

ATTACHMENT 6 – MONITORING, ASSESSMENT, AND PERFORMANCE MEASURES

Santa Clarita Valley Water Use Efficiency Plan Programs (CLWA – 4, SCV WUE Programs)

Project Overview

The Project implements four conservation programs of the Santa Clarita Valley Water Use Efficiency Plan (SCV WUE Plan); the Santa Clarita Valley Large Landscape Audit and Incentive Program, the Santa Clarita Valley Commercial, Industrial and Institutional (CII) Audit and Customized Incentive Program, the Santa Clarita Valley Landscape Contractor Certification and Weather-based Irrigation Controller Program, and the High Efficiency Toilet Rebate Program. These programs have already had one successful year of implementation with an estimated water savings of 1,972 acre-feet (AF). Implementation of all four programs will result in a phase-in of savings in 2011 through 2013. By 2014, the programs will be fully implemented, achieving a maximum annual savings amount of 613 AF. These savings will be sustained through 2020. Over the life of the project, total water savings will amount to 6,580 AF.

Performance Measures

The main goal of the SCV WUE Programs Project is to assist the region in meeting the targeted conservation in new legislation. Senate Bill 7x-7 was signed into law in November 2009 requiring a 20 percent reduction in per capita water use by 2020 statewide (20x2020). The Project's incentives to help meet the 20x2020 reduction include rebates on weather-based irrigation controllers (WBICs), high efficiency nozzles, and high efficiency (HET) toilets. The Project's water savings of 613 AFY would meet the IRWMP objective **Reduce Water Demand**, and measurable target of 10 percent reduction in projected urban water demand through the Region through implementation of water conservation measures.

The SCV WUE Programs Project performance measures are summarized in Table 6-1 and include: improved water supply reliability; improved water quality; public education on water conservation; and improved air quality. The project will be implemented within the CLWA service area and a monitoring plan will be identified when the PAEP is developed. Hence, specific monitoring locations are not shown on the detailed project map (Figure CLWA-4).

The SCV WUE Programs Project would reduce dependence on imported water by reducing overall water demand that would otherwise be met with imported SWP water. The amount of imported water avoided as a result of the project would be quantified as the reduction in water demand per capita in comparison to previous years and would be monitored through customer meters.

By decreasing the amount of water used for irrigation and indoor use, the SCV WUE Programs Project will result in an overall decrease in runoff caused by over-irrigation and thus the loading-rate of pollutants into groundwater. To **Improve Water Quality**, an IRWMP objective, would be measured as the decrease in run-off which is proportional to the reduction in irrigation demand resulting from the project. The reduction in indoor use will decrease the total volume of effluent requiring treatment at local water reclamation plants.

This project would allow for an improvement of water quality by contributing to the reduction in the import of salts to the Basin. The improvement in water quality is the mass of salt that is not brought into the Basin and would be measured as the avoided chloride treatment that is required by local wastewater treatment plant and the reduction in outdoor water demand multiplied by the concentration of salts.

By offsetting imported water demands with reduced water usage, the Project would avoid emissions of CO₂ (a greenhouse gas) generated by transporting imported SWP water to Valley. The long-distance transport of water in conveyance systems is a major element of California's total demand for electricity. The reduction in CO₂ emissions would be measured as the avoided import of SWP to the Region versus the use of recycled water, which will be measured as part of this performance measure, and the reduction in energy requirements resulting from this project.

1. Is the Project Consistent with the Basin Plan?

Yes, the SCV WUE Programs Project is consistent with the Los Angeles Regional Water Quality Control Board Basin Plan (Basin Plan). The project helps to meet the nitrate and chloride TMDLs which are currently listed on the 303(d) lists for the Santa Clara River, and the project does not contribute to an exceedance of any other water quality objectives within the watershed. The Project will result in a reduction in runoff volume which will be proportional to the 1,972 AFY of expected savings resulting from implementation of the four conservation programs. Assuming that the percent reduction in runoff volume is 10 percent, this translates into approximately 197 AFY. The project would therefore result in a likewise reduction in runoff to the Santa Clara River containing constituents such as coliform bacteria, nutrients, pesticides, sediment, and trash.

2. Do the Output Indicators Effectively Track Output?

Deliveries of water produced by water purveyors to customers

This output indicator will provide an estimate of how much water is being conserved through a comparison of per capita water demand from previous years, thereby providing a basis for calculating the actual water savings resulting from this project. This output indicator is deemed adequate because it shows that through the use of WBICs and other conservation measures, outdoor water demand can be reduced.

Monitoring chloride concentrations of SWP water

This output indicator monitors the concentration of chloride entering the Basin from SWP water.

Installation of WBICs, nozzles, and HET toilets to manage water usage

This output indicator will provide the quantifiable benefits of the project by demonstrating the water supply conserved as a result of the installation of the WBICs, nozzles, and HET toilets through review of customer metered data.

Attendance at water use efficiency workshops

This output indicator will provide an estimate of how many people are being educated on water-efficient outdoor water use through attendance, education and training sessions at the workshops.

3. Are the Outcome Indicators Adequate to Evaluate Change Resulting From the Work?

Quantification of the decrease in water demand compared to previous years

This outcome indicator will show the effectiveness of the project in conserving water. The project will also provide the comparison of water usage after the incentives have been installed versus the historical water usage prior to the installation of the incentives for those customers receiving them.

Quantification of imported water use avoided as a result of the project

This outcome indicator will show the reduction of imported water use as a result of reduced water demand and in the subsequent water savings.

