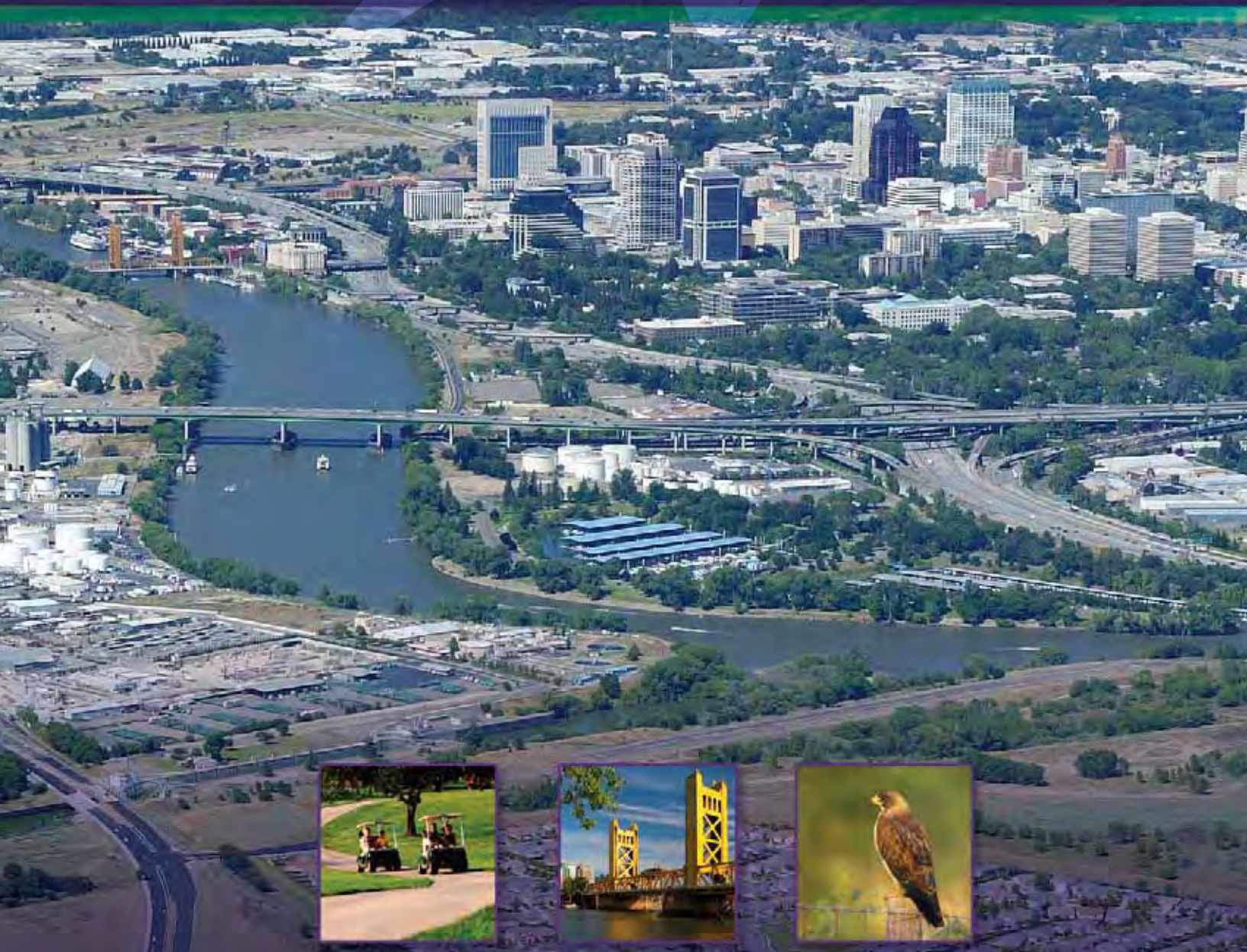
WATER RECYCLING
It's only natural

SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT

# WATER RECYCLING OPPORTUNITIES STUDY









EXECUTIVE SUMMARY | FEBRUARY 2007

# ACKNOWLEDGMENTS

## *Water Recycling Advisory Committee*

The Water Recycling Advisory Committee (WRAC) was formed in 2005 as a means of gaining valuable insight into the Water Recycling Opportunities Study (WROS) and providing an opportunity for stakeholders to learn more about planned water recycling program activities. The WRAC ensured concerned agencies, organizations, communities and other stakeholders were able to inform, comment on and improve the WROS as it was being developed.

The WROS has benefited greatly from the input and participation of the WRAC. The Sacramento Regional County Sanitation District (SRCSD) extends its appreciation to the following organizations for their role in making this program one that is visionary, strategic and attainable:

- Building Industry Association
- California Department of Health Services
- City of Elk Grove
- City of Folsom
- City of Rancho Cordova
- City of Roseville
- City of Sacramento, Department of Parks and Recreation
- City of Sacramento, Department of Utilities
- City of West Sacramento
- City of West Sacramento, Facility Development & Maintenance
- Cordova Recreation and Parks District
- County of Sacramento, Department of Environmental Review and Assessment
- California Department of Water Resources-Office of Water Use Efficiency
- El Dorado Irrigation District
- Elk Grove Unified School District
- Environmental Council of Sacramento
- Regional Water Authority
- Sacramento County Environmental Management Department
- Sacramento County Regional Parks
- Sacramento County Water Agency
- Sacramento Regional County Sanitation District
- The Cosumnes Community Services District (formerly Elk Grove Community Services District)
- The Nature Conservancy

# Project Team

SRCSD wishes to acknowledge the WROS Project Team.

## SRCSD MANAGEMENT AND PROJECT TEAM

Glenn Bielefelt
Kent Craney
Stan Dean
Christoph Dobson
John Dodds
Gerald Fejarang
Heleana Galvan
Claudia Goss
Wendell Kido
Helen Lu
Marcia Maurer
Terrie Mitchell
Mark Newton
Dave Ocenosak
Steve Ramberg
Jose Ramirez
Ruben Robles
Patrick Schroeder
Robert Seyfried
Robert Shanks
Mary Snyder
Prabhakar Somavarapu
Lysa Voight

## CONSULTANT PROJECT TEAM

### MWH Americas, Inc.

Samer Adham
Elizabeth Brown
John Buttz
Ping Chen
James Darke
Marshall Davert
LaSandra Edwards
Jafar Faghih
Jonathan Goetz
Dawn Guendert
Rajaa Hassan
Richard Howell
Stephen Irving
Mary Jimenez
Jennifer Johnson
Stephen Lacy
Ian Lang
Mike Massaro
Robert Maurer
Vanessa Nishikawa
Richard Plecker
Mimi Reyes
Yung-Hsin Sun
Khalid Talaat
Peggy Umphres
Craig Wallace
Keith Wallace
Mike Watson

### Larry Walker Associates

Tom Grovhoug

### Lucy & Company

Lucy Eidam
Joshua Newcom
Cinamon Vann

### Somach, Simmons & Dunn

Andrew Hitchings
Paul Simmons

### SRCSD Consultants

Craig Johns
Robert Shanks

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# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ADWF | Average Dry Weather Flow |
| AF/year | Acre-feet per year |
| ARB IRWMP | American River Basin Integrated Regional Water Management Plan |
| Bart Cavanaugh | Bartley Cavanaugh Golf Course |
| B/C | benefit/cost |
| BCE | Business Case Evaluation |
| Bill Conlin | Bill Conlin Park |
| BOS | Board of Supervisors |
| Cal-Am | California-American Water Company |
| Capital Golf | Capital Golf Department |
| CDP 3.0 | Criterium Decision Plus 3.0 |
| CEQA | California Environmental Quality Act |
| Cherry Island/ Gibson Ranch | Cherry Island Golf Course, Cherry Island Soccer Field Complex, Gibson Ranch County Park, Antelope Greens Golf Course, and Northbrook Park |
| CVRWQCB | Central Valley Regional Water Quality Control Board |
| Delta Shores | Delta Shores Development |
| DHS | California Department of Health Services |
| DWR | California Department of Water Resources |
| EID | El Dorado Irrigation District |
| EID WRMP | El Dorado Irrigation District Water Recycling Master Plan |
| EIR | Environmental Impact Report |
| Elk Grove | City of Elk Grove |
| EMB | Effluent Management Benefits |
| ESP | Elverta Specific Plan |
| EUAC | Equivalent Uniform Annual Cost |
| EUAC/AF | Equivalent Uniform Annual Cost per acre-foot |
| Folsom | City of Folsom |
| FRWA | Freeport Regional Water Authority |
| Glenborough Development | Glenborough Development, also know as Glenborough at Easton and Easton Place, and Glenborough Planning Areas |
| GSWC | Golden State Water Company |
| hp | horsepower |
| IRWM | Integrated Regional Water Management |
| kWh | kilowatt-hour |
| LNWI | Lower Northwest Interceptor |
| MBR | Membrane Bio-Reactor |

| | |
|---|---|
| MCDA | Multi-Criteria Decision Analysis |
| MF | microfiltration |
| MG | million gallons |
| MGD | million gallons per day |
| ml | milliliter |
| MOU | Memorandum of Understanding |
| MPN | Most Probable Number |
| NCMWC | Natomas Central Mutual Water Company |
| NJV | Natomas Joint Vision |
| NPDES | National Pollutant Discharge Elimination System |
| O&M | Operations and Maintenance |
| Parks & Rec | City of Sacramento Parks and Recreation Department |
| PCC | Probable Construction Cost |
| POA | Principles of Agreement |
| Rancho Cordova | City of Rancho Cordova |
| Regional Parks | County of Sacramento Department of Regional Parks |
| RLECWD | Rio Linda/Elverta Community Water District |
| RO | reverse osmosis |
| RWA | Regional Water Authority |
| RWQCB | Regional Water Quality Control Board |
| SCWA | Sacramento County Water Agency |
| SGA | Sacramento Groundwater Authority |
| SOI | Sphere of Influence |
| SRCSD | Sacramento Regional County Sanitation District |
| SRWTP | Sacramento Regional Wastewater Treatment Plant |
| SWRCB | State Water Resources Control Board |
| TDS | Total Dissolved Solids |
| TM | Technical Memorandum |
| TNC | The Nature Conservancy |
| TOC | Total Organic Carbon |
| TPCC | Total Probable Capital Cost |
| UF | ultrafiltration |
| UNWI | Upper Northwest Interceptor |
| West Sacramento | City of West Sacramento |
| WRAC | Water Recycling Advisory Committee |
| WRF | Water Reclamation Facility |
| WROS | Water Recycling Opportunities Study |

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SECTION 1

# INTRODUCTION

The Sacramento Regional County Sanitation District (SRCSD) is considering implementation of a large-scale Water Recycling Program. In January 2004, the SRCSD Board of Directors approved the concept of this program which includes the following goals:

- Increase water recycling throughout the Sacramento region on the scale of 30 to 40 million gallons per day (MGD) over the next 20 years.
- Increase utilization of recycled water to expand SRCSD's effluent management options beyond continued discharge to the Sacramento River.
- Increase utilization of recycled water to meet growing non-potable demands, allowing Sacramento area water purveyors to reduce demands on their existing high quality water supplies and reduce the need for additional water supplies in the future.

To evaluate the feasibility of implementing a large-scale Water Recycling Program, SRCSD began preparation of its Water Recycling Opportunities Study (WROS) in November 2004. The WROS serves to (1) study areas throughout the Sacramento Region and SRCSD service area to identify potential water recycling opportunities, (2) engage potential water recycling partners and stakeholders, (3) develop, assess, and prioritize potential water recycling projects, and (4) provide a strategy to further develop and implement the projects initially selected to move forward in achieving the stated goals of the large-scale Water Recycling Program.

The WROS and large-scale Water Recycling Program build on SRCSD's existing small-scale Water Recycling Program, which was developed in the mid-1990s and began service to communities in southern Sacramento County in 2003. This small-scale program allowed SRCSD to gain experience in developing and operating its existing Water Reclamation Facility (WRF) at the Sacramento Regional Wastewater Treatment Plant (SRWTP).

The WROS is the culmination of 2 years of effort, and is one of many steps toward implementation of a large-scale Water Recycling Program. For some of the most promising water recycling projects identified in the WROS, the next step in implementation will include additional "feasibility-level" analysis. The purpose of the feasibility-level analysis is to further develop the technical, institutional, and financial aspects of the projects to allow SRCSD and its potential water recycling partners to decide whether or not to move forward with implementation. Provided one or more of the projects proves viable for SRCSD and associated water purveyors and land use authorities, additional implementation steps are described, in general, in the last section of this document.

This Executive Summary contains an overview of the WROS, while the groundwork supporting the findings presented herein is compiled in a series of detailed Technical Memoranda (TM) that are bound separately in **Appendices A** through **F**.

## Setting

### California

Recycled water has been successfully used in California since the turn-of-the-century, beginning with the landscape irrigation of Golden Gate Park in the early 1900s. Today, non-potable use continues around the state with the irrigation of agricultural crops and landscapes, industrial uses such as cooling towers at thermal generation plants, and habitat restoration/ protection.

