedness

This is a drought preparedness project which helps prepare against the long term effects of drought by capturing a new, sustainable water supply that would otherwise be lost to the basin. By using treated wastewater to off-set the use of groundwater, the basin's groundwater supply will be conserved and be available in dry years. The project makes use of the natural processes of wastewater treatment and infiltration into the underflow of the Salinas River. US CUP contributes to sustainable water supply and reliability during water shortages and will achieve the following drought preparedness benefits:

- Promote water conservation, conjunctive use, reuse and recycling:
  - This project will create a new drought resistant water supply that utilizes a supply that would otherwise be lost to the basin. Use of this new water supply will off-set the use of and conserve groundwater.
- Efficient groundwater basin management:
  - By recovering treated wastewater, deep groundwater supplies are available over a longer period of time, extending existing supply during water shortages.
- Establish system interties:
  - Project ties the wastewater and water systems together by retrieving treated wastewater for domestic use in a renewable cycle.

5. DIRECT WATER- RELATED BENEFIT TO A DAC

Not applicable

6. PROJECT PERFORMANCE MONITORING PLAN

Project Performance Monitoring Plan **Project: TCSD Upper Salinas River Basin Conservation/Conjunctive Use Project**		
Proposed Physical Benefits	**Targets**	**Measurement Tools and Methods**
Create new water supply	Initially retrieve 200,000-220,000 gpd, less 2%, with total flow increasing with population. Water supply becomes available 28 months or 35 months later at the Smith Well or Creekside well respectively.	1. Measure East Side Wastewater flows being diverted to MWWTP with flow meter located at new Lift Station 3. SCADA monitors flows 24 hours per day. Daily flows will be logged to track inflow to the MWWTP. 2. Measure total influent to MWWTP with flow meter. SCADA monitors flows 24 hours per day. Daily flows will be logged to track inflow to the MWWTP. 3. Measure volume of treated wastewater discharged to MWWTP with flow meter located at the Selby Site prior to discharge into ponds. Total discharge is logged daily and tracked monthly. 4. Based on discharge volumes, water will be retrieved at downstream municipal wells, 28 months at Smith River Well, or 35 months at Creekside River Well. SCADA monitors well pumping run time and flows 24 hours per day. Quantity of water from each water source is tracked daily and wells are adjusted daily to divert the total quantity allowed by the various sources.
Creekside Deep and Davis wells contain arsenic in natural levels over 10 ugl. The groundwater from this deep well must be blended for potable use in the District. Increase use of the River wells introducing other water supplies reduces the quantity of deep well water containing arsenic that is needed and therefore the overall arsenic level is reduced.	Reduce blended arsenic levels to 5 ugl or less. When retrieval water is available, it may be blended with one or two deep groundwater wells with high arsenic. Blending will reduce the arsenic to allowable levels and more water becomes available for municipal use.	1. Measure and log the arsenic levels in Creekside and Davis Wells on a weekly basis. 2. Set a maximum of 5 ugl for arsenic (reducing blend ration from 6 to 8 ugl to 5 ugl for water quality benefit) and determine the blend ratio required when Creekside and/or Davis wells are needed to meet supply demand. (Summer season). 3. Track the number of days the blended deep wells are needed to meet supply demand. 4. Measure and log the quantity of water pumped at each District well, including Creekside and Davis wells on a daily basis. 5. Determine the total volume of water from all well sources and compare it to the total volume of blended water entering the distribution system.

Project Performance Monitoring Plan Project: TCSD Upper Salinas River Basin Conservation/Conjunctive Use Project		
Proposed Physical Benefits	**Targets**	**Measurement Tools and Methods**
		6. Measure and log the lower arsenic levels at the blend station on a weekly basis. 7. Report the number of days the deep wells are needed for supply and compare that to the number of days blended deep wells would have been needed without this project.

7. COST EFFECTIVE ANALYSIS

Cost Effective Analysis Project Name: Upper Salinas River Basin Conservation/Conjunctive Use Project	
Question 1	**Types of benefits provided as shown in Table 5:** *(Primary) Water Supply and (Secondary) Water Quality Improvement*
Question 2	**Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?** *Yes*
	If no, why? *N/A*
	If yes, list the methods (including the proposed project) and estimated costs: ***Alternative 1:*** *Drill additional new deep groundwater wells to obtain additional supply. (No cost determined. because deemed infeasible due to limited deep groundwater supply and does not provide water supply redundancy or ensure safe and reliable water deliveries during drought or emergency situations.)* ***Alternative 2:*** *Obtain additional water permit rights to pump Salinas River Water. (No cost determined because deemed infeasible due the Salinas River rights being fully allocated.)* ***Alternative 3****: Purchase Additional Nacimiento Water (Capital Cost: $7,000,000; Annual O&M cost: $275,000; Price of Water: TBD) Deemed infeasible due to need to construct a new turnout and the need to treat Nacimiento water (treatment plant) prior to delivery.* ***Proposed Project:*** *Construct a force main and two lift stations to capture wastewater flows for treatment, infiltration into the Salinas River underflow and subsequent retrieval at municipal wells downstream. (Capital cost: $9,700,000; Annual O&M cost: $323,000).*
Question 3	**If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods:** *While Alternative 3 appears to have a lower capital cost than the proposed project, it is not considered a viable alternative because if the proposed project is not built, the east side wastewater area flows will continue to flow to the Paso Robles WWTP and the District will be responsible for paying for $4,700,000, or 9% of the construction costs of the new Paso Robles WWTP and the associated O&M costs of $221,000. Considering these related costs, the proposed project becomes the least cost alternative.*

PROJECT 2 - OCEANO COMMUNITY SERVICES DISTRICT - WATER RESOURCES RELIABILITY PROGRAM (WRRP)

1. PROJECT DESCRIPTION

Implementation Project: Water Resources Reliability Program (WRRP) Study.

Implementing Agency / Organization: Oceano Community Services District (OCSD), a Disadvantaged Community.

Brief Description: The WRRP seeks to improve OCSD's water resources reliability and management through recycled water recharge, stormwater capture and recharge, and reduction of leaks.

Oceano is located on the central coast of California, situated 17 miles south of San Luis Obispo. The unincorporated community qualifies under the State's definition as a disadvantaged community (DAC). Oceano Community Services District (OCSD) provides water supply to its 2,300 customers (7,294 people) utilizing water from three sources: Santa Maria Groundwater Basin, the State Water Project (SWP), and Lopez Lake, for a total allocation of 1,953 acre feet per year (AFY). Although past and current leaders at OCSD have acted responsibly to provide the community with three sources of supply, each supply is being reduced. OCSD was only able to pump 30% of the groundwater supply it has been allocated due to declining groundwater levels and threats of sea water intrusion (*NCMA 2014 Annual Monitoring Report, Fugro, April 2015)*. The SWP recent deliveries have been at 20% of its allocations and OCSD is reliant on the San Luis Obispo (SLO) County Flood Control and Water Conservation District to provide additional allocations. The Lopez Project deliveries were cut by 10%. Continuing restrictions in the community's water sources and extended drought conditions will create additional challenges in OCSD's ability to meet its demand, which recently have declined to 885 AFY. OCSD has implemented drought conservation rates, including an additional tier to their rate structures, and adopted the State Water mandates. The WRRP study grant request is needed to provide financial support to ensure that this DAC can build upon past and current initiatives to enhance water resource reliability and promote the health and safety of its residents.

OCSD is facing an uncertain water supply, and is taking proactive action in support of a reliable, drought resistant water supply to meet seasonal and projected annual demands. Enhancing the reliability of its groundwater allocation provides the greatest opportunity for OCSD to take direct actions to address water supply reliability, provide operational flexibility, and reduce OCSD's reliance on regional resources. The WRRP Study will enable OCSD to evaluate and prioritize critical water quantity and quality issues that it cannot otherwise prepare for due to existing funding constraints. Although, OCSD did implement drought conservation rates in 2015, those rates will only be sufficient to cover lost revenues, eliminate the pre-existing budget deficit, and provide funding for additional conservation projects.

The proposed WRRP Study addresses Oceano's three highest priority water management components and establishes program priorities for short and long term implementation, based on quantifiable benefits to help OCSD address a critical water supply need in a sustainable and fiscally sound manner. The WRRP Study also supports a critical regional effort to address groundwater declines in the adjudicated basin. The three WRRP study components include:

Recycled Water Injection Well Site Plan. This study identifies the optimal recycled water injection well locations in Oceano to enhance the reliability of water supplies by recharging the groundwater basin by up to 860 AFY *(Water Facilities Planning Study, City of Pismo Beach, April 2015)*, improving groundwater quality with the injection of highly treated recycled water, and preventing salt water intrusion.

Low Impact Development (LID) Plan. This study component updates the existing 2004 Drainage and Flood Control Study to incorporate LID standards and to identify optimal programs and projects within Oceano to enhance stormwater recharge and to reduce non-point source pollution.

Leak Detection and Management Plan. Currently, OCSD experiences approximately 9-14% water loss in its distribution system. The development of a Leak Detection and Management Plan and update of the 2009 Water Master Plan (including a Capital Improvement Plan (CIP)), will enable OCSD to establish reliable metrics on actual water losses, to prioritize system projects, to reliably minimize system losses (thereby increasing in-system water), and to establish criteria to measure program success.

Need for Expedited Funding. Expedited funding is needed because the reliability of OCSD's water supply is uncertain in the face of continued drought conditions and changing water allocations. The WRRP will provide OCSD with a comprehensive program to address a critical water supply need. Oceano, a DAC, has been operating with a water fund operating deficit over the past several years, and the recently adopted conservation rates are insufficient to fund critical infrastructure and water resource reliability efforts. No additional funding is available to address this program.

2. PROJECT MAP

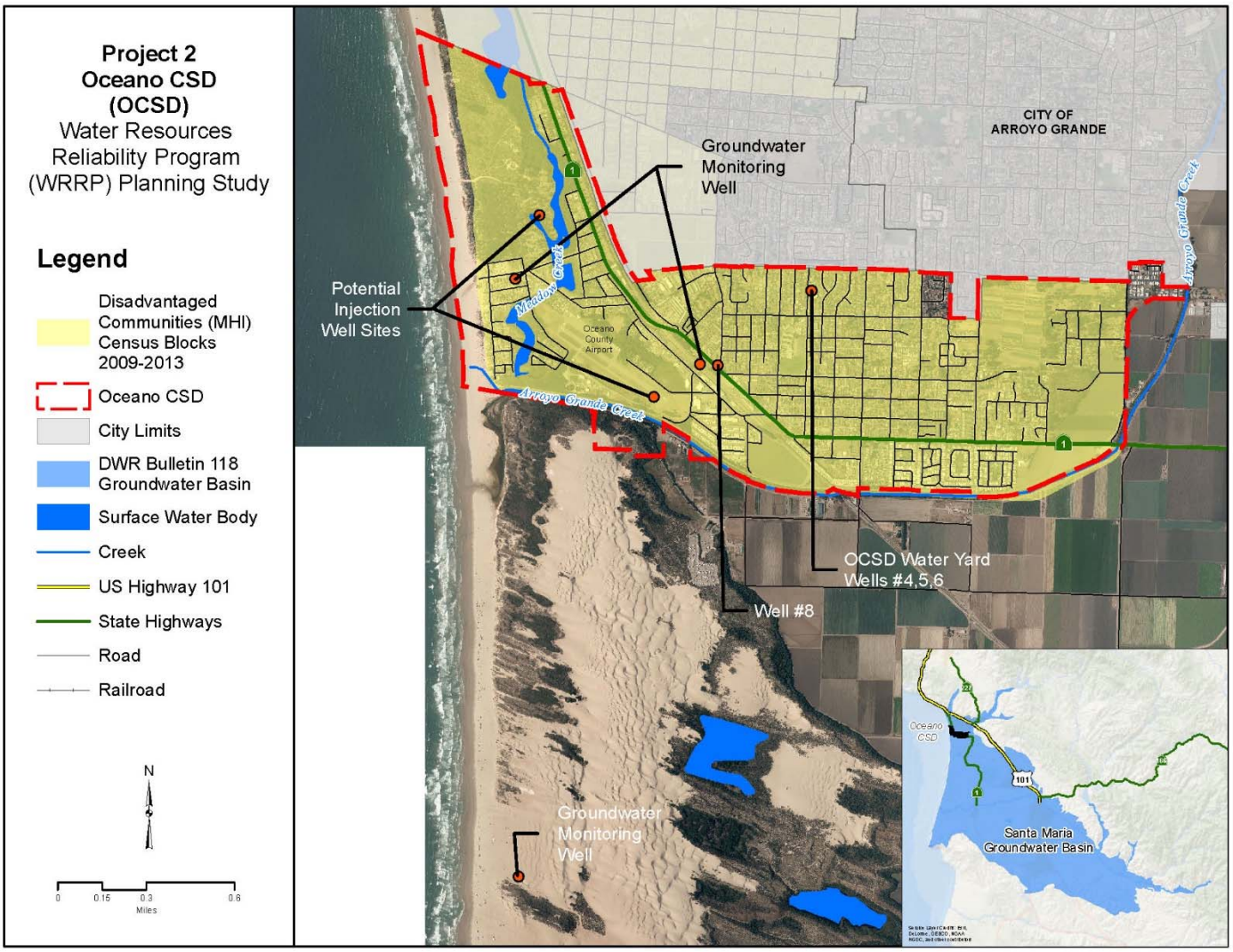


Figure 1 - OCSD Water Resources Reliability Program Project Map

3. PROJECT PHYSICAL BENEFITS

The Water Resources Reliability Program (WRRP) study intends to provide a direct water-related benefit to a project area entirely comprised of a DAC and is in the planning phase, so therefore is not required to quantify benefits. As required, a qualitative description of the proposed work and anticipated benefits of the project upon completion of the construction is discussed below.