Quantification of water saving from water use efficiency incentives

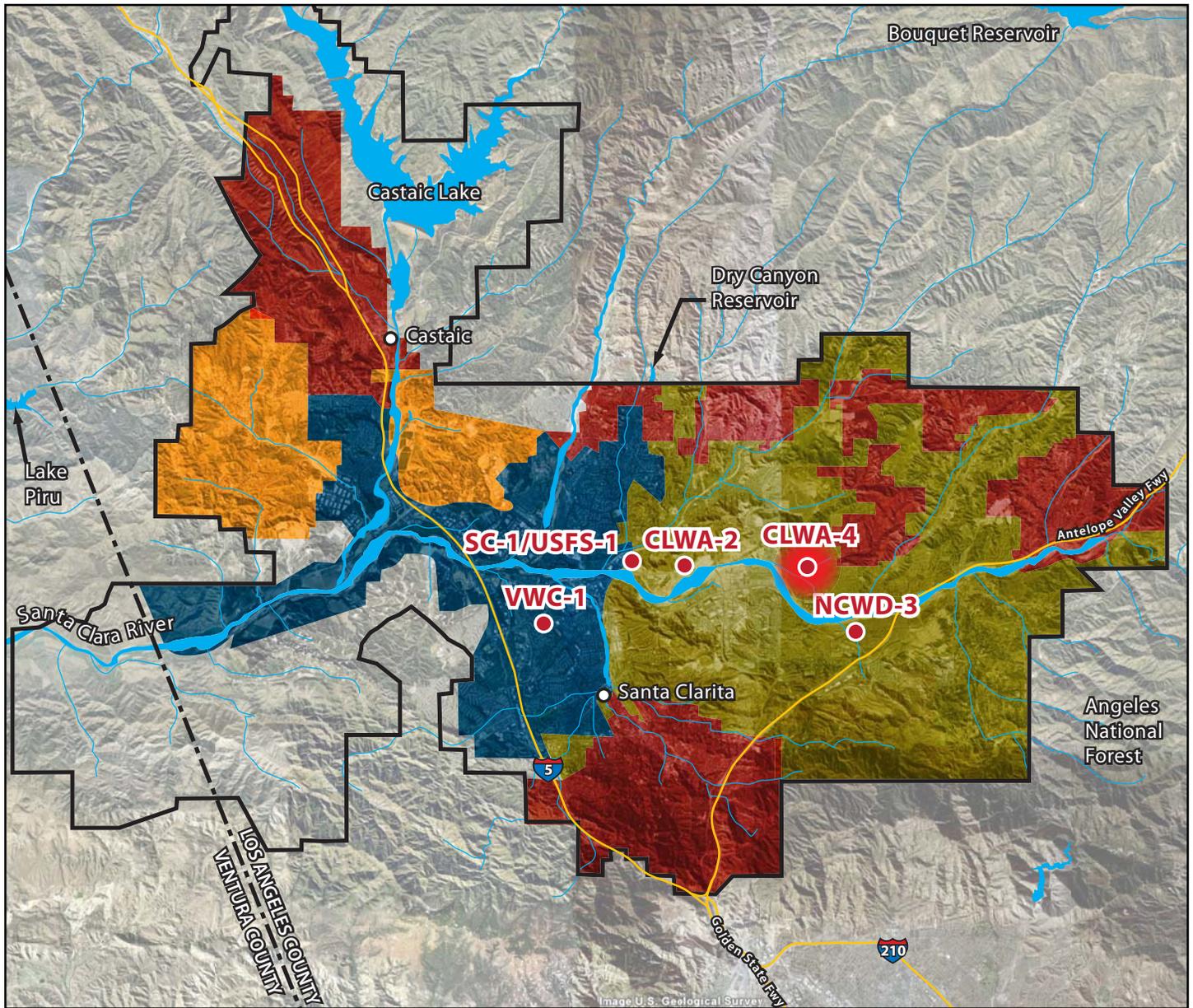
This outcome indicator will measure the water saving from installation of WBICs and accompanying high efficiency nozzles, large landscape audits, CII audits, and HETs by tracking water use in the years that follow.

Quantification of the number of visitors to the water use efficiency workshops

This outcome indicator will show how effective the public workshops are by the number of customers in attendance.

4. Is it Feasible to Meet the Targets within the Life of the Proposal?

The feasibility and success of each of the Best Management Practices (BMPs) to be implemented by CLWA-4 is documented in the SCV WUE Plan, provided as Reference CLWA-4.1. The programs have already had one successful year of implementation with an estimated water savings of at least 986 AF, and now seek expansion consistent with the SCV WUE Plan. These conservation projects will be (or are already) underway regardless of this specific funding opportunity since they are an important part of helping the Region to achieve a balanced water portfolio. Based on existing literature as well as documentation provided for this project, it is feasible for this project to meet the identified targets.



LEGEND:

-  CLWA Service Area
-  L.A. County Waterworks District #36
-  Newhall County Water District
-  Santa Clarita Water Division
-  Valencia Water Company
-  Project Location
-  Service Area Wide
-  Interstate Line
-  County Line



Sources:

1. Castaic Lake Water Agency Service Area
2. Google Earth - Image U.S. Geological Survey

CLWA-4

SCV Water Use Efficiency Plan Programs

**TABLE 6-1
 SCV WUE PROGRAMS PROJECT PERFORMANCE MEASURES**

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
Improve water supply reliability through reduced water demand	Decreased outdoor water use and overall water demand in the Region	Deliveries of water produced by purveyors to customers	Quantification of the decrease in water demand compared to previous years	Volume delivered to water customers per customer flow meters; comparison of actual water usage vs. historical usage	Reduction of water demand and water dependence by 613 AFY to 2020, and approximately 6,580 AF of water over the project lifetime
	Interest in utilization of 1,507 WBICs and accompanying nozzles and 502 HET toilets	Installation of 1,507 WBICs and accompanying nozzles and 502 HET toilets to manage water usage	Quantification of 1,507 of WBICs and accompanying nozzles and 502 HET toilets distributed	Record of 1,507 of WBICs and accompanying nozzles and 502 HET toilets and distributed	Distribution of 1507 WBICs and accompanying nozzles, and 502 HET toilets
Improve Water Quality	Reduced irrigation run-off into the Groundwater Basin	Deliveries of water by water purveyors to customers	Quantification of existing imported water use avoided as a result of the project	Volume delivered to water customers per customer flow meters; comparison of actual water usage vs. historical usage	Reduction of water demand and water dependence by approximately 613 AFY (starting in 2014) or 6,580 AF of water over the project lifetime

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
	Reduced import of chlorides into the groundwater Basin	Monitoring chlorides concentrations in SWP water		Part of standard monitoring data collected by CLWA	Reduction in ~24 metric tons of salt per year and 638 metric tons of salt over the 27 year project lifetime
Educate public on water conservation	Decreased outdoor water use and overall water demand in the Region	Installation of WBICs, nozzles, and HETs to manage water usage	Quantification of increase in WBICs, nozzles, and HETs purchased	Record of number of WBICs, nozzles, and HETs purchased	Distribute 1,507 WBICs and accompanying nozzles, and 502 HETs
	Increased number of residents and businesses who understand what types of plants to use to reduce water consumption	Attendance at the water use efficiency workshops	Quantification of attendance water use efficiency workshops	Record of number of customers at the water use efficiency workshops	Attendance of 420 people at water use efficiency workshops
Reduced GHG emissions	Reduced emissions of CO2	Deliveries of water produced by water purveyors to customers	Quantification of existing imported water use avoided as a result of the project	Volume delivered to water customers per customer flow meters; comparison of actual water usage vs. historical usage	Reduction in the emission of 115 metric tons of CO2 per year or 3,106 metric tons of CO2 over project lifetime

Santa Clara River – Sewer Truck Line Relocation (Phase I) (NCWD – 3, Sewer Trunk Line Removal)

Project Overview

Within the riverbed, Newhall County Water District (NCWD) maintains a portion of a sewer trunk line in the Canyon Country area of Santa Clarita. NCWD has owned and operated this trunk line since the late 1960's and has previously combated sewer trunk line breakage by preventative maintenance and proactive responses. Nevertheless, the threat of an accidental release has become increasingly evident and relocation of the trunk line out of the riverbed is now a priority. A line break would be detrimental to the ecosystems in and around the river and also could affect domestic groundwater wells within the region.