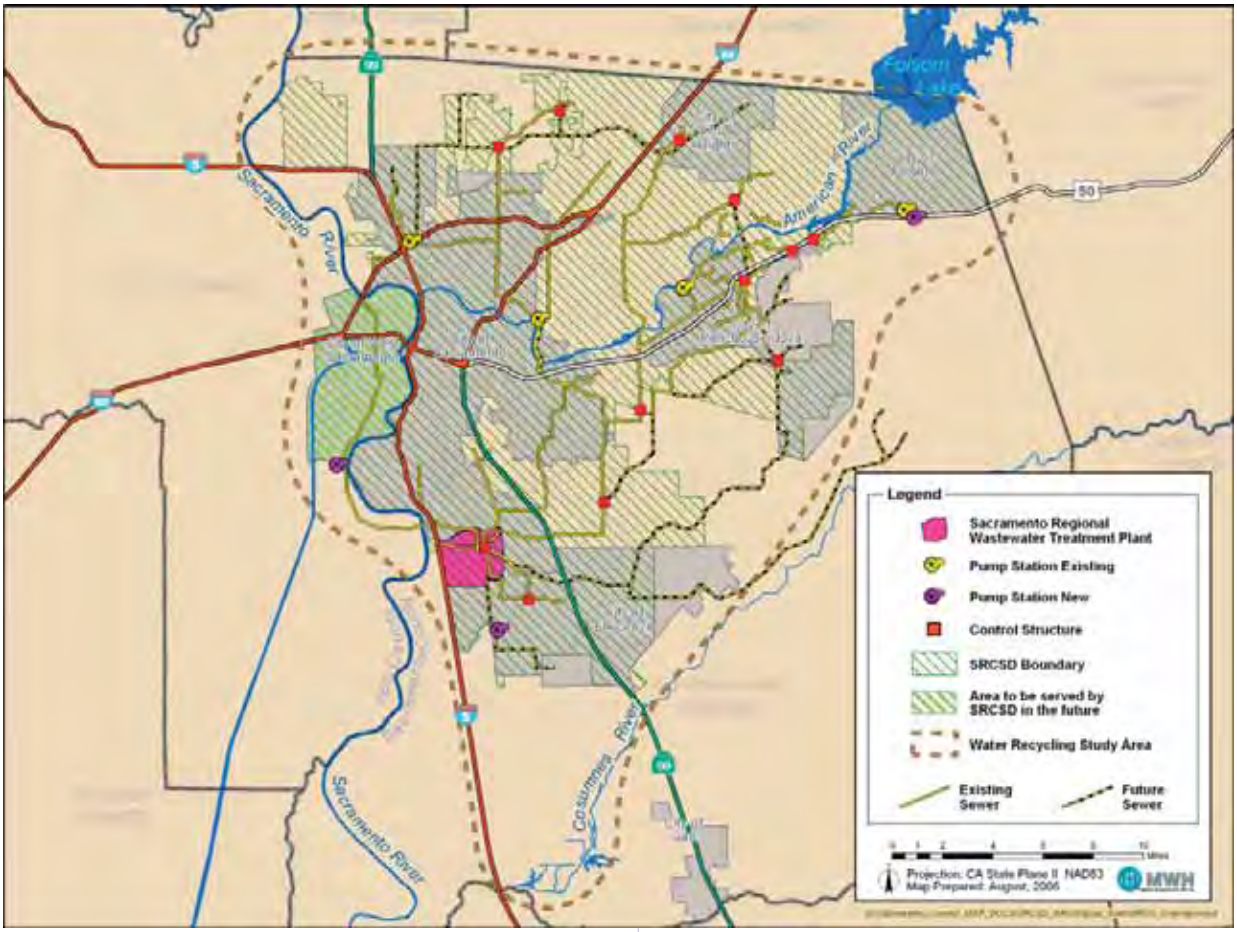


**Figure 1-1 | SRCSD Water Recycling Opportunities Study Area Map**

Both California laws and local ordinances have stressed the importance of water recycling as a viable source of water supply. At a state level, water recycling law:

- Authorizes land use authorities and other public agencies to require the installation of separate systems for the use of recycled water on private property.
- States that the continued use of potable water for landscape irrigation and certain other non-potable water uses is an unreasonable use of drinking water if recycled water is available and usable for such purposes.
- Calls for increasing water recycling statewide to one million acre-feet per year (AF/year) or over 325 billion gallons per year.

Water recycling ordinances for both cities and counties exist nationally, including in California. Such ordinances commonly require installing recycled water distribution system, or "purple pipe."

Regulation of water recycling is vested by State law in the State Water Resources Control Board (SWRCB) and California Department of Health Services (DHS). Permits are issued to each water recycling project by one of the nine Regional Water Quality Control Boards (RWQCB) that are part of the SWRCB. These permits include water quality protections as well as public health protections by incorporating criteria established by DHS. The criteria issued by DHS are found in Title 22 of the California Code of Regulations. DHS does not have enforcement authority for the Title 22 criteria; the RWQCBs enforce them through enforcement of their permits containing the applicable criteria. To protect public drinking water supplies, DHS also has regulations to prevent cross connections between recycled water systems and potable water systems. Local health departments and DHS have enforcement authority over the DHS cross connection prevention regulations.

**Table 1-1| Sacramento County Population Projections**

| Year | Population | Increase from 2000 | Percentage Increase from 2000 |
|---|---|---|---|
| 2000 | 1,230,465 | --- | --- |
| 2010 | 1,555,848 | 325,383 | 26% |
| 2020 | 1,946,679 | 716,214 | 58% |
| 2030 | 2,293,028 | 1,062,563 | 86% |
| 2040 | 2,579,720 | 1,349,255 | 110% |
| 2050 | 2,959,427 | 1,728,962 | 141% |

*Data Source: California Department of Finance, Demographic Research Unit (May 2004). Used for consistency with statewide projections.*

## SRCSD

SRCSD was established in 1973 and began providing regional wastewater services in 1982 by treating sewage collected from an area that currently encompasses all urbanized areas of Sacramento County and will soon include parts of Yolo County (see **Figure 1-1**). Over the past decade, the regional land use profile has transformed from primarily agricultural to urban in many parts of the SRCSD service area.

Water service for this same geographic region is provided by a host of purveyors, including cities, public and private municipal water utilities, and irrigation districts. Numerous "self-suppliers" are also present in the region (e.g., golf courses, parks, and agricultural interests).

The current institutional separation of the water and wastewater service functions presents challenges to integrated resources planning efforts such as the SRCSD large-scale Water Recycling Program. Additional complexity results from the fact that land use authority also is dispersed among several agencies in the region.

## Region

Recycled water is used to meet non-potable water demands by water purveyors throughout the greater Sacramento area (e.g., Sacramento County Water Agency (SCWA), City of Roseville, El Dorado Irrigation District (EID), Rancho Murieta Community Services District, City of Galt, and City of Lincoln).

Water recycling is, and will continue to be, an important component of regional water resources planning. An example of regional planning is the American River Basin Integrated Regional Water Management Plan (ARB IRWMP)* – a comprehensive planning document prepared on a region-wide scale that identifies priority water resources projects and programs with multiple benefits. The ARB IRWMP relies upon specific and focused local and sub-regional planning efforts, such as the SRCSD WROS, for its foundation, and investigates a broad spectrum of water resources issues including water supply, flood management, water quality, environmental restoration, environmental justice, stakeholder involvement, and far-reaching community and statewide interests. Water recycling is incorporated into the plan's regional objectives, water management strategies, priorities, and necessary projects/programs. Development and implementation of these local and regional projects/programs, such as the large-scale Water Recycling Program, are essential to the continued success of this, and other, integrated regional efforts as well as eligibility for grant funding opportunities (e.g., Propositions 50 and 84).

** The ARB region encompasses all of Sacramento County and most of Placer and El Dorado counties, except the areas in the Tahoe Basin which are part of a separate planning effort. Adopted in May 2006, the ARB IRWMP is being implemented and updated by the Regional Water Authority (RWA), Freeport Regional Water Authority (FRWA), SCWA, participants, stakeholders, and other agencies/organizations.*

# Drivers

Fundamental drivers for the SRSCD large-scale Water Recycling Program are population growth, potentially costly effluent disposal requirements, and concerns of other stakeholders.

## Population Growth

The 2006 population of California is about 36 million, and the California Department of Finance predicts that by 2020, the population will be nearly 44 million. In water and wastewater terms, this increase of 8 million more people in the State translates to an additional annual water demand of roughly 2.5 million AF/year and 670 MGD of additional wastewater treatment and disposal.

In Sacramento County, population projections are just as challenging for the water and wastewater municipalities. A projected population increase of 400,000 during the next decade (see **Table 1-1**) translates to an additional need for approximately 125,000 AF/year of water supply and 33 MGD of wastewater treatment and disposal.

Water recycling has the potential to transform wastewater effluent into a regional asset, providing a drought-proof water supply for irrigation and industrial use and freeing up high-quality potable water for other uses. Statewide and regional population projections and the potential for using wastewater effluent sources make a compelling argument for consideration of a large-scale Water Recycling Program.

## *Potentially Costly Effluent Disposal Requirements*

The general regulatory trend in the Central Valley is for increasingly stringent permit requirements. For the last few years the Central Valley Regional Water Quality Control Board (CVRWQCB) has issued permits to several dischargers that have resulted in these facilities having to install advanced treatment to meet these requirements.

The SRWTP, however, discharges under vastly different conditions than many of the other dischargers in the Central Valley. Most other dischargers discharge to either effluent dominated water bodies (EDW) or stagnant water bodies. As a result, dilution does not occur, and advanced treatment is necessary to meet the more stringent requirements. The SRWTP discharges to the Sacramento River which has substantially higher flows than most EDWs or stagnant water bodies. SRCSD's SRWTP 2020 Master Plan Environmental Impact Report (EIR) utilized a sophisticated modeling effort to evaluate its impact on water quality and determined that continued discharge of secondary treated effluent would not impact the beneficial uses of the Sacramento River. If the CVRWQCB does not consider dilution in setting effluent limits in the renewal of the National Pollutant Discharge Elimination System (NPDES) permit, the SRWTP may be faced with the same stringent permit requirements as dischargers to EDWs or stagnant water bodies.

A large-scale Water Recycling Program could help SRCSD meet otherwise costly waste discharge requirements by reducing the discharge to the Sacramento River (See **Figure 1-2**). Water recycling could defer or reduce the need for future increases in the permitted capacity of SRWTP beyond the current planning horizon and could potentially impact the imposition of additional treatment requirements in the future.

The current NPDES permit for the SRWTP was adopted in August 2000 and expired on August 1, 2005. The SRWTP's application for permit renewal was submitted to the CVRWQCB, as required, in February 2005. Until the CVRWQCB issues a revised permit, the August 2000 permit remains in effect. In the permit renewal application, SRCSD also requested a capacity increase from a permitted average dry weather flow (ADWF) of 181 MGD to 218 MGD, in response to planned and legal permitted growth via the local and county general planning process through the year 2020. SRCSD staff is currently discussing the permit renewal and capacity increase with the CVRWQCB staff. One potential outcome could be the need for SRCSD to implement some type of advanced treatment to meet more stringent requirements.

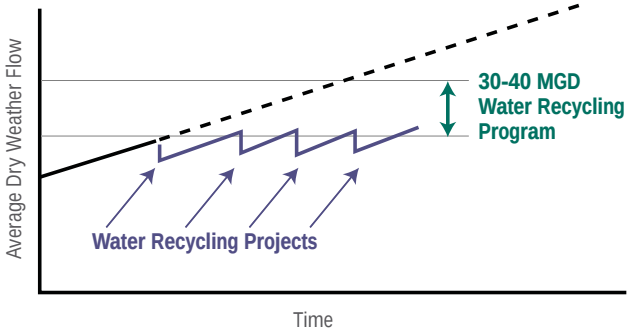


**Figure 1-2| Water Recycling Creates Potential to Reduce Effluent Discharge to Sacramento River**

## *Concerns of Other Stakeholders*

SRCSD has faced challenges from different downstream entities (e.g., water purveyors, environmental organizations, etc.). The water purveyors and environmental organizations submitted significant comments during the 2000 NPDES Permit Renewal efforts. A group of water purveyors has recently filed a legal challenge against SRCSD's SRWTP 2020 Master Plan Environmental Impact Report (EIR). The water purveyors are concerned with specific constituent loadings that may impact their raw water supply (e.g., total organic carbon (TOC), total dissolved solids (TDS), pathogens, and nutrients). The 2020 Master Plan EIR found, through extensive water quality modeling, that the impact of these constituents on downstream water supplies was not significant. Removal of these constituents to the

degree requested by the water purveyors would require SRCSD to install costly advanced treatment processes. The primary concern of the environmental organizations was with the impacts of the SRWTP discharge on aquatic life uses in the vicinity of the discharge to the Sacramento River. These organizations argued for more stringent effluent limitations on toxic pollutants and argued against the consideration of dilution in setting effluent limits.

Developing a large-scale Water Recycling Program may be favorable to SRCSD in future discussions with the CVRWQCB and downstream interests.

## Objectives

Given the drivers described above, the objectives of WROS are as follows:

**Identify, prioritize, and sequence water recycling projects** – A primary element of the WROS is the identification and development of potential water recycling projects to increase recycled water production and usage capacities to 30 to 40 MGD over the next 20 years. The WROS provides a systematic approach to identifying water recycling opportunities, defining projects, and screening and prioritizing those projects.

**Identify potential water recycling partners** – SRCSD's central focus is the conveyance, treatment, and disposal of wastewater in a safe, environmentally sustainable, and cost-effective manner. SRCSD is not a water purveyor and thus must look to partner with water purveyors and land use authorities in the region to implement a large-scale Water Recycling Program. The WROS identifies potential partners associated with specific water recycling opportunities and projects.

**Determine the best balance between water recycling and continued discharge to the Sacramento River** – One of the primary goals of the WROS is to consider the balance between continued effluent discharge to the Sacramento River and development of a large-scale Water Recycling Program. The WROS identifies potential costs and benefits of water recycling and considers future potential waste discharge requirements that may be imposed by the CVRWQCB on existing and future SRWTP effluent flow.

**Provide technical document to support California Environmental Quality Act (CEQA) compliance** – If SRCSD wishes to move forward with a large-scale Water Recycling Program, it will be necessary to perform a comprehensive review of the Program elements to satisfy CEQA requirements. The preferred approach is through preparation of a tiered environmental document. The first tier would be a programmatic EIR addressing large-scale planning issues (e.g., consistency with general plans, growth inducement, and general types and locations of recycled water use). If the program level plan were approved, the second tier would be project-specific environmental documents to focus on the impacts directly related to construction and operation of particular water recycling facilities. The WROS provides technical information to support the programmatic-level EIR.

**Develop recommended steps for program implementation** – Implementation of a large-scale Water Recycling Program that may include short-term and long-term strategies with multiple partners and jurisdictions can become quite complex. The WROS provides a roadmap outlining and sequencing the major steps for short-term and long-term implementation strategies.

## Status Quo Assumption

While the WROS examines a number of potential scenarios related to SRCSD's future NPDES permit requirements, this analysis is intended only to quantify the sensitivity of the benefits and costs of implementing a large-scale Water Recycling Program. The WROS makes no prediction as to the outcome of the NPDES permit negotiations, but instead, for the purposes of the evaluation, assumes a status quo condition. If future permit conditions are different than existing conditions, the benefits of water recycling related to effluent management should be re-examined.

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SECTION 2

# APPROACH

SRCSD has structured development of the recommended projects and the WROS in several steps (see **Figure 2-1**). Input from stakeholder representatives, elected officials, potential project partners, technical experts, and SRCSD Management has helped shape the direction of the WROS along the way. The structure of this Executive Summary follows that of the WROS approach.

The WROS approach was facilitated by the completion of four distinct but integrated tracks of activities including technical, outreach, briefings, and fast track projects (see **Figure 2-2**).