With potential reductions in SWP, Lopez Lake, and groundwater allocations paired with extended drought conditions, OCSD is looking to augment its water supply sources with a critical, multi-component program. Each of the WRRP study components (Reclaimed Water Injection Wells, Low Impact Development Plan, and Leak Detection and Management Program) are anticipated to result in physical benefits targeting specific IRWM project elements as discussed below.

Recycled Water Injection Well Site Plan:

Benefit: The Recycled Water Injection Well Program is anticipated to result in the benefits of groundwater recharge of up to 860 AFY (Element IR.5) which will enhance the reliability of Oceano's groundwater allocation established in the Santa Maria adjudication. The secondary benefit will include improvement in ground water quality and enhanced groundwater basin management (Element IR.7), which can be quantified by measuring increases in groundwater levels which can reduce sea water intrusion in the region.

Proposed Work: The community of Oceano pumps groundwater from the Northern Cities Management Area of the Santa Maria Groundwater Basin extractions. The extended drought is now creating a significant threat of seawater intrusion – with Oceano, the sole disadvantaged community (DAC) facing the greatest risk based on its groundwater extraction well locations. The groundwater basin is heavily adjudicated, which does not help solve the declining water levels and ongoing groundwater impairment by sea water.

The City of Pismo Beach and the South San Luis Obispo County Sanitation District (SSLOCSD), two neighboring agencies, are pursuing reclaimed water projects. The SSLOCSD currently provides treatment services for Oceano's service area, while the City of Pismo Beach utilizes the SSLOCSD's ocean outfall. As both agencies have facilities in Oceano, both will produce reclaimed water supplies that can be made available for Oceano. SSLOCSD has flows of approximately 2,200 AFY that could also be injected into the groundwater basin if a suitable well site is identified. While SSLOCSD is still in the process of investigating the feasibility of implementing a recycled water program, Pismo Beach has already completed a Recycled Water Feasibility Study (completed April 2015). The Pismo Beach study (*Recycled Water Facilities Planning Study, City of Pismo Beach, April 2015*) recommended implementation of a groundwater recharge program of approximately 900 AFY with potential injection wells located near to OCSD, as shown on Figure 2, below. The next steps for Pismo Beach in moving towards implementation are to develop agreements between participating agencies, prepare CEQA/permitting, acquire funding, and determine injection well locations.

As part of the WWRP study, OCSD will conduct a Reclaimed Water Injection Well Study to identify the optimal location(s) for groundwater injection wells considering both potential reclaimed water sources (City of Pismo Beach and/or the SSLOCSD). As part of the study, OCSD will identify potential groundwater injection well sites, develop groundwater impact projections, identify facility and land requirements, identify construction considerations, develop planning level cost estimates, identify environmental considerations, and develop an evaluation matrix in order to develop a preferred program. The study will result in the identification of preferred reclaimed water injection well sites and planning level documents to support the predesign and design phase of the program.

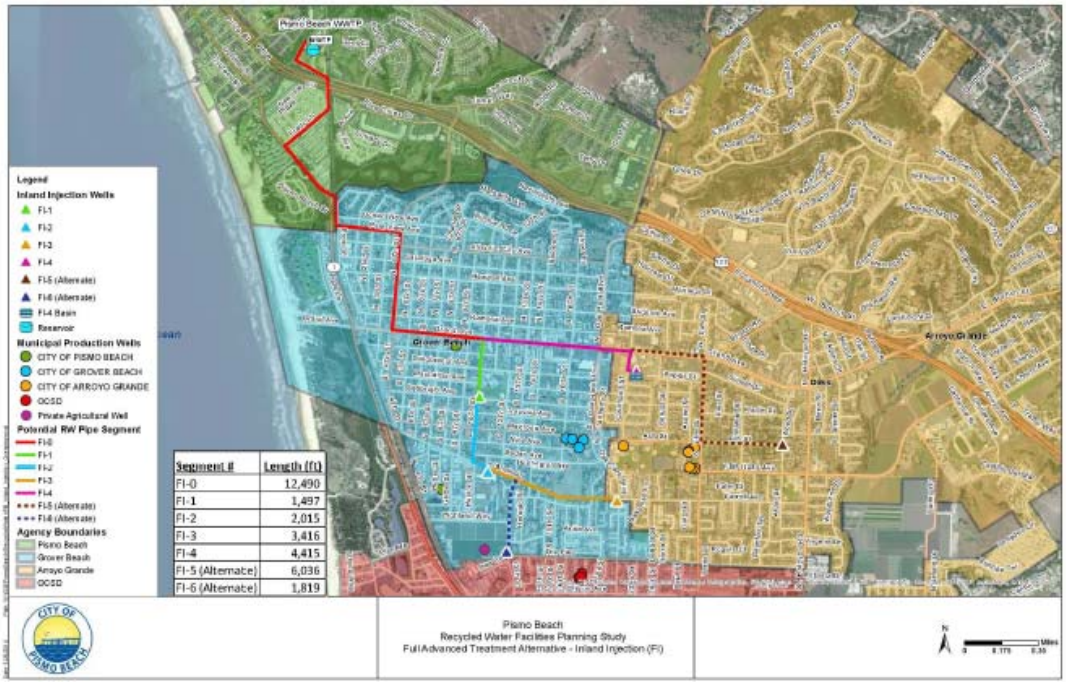


Figure 2 - City of Pismo Beach Recycled Water Program - Injection Well Map

<u>Low Impact Development Plan:</u>

Benefit: The Low Impact Development (LID) Plan component is anticipated to result in the capture of storm water (Element IR.2) and increased groundwater recharge (Element IR.5). The secondary benefit will include the improvement in water quality and reduction in non-point source pollution (Element IR.4). In addition, implementation of LID standards also supports the efforts of the Central Coast Regional Water Board, which is requiring enhanced mitigation for groundwater recharge when projects create new or replace existing impervious areas, such as replacement of sidewalks, and not just for new development projects.

Proposed Work: The community of Oceano includes antiquated subdivisions, constructed prior to the development of LID standards. Much of the community of Oceano includes subdivisions without curb gutters and sidewalks in many areas. These existing conditions provide an opportunity to implement a wide range of LID standards to capture storm water, reduce non-point pollution, and enhance groundwater recharge. Anticipated projects include drainage swales, groundwater percolation chambers, and other similar features. As part of the study, Oceano will engage an LID specialist to review existing documents and ordinances, review planning, and zoning maps, identify applicable community and individually based LID measures, develop planning level costs, identify performance metrics, develop proposed ordinances language for future developments and conduct stakeholder outreach. The plan will also propose a program to provide mitigation for new development projects when those projects create impervious surfaces and/or when implementation of on-site LID projects cannot fully mitigate project impacts from those projects. As part of this study, the *2004 Drainage and Flood Control Plan* will be updated to include LID standards, identified projects, and programs. This component of the study will result in the identification of preferred LID standards, identification of proposed LID ordinances and projects for implementation, and development of performance metrics.

<u>Leak Detection and Management Plan:</u>

Benefit: The Leak Detection and Management Plan is anticipated to result in the reduction of system water losses which will result in overall water supply savings (Element IR.1).

Proposed Work: OCSD owns and operates the water distribution system for the community of Oceano. Oceano, a DAC, has limited resources which have been expended on other critical programs over the past several years and, therefore, does not have sufficient funds for a leak detection and monitoring plan. It's estimated that the distribution system currently has a water loss of 83-136 AFY per year (9-15%) through its distribution system. With the development of a leak detection and management plan, OCSD will be able to identify and prioritize water distribution system projects to capture the majority of these system losses resulting in a more reliable water source for the community.

The Leak Detection and Management Plan will provide OCSD with a program to identify and evaluate leaks on an ongoing basis, and will assist property owners and businesses with leak detection identification. In addition, the OCSD's 2009 Water Master Plan identified infrastructure that is antiquated and should be replaced, however there is a need to

update the Water Master Plan to identify priority projects for implementation. The updated Water Master Plan will evaluate the water distribution system as a whole and provide a Capital Improvement Plan (CIP) to identify the distribution system components that need to be replaced, including priorities and cost estimates. As part of the work for this component, OCSD will complete a detailed review of historical information (e.g. water production/consumption data, review leaks and leak repair reports), collect field data (water production and flow measurements), conduct field surveys to assess the system, conduct acoustic leak testing in areas of high concern and identify priority leak areas. This information will serve as the basis for the recommended Leak Detection and Management Plan, and will support the update of the 2009 Water Master Plan and associated CIP.

Summary:

The OCSD WRRP study will provide this disadvantaged community with a multi-faceted program that prioritizes water supply reliability, regional groundwater supply improvement, and water quality improvement program efforts that it cannot otherwise plan for due to existing funding constraints. And, although OCSD has implemented drought conservation rates in 2015, those rates will only be sufficient to cover lost revenues that have resulted from conservation, eliminate the pre-existing budget deficit, and possibly provide funding for water conservation programs.

The WRRP study provides the greatest opportunity for OCSD to take direct actions to enhance the reliability of its groundwater allocation and provides OCSD with operational flexibility to optimally utilize its source waters in consideration of regional impacts and in light of the changing water allocations.

4. TECHNICAL ANALYSIS OF EACH PHYSICAL BENEFIT CLAIMED

The Oceano Community Services District (OCSD), is planning to conduct the Water Resources Reliability Program (WRRP) study to provide for a reliable, drought resistant water supply program for the community. The WRRP study is the first step in preparing against the long term impacts of the drought. The programs consists of three main components including: supplementing the region's groundwater supply via reclaimed water injection wells, implementing Low Impact Development (LID) programs to capture and treat stormwater, and reducing distribution system losses through a Leak Detection and Management Plan and identified distribution system projects. The WRRP study will provide tools and a roadmap for OCSD to provide itself with a more reliable water supply in the drought years. This project is meeting a critical water supply reliability need for a disadvantaged community that would otherwise not be feasible due to funding constraints.

Oceano is located on the central coast of California, situated 17 miles south of San Luis Obispo and is bordered by the City of Grover Beach to the north, the Pacific Ocean to the west, and is surrounded by farm fields and sand dunes to the east and south (Figure 3). The unincorporated community of Oceano qualifies under the State's definition as a disadvantaged community (DAC) and consists of predominately white and Hispanic residents.