The Sewer Trunk Line Removal Project is proposed in phases, with Phase 1 being the engineering and planning associated with relocating the sewer trunk line out of the Santa Clara riverbed. Phase 2 would concentrate on the actual removal or the gravity feed portion of the sewer trunk line. Within Phase 2, construction activities would relocate the sewer flow fed by gravity, prior to the proposed sewer lift station, into the public right-of-way. In Phase 3, the construction of a sewer lift station, forced sewer main, and the remaining gravity feed portion of the sewer trunk line to complete the relocation project. Funding is being requested for Phase 1 only, which includes: river bank protection, land title requests, surveying, and the engineering report.

Performance Measures

The main goals of the Sewer Trunk Line Removal Project are to eliminate the possibility of a sewer discharge into the Santa Clara River and to minimize or eliminate disturbance of native vegetation caused by the frequent and ongoing maintenance on the exposed sewer trunk line. The Project will eventually result in the removal of the sewer line into the public right-of-way during a future phase (Phases 2 and 3) of the project.

The Sewer Trunk Line Removal Project performance measures are summarized in Table 6-2 and include: completion of the planning and design of the project; and the minimization or elimination of disturbances of native vegetation caused by the ongoing maintenance to the sewer trunk line.

When the project is ready for construction a PAEP will be prepared for the assessment and evaluation of project performance and to identify measures that can be used to monitor progress towards achieving project goals. Performance and monitoring measures will be identified for long-term monitoring and reporting of project efficacy, which likely will be done in accordance with the SWRCB Waste Discharge Requirements (WDRs). Hence, specific monitoring locations are not shown on the detailed project map (Figure NCWD-3).

However, for Phase 1, performance measures for the Project will focus on completing the planning, design, and engineering tasks necessary to safely relocate the trunk line in order to proceed at a future time to Phases 2 and 3 and complete the project. Funding is requested for river bank protection, design, land title requests, surveying, and the engineering report.

1. Is the Project Consistent with the Basin Plan?

Yes, the project is consistent with the Basin Plan. The project does not contribute to the nitrate or chloride TMDLs which are currently listed on the 303(d) lists for the Santa Clara River, nor does the project contribute to exceedances of any water quality objectives within the watershed.

2. Do the Output Indicators Effectively Track Output?

Preparation of all necessary engineering studies, reports, and plans and make submittals to regulatory agencies

This output indicator will provide the documentation necessary to show that the permits for the Project have been prepared and approved by the regulatory agencies.

Native vegetation re-established in the area

This output indicator will show that the methods being implementation are resulting in the native vegetation successfully reestablishing within the project area.

3. Are the Outcome Indicators Adequate to Evaluate Change Resulting From the Work?

All regulatory permits are issued and 60-90 percent design documents produced

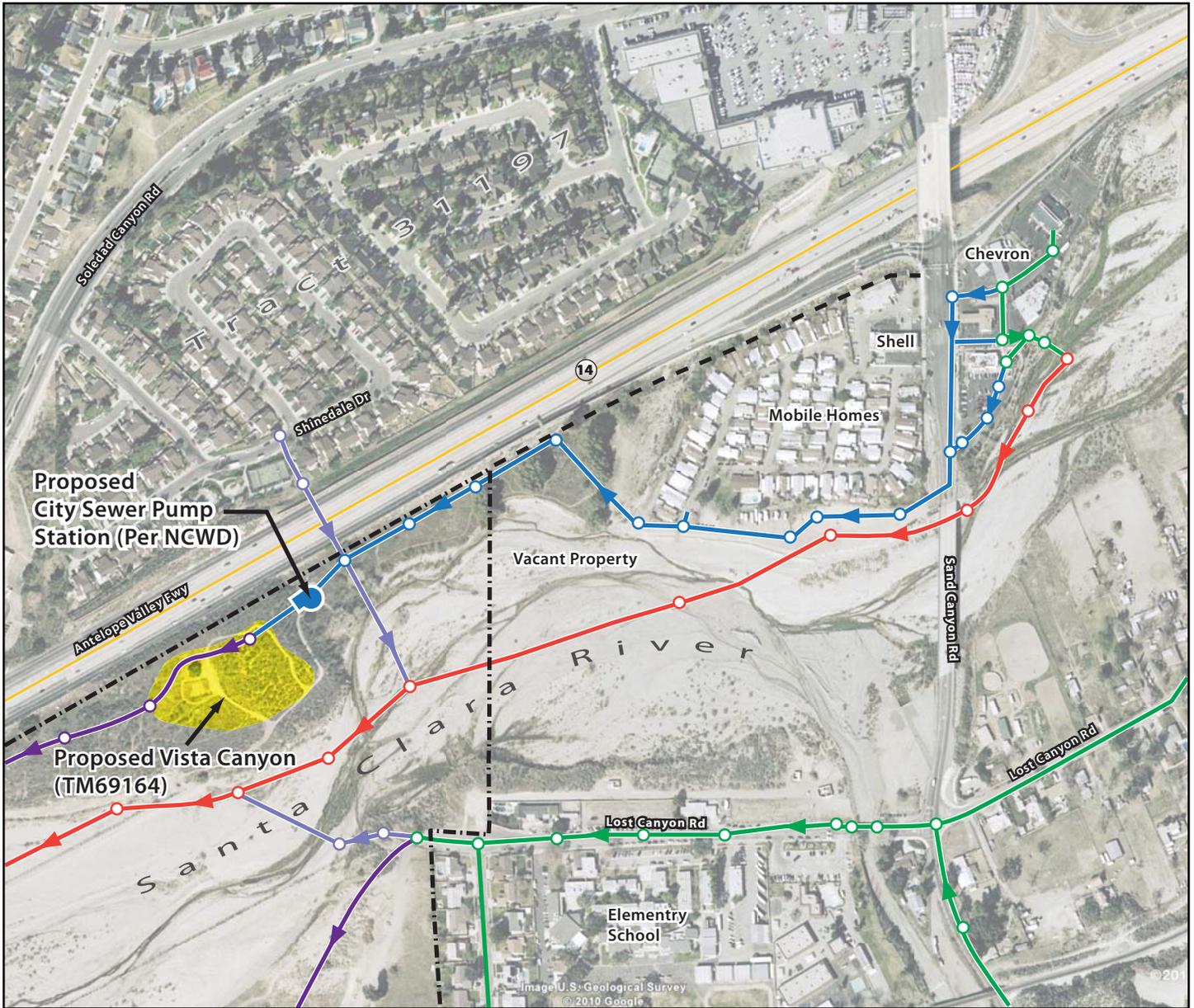
This outcome indicator shows that the project is progressing and completing the tasks necessary to complete Phase 1 and move on to the construction of the project in future Phases 2 and 3.

Percent increase in native vegetation coverage

This outcome indicator provides the delta as compared to the baseline by which to measure progress of the project. Tracking this data point over time will indicate whether the native vegetation is successfully being reestablished.

4. Is it Feasible to Meet the Targets within the Life of the Proposal?

Yes, NCWD is committed to completing the planning and design of the Project within the timeframe of the Proposal and within the budget proposed. The project is structured in a phased approach so that each phase can be implemented in an efficient and practical manner, well suited to the District's financial capabilities and needs of the Project.