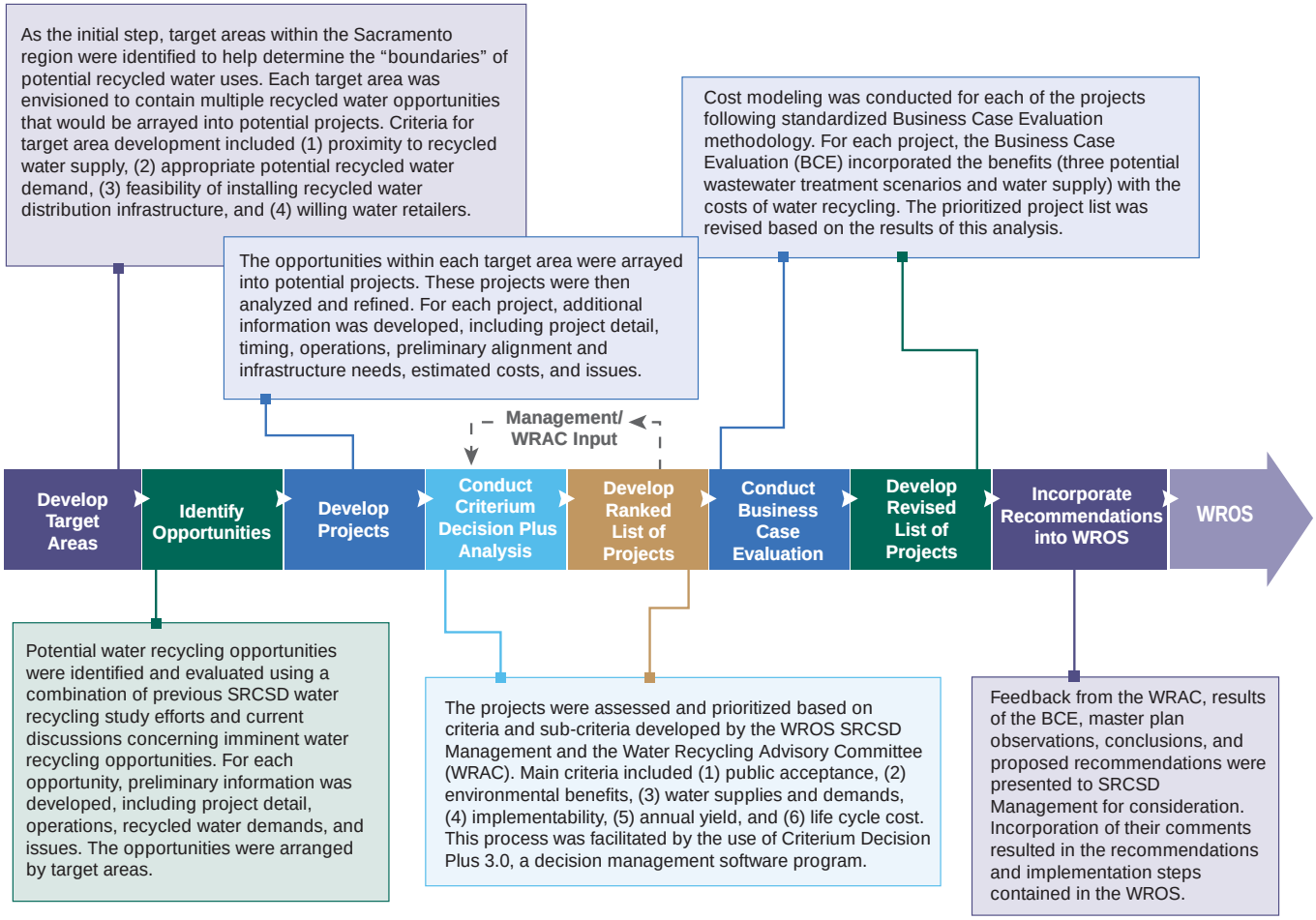



**Figure 2-1 | SRCSD Water Recycling Opportunities Study Approach**

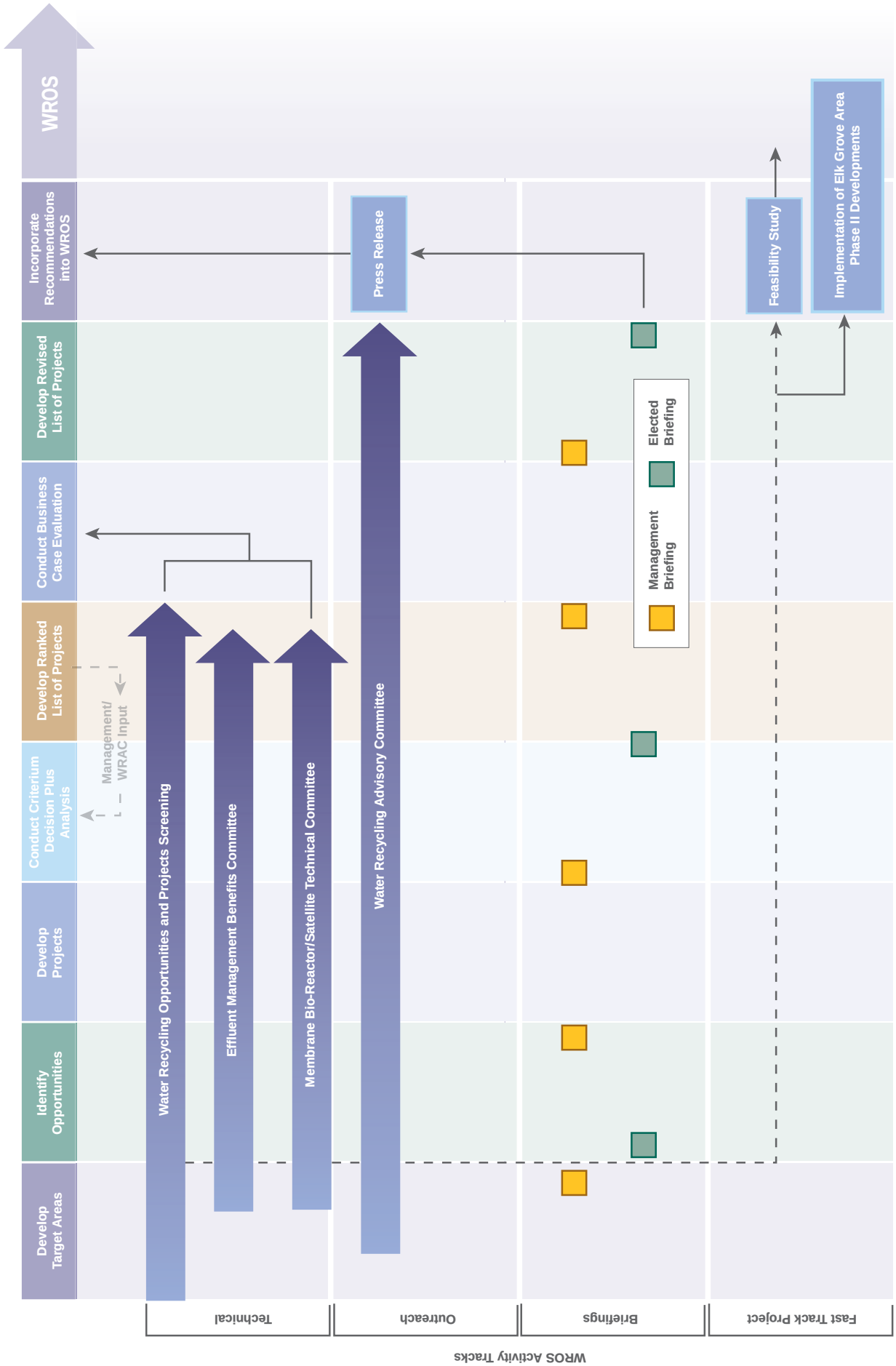
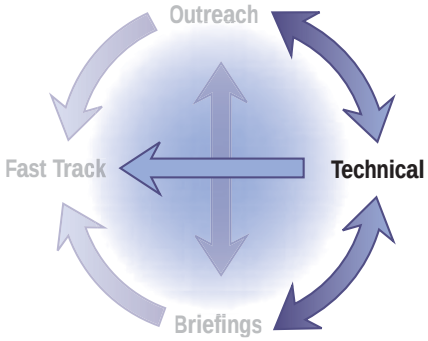



**Figure 2-2 | Integrated Activity Tracks for Water Recycling Opportunities Study Completion**

## 1. Technical

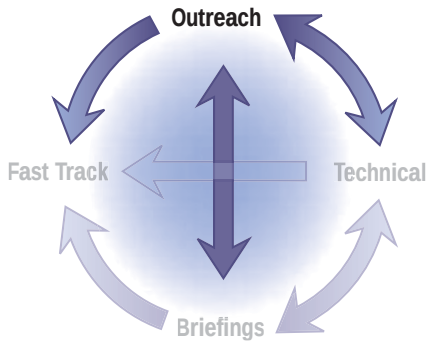



Throughout the process of developing and screening the water recycling opportunities and projects, the WROS incorporated data and feedback from other concurrent efforts (e.g., committees, briefings, fast track activities) into the analyses. Other technical efforts included the following:

**Effluent Management Benefits (EMB) Committee** – This committee was formed to identify and evaluate, to the degree possible, the current and predicted future benefits (e.g., cost savings, regulatory compliance) of reducing SRWTP effluent discharge through water recycling. The committee evaluated three potential future SRWTP treatment scenarios: (1) continuation of existing treatment (e.g., disinfected secondary achieving a median total coliform concentrations of 23 Most Probable Number (MPN)/100 milliliter (ml)), (2) addition of membrane filtration, and (3) addition of membrane filtration, nutrient removal, and temperature treatment (e.g., cooling towers). The results were fed into the Business Case Evaluation (BCE) and overall WROS analyses (see **Appendix B1**).

**Membrane Bio-Reactor (MBR)/Satellite Plant Technical Committee** – This committee assessed the feasibility of centralized and decentralized (satellite facilities) recycled water opportunities and projects. Efforts included evaluation of treatment processes, identification of concerns related to remote recycled water treatment facilities, cost estimation, and analysis of impacts on the interceptor system. The results were integrated into the overall WROS analyses (see **Appendix B2**).

## 2. Outreach




The outreach effort was defined by a comprehensive plan that identified three tiers of stakeholders (potential partners, interested parties, and other stakeholders) and outlined three objectives (increase stakeholder awareness of opportunities for water recycling through SRCSD, obtain and respond to feedback from stakeholders on perceptions of SRCSD's water recycling demonstration project, and generate agreements among audiences that result in tangible water recycling projects). Strategies included a newly developed water recycling report, a revamped Web site, fact sheets, and media outreach during key milestones such as discussion of a water recycling ordinance with the SRCSD Board of Directors. (See **Appendix C1** for more detailed information on the WROS outreach program.)

Stakeholder interaction also was a critical component of the WROS outreach. Over 20 stakeholder interviews were held during the course of the WROS outreach to elicit input to help direct the development of opportunities and projects.

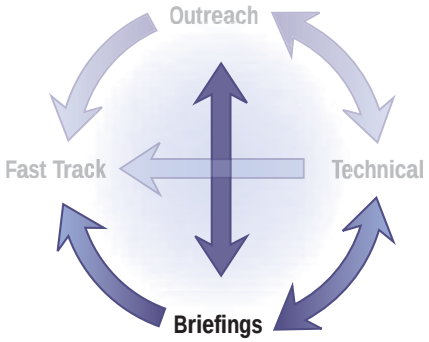
Development and implementation of the Water Recycling Advisory Committee (WRAC) took the stakeholder interaction process a step further.

The WRAC was comprised of over 30 representatives, including water suppliers, county and state regulators, stakeholders with water recycling experience, park districts, development interests, and environmental interests.

The WRAC provided opportunities for stakeholder input on key aspects of the WROS.

Over the course of five meetings, WRAC participants were provided information about the larger scale Water Recycling Program and development of the WROS. In addition, WRAC participants were given the opportunity to review and provide input on key aspects of the WROS, including potential water recycling opportunities and projects, prioritization criteria used to rank those projects, the outcome of the prioritization process, project cost estimates, and the WROS. (See **Appendix C** for more detailed information on the WRAC, including a database of participants and meeting recaps.)

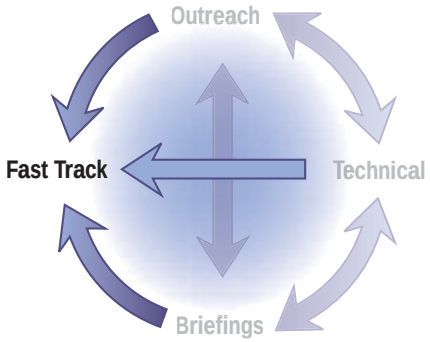
## 3. Briefings (Management and Elected Officials)




**Management briefings** – These briefings were conducted at regular intervals during the planning effort. SRCSD Management was provided with information on strategic water recycling issues raised during the course of WROS development, analysis of potential projects, and stakeholder involvement. Management shared ideas, provided feedback, and ensured consistency with the overall SRCSD vision.

**Elected officials briefings** – These briefings were conducted at strategic points during the planning effort to communicate key aspects of the WROS to the SRCSD Board of Directors and local elected officials.

## 4. Fast Track Projects




Early in the WROS process, it was recognized that attractive recycled water opportunities and projects would likely be identified during WROS development that would need to be pursued independent of the WROS schedule. This separate process allowed for the "fast track" analysis of such opportunities and projects to: (1) establish the need to condition new developments with recycled water infrastructure, consistent with applicable processes and planning timelines, (2) make use of construction time frames and activities associated with the other projects (e.g., coordinating the recycled water transmission pipeline for the South County Agriculture and Habitat Project with SRCSD's South Interceptor Project), and (3) meet the needs of potential partners. The WROS worked in conjunction with local land use authority staff and building industry and other stakeholders, as needed, to evaluate fast track projects (e.g., South County Agriculture and Habitat, Elk Grove Area Phase II Developments, etc.). These projects were incorporated into the WROS.

SECTION 3

# DEVELOPMENT OF TARGET AREAS, OPPORTUNITIES, AND PROJECTS

Ensuring the stated goals of the large-scale Water Recycling Program are achievable through implementation of the WROS, and evaluating the feasibility of that implementation, required preliminary development of potential projects comprising the WROS, including type, size, alignment and infrastructure needs, timing, operations, cost, and probable issues.

The WROS employed a three-step approach to defining potential projects. This section summarizes the three steps – (1) development of target areas, (2) identification of water recycling opportunities, and (3) development of potential recycled water projects – and concludes with brief project descriptions. Detailed descriptions of the three steps and potential projects are included in **Appendix A**.