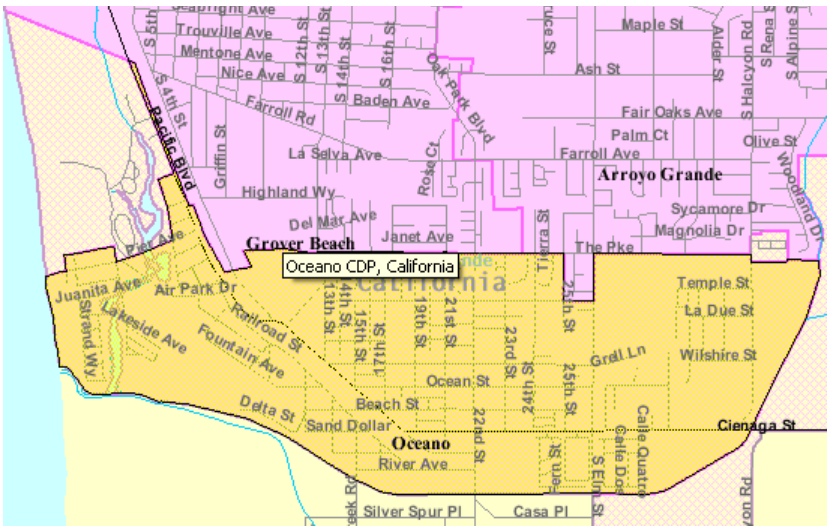


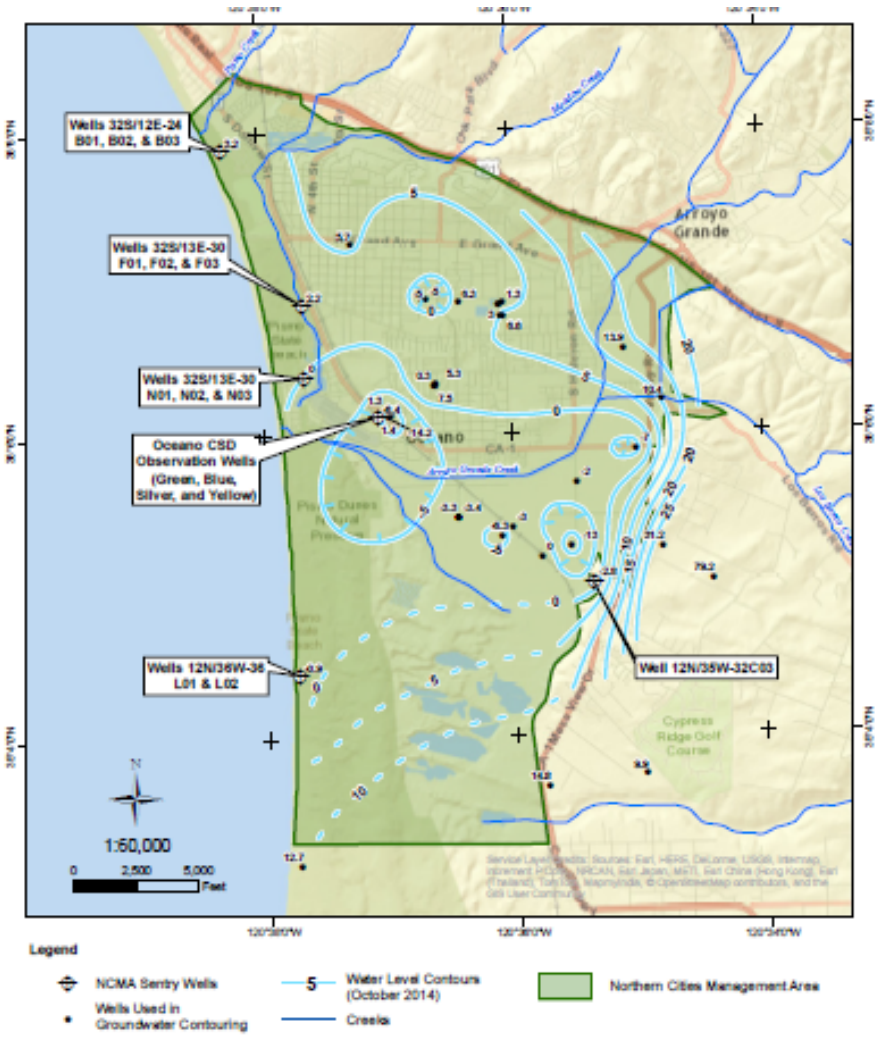
Figure 3 - Location of Oceano Community

OCSD provides water service to the community of Oceano, a service area encompassing 1,150 acres. OCSD currently provides water service for a population of 7,294 people and is projected to increase to 12,855. This correlates to a current water demand of 885 acre feet per year (AFY) and a future water demand of 1,277-1,419 AFY *(County of San Luis Obispo Facilities Inventory, Oceano)*. There are three sources of water supply for OCSD including the State Water Project (SWP), the Lopez Lake, and from an allocation of groundwater from the adjudicated Santa Maria Valley Groundwater Basin, however restrictions for each of these sources may result in the inability of OCSD to meet its demands. Each of the sources and potential restrictions as they pertain to OCSD are discussed below.

Groundwater Source Considerations:

The community of Oceano pumps groundwater from the Northern Cities Management Area (NCMA) of the Santa Maria Groundwater Basin, which is adjudicated. The adjudication has not solved declining water levels, and ongoing groundwater extractions and the drought are now creating a significant threat of seawater intrusion – with Oceano, the sole disadvantaged community facing the greatest risk based on well locations. OCSD depends on water from two wells that extract groundwater from the Tri-Cities Mesa Arroyo Grande-Plains Hydrologic subareas Groundwater Basin. In 2014, Oceano pumped 259.1 AF of water (or 28.8% of its allocation) from its groundwater wells. OCSD's groundwater allocation is limited to 900 AFY pursuant to stipulations adopted in the adjudication and by agreement with the City of Arroyo Grande, the City of Pismo Beach, and the City of Grover Beach. As party to the Santa Maria Valley Groundwater Basin litigation, extraction rights may be decreased at a future date. Currently, OCSD is only able to pump 30% of its 900 AFY groundwater allocation from the adjudicated Santa Maria Valley Groundwater Basin due to significantly declining groundwater levels and the threat of sea water intrusion. In addition, sea water intrusion has been measured in two of OCSD's coastal monitoring wells and the continued drought threatens the supply's reliability. The rains of 2010-2011, and reduced groundwater production, pushed back the subterranean ocean interface; however, with extended drought conditions and the close proximity of that interface creating supply uncertainties, OCSD may need to reduce its groundwater extractions.

Sea Water Intrusion Considerations:
According to the Northern California Management Area (NCMA) 2014 Annual Monitoring Report (April 2015), while the 2014 groundwater extraction in the Northern Cities Management Area of the Santa Maria Groundwater Basin was 42% of estimated safe yield, groundwater elevations declined by several feet with some elevations dropping below sea level within the NCMA. This condition, even with groundwater extraction at 42% of the safe yield and declining water elevations, illustrates the impacts of the ongoing severe drought that has significantly reduced recharge. This condition is also, in part, a result of the impacts of reduced subsurface inflow recharge from the east that has occurred due to the overdraft pumping in the Nipomo Mesa Management Area (NMMA).



WATER LEVEL CONTOURS, OCTOBER 2014
Northern Cities Management Area

The condition of declining water levels in the NCMA, even with a total pumping at 42% of the basin safe yield, will be exacerbated if the NCMA agencies are required to increase their dependency on groundwater withdrawals due to reductions or interruption in local surface water supplies or State Water Project (SWP) deliveries. Coupled with the deepening pumping depression within the central part of the NMMA, and expansion of the groundwater depression to the west and north of Mesa towards the NCMA, has eliminated the historical groundwater divide between the NCMA and NMMA. With the loss of this divide, there has been a reversal of groundwater gradients and the development of a landward gradient in the central portion of the NCMA. The result of this is the loss of historic aquifer recharge by subsurface inflow - thereby reducing the yield of the aquifer, combined with reduced inflows and overdraft pumping of the basin which has caused reversal of the groundwater gradient and puts the basin at risk for seawater intrusion (*NCMA 2014 Annual Monitoring Report, Fugro April 2015*).

The intrusion of sea water in the groundwater wells and further inland may result in costly treatment and/or potential impacts to downstream agricultural users. Monitoring data from 2009 confirmed the findings that there was a significant increase in sodium and chlorides in the deep sentry wells, following two years of significantly low water elevations (below the 7.5 NAVD88). A continuation of conditions with water elevations and index values below the 7.5 foot index creates an environment for increased risk for sea water intrusion.

The NCMA adopted a Strategic Plan in 2014 to enhance water reliability. Strategies identified to manage water levels include encouraging conservation, capturing stormwater runoff, recharging the groundwater basin, and augmenting supplies with recycled water. The WRRP study targets programs to enhance groundwater supply by capturing stormwater runoff and recharging the groundwater basin with recycled water - which may help to mitigate sea water intrusion.

Lopez Lake Source Water Considerations:

The operation safe yield of Lopez Lake is 8,730 acre feet per year (AFY), which reflects the amount of sustainable water supply during a drought of defined severity. OCSD receives a 303 AFY allocation from Lopez Lake, subject to possible increases due to the availability of surplus water or reductions in withdrawals if habitat requirements dictate. In 2014, surplus water was made available to contractors, resulting in OCSD receiving 547 AF of water. In 2014, a Low Reservoir Response Plan (LRRP) was adopted for Lopez Lake to implement when the amount of water in storage in the reservoir

dropped below 20,000 AF in order to maximize its reliability during the drought. The LRRP delineates mandatory cutbacks in lake withdrawals based on the reservoir capacity in order to preserve water within the reservoir for a minimum of 3 to 4 years under drought conditions. Strategies have been defined to reduce municipal diversions according the water level triggers. It is anticipated that Lopez Lake source water may run out in the next two to three years, under continued drought conditions.

Currently, the Zone 3 Advisory Group has implemented cut-backs for 2015 to help ensure that the water supply continues, albeit with reduced flows, as the drought persists. The Lopez Water Supply Project has reduced deliveries to its communities by 10% based on estimated storage levels before any winter rains may produce reservoir inflow.

State Water Project Source Water Considerations:

OCSD has a contractual water delivery allocation of 750 AFY from the State Water Project (SWP). Due to the extended drought, the SWP established a 20% delivery schedule. Reliability of the SWP is an ongoing concern, but the improvements to the reliability of State Water are being addressed by the Department of Water Resources (DWR) and State Water Contractors. As a result, OCSD has no tasks that it is responsible for directly relating to SWP reliability, but concerns over the reliable availability of SWP water creates a great need to enhance groundwater reliability for diversity in OCSD's supply.

Summary:

While OCSD has a total allocation of 1,953 AFY, there is no certainty in the amount delivered due to a number of factors. In 2014, OCSD was able to use 259 AF from groundwater and 548 AF from surface supplies for a total of 807 AF. At this time, with the implementation of conservation measures, OCSD is capable of meeting the seasonal average daily water demands through a combination of supply sources; However, OCSD must develop a reliable water supply program to accommodate for extended drought conditions, changes in supply allocations, and to accommodate growth in the community. With the reduction in SWP supplies and Lopez Lake source water coupled with the extended drought, OCSD is facing an uncertain water supply. The disadvantaged community is in need of a reliable, drought resistant water supply to meet seasonal and projected annual demands, while protecting its groundwater resource. Enhancing the reliability of its groundwater allocation provides the greatest opportunity for the OCSD to take direct actions to cure an existing water supply reliability issue. To improve water supply reliability and operational flexibility, OCSD is looking to complete the WRRP study to identify and prioritize recharge options including recycled water and LID projects and programs.

The implementation of the WRRP study addresses Oceano's (a DAC) three highest priority water management elements, to provide for a reliable water supply to meet seasonal and projected annual demands, including:

Recycled Water Injection Well Site Plan.
This component of the study identifies the optimal recycled water injection well locations in Oceano to enhance the reliability of OCSD's groundwater supplies by providing for the recharge of groundwater basin by up to 900 AFY, as well improving groundwater quality with the injection of recycled water, and the reduction of salt water intrusion into the wells. The study includes an evaluation, identification, and prioritization of injection well sites to be constructed as part of the overall recycled water program being planned by the City of Pismo Beach and the South San Luis Obispo County Sanitation District.

Low Impact Development (LID) Plan.
This component of the study updates the existing 2004 Drainage and Flood Control Study to incorporate LID standards and to identify optimal programs and projects within Oceano to enhance stormwater recharge and to reduce non-point source pollution. With the implementation of LID programs, OCSD is able to capture stormwater, reduce nonpoint source pollution, and improve surface and groundwater quality.