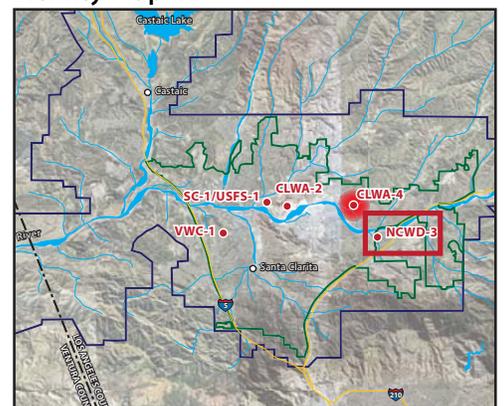
LEGEND:

- Proposed City Sewer (per NCWD)
- Proposed City Sewer (per VC)
- Existing City Sewer
- Existing NCWD Sewer
- Existing County Sewer
- Vista Canyon Boundary
- Existing Caltrans Fence
- Interstate Line

Sources:

1. Alliance - Sand Canyon Sewer Relocation Exhibit, 11/06/09
2. Google Earth - Image U.S. Geological Survey

Vicinity Map



NCWD-3

Santa Clara River Sewer Trunk Line Relocation (Phase 1) Project

**TABLE 6-2
 SEWER TRUNK LINE REMOVAL PROJECT PERFORMANCE MEASURES**

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
To complete the planning and design of the project	Issuance of permits required to move forward onto Phase 2 and Phase 3 of the project	Preparation of all necessary engineering studies, reports, and plans and make submittals to regulatory agencies	All regulatory permits are issued and 60-90 percent design documents produced	Submittal and feedback from regulatory agencies and permits issued	Design and specifications are at 100percent and permits are included within the design documents
Minimize or eliminate disturbance of native vegetation caused by ongoing maintenance	Native vegetation of the affected area	Native vegetation re-established in the area	Percent increase in native vegetation coverage	Riverbank protection monitoring plan will ensure native vegetation is reestablished	Native vegetation monitoring program complete

Santa Clarita Valley Southern End Recycled Water Project (VWC - 1, SCV Recycled Water)

Project Overview

Valencia Water Company (VWC) wants to expand the existing recycled water transmission and distribution system within the Santa Clarita Valley in order to supply recycled water to additional customers within its service area. VWC currently relies on imported State Water Project (SWP) water (imported via CLWA) to meet roughly one-half of its potable water demands. The balance of the VWC's potable demand is met through local groundwater sources. The use of recycled water made available via the Project will offset the use of 910 AFY of imported water because imported water is the marginal water source (i.e., it is the most expensive source of supply available to VWC).

Performance Measures

The primary goal of the SCV Southern End Recycled Water Project is to extend recycled water to additional customers to the southerly portion of the Santa Clarita Valley to already identified users.

The SCV Southern End Recycled Water Project performance measures are summarized in Table 6-3 and include: improved water supply reliability and maximization of the beneficial use of recycled water; and improved water quality.

The SCV Southern End Recycled Water Project would improve water supply reliability by expanding the local recycled water supply, to the southerly portion of the Santa Clarita Valley that would be used in lieu of imported supply. By offsetting current potable water use with recycled water, the project reduces reliance on existing demand for imported water. Reduced need for SWP imported water leads to three benefits: 1) avoided costs of imported water, 2) avoided costs of imported supplies, and 3) reduced stress on the Bay Delta. The amount of avoided imported water demand as a result of the project would be quantified as the amount of recycled water delivered to customers. This new source of water would be a drought proof supply, thereby increasing local water supply reliability. Both the actual amount of imported water and amount of recycled water delivered to customers would be monitored to track the progress of the project. The reduction in dependence of imported water is assumed to be the delivery of recycled water to customers. The Project's use of 910 AFY of recycled water would meet the IRWMP objective **Increase Water Supply**, and help to meet the measurable target of increased use of recycled water by 17,400 AFY by 2030 in the 2005 UWMP.

The SCV Southern End Recycled Water Project would improve water quality within the Basin by contributing to a reduction in the import of chloride to the Basin, and would meet the IRWMP objective **Improve Water Quality**. By serving customers recycled water in lieu of imported water, this project avoids the introduction of additional salts to the Basin. As a new supply produced from local water, recycled water contains salts, nutrients and other constituents that were already present in the basin. Water which is imported from outside of the Basin, also contains salts, nutrients and other constituents. When imported water is used in the Basin, those salts nutrients and other constituents remain in the Basin increasing the mass of salts in the Basin. By avoiding additional water imports, using recycled water effectively avoids importing additional salts. The improvement in water quality would be measured as the avoided water imported to the Region

(equal to the delivery of recycled water to customers) multiplied by the chloride concentration to provide an estimate of mass of salt that will NOT be imported in the Basin. Monitoring will take place at the WRP and at the end of distribution; see Figure VWC-1 for identification of these locations.

By offsetting imported water demands with locally produced water, the project will also avoid emissions of CO₂ (a greenhouse gas) generated by the production of energy required to transport imported water to the VWC service area. The long-distance transport of water in conveyance systems is a major element of California's total demand for electricity. The reduction in CO₂ emissions would be measured as the avoided imported water to the Region versus the use of recycled water, which will be measured as part of this performance measure, and the reduction in energy requirements resulting from this project.

1. Is the Project Consistent with the Basin Plan?

Yes, the project is consistent with the Basin Plan. The project does not contribute to the nitrate or chloride TMDLs which are currently listed on the 303(d) lists for the Santa Clara River, nor does the project contribute to an exceedance of any water quality objectives within the watershed. Beneficial reuse of the recycled water will ensure that long-term water quality improvements are realized in the Region. More specifically, by serving customers recycled water in lieu of imported water, this project avoids the introduction of additional salts (i.e., total dissolved solids) to the basin. As a new supply produced from local water, recycled water contains salts, nutrients and other constituents that were already present in the basin. SWP water, which is imported from outside of the basin, also contains salts, nutrients and other constituents. When imported water is used in the basin, those salts nutrients and other constituents are imported to and remain in the basin. By avoiding SWP water imports, using recycled water effectively avoids importing additional salts.

2. Do the Output Indicators Effectively Track Output?

Availability of recycled water for residential and M&I uses

This output indicator will be used to track the progress of the project and provide an accurate account of the recycled water being produced throughout the Region.