## *Development of Target Areas*

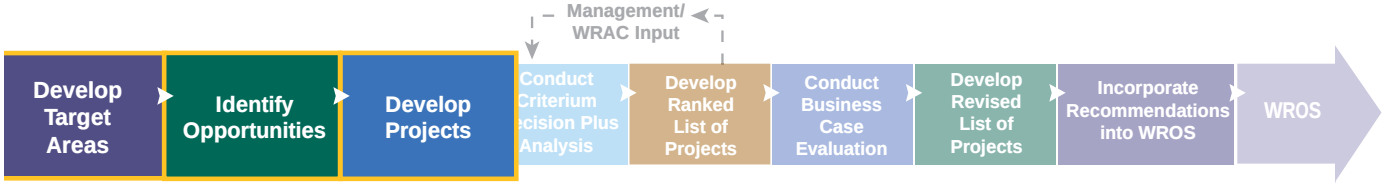
Given the geographic scope of the Sacramento region, the first step in defining potential projects was to determine areas within the region to target for water recycling. The initial screening process used four criteria to determine the appropriate "target areas". This process is depicted in **Figure 3-1** and the criteria are described below.

**Geographical proximity to recycled water supply** – This criterion recognized the feasibility of a centralized recycled water supply from SRWTP or a decentralized (i.e., satellite treatment facility along major gravity sewer interceptor) recycled water supply within the target area.

Buffer zones around supply sources were established to delineate geographical proximity to the recycled water supply.

**Appropriate potential recycled water demand** – This criterion included present and future developments that would encourage non-potable recycled water use with a focus on large irrigation demands, such as golf courses, parks, landscape medians, and agricultural irrigation. Irrigation demands typically increase during the long, dry summer seasons in the Sacramento region, and recycled water could be used to supplement available supplies during this period.

**Feasibility of installing recycled water distribution infrastructure** – This criterion addressed the feasibility of installing necessary infrastructure and delivering recycled water to potential users. In general, retrofitting existing irrigation systems to deliver recycled water was not cost-effective; therefore, this criterion tends to favor areas of new development where recycled water systems could be installed along with all other infrastructure.




*Intersecting the screening criterial discussed target areas are developed.*

**Figure 3-1 | Initial Screening Criteria for Target Areas**

**Willing water retailers and land use authorities** – As a potential large-volume wholesaler of recycled water, SRCSD must partner with willing water retailers and interact with various land use authorities. This criterion recognized that the region includes many water purveyors with varying interests related to water supply, operation, expenditures, etc., and that land use authorities in the region have different policies regarding recycled water (or lack thereof).

By geographically overlaying the above criteria on a map of the Sacramento region, five target areas were identified, as shown in **Figure 3-2**. These areas became the focus of further development in the WROS; the remainder of the Sacramento region could be examined in the future if SRCSD decides to further expand its Water Recycling Program.

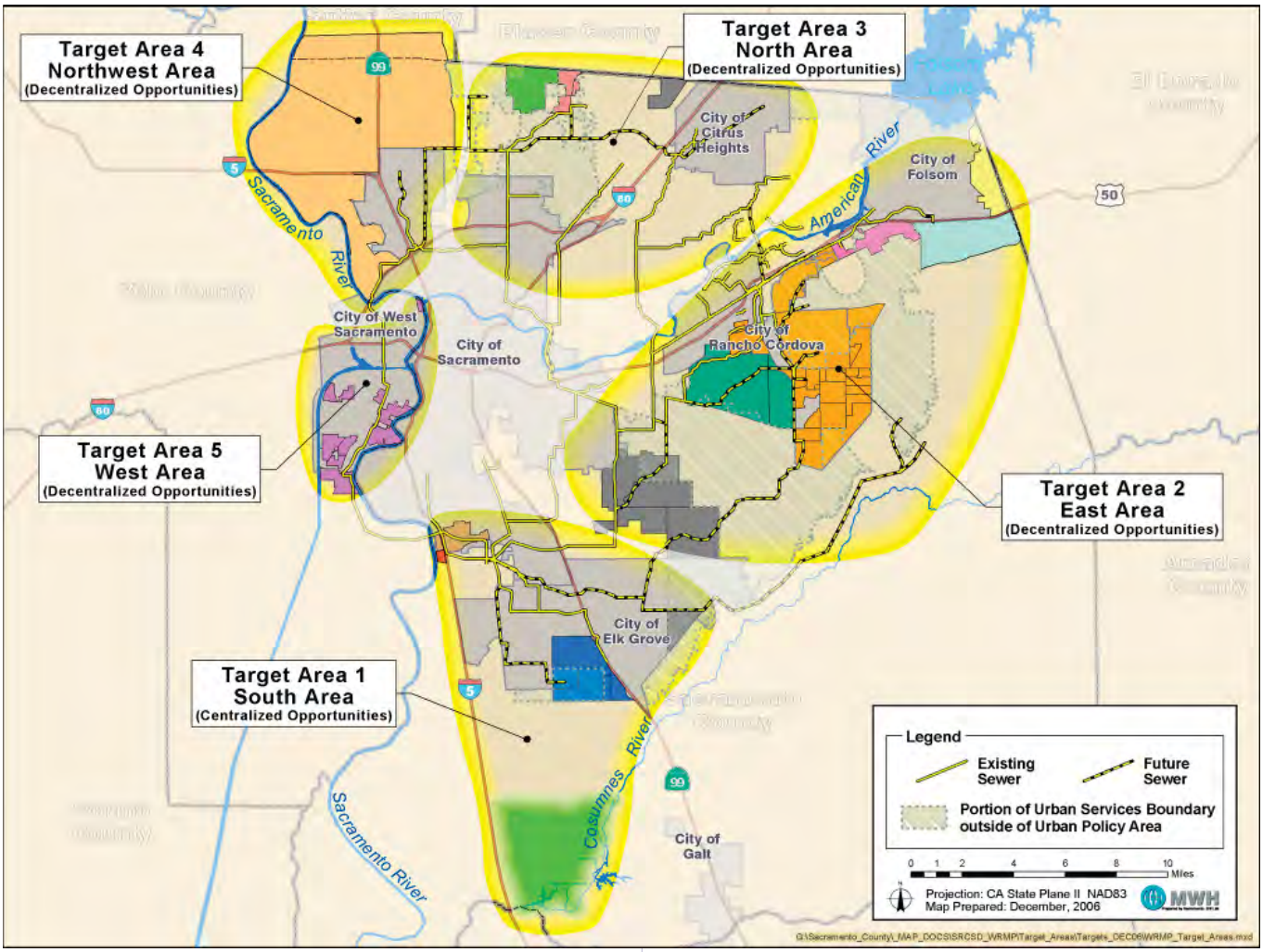



**Figure 3-2 | Identified Target Areas for Water Recycling in the Sacramento Region**

## *Identification of Water Recycling Opportunities*

The second step in defining potential projects involved refining specific water recycling opportunities within each target area. For each opportunity, information was developed in the following five categories: type of recycled water use, recycled water demand, location, opportunity timing, and potential participants.

**Type of recycled water use** – Two types of water recycling needs were identified in the WROS: urban and agricultural irrigation. Urban irrigation (Scenarios C and D) would be supplied with disinfected tertiary recycled water conforming with Title 22 requirements for unrestricted use. Agricultural irrigation (animal feed crops only, such as alfalfa) would be supplied with disinfected secondary-23 recycled water.

**Scenario C** – *Scenario C recycled water use would require installation of a dual plumbed system – one potable (drinking water) system and one "purple pipe" system for urban irrigation use only in new parks, golf courses, school fields, streetscapes, etc. Although intended for restricted, disinfected tertiary recycled water, the purple pipe system could be supplied with potable water, untreated surface water or groundwater, or remediated groundwater, depending on availability.*

**Scenario D** – *Scenario D recycled water use would include Scenario C plus extension of the distribution system within a development to provide restricted, disinfected tertiary recycled water for residential irrigation (frontyard and backyard irrigation).*

**Recycled water demand** – Recycled water demands were developed using the required irrigation area, rate of water application from a typical irrigation system, and amount of evapotranspiration anticipated to occur in the area. For this analysis, annual average demands, average day demands, and maximum day demands were estimated for each opportunity.

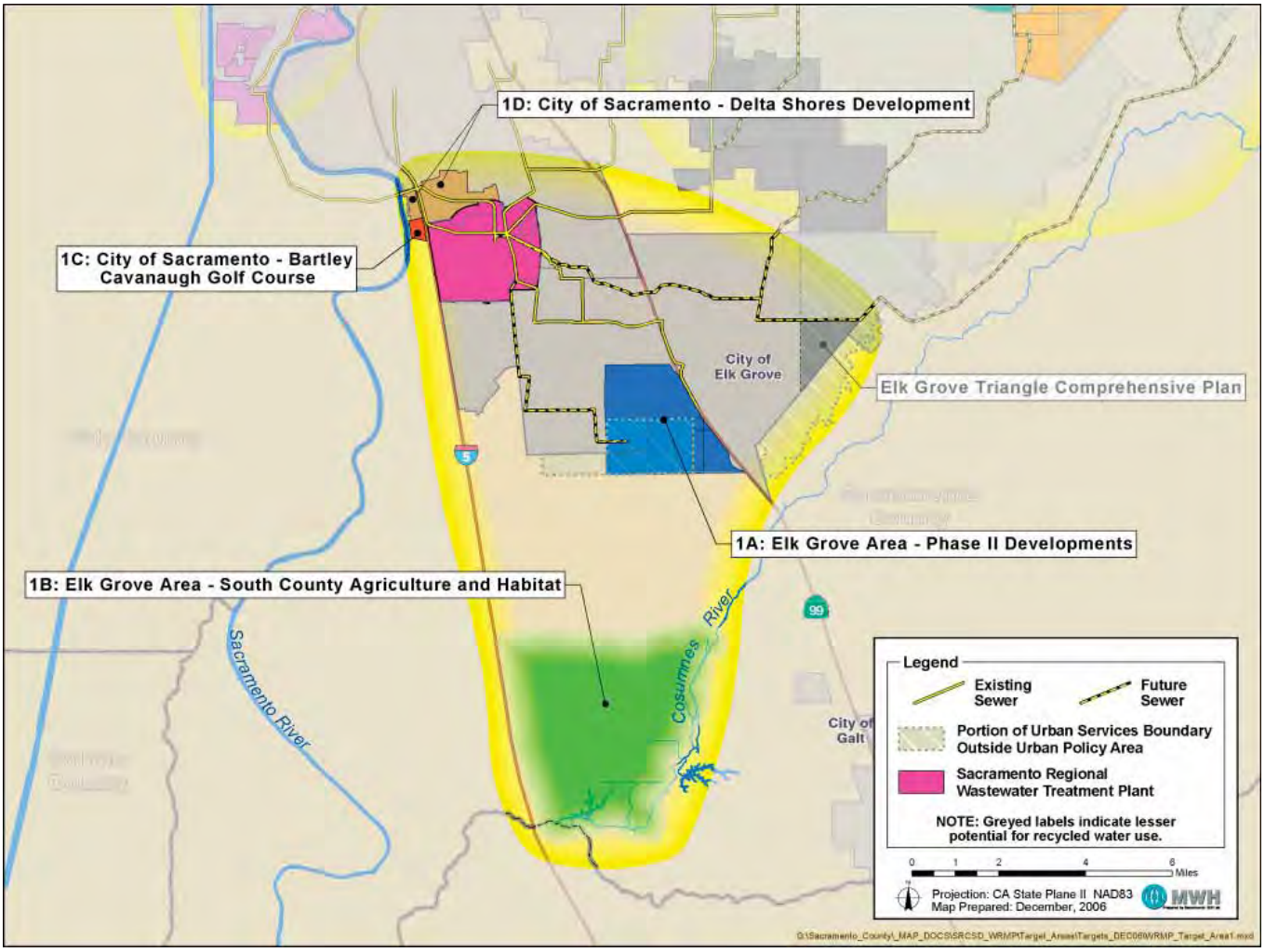
**Location** – The geographic location of potential water recycling use determined whether an opportunity would be supplied by a centralized source of recycled water from SRCSD's WRF or a decentralized satellite treatment facility.

**Opportunity timing** – Opportunities for water recycling were identified for existing, short-term, or long-term potential recycled water users. New developments often represented greatest potential water recycling opportunities.

Other developments were preliminarily analyzed and determined to have lesser potential for recycled water use for various reasons (e.g., status of existing planning, design, and/or approval processes, previously defined sources of water). These developments were not carried forward in the WROS analysis because of implementation considerations and the significant costs associated with recycled water retrofits. Exceptions included areas such as Bartley Cavanaugh Golf Course, where the need for a supplemental water supply exists and irrigation infrastructure is available.