Leak Detection and Management Plan.
This component of the program provides OCSD the ability to minimize and capture water system losses. Currently, it is anticipated OCSD loses approximately 9-14% in its system. With the development of a Leak Detection and Management Plan, associated Water Master Plan and overall Capital Improvement Plan (CIP), OCSD will be able to prioritize system projects to reliably capture water system losses and increase in-system water. This component will help ensure that OCSD does its part in replacing antiquated infrastructure which is contributing to water losses.

The WRRP study establishes program priorities for short term and long term implementation, based on quantifiable benefits that will help OCSD address a critical water quality need in a sustainable and fiscally sound manner. In addition, by identifying optimal injection well locations, the reclaimed water component of the WRRP supports a critical regional effort to address groundwater declines in the adjudicated Santa Maria groundwater basin. The multi-component Water Resources Reliability Program (WRRP) study proposed by the OCSD will enable this disadvantaged community to evaluate and prioritize these critical water quantity/quality issues that it cannot otherwise prepare for due to existing funding constraints. Although OCSD did implement drought conservation rates in 2015, those rates will only be sufficient to cover lost revenues that have resulted from conservation, eliminate the pre-existing budget deficit, and possibly provide funding for additional water conservation programs.

5. DIRECT WATER- RELATED BENEFIT TO A DAC

DAC: A Disadvantaged Community (DAC) is "a community with a median household income of less than 80% of the Statewide average" or $48,875. Oceano has a median household income of $43,567, with about 14.1% of families and 16.3% of the population below the poverty line, including 22% of those under age 18 and 6.2% of those over 65. The community consists predominantly of white (68.7%) and then Hispanic (44.6%) population. Under the State's definition, the unincorporated community of Oceano qualifies as a Disadvantaged Community (DAC). 100% of the project service area will benefit the DAC's water supply need.

Specific Water Related Need: The OCSD obtains it sources of supply from the State Water Project (SWP), the Lopez Water Supply Project and from an allocation of groundwater from the adjudicated Santa Maria Valley Groundwater basin. Reliability of the SWP is an ongoing concern, but the improvements to the reliability of State Water are being addressed by the Department of Water Resources (DWR) and State Water Contractors. Therefore, while OCSD has no tasks that it is directly responsible for relating to SWP reliability, concerns over the SWP create a great need to also enhance groundwater reliability. Similarly, the local Lopez Water Supply Project is reducing deliveries as a result of the current drought. A Low Reservoir Response Plan (LRRP) for the Lopez project has been adopted by all affected agencies in order to maximize its reliability during the drought and cut-backs are occurring in 2015 to help ensure that the supply continues, albeit with reduced flows, as the drought persists.

Enhancing the reliability of its groundwater allocation provides the greatest opportunity for the OCSD to take direct actions to cure an existing water supply reliability issue. OCSD was only able to pump about 30% of its groundwater allocation in 2014 due to significantly declining groundwater levels and the threat of sea water intrusion. Therefore, to provide a sustainable and reliable water supply for the community, OCSD needs to do its part to augment local supplies with recharge of recycled water and stormwater and to better utilize the water resources it has through leak detection and management. The water related need for the OCSD is to improve water supply reliability, and the WRRP study specifically addresses groundwater reliability, non-point source reduction, and water supply reliability.

6. PROJECT PERFORMANCE MONITORING PLAN

This Section was not required as the Water Resources Reliability Program (WRRP) Study intends to provide a direct water-related benefit to the Oceano Community Service District, which is a project area entirely comprised of a DAC, and is solely in the planning phase with this solicitation.

7. COST EFFECTIVE ANALYSIS

This Section was not required as the Water Resources Reliability Program Study (WRRP) intends to provide a direct water-related benefit to the Oceano Community Service District, which is a project area entirely comprised of a DAC, and is in the planning phase with this solicitation.

PROJECT 3 - SAN SIMEON COMMUNITY SERVICES DISTRICT - WELL HEAD TREATMENT PROJECT (WHTP)

1. PROJECT DESCRIPTION

Name of Implementing Agency/Organization: San Simeon Community Services District (SSCSD).

Name of Project: SSCSD Well Head Treatment Project (WHTP).

Project Description: SSCSD will construct the WHTP to mitigate high chloride and hardness levels, caused by drought conditions, to ensure a reliable, drought resistant water supply

Expanded Project Description: The disadvantaged community (DAC) of San Simeon is located on the North Coast of San Luis Obispo County, California, in the Pico Creek watershed. The San Simeon Community Services District (SSCSD) was formed in 1961 to provide water, sewer, streetlights, storm drainage, and pavement/street services. Water usage is a major financial contributor to the SSCSD for maintaining infrastructure in support of the community population, tourism serving employees, and tourism. The community relies entirely on groundwater to meet its potable demands, as there is no surface water supply. SSCSD, while permitted to pump 140 acre feet per year (AFY), is currently pumping 90 AFY. SSCSD pumps water from its two potable water wells located in the Pico Creek Valley. For the past 20 years, the SSCSD has experienced seawater intrusion when their groundwater well levels reach 14 feet below sea level, typically during periods of drought conditions. The continued severe drought has placed the SSCSD water supply in jeopardy since total rainfall is less than minimum rainfall needed to replenish its sole potable water supply. As demonstrated through groundwater modeling and monitoring, the extended drought has greatly impacted the potable water supply, due to seawater intrusion into the wells, with a significant increase in chlorides, as high as 3,500 milligrams/liter (mg/L), and hardness (total dissolved solids (TDS), as high as 3,000 mg/L**.** According to the State's Division of Drinking Water (DDW), if the potable water well chloride levels cannot be reduced to less than 2,500 mg/L (ten times the recommended secondary maximum contaminant level (MCL) of 250 mg/L), the potable water wells maybe shut down leaving SSCSD without a water supply source.

Since 1987, the SSCSD has mandated water conservation measures throughout the SSCSD service area based on groundwater levels in the two wells. The conservation measures have assisted SSCSD in slowing the degradation of the potable wells, but have not proven to be a long term sustainable solution. SSCSD is currently under a Stage 3 Emergency, due to low groundwater well levels and high seawater intrusion in their potable water wells, requiring all potable uses other than inside the home being completely restricted. In addition, all water consumers are mandated to purchase recycled water from the SSCSD Recycled Water System for outside uses. Without the expedited implementation of the proposed project to treat its sole potable water supply, there are possible disastrous consequences to the community by late summer to early fall of 2015 with SSCSD not being able to provide a clean, affordable and accessible water source for human consumption, cooking and sanitary purposes (Human Right to Water).

The WHTP project entails the installation of a reverse osmosis (RO) treatment system to remove chlorides and TDS and therefore reliably produce potable water for its service area. The infrastructure improvements include the construction of a well head treatment technology (RO) on its water supply wells to remove chlorides and TDS. The RO system will allow SSCSD to operate Wells #1 and #2 continuously, treating approximately 35 AFY, when the chlorides are elevated (e.g. drought conditions). The RO system would only be used during high chloride level events and is not anticipated to negatively impact any environmental resources. The SSCSD has been long planning for this project and all of the planning, feasibility, and environmental studies/documentation are complete and 95% design is complete.

SSCSD is projecting that the community will have a water supply shortfall by November of 2015, due to the elevated chloride levels in its potable water source water, or the water will be so contaminated its use will be prohibited. The WHTP project will provide SSCSD, a water source limited community, with a reliable, drought resistant water supply to meet its current and future seasonal and projected annual demands.

Need for Expedited Funding: Expedited funding is needed for this project because the community anticipates running out of potable water by November 2015. SSCSD, a disadvantaged community (DAC), does not have the financial resources to construct an RO system which is critical in providing a safe and sustainable water supply to meet its community's demands in the face of the continued drought conditions. In order to avoid complete shutdown of the potable water system whether for lack of water or complete chloride contamination, immediate funding is needed to complete the project in fall 2015, to ensure RO system startup is completed before the increase chloride levels make it difficult to stabilize the system.

2. PROJECT MAP

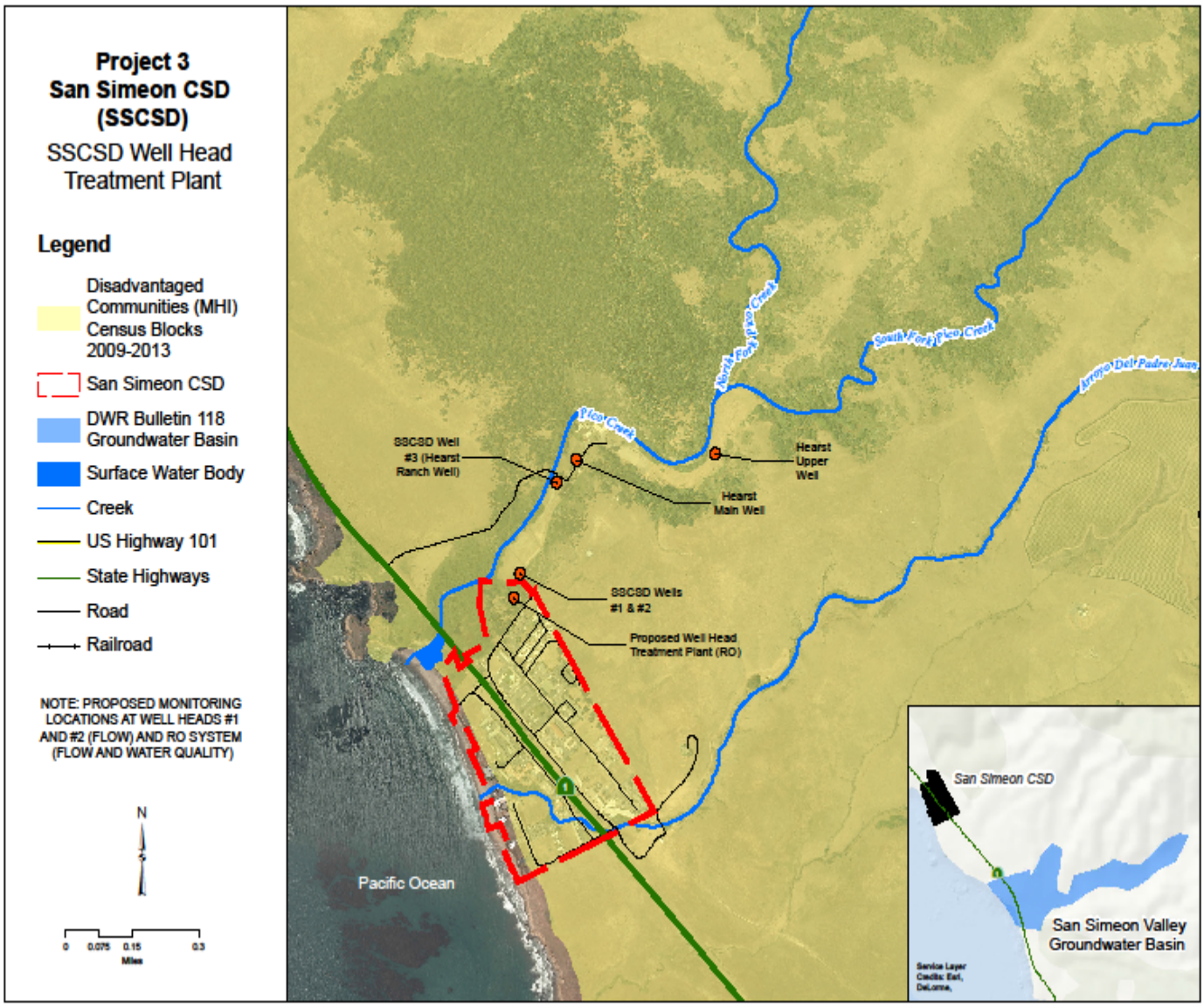


Figure 1 - SSCSD Well Head Treatment Project - Project Map

3. PROJECT PHYSICAL BENEFITS

The San Simeon Community Services District (SSCSD) service area is a water deficient community that relies heavily on groundwater as its potable water supply. The groundwater aquifer experiences seawater intrusion due to seasonal and drought conditions which results in elevated concentrations of chlorides and TDS. The SSCSD gains immediate benefit from this project by providing a drought tolerant source of water. Without this project, SSCSD will run out of potable water for health, safety, and sanitation purposes by the fall of 2015. This project also eliminates the need for truck deliveries of water for potable use, in turn reducing the associated greenhouse gas (GHG) emissions. Refer to Tables 4.1 and 4.2 for a summary of the primary and secondary physical benefits:

- **Primary Benefit - Improvement of Water Quality (IR.7) and Contaminant and Salt Removal through Other Treatment Technologies (IR.6):** The Primary benefit of the WHTP is the reduction of the high chloride and TDS concentrations which result in at the loss of this DAC's sole non-potable water source. The WHTP will reduce chloride concentrations from approximately 2,500 milligram per liter (mg/L) to 30 mg/L and TDS concentrations from approximately 3,000 mg/L to 100 mg/L in the SSCSD water supply wells. The reduction in chloride concentrations will provide SSCSD with a water supply that complies with the Division of Drinking Water (DDW) maximum contaminant level (MCL) requirements. The reduction in TDS concentrations will help to slow down the premature deterioration of the distribution system, residential water heaters, water softeners, refrigerators and other household and commercial appliances. This project provides SSCSD with operational flexibility and better prepares this community for continued and future drought conditions.