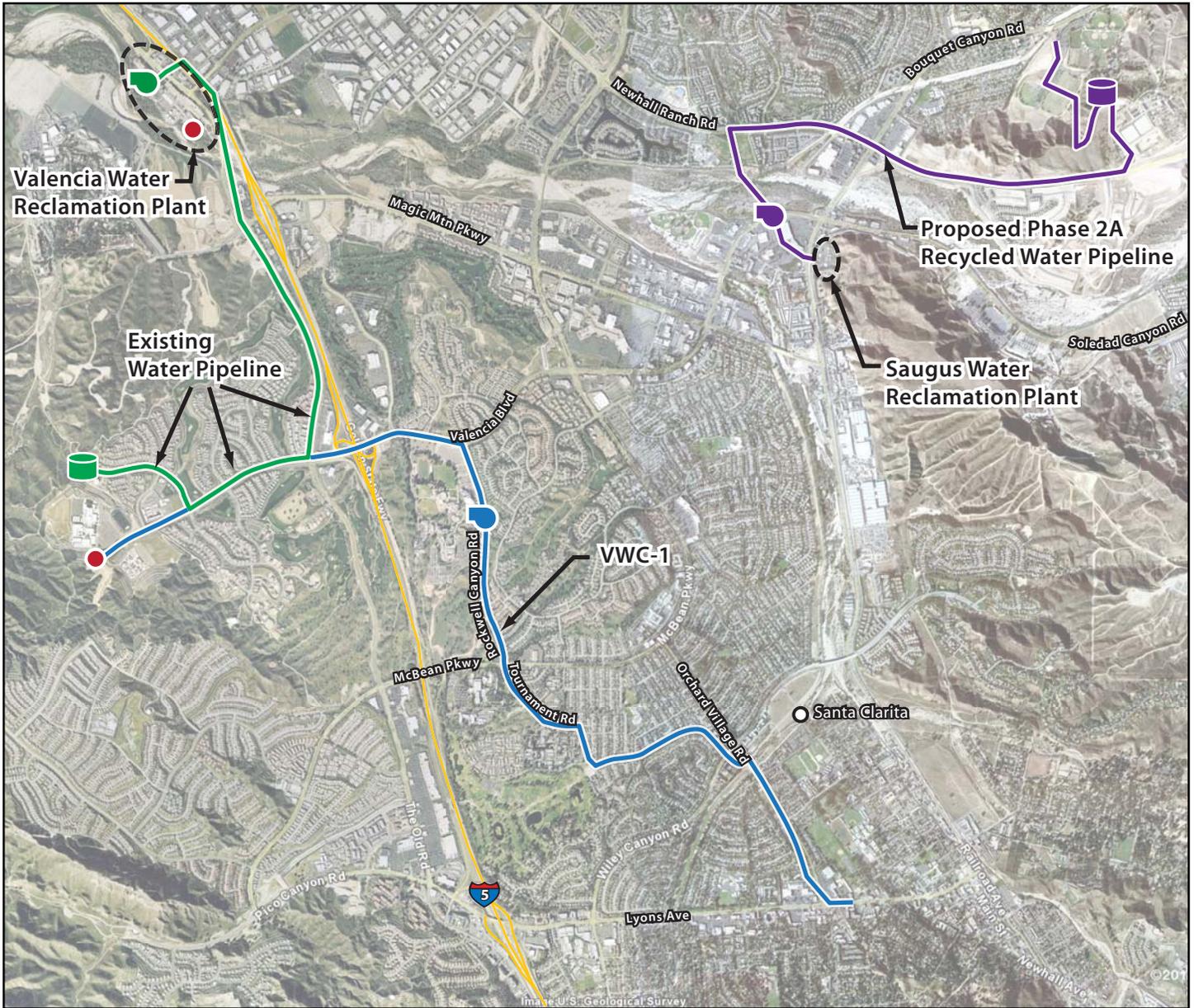
Monitoring of effluent for water quality constituents identified in Waste Discharge Requirements (WDSs) and Title 22 of the California Code of Regulations

This output indicator will be used to track the total quantity of effluent to ensure regulatory requirements are met. WDRs dictate water quality requirements for the effluent that is discharged from the plant. Title 22 requirements are standards for water quality that dictate the type of reuse.

3. Are the Outcome Indicators Adequate to Evaluate Change Resulting From the Work?

Quantification of the recycled water produced as a result of the project

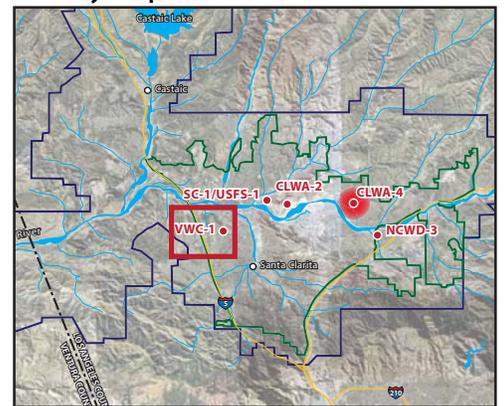
This outcome indicator will provide the actual amount of recycled water produced in the Region.



Legend:

-  Water Pump Station
-  Water Pipeline
-  Water Storage Tank
-  Interstate Line
-  Monitoring Location

Vicinity Map



Sources:

1. Draft Recycled Water Phase 2C Planning & Preliminary Design Layout
2. Google Earth - Image U.S. Geological Survey

VWC-1

SCV Southern End Recycled Water Project

Quantification of the local water resources (i.e. recycled water) used in lieu of imported water as a result of the project

This outcome indicator will provide the actual amount of recycled water used in the Region, replacing imported water and/or groundwater supplies.

Improved effluent quality

The outcome indicator will evaluate the improvement in water quality resulting from the projects and will be used to determine the improvement in effluent quality resulting from the projects.

4. Is it Feasible to Meet the Targets within the Life of the Proposal?

There is considerable information to support the feasibility of a recycled water market within the Santa Clarita Valley, and where recycled water can specifically replace potable water. Both the Recycled Water Master Plan (2002), and the Dexter Wilson Technical Memorandum (References VWC-1.1 and VWC-1.3) concluded that the Project was feasible for implementation on a per-acre cost basis and on the identified recycled water demands. Thus it is feasible that these targets will be met within the life of the Proposal.

**TABLE 6-3
 SCV Southern End Recycled Water Project Performance Measures**

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
Improve water supply reliability by creating new supply & maximize beneficial use of recycled water supply	Increased use of underutilized recycled water	Availability of recycled water for residential and M&I uses	Quantification of the recycled water produced as a result of the project	Recycled water effluent flow meters at Valencia WRP	Production capacity of approximately 910 AFY of new recycled water
			Quantification of the local water resources (i.e. recycled water) used in lieu of imported water as a result of the project	Volume delivered to recycled water customers per customer flow meters	Expected delivery of 455* AFY by 2014 and 8,190 AFY by 2020

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
Improve water quality	Produce effluent that meets WDR and Title 22 requirements for restrictions	Monitoring of effluent for water quality constituents identified in WDRs and Title 22	Improved effluent quality	Part of standard monitoring data collected by SCVSD	Meet or exceed WDR for effluent 100 percent of the time
Reduced GHG emissions	Reduced emissions of CO ₂	Availability of recycled water for residential and M&I uses	Quantification of the recycled water produced a result of the project	Quantification of the recycled water produced a result of the project	Reduction in the emission of 222 metric tons of CO ₂ per year or 10,791 metric tons of CO ₂ over the 50-year project lifetime

* The Project will become operational in mid-2014, so will deliver 455 AF in that year.