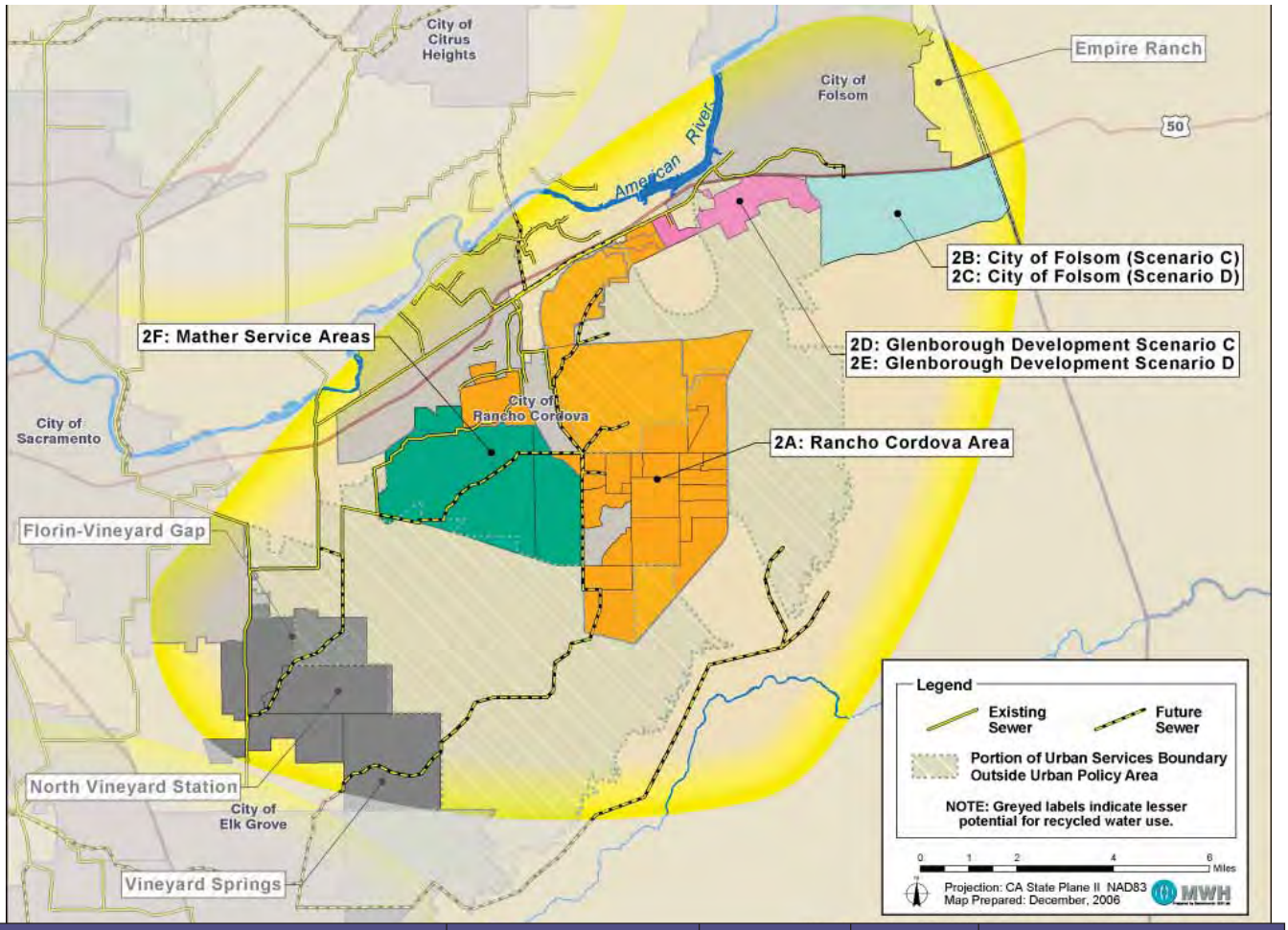
**Potential participants** – The WROS identified agencies whose participation would be required to implement an opportunity (e.g., water purveyors, land use authorities, school districts, park districts).

Potential opportunities are grouped by target areas and summarized in **Figures 3-3** through **3-7**.




| Location(s) | | Type(s) of Use | Average Day Demand (MGD) | Peak Day Demand (MGD) | Participants |
|---|---|---|---|---|---|
| **1A** | **Elk Grove Area - Phase II Developments** | Urban Irrigation (Disinfected Tertiary) | 2.3 | 5.8 | SRCSD, Sacramento County Water Agency, City of Elk Grove |
| **1B** | **Elk Grove Area - South County Agriculture and Habitat** | Agricultural Irrigation (Disinfected Secondary-23) | 9.3 | 16.5 | SRCSD, Sacramento County Water Agency, City of Elk Grove |
| **1C** | **City of Sacramento - Bartley Cavanaugh Golf Course** | Urban Irrigation (Disinfected Tertiary) | 0.3 | 0.7 | SRCSD, City of Sacramento, Capital Golf Department |
| **1D** | **City of Sacramento - Delta Shores Development** | | | | |
| | Delta Shores Development | Urban Irrigation (Disinfected Tertiary) | 0.6 | 1.4 | SRCSD, City of Sacramento, City Parks and Recreation Department |
| | Bill Conlin Park | | 0.1 | 0.1 | |

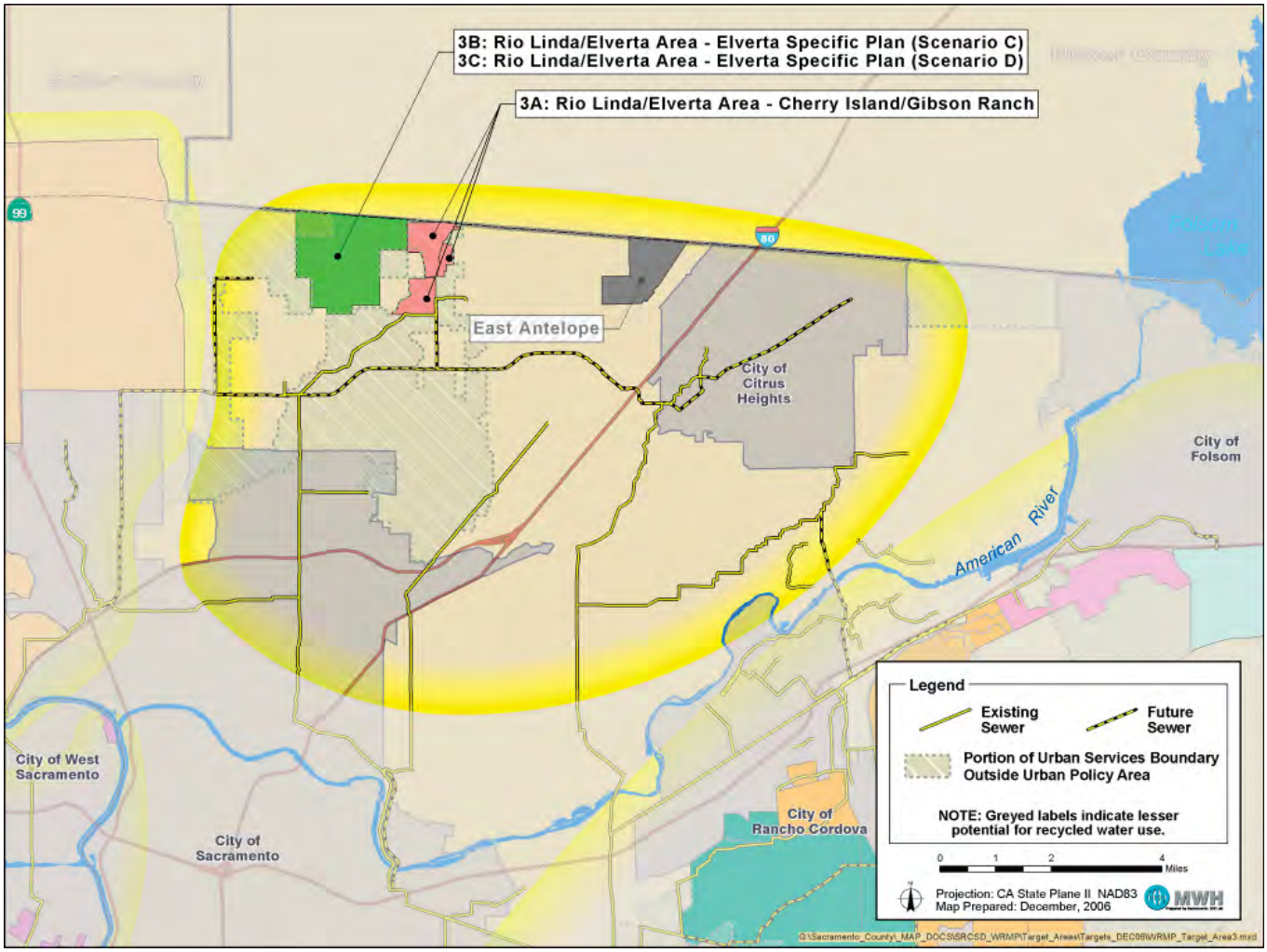
**Figure 3-3 | Target Area 1 - South Area (Centralized Opportunities)**




| Location(s) | | Type(s) of Use | Average Day Demand (MGD) | Peak Day Demand (MGD) | Participants |
|---|---|---|---|---|---|
| 2A | **Rancho Cordova Area** | | | | |
| | North Area | Urban Irrigation (Disinfected Tertiary) | 0.7 | 1.9 | SRCSD, Sacramento County Water Agency, Golden State Water Company, California American Water Company, City of Rancho Cordova, City of Folsom Utilities |
| | Central Area | | 1.8 | 4.7 | |
| | South Area | | 1.3 | 3.2 | |
| 2B | **City of Folsom (Scenario C)** | Urban Irrigation (Disinfected Tertiary) | 2.9 | 7.3 | SRCSD, City of Folsom |
| 2C | **City of Folsom (Scenario D)** | Urban Irrigation (Disinfected Tertiary) | 11.2 | 28.2 | SRCSD, City of Folsom |
| 2D | **Glenborough Development (Scenario C)[1]** | Urban Irrigation (Disinfected Tertiary) | 0.3 | 0.9 | SRCSD, City of Folsom |
| 2E | **Glenborough Development (Scenario D)** | Urban Irrigation (Disinfected Tertiary) | 1.9 | 4.9 | SRCSD, City of Folsom |
| 2F | **Mather Service Areas** | | | | |
| | Mather Parks | Urban Irrigation (Disinfected Tertiary) | 1.9 | 4.7 | SRCSD, Sacramento County Water Agency, County of Sacramento Department of Regional Parks, Sacramento County Board of Supervisors |
| | Mather Golf Course | Urban Irrigation (Disinfected Tertiary) | 0.5 | 1.2 | |

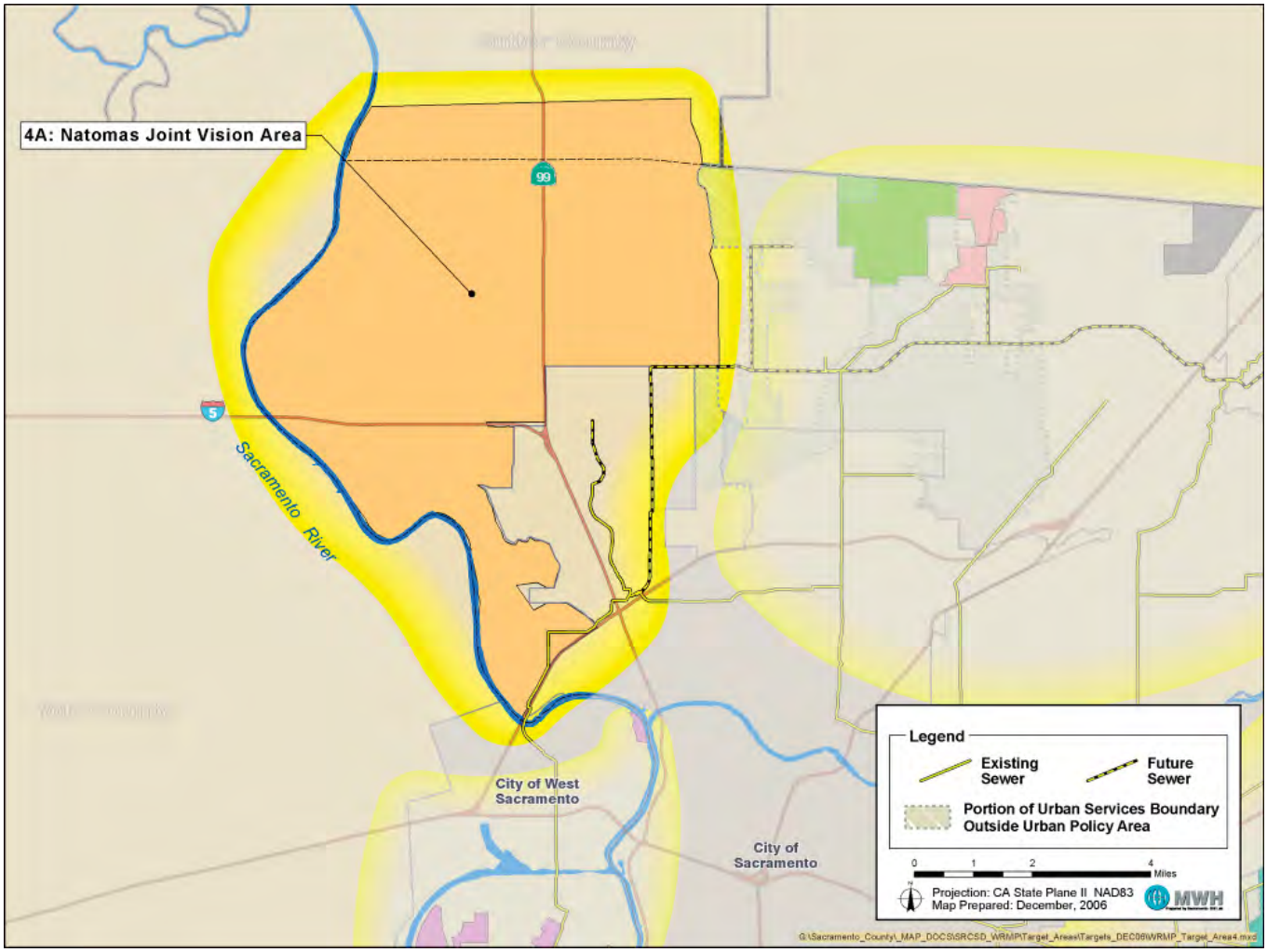
*Note:*
*[1] Also known as Glenborough at Easton and Easton Place, and Glenborough Planning Areas.*