- **Secondary Benefit - Reliable Water Supply (IR.1):** With the construction of the WHTP, SSCSD will provide its community with a drought resistant, reliable, water supply year-round. Per communications with the DDW, if the potable water well chloride levels cannot be reliably reduced to less than 2,500 mg/L (ten times the recommended secondary MCL of 250 mg/L), the potable water wells maybe shut down leaving SSCSD without a water supply source. If the wells are shut down, the only feasible alternative is the delivery of potable water using water trucks.

Annual Project Benefits - Benefit A1 (Primary)
Project Name: SSCSD Well Head Treatment Project

Type of Benefit Claimed: Improvement in Water Quality & Contaminant and Salt Removal Through Other Treatment Technologies

Units of Benefit Claimed: Amount of Chlorides and Total Dissolved Solids (TDS) Reduced in mg/L in SSCSD's Potable Water Source

Anticipated Useful Life of Project (years): 20 years plus

(a)	(b)	(c)	(d)
		Physical Benefits	
Year(1)(2)	**Without Project(3)**	**With Project(5)**	**Change Resulting from Project**
2015	Chloride Levels (1,200-3,500 mg/L or greater) TDS(4) levels (up to 3,000 mg/L)	Chloride (30 mg/L) TDS(4) (500 mg/L)	Anticipated Chloride reductions range from 1,170-3,470 mg/L Anticipated TDS reductions of up to 2,500 mg/L
2016	Chloride Levels (1,200-3,500 mg/L or greater) TDS(4) levels (up to 3,000 mg/L)	Chloride (30 mg/L) TDS(4) (500 mg/L)	Anticipated Chloride reductions range from 1,170-3,470 mg/L Anticipated TDS reductions of up to 2,500 mg/L
2017 - 2024(6)	-	-	-
2025	Chloride Levels (1,200-3,500 mg/L or greater) TDS(4) levels	Chloride (30 mg/L) TDS(4) (500 mg/L)	Anticipated Chloride reductions range from 1,170-3,470 mg/L

Annual Project Benefits - Benefit A1 (Primary)
Project Name: SSCSD Well Head Treatment Project

Type of Benefit Claimed: Improvement in Water Quality & Contaminant and Salt Removal Through Other Treatment Technologies

Units of Benefit Claimed: Amount of Chlorides and Total Dissolved Solids (TDS) Reduced in mg/L in SSCSD's Potable Water Source

Anticipated Useful Life of Project (years): 20 years plus

(a)	(b)	(c)	(d)
Physical Benefits			
Year(1)(2)	**Without Project(3)**	**With Project(5)**	**Change Resulting from Project**
	(up to 3,000 mg/L)		Anticipated TDS reductions of up to 2,500 mg/L
2026	Chloride Levels (1,200-3,500 mg/L or greater) TDS(4) levels (up to 3,000 mg/L)	Chloride (30 mg/L) TDS(4) (500 mg/L)	Anticipated Chloride reductions range from 1,170-3,470 mg/L Anticipated TDS reductions of up to 2,500 mg/L
2027	Chloride Levels (1,200-3,500 mg/L or greater) TDS(4) levels (up to 3,000 mg/L)	Chloride (30 mg/L) TDS(4) (500 mg/L)	Anticipated Chloride reductions range from 1,170-3,470 mg/L Anticipated TDS reductions of up to 2,500 mg/L
2028 - 2035(6) (20-Year Project Life)	-	-	-

Notes:
1) Implementation of this project results in a benefit over the entire 20 year life of the project.
2) Project implementation during drought conditions which is estimated to occur every 8 years for a duration of 3 years.
3) Hardness is measured as Total Dissolved Solids (TDS).
4) Historical Range of Chlorides and TDS in Wells #1 and #2 during drought conditions.
5) Anticipated chloride and TDS concentration in RO effluent based on Wigen's Technology Specification.
6) While drought condition benefits are presented, based on historical chloride measurements it appears that there are seasonal impacts to the potable water system, therefore SSCSD anticipates operating the RO system every year due to the seasonal degradation of their potable water wells.

Annual Project Benefits - Benefit A2 (Secondary)
Project Name: SSCSD Well Head Treatment Project

Type of Benefit Claimed: Avoided Greenhouse Gas (GHG) Emissions and Truck Trips due to Avoided Truck Deliveries of Water for Consumption[1]

Units of Benefit Claimed: Avoided Metric Tons of Carbon Dioxide Equivalent Emissions and Number of Truck Trips

Anticipated Useful Life of Project (years): 20 years plus

(a)	(b)	(c)	(d)
Physical Benefits			
Year	**Without Project (Due to Truck Deliveries)[2,5,6]**	**With Project (No Deliveries)[3,5,6]**	**Change Resulting from Project[4,5,6]**
2015[7,8]	GHG: 198 Truck Trips: 2,705	GHG: 31 Truck Trips: 0	GHG: (167) Truck Trips: (2,705)
2016[7,8]	GHG: 198 Truck Trips: 2,705	GHG: 31 Truck Trips: 0	GHG: (167) Truck Trips: (2,705)
2017- 2024[8,9]	-	-	-
2025[8]	GHG: 198 Truck Trips: 2,705	GHG: 31 Truck Trips: 0	GHG: (167) Truck Trips: (2,705)
2026[8]	GHG: 198 Truck Trips: 2,705	GHG: 31 Truck Trips: 0	GHG: (167) Truck Trips: (2,705)
2027[8]	GHG: 198 Truck Trips: 2,705	GHG: 31 Truck Trips: 0	GHG: (167) Truck Trips: (2,705)
2028 - 2035 (20-Year Project Life) [8,9]	-	-	-

Notes:

1) Implementation of this project results in a net benefit over the entire 20-year life of the project during drought and seasonal conditions.
2) Assumed Diesel Heavy-Duty Truck = 10.1516 kg CO2e/gallon = 1.692 kg CO2e/mile and 6 miles per gallon based on EPA Climate Leaders GHG Inventory Protocol: Direct Emissions from Mobile Combustion Sources (May 2008).
3) Assumed 615 kWh/day is required to operate the RO system and electricity emissions factors based on EPA Year 2010 eGRID 9th edition Version 1.0 February 2014.
4) A negative result represents avoided GHG emissions and truck trips due to eliminating the truck traffic required for delivering potable water to the SSCSD service area.
5) During drought conditions, 83 AFY is available from CSA-10A hydrant to be delivered to SSCSD.
6) Water will be delivered or treated only as needed during drought or other emergency conditions (i.e., when chlorides are typically above 250 mg/L) which is assumed to be 6 months of the drought year on average.
7) Drought conditions are assumed to continue into 2016.
8) Based on historical rainfall data in San Luis Obispo (SLO) County, a drought is likely to occur every 8 years and last for 3 years.
9) While drought condition benefits are presented, based on historical chloride measurements it appears that there are seasonal impacts to the potable water system, therefore SSCSD anticipates operating the RO system every year due to the seasonal degradation of their potable water wells.

4. TECHNICAL ANALYSIS OF EACH PHYSICAL BENEFIT CLAIMED

Project Need

The SSCSD service area is a water deficient community that relies solely on groundwater for its potable water source. The groundwater wells pump from the Pico Creek basin that is heavily influenced by seawater intrusion. The extended drought continues to impact the watershed as the percolated water is consumed, therefore not replenishing the aquifer and increasing the chloride concentrations in SSCSD's potable groundwater supply. As documented the *Groundwater Availability Study Pico Creek Valley Groundwater Basin* report, the chloride concentrations can reach 2,500 mg/L and TDS concentrations can reach 3,000 mg/L if the water levels are below 13 feet in the water supply wells. Implementation of the WHTP will allow SSCSD to treat its sole groundwater source, using Reverse Osmosis (RO), to reduce chloride and TDS concentrations to acceptable maximum contaminant levels (MCLs) in order to ensure a reliable, long term water supply for SSCSD to meet its community's current and future demands in consideration of seasonal and drought conditions.

Without Project Conditions

Without the WHTP project, SSCSD will not be able to meet the current and future demands of its service area and/or the Division of Drinking Water (DDW) may not allow SSCSD to utilize its groundwater wells to meet the potable water demands of its community due to the elevated chloride concentrations (well above the secondary MCLs of 250 mg/L) for domestic use.

Based on the preliminary engineering/feasibility study, there is no alternate groundwater or surface water supply sources available for SSCSD to acquire in lieu of its existing groundwater source. If SSCSD was unable to meet their potable water demands, via its groundwater source, the only other alternative for SSCSD to continue providing potable water service to the community will be to truck in potable water from a nearby State Water Project location (CSA-10A in Cayucos). The cost to purchase the water (approximately $215,000/year) plus the transportation cost (approximately $175,000) for a total of $390,000/year. In addition, to the cost associated with this alternative, consideration must also be given to the impacts of greenhouse gas due to the truck trips. While feasible on a temporary basis, this not a fiscally sustainable long term solution for SSCSD (a DAC) and would result in the district potentially going bankrupt.

Existing Facilities and Supplies

The community of San Simeon, a DAC, is located on the central coast of California (Figure 2). According to the 2010 US Census calculations, the community has a total population of 462 people and a total of 301 housing units. SSCSD was formed in 1941 and serves an area of approximately 100 acres. SSCSD is responsible for the potable water, wastewater collection, storm drainage piping, and pavement/ sidewalk maintenance within the community. SSCSD operates and maintains a wastewater facility with an ocean outfall line, a recycled water system (which is primarily used for landscape irrigation), and a 150,000 gallon reservoir for fire, regulatory and emergency storage. The water system maximum day demand was calculated to be 148,860 gallons (*Preliminary Engineering Report*, April 2015). The major financial contributor to SSCSD for maintaining the infrastructure is water usage.

Figure 2 - San Simeon Location and Pico Creek Watershed

The existing potable water distribution system consists of two potable water wells (Well #1 built in 1952 and Well #2 built in 1962), approximately 11,000 feet of piping, and the 150,000 gallon reservoir. SSCSD's two potable water wells are located in the Pico Creek Valley and have a production capacity of approximately 325 gallons per minute (gpm). The two submersible well pumps and motors were replaced in 2014. As part of this project, new column pipe and electrical/SCADA

improvements were made to the system. The wells, approximately 50 feet, are never operated at the same time due to influence conditions in the groundwater table due to their proximity to each other. The normal pump operations are to operate the wells for approximately four hours a day to fill the reservoir and meet the water demands (approximately 80,000 gallons).

SSCSD's entire potable water supply comes from their groundwater wells located in the Pico Creek Valley immediately north of the boundary of the community. SSCSD does not have a surface water supply source. Diversions from the Pico Creek underflow (Figure 3) by these wells are permitted under State Water Resources Control Board License for Diversion and Use of Water (Permit #12465, License #12272). This license permits a maximum 0.27 cubic foot per second (cfs) to be diverted from January 1 to December 31 of each year and the maximum amount diverted under the license shall not exceed 140 acre-feet per calendar year (AFY).

The Pico Creek watershed is primarily fed from stream flow due to precipitation in the watershed and percolated precipitation from rainfall. Pico Creek is a perennial stream and typical flows are not visible in the non-rainy months. Subsurface flows in the creek maintain a sufficient hydrostatic head to prevent seawater intrusion. In addition, a natural sand berm forms every year at the confluence of the ocean and the creek. This berm forms over the course of the year when stream flow from the creek becomes trapped behind the berms and forms a lagoon. SSCSD being located on the coast translates to seawater intrusion into the groundwater supply when the flows in Pico Creek are diminished due to drought and SSCSD's potable water demands remain consistent.