Electrolysis and Volatilization for Bromide Removal and Disinfectant Byproduct Reduction Demonstration Plant (CLWA – 2, Bromide Removal)

Project Overview

Bromide is a non-volatile anion found in all natural waters. Although bromide is generally considered non-toxic at concentrations found in most drinking water sources, it reacts with a variety of commonly used disinfectants, most notably ozone and chlorine, to create by-products that are of serious public health concern. CLWA has developed a technology that can remove bromide from SWP water. However, this technology needs to be scaled up to determine if it is effective at treatment volumes that make it cost effective. The Bromide Removal Project would improve drinking water quality and allow for disinfectant treatment flexibility.

Performance Measures

The Bromide Removal Project performance measures are summarized in Table 6-4 and include: improved water quality; and making feasible the bromide electrolysis and volatilization technology.

The proposed project is a pilot plant which will treat 300,000 gallons per day (gpd). If the demonstration plant is successful, the Agency can scale up the size of the plant to ultimately treat all of the imported water in the Castaic Lake Water Agency Service area (260,000 customers).

The Agency has been using chloramines to treat drinking water since 2005. If the demonstration plant were sufficiently effective, the plant could return to using free chlorine for disinfection. This would save money (reduced ammonia), improve the chemical water quality (decrease nitrification), improve microbial protection, and improve water quality in regards to discharges to water reclamation plants and direct discharges to the Santa Clara River. This project contributes to the IRWMP objective to **Improve Water Quality**. Refer to Figure CLWA-2 for the detailed project and monitoring locations.

1. Is the Project Consistent with the Basin Plan?

Yes, the project is consistent with the Basin Plan. The project does not contribute to the nitrate or chloride TMDLs which are currently listed on the 303(d) lists for the Santa Clara River, nor does the project contribute to an exceedance of any water quality objectives within the watershed. CLWA-2 will improve the water quality of SWP water and help meet WDRs by reducing bromide loading in the Basin through improved water treatment processes at the RVWTP. The key water quality benefit generated by the Project is compliance with water quality regulations.

2. Do the Output Indicators Effectively Track Output?

Monitoring bromide and concentrations in SWP water

This output indicator monitors the concentration of bromide entering the Basin from SWP water.

Preparation of all necessary engineering studies, reports, and plans and make submittals to regulatory agencies

This output indicator will be used to verify the initial engineering work and permit issuance.

3. Are the Outcome Indicators Adequate to Evaluate Change Resulting From the Work?

Quantification of reduced bromide and DBPs as a result of the project

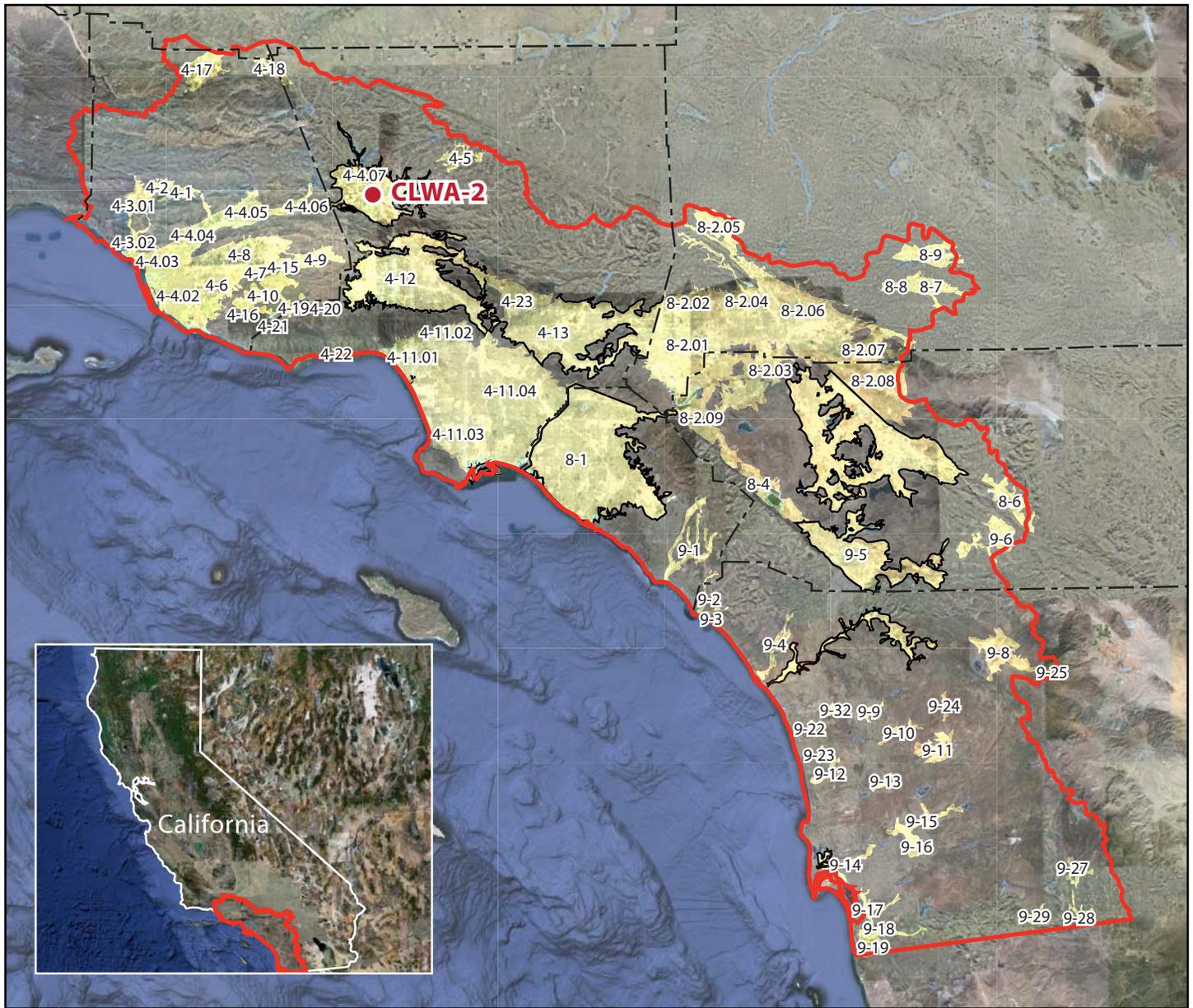
This outcome indicator will evaluate the improvement in water quality resulting from the project and will be used to determine the quantity in tons of bromide per year removed as a result of the project.

Necessary approvals are obtained from regulatory agencies to allow construction and operation of the treatment plant

This outcome indicator is adequate because prior to construction of the Demonstration Plant all permits will need to be obtained from the appropriate regulatory agencies, in particular, the California Department of Public Health.