**Figure 3-4| Target Area 2 - East Area (Decentralized Opportunities)**



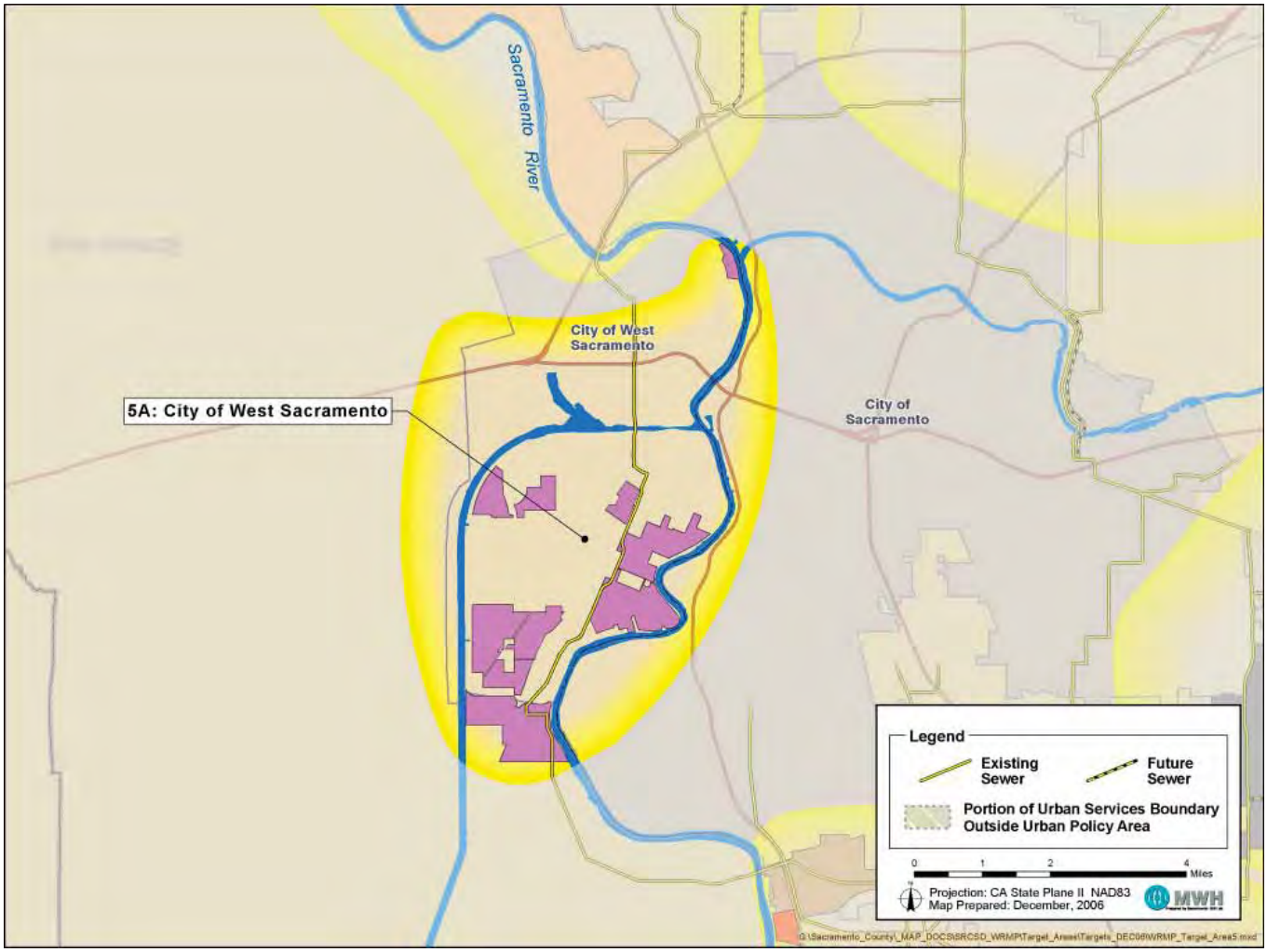

| Location(s) | | Type(s) of Use | Average Day Demand (MGD) | Peak Day Demand (MGD) | Participants |
|---|---|---|---|---|---|
| **3A** | **Rio Linda/Elverta Area-Cherry Island/Gibson Ranch** | Urban Irrigation (Disinfected Tertiary) | 1.3 | 3.2 | SRCSD, County of Sacramento Department of Regional Parks, Sacramento County Board of Supervisors |
| **3B** | **Rio Linda/Elverta Area-Elverta Specific Plan (Scenario C)** | Urban Irrigation (Disinfected Tertiary) | 0.3 | 0.7 | SRCSD, County of Sacramento Department of Regional Parks, Sacramento County Board of Supervisors |
| **3C** | **Rio Linda/Elverta Area-Elverta Specific Plan (Scenario D)** | Urban Irrigation (Disinfected Tertiary) | 1.8 | 3.6 | SRCSD, County of Sacramento Department of Regional Parks, Sacramento County Board of Supervisors |

**Figure 3-5 | Target Area 3 - North Area (Decentralized Opportunities)**




| Location(s) | | Type(s) of Use | Average Day Demand (MGD) | Peak Day Demand (MGD) | Participants |
|---|---|---|---|---|---|
| **4A** | **Natomas Joint Vision Area** | Urban Irrigation (Disinfected Tertiary) | 4.4 | 11.1 | SRCSD, Sacramento County Board of Supervisors, City of Sacramento, Natomas Central Mutual Water Company |

**Figure 3-6 | Target Area 4 - Northwest Area (Decentralized Opportunities)**




| | Location(s) | Type(s) of Use | Average Day Demand (MGD) | Peak Day Demand (MGD) | Participants |
|---|---|---|---|---|---|
| 5A | **City of West Sacramento** | | | | |
| | Southport Framework Plan | Urban Irrigation (Disinfected Tertiary) | 0.8 | 2.1 | SRCSD, City of West Sacramento |
| | University Park | | 0.1 | 0.3 | |
| | Central Park | | 0.4 | 1.1 | |
| | Sports Complex | | 0.1 | 0.3 | |

**Figure 3-7 | Target Area 5 - West Area (Decentralized Opportunities)**

## Development of Potential Water Recycling Projects

A water recycling project was developed to meet the recycled water demand for the identified opportunities shown in Figures 3-3 through 3-7. Some of the identified projects were combined into larger projects to provide recycled water to several opportunities. The project location, size, appearance, treatment technology, and reliability depended on the recycled water source and type of use.

## Centralized vs. Decentralized Supply

As discussed earlier, the WROS assessed the feasibility of a centralized recycled water supply or a decentralized (satellite facility) recycled water supply within each project area. Centralized projects considered expanding the existing WRF at SRWTP. Decentralized projects involved an MBR satellite facility.

For the purpose of the WROS, required treatment facilities were designed to meet 80 percent of peak day demand. During peak demand periods, it was assumed that the recycled water supply would be supplemented with other supplies (e.g., raw or potable surface water or groundwater).

**MBR** *is a biological reactor with an inclusive membrane filtration system that couples conventional activated sludge processes with low-pressure membranes in the same unit or vessel. The membrane portion of an MBR consists of a microfiltration (MF) or ultrafiltration (UF) membrane, eliminating the need for final clarifiers that are required in conventional activated sludge processes.*

**MBR satellite facility** *is a treatment technology to extract sewage flow from an existing sewer interceptor and discharge residuals back to the sewer interceptor to be treated at the downstream SRWTP. A satellite facility could be used to provide recycled water at the point of reuse. Depending on the interceptor flow rate, the MBR satellite facility could be designed to provide recycled water based on the users' demand pattern or steady flow making the design flexible with minimal need for redundant units.*

## Costs

The estimated costs for each potential project include both the capital costs and annual Operations and Maintenance (O&M) for the required facilities. Probable Construction Cost (PCC) was estimated using nine cost components and a construction contingency. The PCC was then used to develop the Total Probable Capital Cost (TPCC) by incorporating costs associated with construction management, engineering and administration, environmental documentation and permitting, and legal. The O&M cost incorporated the annual costs required to operate the water recycling facilities, including labor, chemicals, and power. TPCC was spread over a 40-year life cycle to calculate the Equivalent Uniform Annual Cost (EUAC) assuming a 3 percent nominal discount rate. For comparative purposes, the overall cost of a potential project, or EUAC per acre-foot (EUAC/AF), was calculated and presented for each potential project to enable evaluation of the net return of TPCC on an annualized or amortized basis. These costs components are shown in **Table 3-1**.

The identified water recycling projects within the target areas are summarized in **Table 3-2**. Italicized projects include two or more individual projects. Demands are additive while the costs are not.

Additional details about the potential projects, their locations, and required infrastructure can be found in **Attachment 1** of this Executive Summary and **Appendix A3**.

## Table 3-1 | Cost Components for Potential Projects

| | |
|---|---|
| + | *Treatment Costs*: Expansion of the existing SRCSD WRF or construction of an MBR satellite facility |
| + | *Supplemental Water Supply Costs*: MBR satellite facilities only – allocation of additional funds to supplement water supply during peak demands (facilities designed to supply 80% of peak day demand) |
| + | *Land Requirement Costs*: WRF expansion occurs on existing SRCSD property; therefore, land acquisition is not required. MBR satellite facilities require a land acquisition of approximately 1.0 acre per 1.0 MGD |
| + | *Right-of-Way Acquisition Costs*: Required for projects with transmission piping alignments outside the public right-of-way |
| + | *Transmission Piping Costs*: Installation of transmission infrastructure |
| + | *Pump Station Costs*: Estimated using the peak day recycled water demand |
| + | *Storage Costs*: Storage of recycled water during periods of low demand |
| + | *In-Track Distribution Piping Costs*: Distribution piping along streets |
| + | *On-Site Irrigation Piping Costs*: Additional costs above and beyond the cost for on-site potable water supply |
| = | **Subtotal** |
| + | 30% of Subtotal for Contingency |
| = | **PCC** |

| | |
|---|---|
| + | 30% of PCC for Engineering, Construction Management, and Administrative Costs |
| + | 3% (or 5%) of PCC for Environmental Documentation, Permitting, and Mitigation Costs[1] |
| + | 2% (or 5%) of PCC for Legal Cost[2] |
| = | **TPCC** |

| | |
|---|---|
| + | Power Cost ($0.10 per kWh) |
| + | O&M of WRF & Satellite Filtration Plant (9.00% of TPCC) |
| + | O&M of Pump Station (5.00% of TPCC) |
| + | O&M of Transmission Piping (0.50% of TPCC) |
| + | O&M of Distribution Piping (In-Track) (3.00% of TPCC) |
| + | O&M of Distribution Piping (On-Site) (3.00% of TPCC) |
| + | O&M of Groundwater Well (9.00% of TPCC) |
| + | O&M of Storage Facilities (1.00% of TPCC) |
| + | O&M of Agricultural Facilities ($100,000 allowance) |
| = | **Total Annual O&M Costs** |

| | |
|---|---|
| + | EUAC of Capital Costs |
| + | Total Annual O&M Costs |
| = | **Total EUAC** |
| / | Average Annual Recycled Water Demand (AF) |
| = | **EUAC/AF** |

[1] *Assumes 3% for all potential projects except 5% for South County Agricultural Lands*
[2] *Assumes 2% for all potential projects except 5% for South County Agricultural Lands*

| KEY | |
|---|---|
| AF – acre-foot | O&M – Operations and Maintenance |
| EUAC/AF – Equivalent Uniform Annual Cost per acre-foot | PCC – Probable Construction Cost |
| kWh – kilowatt-hour | TPCC – Total Probable Capital Cost |
| MBR – Membrane Bio-Reactor | WRF – Water Reclamation Facility |
| MGD – million gallons per day | |

## Table 3-2 | Identified Water Recycling Projects Within Target Areas

| | Potential Water Recycling Projects | Recycled Water Demands | | Estimated Costs [2] | |
|---|---|---|---|---|---|
| | | Average Day Demand (MGD) | Peak Day Demand [1] (MGD) | Capital Costs | EUAC/AF |
| **Target Area 1 - South Area (Centralized Opportunities)** | Elk Grove Area - *Phase II Developments* | *2.3* | *5.8* | *$48M* | *$728* |
| | Elk Grove Area - South County Agricultural Lands | 9.3 | 16.5 | $48M | $245 |
| | *Elk Grove Area - Phase II Developments & South County Agricultural Lands* | *11.6* | *22.3* | *$89M* | *$354* |
| | City of Sacramento - Bartley Cavanaugh Golf Course | 0.3 | 0.7 | $5M | $966 |
| | City of Sacramento - Delta Shores Development | 0.7 | 1.5 | $13M | $1,284 |
| | *City of Sacramento - Bartley Cavanaugh Golf Course & Delta Shores Development* | *1.0* | *2.2* | *$15M* | *$1,025* |
| **Target Area 2 - East Area (Decentralized Opportunities)** | Rancho Cordova Area | 3.8 | 9.8 | $89M | $2,554 |
| | City of Folsom & Glenborough Development (Scenario C) | 1.7 | 4.4 | $83M | $3,010 |
| | City of Folsom & Glenborough Development (Scenario D) | 8.6 | 21.9 | $465M | $3,252 |
| | Mather Service Areas | 2.4 | 5.9 | $55M | $1,781 |
| | *Rancho Cordova Area & Mather Service Areas* | *6.2* | *15.7* | *$224M* | *$2,357* |
| | *Rancho Cordova Area, City of Folsom, Glenborough Development & Mather Service Areas* | *7.8* | *20.0* | *$318M* | *$2,515* |
| **Target Area 3 - North Area (Decentralized Opportunities)** | Rio Linda/Elverta Area - Cherry Island/ Gibson Ranch | 1.3 | 3.2 | $32M | $1,866 |
| | Rio Linda/Elverta Area - Elverta Specific Plan | 0.3 | 0.7 | $17M | $4,430 |
| | *Rio Linda/Elverta Area - Cherry Island/ Gibson Ranch & Elverta Specific Plan* | *1.6* | *3.9* | *$41M* | *$1,902* |
| | *Rio Linda/Elverta Area - Elverta Specific Plan & Natomas Joint Vision Area* | *4.7* | *11.8* | *$177M* | *$2,469* |
| **Target Area 4 - Northwest Area (Decentralized Opportunities)** | Natomas Joint Vision Area | 4.4 | 11.1 | $158M | $2,358 |
| **Target Area 5 - West Area (Decentralized Opportunities)** | City of West Sacramento | 1.5 | 3.8 | $63M | $2,609 |

*Notes:*
*The italicized projects include two or more individual projects. The demands are additive while the cost is not.*
*[1] The design flow of the different water recycling facilities assumed 80% of the peak day demand.*
*[2] Estimated costs based on ENR #7768 (San Francisco and 20-Cities for March 2005).*

| KEY | |
|---|---|
| EUAC/AF - Equivalent Uniform Annual Cost per acre-foot | MGD - million gallons per day |

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SECTION 4

# PROJECT PRIORITIZATION

To facilitate the process of prioritizing the 18 potential projects, the WROS employed a Multi-Criteria Decision Analysis (MCDA) approach. This approach is used to select one of a number of alternatives based on how well those alternatives rate against a chosen set of criteria and sub-criteria and a scoring system. The WROS used the tool Criterium Decision Plus 3.0 (CDP 3.0).

The prioritization criteria and sub-criteria used to evaluate each potential project were developed to reflect the issues associated with project implementation. The process included (1) identifying the criteria and sub-criteria, establishing a hierarchy, and formulating descriptions, (2) determining an objective scoring system for the criteria or sub-criteria, which were used to rate each potential project, and (3) designating weights to reflect the importance of (a) the criteria relative to each other, and (b) the sub-criteria within the criteria. This iterative process involved the WROS, SRCSD Management, and the WRAC – the resulting criteria, sub-criteria, scoring, and weights were input into CDP 3.0. Detailed information on this process is presented in **Appendix D1**.