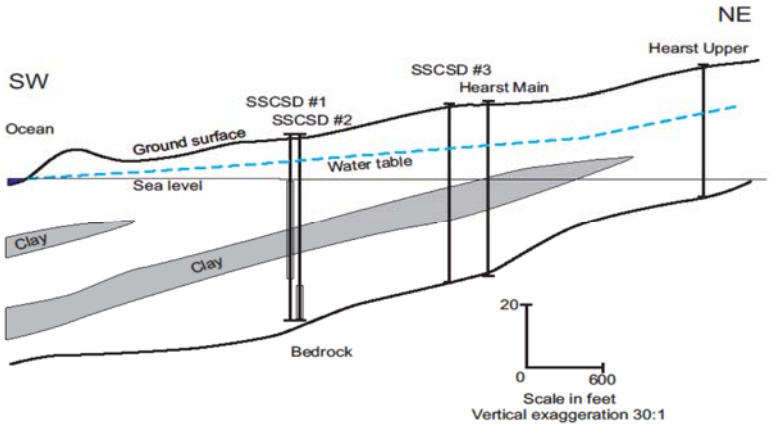


Figure 3 - Pico Creek Watershed Cross-Section and Potable Well Location

The groundwater wells pump groundwater from an aquifer that is very susceptible to drought. Exacerbating the situation is the extended drought which results in low stream flows and therefore the lack of fresh water replenishment to the aquifer. The lowered groundwater elevation and lack of fresh water replenishment, results in a reduced hydrostatic head against seawater intrusion. This combined with winter high surf levels results in seawater intrusion to the groundwater aquifer. Typically, Well #1 is the first to see the impact of elevated chloride levels as it is slightly closer to the Pacific Ocean. Once the chloride levels reach 500 mg/L in Well #1, its use is discontinued and Well #2 is the primary well used to supply SSCSD's drinking water needs. When chloride concentrations in Well #2 become elevated, SSCSD is able to pump limited quantities of Hearst Castle Well #3 water, under an agreement with Hearst Corporation, to blend water in order to reduce the chloride concentrations in the potable water. Under this joint use agreement, SSCSD is only allowed to use the well when the chloride levels prevent SSCSD wells from operating, and for limited uses and quantities.

Recent Conditions

High Chloride levels have compromised the SSCSD potable water wells for over twenty five years. Based on historical data (Figure 4), when the well levels are below 13 feet the chloride concentrations will slowly rise. However, when the well levels are below 13 feet and there are high tides, the chloride concentrations rise fast. As SSCSD enters the winter season where there are low water and high surf levels, it creates a condition where seawater intrusion fills the groundwater aquifer with brackish water, therefore elevating the chlorides (ranging from 550 to 3,500 mg/L) in the SSCSD potable water source.

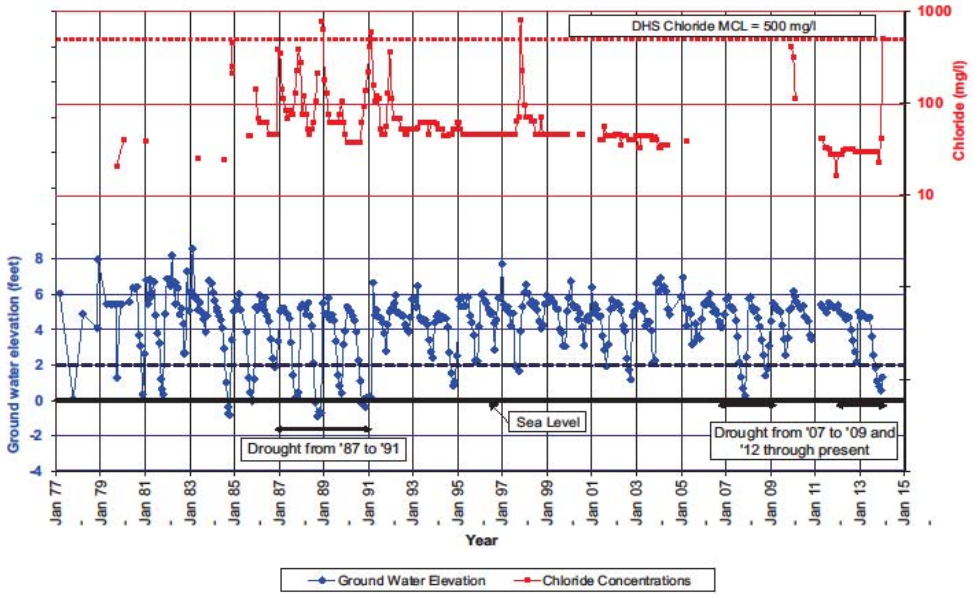


Figure 4 - SSCSD's potable water wells are impacted by seawater intrusion when the water table is low.

To help slow down the intrusion of seawater, SSCSD has mandated water conservation measures throughout the service area based on groundwater levels in the two wells since 1987. The first conservation ordinance (Ordinance 61) was in 1986 which established a building moratorium. In 1987, Ordinance 64 was adopted to encourage water conservation among residents and commercial properties. These conservation measures, while slowing down the seawater intrusion into the wells, have not provided a reliable long term solution. In July 2013, SSCSD went into a Stage 2 Alert which restricted all outside use of potable water and placed heavy restrictions on hotels. In early 2014, the use of Well #1 was discontinued due to drastically elevated chloride levels. In April 2014, SSCSD implemented stricter mandatory water restrictions through Ordinance 114 on all landscaping and all non-essential uses throughout the service area and harsher fines in order to conserve potable water. In July 2014, SSCSD declared a water emergency and immediately implemented Stage 3 Water Restrictions in effort to not run out of potable water by October/November of 2015. SSCSD is still in Stage 3 Alert with all potable water uses other than inside the home completely restricted and higher penalties. All residents and commercial properties are mandated to purchase recycled water from the SSCSD Recycled Water System to perform outside water uses.

The extended drought continues to impact the watershed as the percolated water is consumed, therefore not replenishing the aquifer and increasing the chloride concentrations in SSCSD's potable water groundwater supply. During the period of October through May 2015 there have been no major rain events to replenish the groundwater aquifer and therefore reduce the chloride concentrations. Table 5.1 summarizes recent chloride levels in Wells #1 and #2. Typically, the wet season chloride concentrations are 30 mg/L, however SSCSD is entering the dry season with chloride concentrations above 250 mg/L (the recommended secondary maximum contaminant level (mcl) per Title 22). As Pico Creek has no flow, SSCSD is anticipating to start the fall season with water well levels at 13 to 14 feet. Based on historical records, this water level will result in the intrusion of seawater and therefore elevated chloride concentrations in the potable water system.

Historical Chloride Levels Wells 1 and 2(1)			
Year	**Water Level (feet)(2)**	**Chloride Level (mg/L)(3)**	**Notes**
2010	9.8-12.4	N/A	Chloride and TDS not measured.
2011	9.6-11	28-32	Elevated level in fall typically – seasonal.
2012	10.6-13.9	28-32	Elevated level in fall typically – seasonal.

Historical Chloride Levels Wells 1 and 2[1]			
Year	**Water Level (feet)[2]**	**Chloride Level (mg/L)[3]**	**Notes**
2013	11.1-15.5	30-47	Elevated level in fall typically – seasonal.
2014	Jan: 14.5 Feb: 13.5 Mar: 10.5 Apr: 10.6 May: 10.5 Jun: 11.4 Jul: 12.7 Aug: 14.0 Sep: 13.0 Oct: 13.0 Nov: 13.7 Dec: 10.5	Jan: 47-1081 Feb: 976-1169 Mar: 378-1000 Apr: 177-412 May: 127-241 Jun: 147-221 Jul: 205-343 Aug: 205-343 Sep: 321-942 Oct: 451-2499 Nov: 1529-2499 Dec: 458-3593	Range is high and low level within the month. Rain events in watershed lowered the chloride levels temporarily.
2015[4]	Jan: 9.9-10.4 Feb: 8.9-11 Mar: 9.9-11 Apr: 10.1-11 May: 9.9-10.3 Jun: 10.2-11	Jan: 632-1065 Feb: 416-812 Mar: 315-445 Apr: 170-315 May: 129-294 Jun: 161-214	Range is high and low level within the month. Rain events in watershed lowered the chloride levels temporarily.

Comments:
1) Source*: San Simeon Community Services District Preliminary Engineering Report*, March 2015.
2) Water level is measured from the ground surface to static water surface.
3) Lab testing was completed by Abalone Coast Labs and Evoqua Technology.
4) SSCSD 2015 Monitoring Well Data.

Without Project Conditions

There is no other project planned in lieu of the WHTP. SSCSD has not been able to find an alternate cost efficient potable water source to meet the demands of the service area. The water wells are the community's sole water supply. The chloride situation in the well field is drastically reducing the options for production of potable drinking water that has acceptable levels of chloride. Both main wells are impacted by the chloride levels and Well #3 is being relied upon solely by SSCSD. Well #3 is also starting to show elevated chloride levels.

The WHTP is the only project that can allow SSCSD to meet its community's current and future demands, considering seasonal and drought conditions, and ensure a reliable, long term water supply. Without this project, SSCSD will not be able to meet the demands of its service area or DDW may shut down the use of the potable water wells, due to the elevated chlorides being well above secondary MCLs, leaving the community without a potable water source. As a disadvantage community, and with water conservation efforts impacting the SSCSD's financial budget, importing potable water is not an option.

Estimating Physical Benefits

The WHTP consists of the installation of a reverse osmosis system to treat the groundwater diverted from Wells #1 and #2, to ensure an adequate supply of potable water year round in consideration of seasonal and drought conditions. The project allows SSCSD to meet current and projected demands beyond what is anticipated under the without the project condition. SSCSD has invested significant resources and time to verify, quantify, and evaluate potential alternatives to reduce the elevated chloride and TDS concentration in their potable water supply. The physical benefits of this project were derived through scientific study and evaluation, dating back to the 1986 hydrogeologic study and followed by numerous studies, as summarized below:

- *Groundwater Availability Pico Creek Ground Water Basin (March, 1986)* - SSCSD hired Timothy S. Cleath, Engineering Geologist to complete this study in two phases to assess the Historical Groundwater Availability and the Future Groundwater Availability. The historical analysis verified SSCSD concerns that when groundwater levels declined, chloride and TDS concentrations were found at elevated concentrations in the potable water wells. Work included the development of HEC-4 modeling of basin responses, exploratory drilling to define the basin characteristics, and water level/quality monitoring. Phase 1 confirmed the presence of seawater intrusion in the Pico Creek groundwater basin. In addition, the available yield of the basin varied depending on creek flow duration, but extractions in excess of 120 AFY could result in the impairment of water quality. It was

recommended that SSCSD implement mandatory conservation measures, as well as obtain permission from Hearst Corporation to locate a well further upstream in case of an impairment. The future analysis focused on the future groundwater availability to meet projected demands and identification of measures to mitigate the impacts of seawater intrusion. Based on the projected demands and groundwater modeling, it was noted that measures needed to be implemented to increase the basin yield to meet demands. Measures included: groundwater recharge in the upstream portion of the watershed; a hydraulic seawater intrusion barrier downstream of the wells; and a subsurface dam downstream of the wells.

- *Community Plan (April, 2006)-* The Draft *Community Plan for Cambria and San Simeon* (Community Plan) was updated and approved in April 2006 by the San Luis Obispo County Board of Supervisors. This document provided the planning basis for the SSCSD Water Master Plan. The Community Plan projected a managed growth projection of 2.3% per year in San Simeon for the twenty year life of the Plan. It was noted that growth rates in San Simeon have decreased in recent years, primarily due to a SSCSD imposed moratorium on growth and other resource constraints.

- *San Simeon CSD Water System Master Plan and Wastewater Collection System Evaluation (November, 2007) - S*SCSD hired Boyle Engineering Corporation to complete this study to identify required water system improvements to meet existing and projected demands. Boyle Engineering reviewed the results of the *San Simeon Water Production Well Evaluation* (October 2006) to confirm the condition, capacity, and safe yield of SSCSD's groundwater wells. Boyle confirmed the report's findings - the safe yield of the Pico Creek groundwater basin was estimated to be 120 AFY, with Hearst Ranch drawing approximately 16 AFY from its two wells and the extractions by SSCSD's two wells not to exceed 104 AFY. Boyle evaluated the ability of the existing wells to meet the increasing SSCSD demands, assessed the condition of the well casing, performance, and efficiency of the pumps, and made recommendations for water system improvements. The study supported the findings that seawater intrusion episodes of short duration could be expected during extended gaps between wet seasons. However, groundwater levels fluctuated in response to a combination of both production rates and precipitation. For example during the period of 1984-1989, high production rates were the primary cause of lower water levels.