4. Is it Feasible to Meet the Targets within the Life of the Proposal?

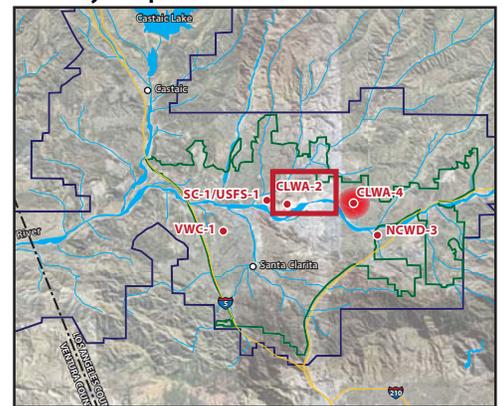
There are a number of technical peer reviewed reports that support the technical adequacy of the CLWA-2 project. The two references that were chosen (see the Work Plan in section 3) because they demonstrate the capability of the water treatment technology being proposed, the use of the technology on waters used by CLWA, and the sufficiency of a pilot project. Reference CLWA-2.2 goes even further to confirm that the treatment technology when used on SWP water under various conditions, demonstrated a removal of up to 35 percent of bromide and up to 60 percent less disinfection by-products (DBPs) measured. Reference CLWA-2.2 summarizes the results of a first-phase bench, pilot, and feasibility study investigating the practicality of using electrolysis to remove bromide and brominated DBPs from drinking water. The study was funded by CLWA and AwwaRF. The authors, listed in the blue box, are currently seeking funding for a second phase Tailored Collaboration project to further demonstrate this technology's efficacy, develop a preliminary design of the electrolytic reactor, evaluate safety issues, and quantify capital and operation and maintenance costs. Thus, it is feasible to meet the following targets within the life of the Proposal.



LEGEND:

- Groundwater Basin
- Hydrologic Region Boundary
- 4-17 Basin Number
- 8-2.05 Subbasin Number
- County Line

Vicinity Map



Sources:

1. South Coast Hydrologic Region, State of California - Department of Water Resources
2. Google Earth - Image U.S. Geological Survey

**CLWA-2
Bromide Removal Project**

**TABLE 6-4
 BROMIDE REMOVAL PROJECT PERFORMANCE MEASURES**

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
Improve Water Quality	Reduced import of bromide into the groundwater Basin	Monitoring bromide concentrations in SWP water	Quantification of reduced bromide and DPBs as a result of the project	Part of standard Monitoring data collected by CLWA	Reduction in X tons of bromide per year to the Region over project lifetime
To make feasible the bromide electrolysis and volatilization technology on a large enough scale to be cost effective, and thus beneficial the entire Valley	Provide a proven technology for future electrolysis and volatilization projects similar water types	Preparation of all necessary engineering studies, reports, and plans and make submittals to regulatory agencies	All regulatory permits are issued to construct the Demonstration Project	Submittal and feedback from regulatory agencies and permits issued	Demonstration Project is constructed

Santa Clara River, San Francisquito Creek Arundo and Tamarisk Removal Project (SC – 1/USFS – 1, SCR Arundo Removal)

Project Overview

The Santa Clara River (SCR) Arundo Removal Project is the implementation of a site specific Arundo and Tamarisk removal project within the City of Santa Clarita in a highly visible area bordered by recreational trails to demonstrate a natural resource management project to the public, improve habitat, and increase surface water. Due to the nature of Arundo and Tamarisk, it is necessary to undertake removal and restoration of these invasive plant species, some of which have colonized in large extents in the Upper Santa Clara River watershed, to prevent “re-seeding” of the noxious weed in the lower river reaches.

Performance Measures

The goals of this project are at minimum to successfully eradicate Arundo and Tamarisk from within the Project Area 1, as described in Phase 1 of the work plan. The SCR Arundo Removal project will result in increased river flows via elimination of water loss from evapotranspiration as Arundo consumes almost three times the amount of water used by native species, and studies of arundo in the Santa Clara River have shown transpiration of about 10 acre-feet per acre. One adult tamarisk tree can consume approximately four acre-feet of groundwater annually. With an assumed restoration of at least 20 acres of Arundo and Tamarisk to be removed from the River, the project would save at least 140 acre feet of water on an annual basis. The project meets the IRWMP objective to Promote Resource Stewardship and will contribute to the target of reducing invasive species to 40 percent or less cover of the understory and canopy in years 1 to 5. The project's water savings will help to meet the IRWMP objective Reduce Water Demand and will be applied to the measurable target to reduce overall water demand by 10 percent throughout the region by 2030.

The SCR Arundo Removal Performance Measures are summarized in Table 6-5 and include: eliminating Arundo and Tamarisk from the upper Santa Clara River; improved water quality within the River; and prevention of future reinfestations of the invasive species.

The project sites will be frequently monitored to ensure that any changes, such as additional Arundo resprouts, will be treated in a timely manner. Previous restoration efforts have shown that this after treatment monitoring and maintenance program is essential to the success of the restoration effort. The monitoring and maintenance program is backed by the Santa Clara River Invasive Weeds Task Force and funded through an endowment that the US Fish and Wildlife Service developed specifically to fund long term management of previously cut Arundo infestation areas. The City has been in discussions with US Fish and Wildlife Service to continue the life of this program. Potential monitoring locations are shown on the detailed project map, Figure SC-1/USFS-1.

1. Is the Project Consistent with the Basin Plan?

Yes, the project is consistent with the Basin Plan. The project does not contribute to the nitrate or chloride TMDLs which are currently listed on the 303(d) lists for the Santa Clara River, nor does the project contribute to an exceedance of any water quality objectives within the watershed. The

Project's design and implementation methods were evaluated as part of the Upper Santa Clara River Arundo/Tamarisk Removal Plan (SCARP). Water quality monitoring for the site specific project was performed before and after implementation. Due to the long-term nature of invasive plant removal benefits, immediate water quality advantages are not necessarily measurable. Results for both baseline and post-treatment sampling at both upstream and downstream sampling sites are well below stated objectives by the Basin Plan for nitrate, nitrite, total dissolved solids, and ammonia.

2. Do the Output Indicators Effectively Track Output?

Re-establishment of native vegetation after treatment

This output indicator will document progress towards elimination of the invasive species by allowing for the native species to regain dominance within the area.

No recurrence of Arundo or Tamarisk

This output indicator will prove that the eradication was a success and provides a measurable scale by which to track project progress.

Re-establishment of native vegetation and species recovery

This output indicator will document the improvement in water quality expected from removing Arundo, a choking weed. Removal of the thick stands of Arundo will also reduce river erosion while protecting adjacent land uses from flooding, allowing for the native vegetation and species recovery to occur.

Development of PAEP and monitoring plan

This output indicator will allow for systematically planning and tracking of eradication efforts so that once the restoration in the Phase 1 (site specific) are complete, there is a plan to continue the efforts into the Angeles Forest area in a similar controlled manner.

3. Are the Outcome Indicators Adequate to Evaluate Change Resulting From the Work?

Percent decrease in Arundo and Tamarisk cover

This outcome indicator will provides a measurable scale by which to track project progress.