*CDP 3.0 was used to prioritize the potential projects. CDP 3.0 is a desktop software Microsoft Windows® decision manager that allows the user to complete basic multi-criteria decision analyses involving complex problems with numerous criteria in timely manner. This software package facilitated managing decision-oriented data, making decisions, developing decision-making guidelines, and communicating recommendations.*


## Prioritization Criteria and Scoring System

The criteria, sub-criteria, and scoring system are summarized below.

### Criterion 1: Public Acceptance

This criterion had four components:

**Type of use** – This sub-criterion considered the type(s) of recycled water use – agricultural irrigation, urban irrigation (Scenario C), urban irrigation (Scenario D), or a combination of uses. The highest score was associated with agricultural irrigation; the lowest with urban irrigation, Scenario D.

**Level of treatment** – This sub-criterion considered the minimum level of recycled water treatment required for the potential project's use – reverse osmosis (RO), Title 22 tertiary-treated recycled water, or Title 22 disinfected secondary-23 recycled water. Higher levels of treatment were awarded higher scores.

**Potential construction impacts** – This sub-criterion considered the potential impacts on parcels near the construction areas, assuming a 100-foot offset. The greater the number of parcels associated with a potential project, the higher the anticipated potential construction impacts and the lower the associated score.

**Potential operational impacts** – This sub-criterion considered the potential residential impacts within a 1,000-foot radius of the treatment facility (centralized or decentralized). The greater the number of residential parcels associated with a potential project, the higher the anticipated potential construction impacts and the lower the associated score.

## *Criterion 2: Environmental Benefits*

This criterion considered a potential project's environmental benefits to designated aquatic and terrestrial habitat for listed species. The highest score was awarded to projects with direct benefits; the lowest to projects without direct benefits.

## *Criterion 3: Water Supplies and Demands*

This criterion and two components:

**Unmet water demands** – This sub-criterion considered the water purveyor's need for additional water supplies to meet projected 2030 water demands. The highest score was awarded to projects where the water purveyor's existing water supply portfolio was not sufficient to meet future demands; the lowest to projects with sufficient existing water supplies.

**Timing** – This sub-criterion considered the timing of the potential project. The highest score was associated with near-term project (i.e., implementation anticipated in less than 5 years); the lowest with long-term projects (i.e., implementation anticipated in more than 10 years).

## *Criterion 4: Implementability*

This criterion had four components:

**Environmental and regulatory requirements** – This sub-criterion considered the complexity of the process to obtain the necessary environmental and regulatory approvals. The highest score was associated with Scenario C use; the lowest with Scenario D use.

**Legal issues** – This sub-criterion considered legal aspects of the potential project, including, but not limited to, water rights, rights-of-way, basin transfers, and interpretation of waste discharge regulations. The greater the number of potential legal issues, the lower the associated score.

**Other potential providers of recycled water** – This sub-criterion considered the existence of other providers that could reasonably serve recycled water to the potential project. The highest score was awarded to projects for which no other provider exists; the lowest to projects with other providers.

**Availability of outside funding** – This sub-criterion considered the availability of potential project funding outside the partners. Grant funding guidelines similar to existing federal and state programs was assumed. The highest score was awarded to projects that met the eligibility criteria of existing funding programs; the lowest to projects that did not.

## *Criterion 5: Annual Yield*

This criterion considered the anticipated annual yield (in AF) of the potential project. SRCSD's preference is for a WRP with a few, large projects rather than several, small projects. The greater the annual yield, the larger the potential project and the higher the associated score.

## *Criterion 6: Life Cycle Cost*

This criterion considered the annualized capital and O&M costs of the potential project over a 40-year life cycle as EUAC/AF. The greater the EUAC/AF, the lower the associated score.

The six criteria were categorized as either "non-financial" (Public Acceptance, Environmental Benefits, Water Supplies and Demands, Implementability, and Annual Yield) or "financial" (Life Cycle Cost) in nature.

## Weights

The weighting process was accomplished in two stages: (1) percentages (or "weights") were allocated to each of the non-financial criteria, totaling 100, and (2) percentages were allocated to both the non-financial and financial categories, totaling 100. The WROS/SRCSD Management assigned criteria weights as a group. For the WRAC, the average of the weights submitted by the WRAC participants was used for each criterion. A comparison of the criteria weights developed by both groups is presented in **Figure 4-1**. Maximum and minimum values are indicated for the WRAC input to show the range of responses.

## Prioritized Projects

Each potential project was assessed using the criteria, sub-criteria, and scoring system. This information and the assigned weights were input into CDP 3.0. The tool was used to rank projects based on the weights from both the WROS/SRCSD Management and the WRAC. Both weighting configurations resulted in the same prioritization. The normalized scores and projects are presented in descending order in **Figure 4-2**. **Table 4-1** summarizes the prioritized potential projects, recycled water demands, and estimated costs.

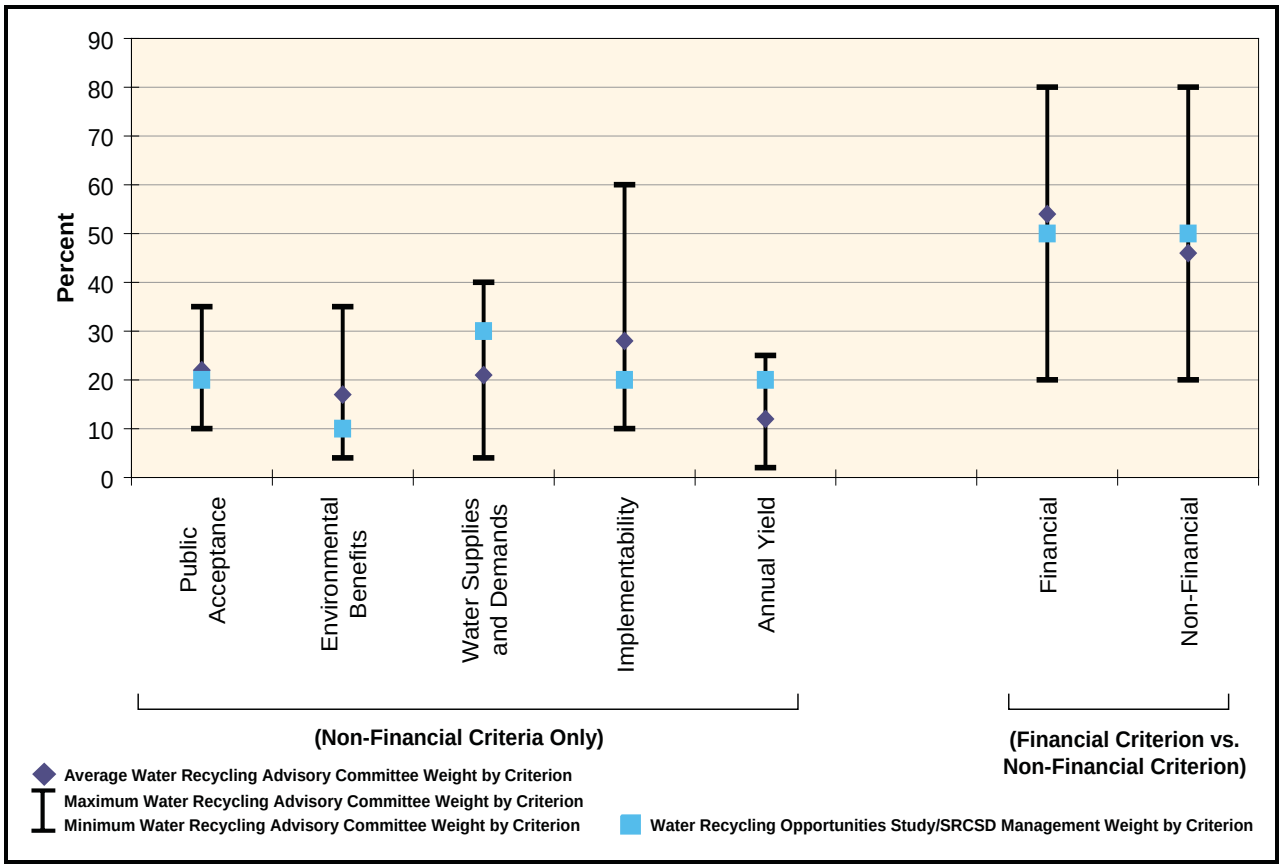
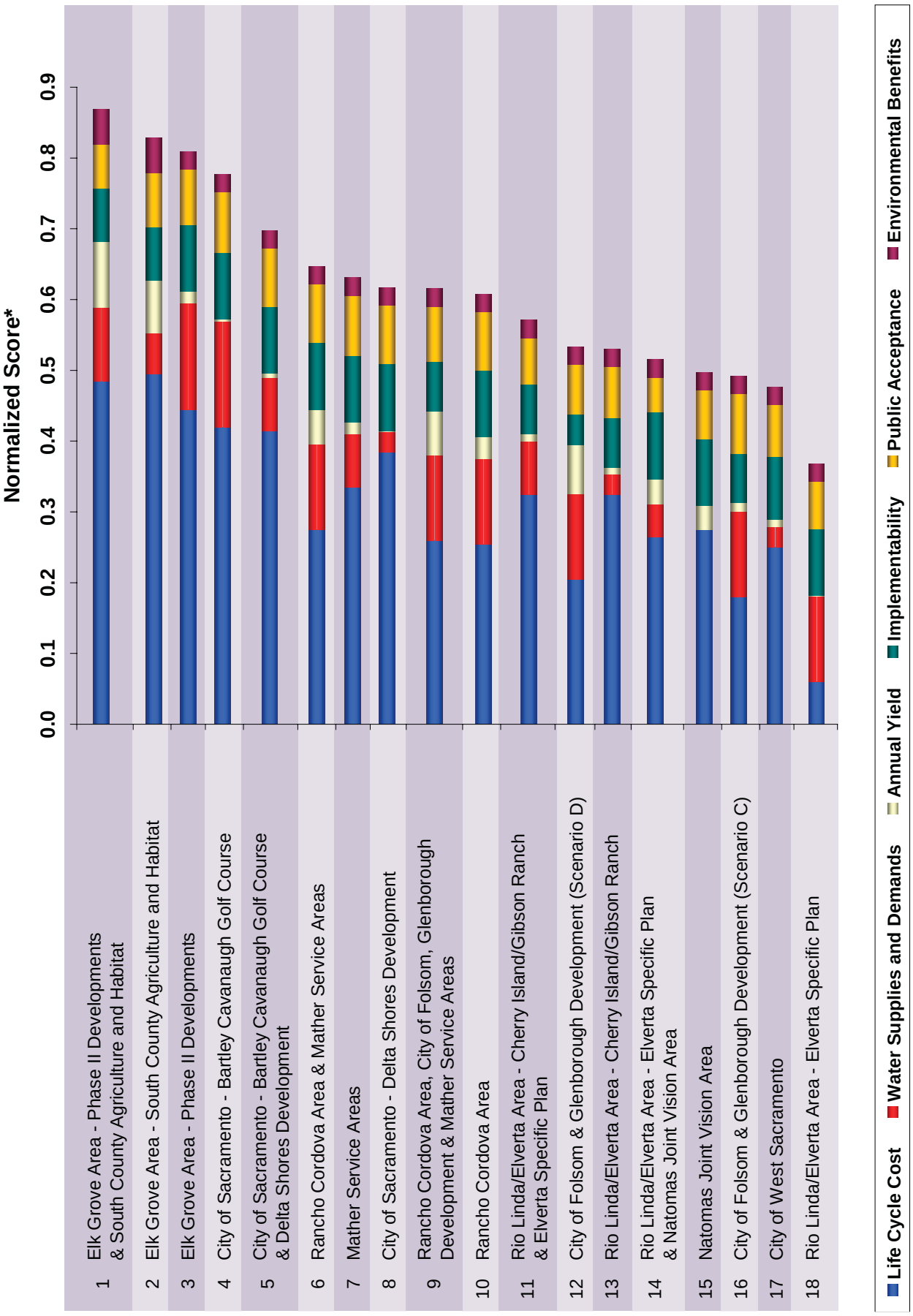



**Figure 4-1 | Comparison of Weighting Factors Developed by the Water Recycling Opportunities Study/SRCSD Management and Water Recycling Advisory Committee**




** Exported data from CDP 3.0 to Excel has a conversion error of 0.01*

**Figure 4-2 | Criterium Decision Plus 3.0 Normalized Scores for Potential Water Recycling Projects**

## Table 4-1 | Summary of Prioritization of Potential Water Recycling Projects

| Potential Water Recycling Projects | CDP 3.0 Ranking | Recycled Water Demands | | | Estimated Costs | |
|---|---|---|---|---|---|---|
| | | Average Day Demand (MGD) | Peak Day Demand (MGD) | Annual Demand (AF/year) | Capital Costs | EUAC/AF |
| Elk Grove Area - Phase II Developments & South County Agriculture and Habitat | 1 | 11.6 | 22.3 | 13,014 | $89M | $354 |
| Elk Grove Area - South County Agriculture and Habitat | 2 | 9.3 | 16.5 | 10,438 | $48M | $245 |
| Elk Grove Area - Phase II Developments | 3 | 2.3 | 5.8 | 2,576 | $48M | $728 |
| City of Sacramento - Bartley Cavanaugh Golf Course | 4 | 0.3 | 0.7 | 591 | $5M | $966 |
| City of Sacramento - Bartley Cavanaugh Golf Course & Delta Shores Development | 5 | 1.0 | 2.2 | 985 | $15M | $1,025 |
| Rancho Cordova Area & Mather Service Areas | 6 | 6.2 | 15.7 | 6,899 | $224M | $2,357 |
| Mather Service Areas | 7 | 2.4 | 5.9 | 2,598 | $55M | $1,781 |
| City of Sacramento - Delta Shores Development | 8 | 0.7 | 1.5 | 394 | $13M | $1,284 |
| Rancho Cordova Area, City of Folsom, Glenborough Development & Mather Service Areas | 9 | 7.8 | 20 | 8,819 | $318M | $2,515 |
| Rancho Cordova Area | 10 | 3.8 | 9.8 | 4,301 | $89M | $2,554 |
| Rio Linda/Elverta Area - Cherry Island/Gibson Ranch & Elverta Specific Plan | 11 | 1.6 | 3.9 | 1,713 | $40M | $1,902 |
| City of Folsom & Glenborough Development (Scenario D) | 12 | 8.6 | 21.9 | 9,701 | $465M | $3,252 |
| Rio Linda/Elverta Area - Cherry Island/Gibson Ranch | 13 | 1.3 | 3.2 | 1,411 | $32M | $1,866 |
| Rio Linda/Elverta Area - Elverta Specific Plan & Natomas Joint Vision Area | 14 | 4.7 | 11.8 | 5,230 | $177M | $2,469 |
| Natomas Joint Vision Area | 15 | 4.4 | 11.1 | 4,928 | $157M | $2,358 |
| City of Folsom & Glenborough Development (Scenario C) | 16 | 1.7 | 4.4 | 1,920 | $83M | $3,010 |
| City of West Sacramento | 17 | 1.4 | 3.8 | 1,736 | $63M | $2,609 |
| Rio Linda/Elverta Area - Elverta Specific Plan | 18 | 0.3 | 0.7 | 302 | $17M | $4,430 |

KEY

AF/year – acre-feet per year
CDP 3.0 – Criterium Decision Plus 3.0
EUAC/AF – Equivalent Uniform Annual Cost per acre-foot
MGD – million gallons per day
O&M - Operations and Maintenance
TPCC - Total Probable Capital Cost

The estimated cost for each potential project is intended to be inclusive of all treatment, storage, transmission, distribution, and on-site irrigation system capital costs. For comparative purposes, the overall cost of a potential project, or EUAC/AF, was calculated and includes the annual O&M cost for the public facilities portion of the project.