- *Groundwater Availability Study Pico Creek Valley Groundwater Basin - 2014 Update (September, 2014)* - SSCSD hired Cleath-Harris Geologists to complete the *Groundwater Availability Study Pico Creek Valley Groundwater Basin 2014 Update* (September, 2014) to update the 1986 *Groundwater Availability Study* and re-evaluate the sustainable yield of the Pico Creek groundwater basin. The report also evaluated whether the well field could sustain the maximum permitted withdrawal of 140 AFY and the resulting impacts to basin water quality and water levels. The study found that when the stream flow is low there can be significant amount of shallow seawater inflow which results in seawater intrusion to the SSCSD well field. The study demonstrated that while the well field could produce the maximum permitted diversion, there were significant increases in seawater intrusion frequency and elevated chloride concentrations up to 1,000 mg/L would most likely occur every drought cycle. And with an extended drought the chloride levels in SSCSD's wells could reach 3,000 mg/L. The report established that the sustainable yield estimate for the Pico Creek Valley groundwater basin should remain at 120 AFY. In addition, the need for additional mitigation contingencies was identified including: reclaimed water use, additional conservation, supplement water source development; or treatment to reduce chloride concentrations.

- *Preliminary Engineering Report; Feasibility Study of Alternatives for a Potable Water Supply - Phoenix Engineering (March, 2015).* SSCSD hired Phoenix Engineering to prepare a preliminary engineering report to confirm the need for the project, identify potential alternatives to address the drought affected potable water supply, perform a feasibility evaluation of the proposed alternatives (including cost estimates), and to identify the proposed project. Alternatives included: a) interconnection with other adjacent existing potable water systems; b) modification of the existing water supply system; c) additional groundwater supply source; d) treatment of groundwater; e) acquisition of an additional surface water s source. The study concluded that the best long term, cost-effective alternative was the construction of a well head treatment system to allow SSCSD to pump groundwater from its existing groundwater basin source, at the lower levels, and allow for the treatment system to remove the elevated chloride concentrations prior to distribution. This alternative provides SSCSD with a potable water source that would be in compliance with the drinking water constituent regulations.

The project recommendation was based on data and conclusions reached in numerous evaluations and studies. Since that recommendation, SSCSD has worked towards identification and development of the required WHTP facilities and is now ready for implementation.

The method for estimating and justification for the benefits claimed are described below:

- The primary physical benefit for this project presented in Table 4.1 is the anticipated reduction in chloride and TDS concentrations (expressed in mg/L) in the potable source waters over the lifetime of the project (i.e., 20

years) in order to meet the current and future demands necessary to sustain the community to meet the minimum life and health requirements for sanitation and drinking. The estimates of anticipated chloride and TDS concentration reductions were calculated based upon the groundwater makeup of the basin and the treatment performance of the reverse osmosis unit. It is anticipated that the chloride concentrations will range from 1,200-3,500 mg/L, while TDS concentrations will be approximately 3,000 mg/L. Based on these concentrations and the RO system performance, it is anticipated that the chloride concentrations will be in the range of 30-100 mg/L and TDS will be approximately 500 mg/L, well below the secondary MCLs.

- The secondary physical benefit presented in Table 4.2 is the avoided greenhouse gas (GHG) emissions due to eliminating truck traffic required for delivering potable water to the service area if the RO system is in operation. The net avoided GHG emissions are calculated over the lifetime of the project based on:
    - The estimated number of truck deliveries (2,705) of potable water per drought year.
    - Water will be delivered or treated only as needed during drought or other emergency conditions (i.e., when chlorides are typically above 250 mg/L) which is assumed to be 6 months of the drought year on average.
    - Drought conditions are assumed to continue into 2016 and based on historical rainfall data in SLO County, a drought is likely to occur every 8 years and last for 3 years.
    - 83 AFY is available for delivery from CSA-10A.
    - Diesel Heavy-Duty Truck (5,000 gallon) to deliver the potable water.
    - The round-trip distance in miles from the SSCSD to CSA-10A hydrant is 43.2 miles.
    - Emissions factors for carbon dioxide, methane, and nitrous oxide per vehicle-mile traveled (based on U.S. EPA Climate Leaders *GHG Inventory Protocol: Direct Emissions from Mobile Combustion Sources*, May 2008).
    - Example Calculation:

      150 VMT/year x 1.692 kg CO_2e/VMT ÷ 1000 kg/mt x 20 years = 5 mt CO_2e per year

      where: VMT (vehicle-mile traveled); kg (kilogram); CO_2e (carbon dioxide equivalent) and mt (metric ton)

While the RO system requires purchased electricity that results in GHG emissions, there are less criteria air pollutant (CAP) emissions from electricity production in California than from truck traffic. Avoiding an increase in truck traffic will avoid an increase in impacts related to CAP emissions. For example, particulate matter emissions can cause/exacerbate respiratory illnesses, and nitrogen oxides and volatile organic compounds lead to photochemical smog that can also cause/exacerbate respiratory illnesses.

Based on these assumptions and calculation, during a drought year approximately 2,705 truck trips would be required to deliver the community's potable water resulting in 198 mt CO_2e emissions per year. The RO system would produce significantly less emissions (31 mt CO_2e per year) which would be due to the electricity required to operate the system. Overall, there is a net benefit to implementing the RO system in terms of GHG emissions and truck traffic.

While drought condition benefits are presented, based on historical chloride measurements it appears that there are seasonal impacts to the potable water system, therefore SSCSD anticipates operating the RO system every year due to the seasonal degradation of their potable water wells.

Required New Facilities and Actions

The WHTP consists of the construction of a membrane technology to address the elevated chloride levels in SSCSD's potable ground water source and to provide SSCSD with a continuous potable water supply. The wellhead treatment technology selected is Reverse Osmosis (RO) and was chosen based on the constituents to be removed and its proven performance with treating groundwater. RO involves the processing of potable water through a reverse osmosis membrane system to remove the chlorides to an acceptable level prior to distribution to the community. Simple filter technologies will not remove the chlorides and TDS and therefore were not considered viable treatment technologies. The RO system will allow SSCSD to operate Wells #1 and #2 continuously when there is a drought and the chlorides are elevated. The RO system would only be used during high chloride level events and would not negatively impact any environmental resources. The RO system would treat approximately 35 AFY (currently SSCSD pumps 90 AFY and is permitted to pump up to 140 AFY). No additional water demand is anticipated with the project due to the moratorium.

A Wellhead Treatment system will allow SSCSD to continue to pump groundwater from the Pico Creek basin, at the lower water levels in Well #1 and #2. The site will be located directly outside of the SSCSD office on a parcel that is owned by

SSCSD as shown on Figure 5. The wellhead treatment system is comprised of an equipment skid mounted reverse osmosis treatment system. SSCSD plans to install the wellhead treatment system on the well field discharge pipeline as it transitions from the potable water well site to the SSCSD distribution system and storage network (Figure 6). The pipeline is an existing 8-inch diameter pipeline. Separate suction and discharge connections would be made on the pipeline located a few feet apart. Isolation valves will be installed to allow the District to isolate the system and the treatment process for maintenance and operation issues. The treatment system will connect to these two connection points. In addition, a clean in place (CIP) system will be provided that will allow for the cleaning of the RO membranes, which will be required from time to time to maximize performance. Both systems will be skid mounted.

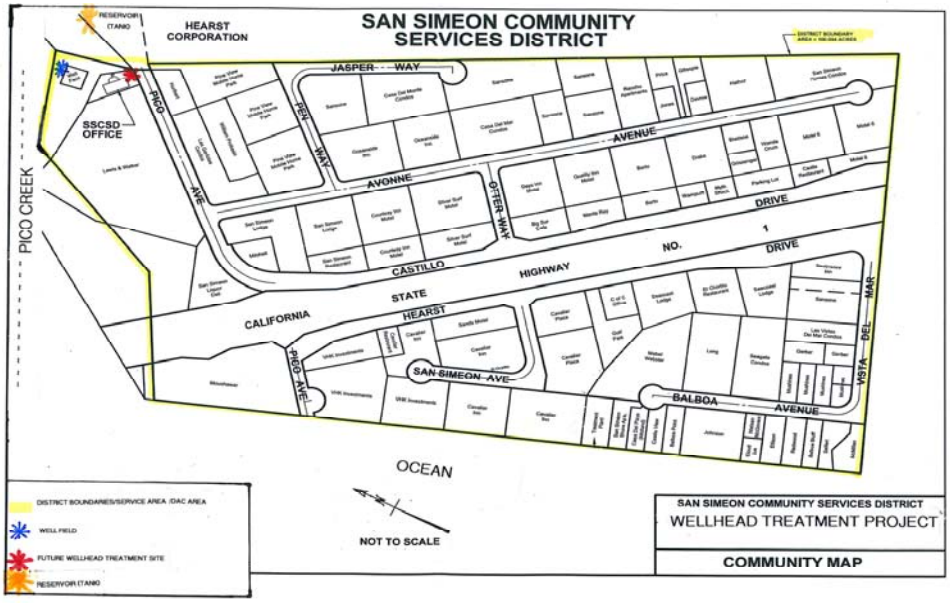


Figure 5 - Proposed Well Head Treatment Project Location

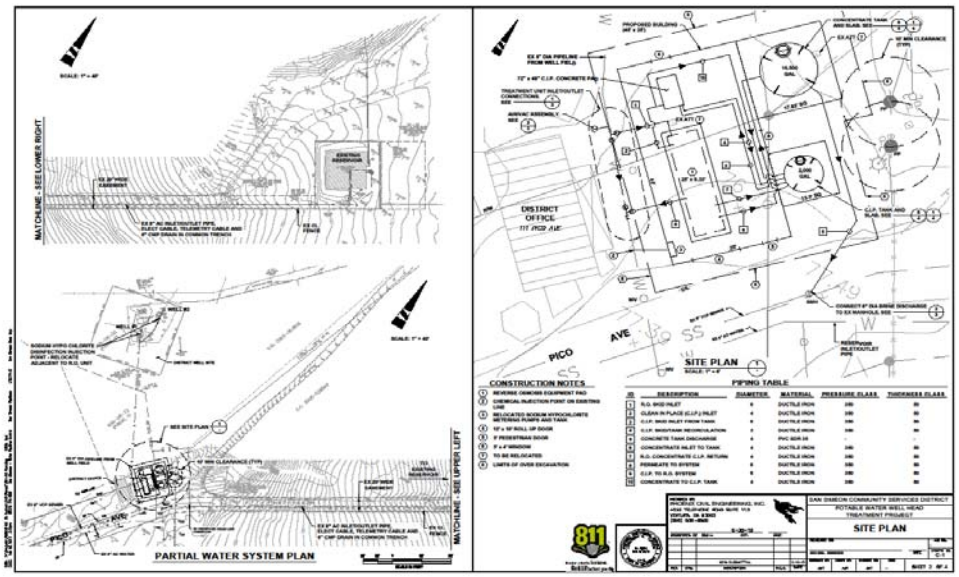


Figure 6 - Proposed Reverse Osmosis Site Layout

Separately, SSCSD will grade the site and install reinforced concrete equipment pads on which to mount the treatment process. Storage tanks (chemicals, concentrate [process reject water] and a permeate tank) will also be installed on pads around the site. A metal building will be installed over the treatment equipment skids to protect them from the environment. Power for the equipment will be supplied from the adjacent PG&E power lines that are located immediately north of the proposed site. The system will require 480 V power which is available from a nearby power pole. The electrical system equipment will be installed adjacent to the remainder of the process equipment. The concentrate will be temporarily discharged into the sanitary sewer collection system which is located adjacent to the proposed treatment unit facility.