Improved water quality and species viability

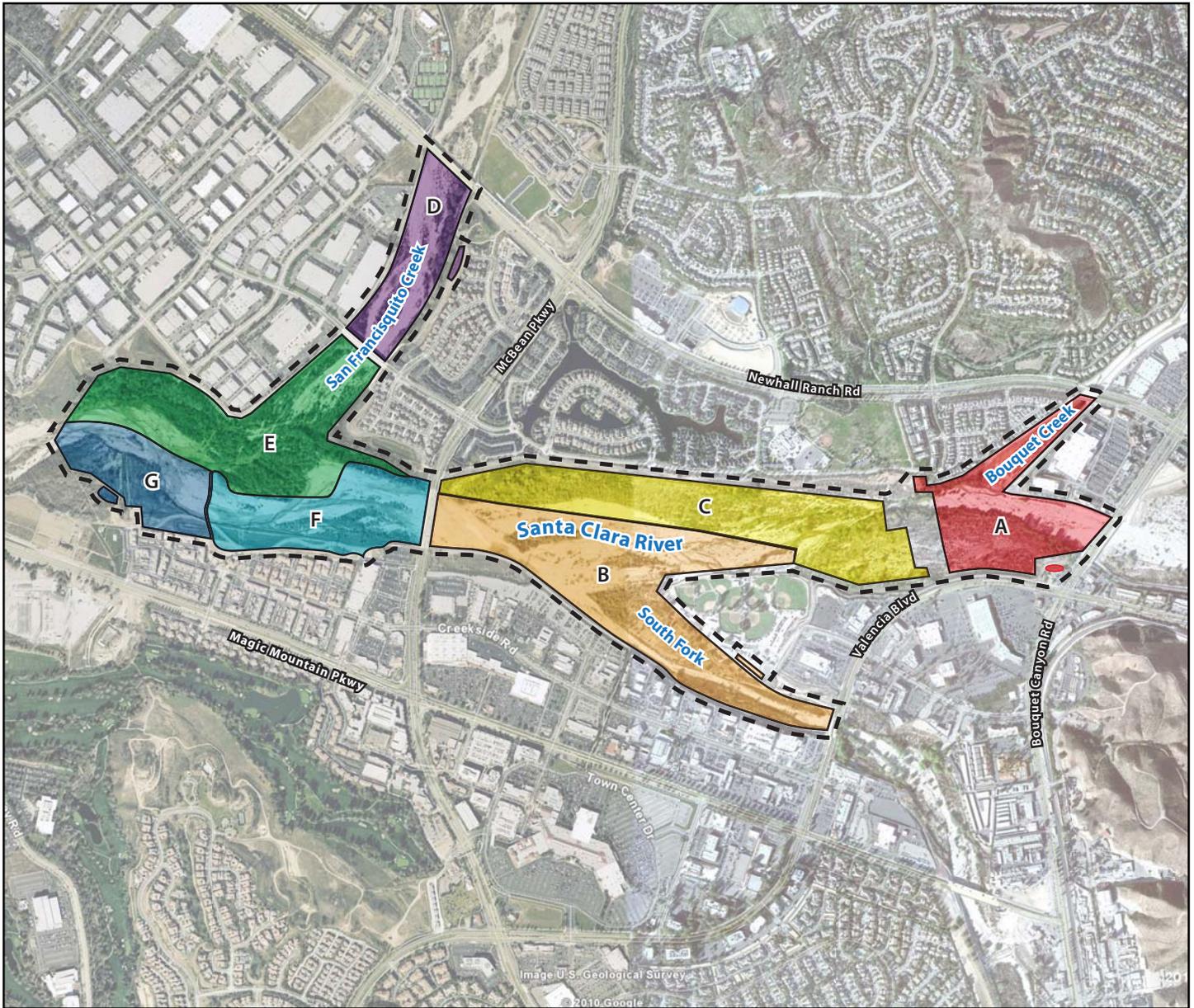
This outcome indicator provides the necessary data needed to determine the environmental benefit result from the project by monitoring the water quality and recurrence of native species to the sites.

Percent recurrence with observed transition to pre-infestation conditions

This outcome indicator allows for tracking of eradication progress as well as indicating how long it will take for regrowth to occur which can be factored into monitoring cycles for new eradication sites.

4. Is it Feasible to Meet the Targets within the Life of the Proposal?

The identified targets in Table 6-5 can be achieved within the life of the Proposal. Restoration efforts at the City's 297-acre site were first implemented in 2006 and 75 acres of Arundo and Tamarisk were successfully removed. A lapse in funding resulted in a hold on the project, however it did allow for gauging how much restoration could be done with what funds and with what



LEGEND:

- Project & Staging Area A
- Project & Staging Area B
- Project & Staging Area C
- Project & Staging Area D
- Project & Staging Area E
- Project & Staging Area F
- Project & Staging Area G
- Project Area of Phase 1

Sources:

1. Upper Santa Clara River Watershed Arundo and Tamarisk Removal Project (SCARP), Site-Specific Implementation Project (SSIP) Area, Wildscape Restoration, November 2008
2. Google Earth - Image U.S. Geological Survey

Vicinity Map

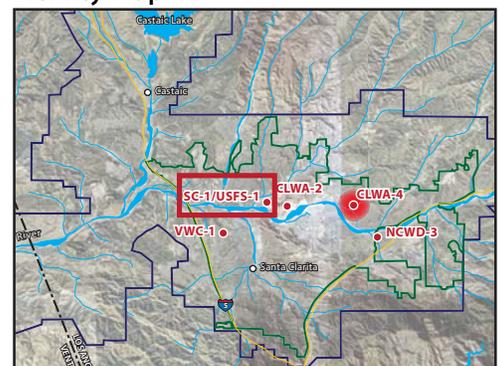


FIGURE 1 OF SC-1/USFS-1
 Santa Clara River, San Francisquito
 Creek Arundo & Tamarisk
 Removal Project, Phase 1

resources. Given the commitment to post eradication monitoring, an endowment from the US Fish and Wildlife Service, it is with high certainty that the targets are feasible.

**TABLE 6-5
 SCR ARUNDO REMOVAL PROJECT PERFORMANCE MEASURES**

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
Eliminate Arundo from the upper Santa Clara River	Complete eradication from the Phase 1, site specific project area site	Re-establishment of native vegetation after treatment No recurrence of Arundo	Percent decrease in Arundo cover	Direct observation and monitoring records of the Task Force and US Fish and Wildlife Service	100 percent eradication of Arundo from the Phase 1, site specific project area site
Eliminate Tamarisk from the upper Santa Clara River	Complete eradication from the Phase 1, site specific project area site	Re-establishment of native vegetation after treatment No recurrence of Tamarisk	Percent decrease in Tamarisk cover	Direct observation and monitoring records of the Task Force and US Fish and Wildlife Service	100 percent eradication of Tamarisk from the Phase 1, site specific project area site
Improve water quality within the Santa Clara River	Improve water quality for habitat and groundwater recharge	Re-establishment of native vegetation and species recovery	Improved water quality and species viability	Monthly monitoring of water quality (dissolved oxygen, pH, temperature, turbidity, conductivity, salinity, TDS)	Overall improvement of water quality, based on upstream of restoration area vs. downstream of restoration area comparisons
Prevent reinfestation of Arundo and Tamarisk	5 years on continuous monitoring with zero infestations	Development of PAEP and monitoring plan	Percent recurrence with observed transition to pre-infestation conditions	Direct observation and monitoring records of the Task Force and US Fish and Wildlife Service	Zero reinfestation for 5 consecutive years during monitoring