The WHTP will be coordinated under the direction of the SSCSD General Manager and/or Administrator, who will provide project management and facilitate the completion of various project elements. In addition, SSCSD is working with a single engineering consultant for the completion of the RO system design and engineering and an electrical engineer for the design and engineering of required electrical systems. SSCSD conducted the required geotechnical investigations and engineering design which is summarized in the *Geotechnical Engineering Report (April 2015).* The Preliminary Engineering Report (including 30% design) was completed in March 2015 and as of July 2015, construction plans and specifications are 95% complete. The plans and bid documents will be 100% complete in early August 2015 and ready for public bid mid-August 2015. The contract will be awarded in September 2015. The duration of the construction contract is estimated to be between 8 to 12 weeks.

In May 2015, SSCSD selected the Wigens Technologies Reverse Osmosis System as the preferred RO Wellhead Treatment and issued a request for bids for the specified equipment in June 2015. The SSCSD Board approved the purchase of the RO Treatment Unit in July 2015 with anticipated delivery of the equipment in October 2015.

SSCSD adopted the CEQA Exemption (Resolution No. 15-372) on April 8, 2015. In addition, SSCSD has obtained the *Land Use Permit* from the County of San Luis Obispo Department of Planning and Building for the proposed project effective May 7, 2015 to November 7, 2016.

Other potential policies and/or actions that maybe required include: Operator Water Treatment Two Certificate, Building Permit, PG&E Service Request, and potential modification of existing agreement with Hearst Castle.

Potential Adverse Effects

The project will have little or no adverse physical effects or impacts to the environment. Implementation of the project would occur within existing utility easements and would be co-located with existing utilities. Therefore, any area disturbance as a result of construction would occur in previously disturbed areas within the urban center of the community and would be temporary in nature. It is anticipated that no native or undisturbed soils would be impacted by construction.

SSCSD has completed the environmental review of the WHTP. The environmental review found the project to be Categorically Exempt as: 1) the proposed treatment system did not result in the expansion of the existing water service capacity and would not result in increased pumping; and 2) the proposed water treatment equipment would be completely contained within the footprint of the existing disturbed SSCSD office parking space. SSCSD adopted the CEQA Exemption on April 8, 2015, as previously discussed.

No adverse effects are anticipated due to the WHTP. If the project is not implemented and the drought conditions continue, SSCSD will not have a reliable source of potable water which will threaten the Human Right to Water in this community.

Long Term Drought Preparedness

This is a drought preparedness project which helps SSCSD prepare against the long term effects of drought by treating an existing water supply that would otherwise be lost to the basin. By treating the groundwater, SSCSD will be able to provide its community with a reliable year round water supply. WHTP contributes to sustainable water supply and reliability during water shortages and will achieve the following drought preparedness benefits:

- Promote water conservation, conjunctive use, reuse, and recycling:
    - This project will create a drought resistant water supply that utilizes a supply that would otherwise be lost to the basin. Use of water supply will offset the need to provide for an alternate new water supply source.
- Efficient groundwater basin management:
    - By treating the groundwater containing elevated levels of chloride and TDS, SSCSD is able to divert its groundwater source even when the wells are at lower water levels, extending the existing supply during water shortages.
    - By treating the existing groundwater source, SSCSD is able to provide its community with a drought resistant reliable water supply source.

5. DIRECT WATER RELATED BENEFIT TO A DAC

The SSCSD Wellhead Treatment Project (WHTP) helps meet the critical water needs of a Disadvantaged Community (DAC). A DAC is "a community with a median household income of less than 80% of the Statewide average" or $48,706. As discussed in Attachment 8, San Simeon, with a population of 462, has a median household income of $34,708. The community consists predominantly of a Hispanic (55.3%) and white (40%) population per the US Census Bureau (2010 census). Under the State's definition, the entire community of San Simeon qualifies as a DAC as shown on Figure 7. The majority of the service area population is comprised of local hotel workers and senior citizens who are not able to afford a rate increase in order to pay for the WHTP project. 100% of the project service area will benefit the DAC's water supply need.

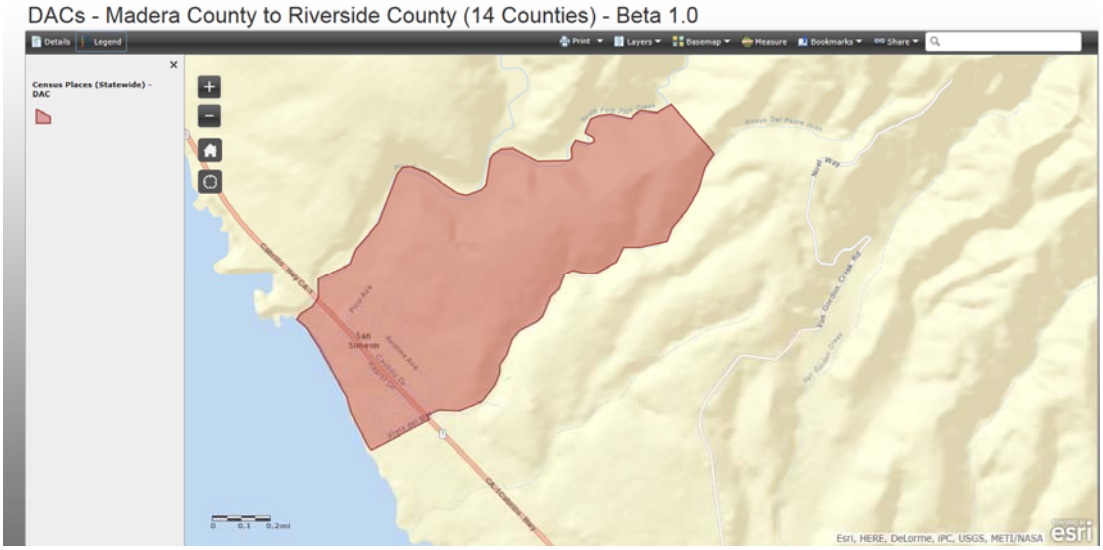


Figure 7 - San Simeon is a DAC

Currently, SSCSD has declared a Stage 3 drought emergency and is at risk of running out of a water source by the end of summer 2015. The groundwater wells have high chloride and TDS levels caused by seawater intrusion and exacerbated by the extended drought conditions. Thus, there is an immediate need to treat its sole source of potable water to provide the basic Human Right to Water in this community. The water related need for the SSCSD is to improve its water supply quality and therefore reliability. With the installation of the WHTP, to reduce the high chlorides in its source waters, SSCSD will improve its potable water source reliability year round. The WHTP provides SSCSD with the greatest opportunity to take direct actions to cure an existing water supply reliability issue. The WHTP study specifically addresses groundwater reliability, salt removal, and water supply reliability and addresses the needs of all San Simeon residents that are within SSCSD's service area. Grant assistance would enable the SSCSD to provide a reliable water source, for its community without impacting the rates.

6. PROJECT PERFORMANCE MONITORING PLAN

The Project Performance Monitoring Plan (PPMP) provides monitoring measures to ensure the proposed project will meet its intended benefit. As discussed in Section 2, the primary physical benefit for this project is the reduction in chloride and TDS concentrations (expressed as mg/L). The secondary benefit is the elimination in truck trips and resulting greenhouse gas impacts. Table 7.1 summarizes the proposed monitoring plan for the SSCSD WHTP:

Table 7.1 – Project Performance Monitoring Plan		
Project: SSCSD Well Head Treatment Project		
Proposed Physical Benefits	**Targets**	**Measurement Tools and Methods**
Drinkable Potable Water - Reduction in Chlorides	30 mg/L Chlorides	Flow Monitoring (Well #1 and Well #2) with a flow meter: 1. Well Head to Reservoir. 2. Well Head to RO System. 3. RO System to Reservoir. Water Quality (at Well #1 and Well #2): 1. Weekly chloride measurements. 2. If high weekly Chloride measurement, implement daily sampling 3. If chloride levels are greater than 400 mg/L, SSCSD to initiate RO system. RO System Monitoring (*when operating*): 1. Daily Influent and Effluent Chloride measurements to verify Chlorides are less than 30 mg/L. 2. If RO influent chloride concentrations are greater than 2,800 mg/L - SSCSD to evaluate modification of membrane and/or addition of minerals.
Drinkable Potable Water - Reduction in Total Dissolved Solids	500 mg/L Total Dissolved Solids Levels	Water Quality (Well #1 and Well #2): 1. Monthly TDS, Ca, and Mg measurements. RO System Monitoring (*when operating*): 1. Influent/Effluent measurements (TDS, Ca and Mg): - Upon Startup - Monthly

7. COST EFFECTIVE ANALYSIS

SSCSD has pursued available alternatives to the proposed Project. The six (6) alternatives along with the proposed project are listed in Table 8.1.

Table 8.1 – Cost Effective Analysis	
Project Name: SSCSD Well Head Treatment Project (WHTP)	
Question 1	**Types of benefits provided as shown in Table 5** *Primary - Water Quality Improvement and Contaminant and Salt Removal by other treatment technologies.* *Secondary - Water Supply Reliability.*
Question 2	**Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?** *Yes.*
	If no, why? *Not Applicable.*
	If yes, list the methods (including the proposed project) and estimated costs.

Table 8.1 – Cost Effective Analysis	
Project Name: SSCSD Well Head Treatment Project (WHTP)	
	Alternative 1: ***Interconnection with other adjacent existing potable water system.*** Connect the SSCSD system with an adjacent community/agency's system. (*No costs determined, because alternative was deemed infeasible due to no improvement in source water quality as the adjacent communities also rely on the same impacted groundwater basin for their water supply*). **Alternative 2:** ***Modify the existing water supply system.*** **a)** Upgrade the current facility operation, by operating the pumps longer, to increase groundwater supplies. (*No costs were determined, because SSCSD is under a moratorium for increased pumping and increasing the groundwater pumping will exacerbate the seawater intrusion as the fresh, rainfall replenished, potable water will be used up faster thereby increasing the rate of seawater intrusion*). **b)** Perform annual berm augmentation to build the Pacific Ocean/Pico Creek natural berm high enough to prevent the overtopping and current entrapment of seawater with Pico Creek, thereby exacerbating the already high chloride levels. (*No costs were determined, because this alternative was considered infeasible due to the extensive permitting /environmental compliance requirements and the required annual resources/costs associated with the alternative*). **Alternative 3:** ***Additional Groundwater Supply.*** Installation of a new potable well, upstream of the current well field near the Hearst Corporation Well #3, in order to prolong the elevated chlorides from reaching the new potable water supply well. (*No costs were determined, because this alternative may cause interference/influence with Well #3. This alternative was deemed infeasible as SSCSD would need to acquire land or permission from Hearst Corporation, which would most likely be reluctant to grant permission due to the potential impact to their wells*). **Alternative 4:** ***New Groundwater Supplies.*** Construct a new groundwater well system in order to obtain a new groundwater supply. (*No costs were developed as this alternative was considered infeasible. All local groundwater aquifers are heavily impacted by the drought and the local basins are heavily adjudicated thereby the availability of pumping rights difficult to acquire*). **Alternative 5:** ***Additional Water Supply*****.** This alternative was considered infeasible as SSCSD does not have any surface water rights. In the vicinity of San Simeon, there are no surface water sources that can be used to provide a supplemental water source to offset the intrusion of seawater in the basin. (*No costs were developed*). **Alternative 6:** ***Import Potable Water****.* This alternative would import potable water from a State Water Project location via water trucks. This is the only potential alternative for SSCSD, as there are no other available surface water or groundwater sources in this adjudicated region. However, the costs associated with this alternative are cost prohibitive for a DAC on a long term basis. (*No costs were developed, because this alternative is infeasible due to the scarcity and distance of potential water sources in San Luis Obispo County and the cost of trucking water*). **Proposed Project:** ***Groundwater Treatment.*** This alternative would entail the installation of a wellhead treatment system (Reverse Osmosis) that would allow for the continued operation of pumping groundwater from the basin at the lower water levels by treating the water source to reduce chloride levels thereby providing SSCSD with a potable water source that is in compliance with regulations. (*Capital Cost: $989,600 Annual O&M Cost: $31,000*).
Question 3	**If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.**

Table 8.1 – Cost Effective Analysis	
Project Name: SSCSD Well Head Treatment Project (WHTP)	
	Not applicable – The Proposed Project is the least cost and most feasible (considering water rights, water quality, adjudications, permitting/environmental and other considerations) alternative. The proposed project ensures safe and reliable water deliveries in a drought or emergency situation and will not result in an increase in the resident's current bill within this DAC.
Comments:	