For the WROS, estimated costs are not apportioned amongst the potential partners. For selected projects, these costs will be further refined and apportioned through future studies.

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SECTION 5

# BUSINESS CASE EVALUATION

As discussed in **Section 4**, the WROS identified 18 potential recycled water projects. The potential projects are located in different geographic areas and have different water recycling demands (**Section 3**). The potential projects would deliver recycled water for sale to retail customers.

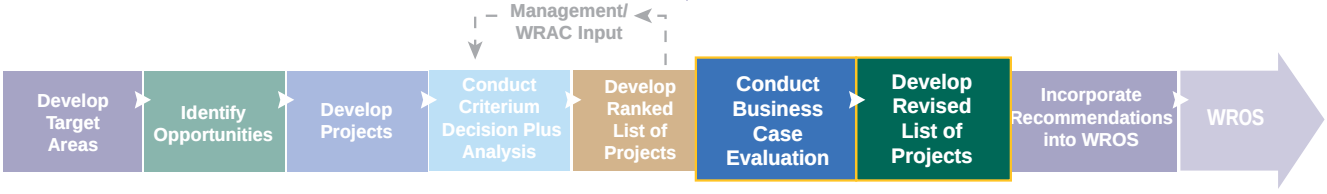
> ***Because local government has fiduciary responsibility to serve constituent customers, the customers' perspectives were considered to identify business case benefits and costs. Said another way, the study objective was to determine which potential water recycling project(s) would best serve customers regardless of who might be the customers' water purveyor, wastewater service provider, or other interested parties of local government.***

It is conceivable that all 18 potential projects could be implemented in some fashion. On first glance, this might appear to be a comprehensive response to total water resource management. But before such an undertaking would start, there must be discernment about the order of which potential projects should be implemented sooner vs. later, and further to verify that the potential projects to be implemented are economically sound--that is, that they provide to the community more benefit than they cost the community. For these dual purposes, the Business Case Evaluation (BCE) was performed to assess the relative attractiveness of the economics of the potential projects and to further rank the projects in economic terms for project scheduling.

It is important to note that while economic assessment is a critical step in the process to consider public investment in utility facilities, it is not the only parameter of importance. Providing for sustainable growth, promoting the appropriate uses of natural resources, and considering the larger societal benefits of water recycling should also play a part in the decision-making process. This BCE does not attempt to quantify these environmental and social benefits.Further, this BCE is project specific and does not attempt to consider broader regional economic benefits such as job-creation, economic growth, etc.

The principal business reasons for interest in potential projects have to do with cost and avoided cost. It is assumed that all potable water supplies would meet (or exceed) minimum levels of service with respect to water quality, quantity, safety, etc., and that all water recycling water potential projects would meet or exceed similar levels of service for the intended and lawful uses that the customers would use the recycled water to satisfy.

Cost parameters associated with the potential projects include features that have relative benefits and costs to the customer in the event of implementation. Therefore, it was appropriate to consider benefit/cost (B/C) ratios as a measurement of business attractiveness for implementation. B/C ratios greater than 1.0 indicate a project would provide net benefit to customers upon implementation and that the project should be implemented. The B/C ratio is also a ranking parameter; the higher the B/C ratio, the earlier the project should be implemented



because the benefits would be greater compared to the costs. Note that this parameter does not mean that the potential project that would generate the most recycled water is necessarily the best project. Often, smaller projects have greater margins of relative benefit compared to larger projects.

Because the potential projects are of different capacities, all cost data were reduced from aggregate project costs to unit costs of recycled water produced (for sale) by the projects. All costs were computed on a dollar per acre-foot per year of demand basis similar to pricing of potable water. Capital costs were converted to EUAC for this purpose, using cost of capital values for discount rate and life cycle time frame (i.e., constant across all potential projects) for economic term in the computation.

## Benefits

Cost parameters that would ***benefit*** customers include the following:

- Avoidance of the allocated cost of water supply, treatment, and transmission facilities that would not have to be built (or would be built later) because recycled water facilities would supply that demand.
- Avoidance of operation and maintenance costs associated with the volume of potable water replaced by the use of recycled water
- Avoidance of capital and/or O&M costs associated with wastewater treatment. During the EMB evaluation, potential avoided costs of wastewater treatment was calculated for three potential future treatment scenarios:
    - Continuation of existing treatment processes at the SRWTP
    - Addition of membrane filtration
    - Addition of membrane filtration, nutrient removal, and temperature control

The BCE model calculated benefits using avoided wastewater treatment costs for each scenario above based on the type of potential water recycling project (centralized or decentralized (i.e., satellite facility)). Two important assumptions pertaining to avoided wastewater treatment costs are as follows:

**Load vs. Concentration** – SRCSD's current NPDES permit contains both mass load-based and concentration-based effluent limits on most contaminants of concern. However, while water recycling would reduce the overall pollutant load to the river, it could marginally increase the effluent concentrations of these same pollutants. The WROS assumes any such marginal changes would not control the timing of and investment in potential additional advanced treatment facilities (i.e., membrane filtration and nutrient removal).

**Recycled Water Use Pattern** – The anticipated recycled water use identified in the WROS generally follows an irrigation pattern with maximum usage in summer months and little or no recycled water use in winter months. Therefore, water recycling would reduce effluent flow and pollutant load to the river during dry months, but not winter months. The benefits of water recycling assume dry month flow and load permit conditions would control the timing of and investment in potential additional advanced treatment facilities (i.e., membrane filtration and nutrient removal).

## Costs

Cost parameters that would ***cost*** customers include the following:

- The unit cost of new recycled water facilities (e.g., treatment plant, storage reservoirs, connecting pipelines) that would have to be built to supply water demand (otherwise met by potable water facilities).
- The cost of operation and maintenance of the recycled water facilities

Once the selection of the preferred project(s) is made, implementation considerations may introduce inter-agency cost allocations and/or subsidies as marketing measures to ensure project viability.

## Benefits and Costs Analysis Results

Table 5-1 presents a comparison of the B/C ratios for the three wastewater treatment scenarios and the rankings from the prioritization process using CDP 3.0 (Section 4) for all potential projects. Projects are sorted based on the "Continuation of Existing Treatment" scenario. Regardless of the treatment scenario, the three projects with B/C ratios greater than 1.0 also have the highest CDP 3.0 rankings.

Figures 5-1 through 5-3 show the relative magnitude of Equivalent Uniform Annual Costs and Benefits for each water recycling project. Longer bars indicate projects with greater costs and/or benefits. The position of the midpoint of these bars relative to the zero value on the X-axis represents whether the project results in a net economic benefit or cost to the community. Finally, the figures also illustrate the relative amount of water supply benefit versus wastewater treatment a particular project provides. However, non-financial benefits (e.g. environmental, contribution towards continued economic growth) to the Sacramento Region and SRCSD service area are not represented in the figures.

**Table 5-1 | Benefit Cost Ratios Comparison**

| | | SRWTP Treatment Scenarios | | |
|---|---|---|---|---|
| Potential Water Recycling Project | CDP 3.0 Ranking | Continuation of Existing Treatment | Addition of Membrane Filtration | Addition of Membrane Filtration + Nutrient Removal * |
| Elk Grove Area – South County Agriculture and Habitat | 2 | 1.12x | 2.09x | 2.32x |
| Elk Grove Area – Phase II Developments & South County Agriculture and Habitat | 1 | 1.04x | 1.71x | 1.87x |
| Elk Grove Area – Phase II Developments | 3 | 1.02 x | 1.35 x | 1.42 x |
| Mather Service Areas | 7 | 0.46 x | 0.60 x | 0.63 x |
| City of Sacramento – Bartley Cavanaugh Golf Course | 4 | 0.37 x | 0.61 x | 0.67 x |
| City of Folsom & Glenborough Development (Scenario C ) | 16 | 0.36 x | 0.44 x | 0.46 x |
| Rancho Cordova Area, City of Folsom, Glenborough Development, & Mather Service Areas | 9 | 0.36 x | 0.45 x | 0.47 x |
| Rancho Cordova Area & Mather Service Areas | 6 | 0.35 x | 0.45 x | 0.48 x |
| City of Sacramento – Bartley Cavanaugh Golf Course & Delta Shores Development | 5 | 0.34 x | 0.57 x | 0.62 x |
| City of Folsom & Glenborough Development (Scenario D) | 12 | 0.33 x | 0.41 x | 0.42 x |
| Rancho Cordova Area | 10 | 0.32 x | 0.42 x | 0.44 x |
| Rio Linda/Elverta Area – Cherry Island/Gibson Ranch | 13 | 0.31 x | 0.44 x | 0.47 x |
| Rio Linda/Elverta Area – Cherry Island/Gibson Ranch & Elverta Specific Plan | 11 | 0.31 x | 0.43 x | 0.46 x |
| City of Sacramento – Delta Shores Development | 8 | 0.28 x | 0.46 x | 0.51 x |
| Natomas Joint Vision Area | 15 | 0.25 x | 0.35 x | 0.37 x |
| Rio Linda/Elverta Area – Elverta Specific Plan & Natomas Joint Vision Area | 14 | 0.24 x | 0.33 x | 0.36 x |
| City of West Sacramento | 17 | 0.22 x | 0.32 x | 0.34 x |
| Rio Linda/Elverta Area – Elverta Specific Plan | 18 | 0.13 x | 0.18 x | 0.20 x |

** Temperature Treatment cost was not included because it is determined to be unbeneficial to water recycling projects because the maximum recycled water usage would be in summer months and little or no recycled water use in winter months.*

| KEY |
|---|
| CDP 3.0 - Criterion Decision Plus 3.0 |

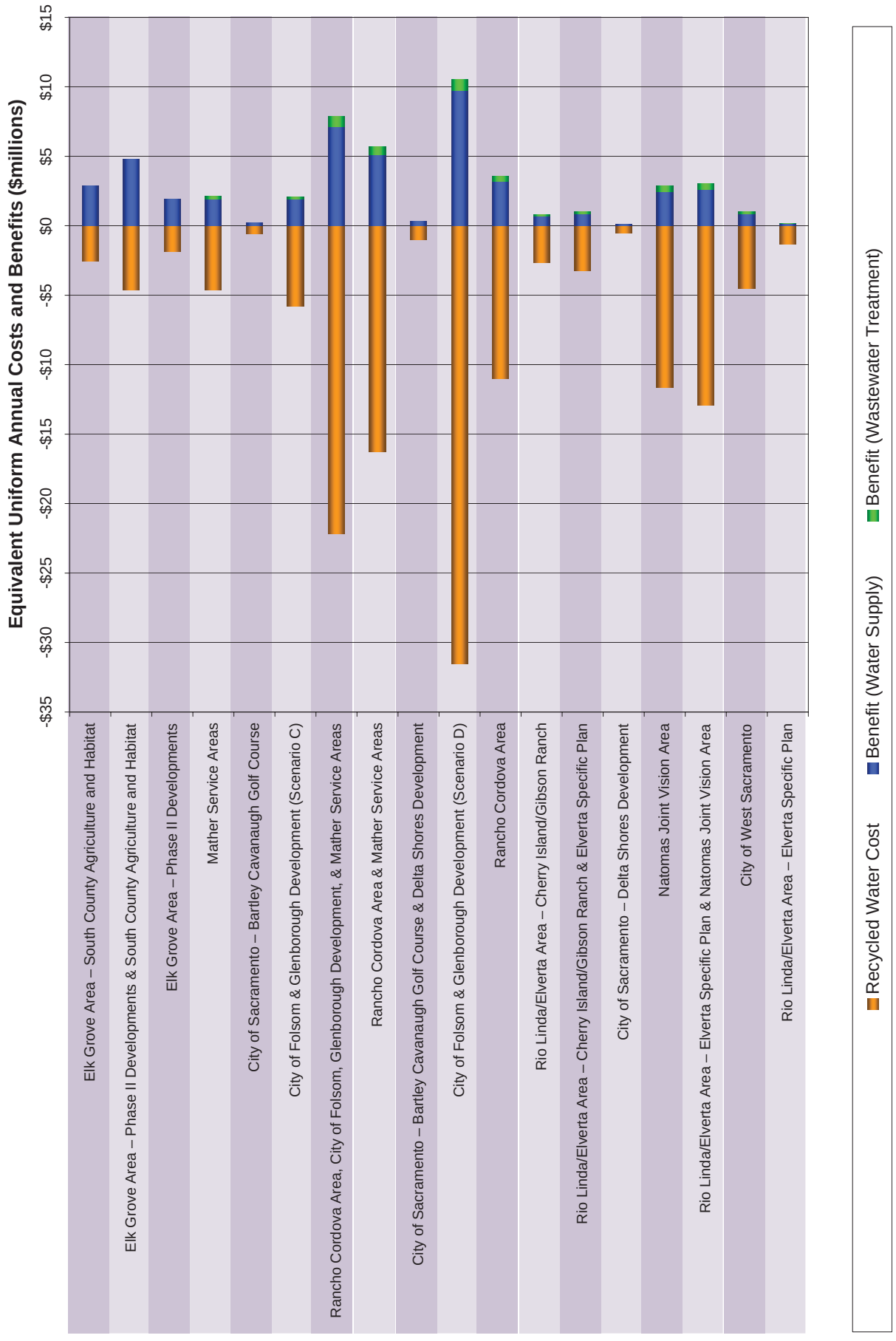



**Figure 5-1 | Water Recycling Benefits and Costs (Continuation of Existing Treatment)**

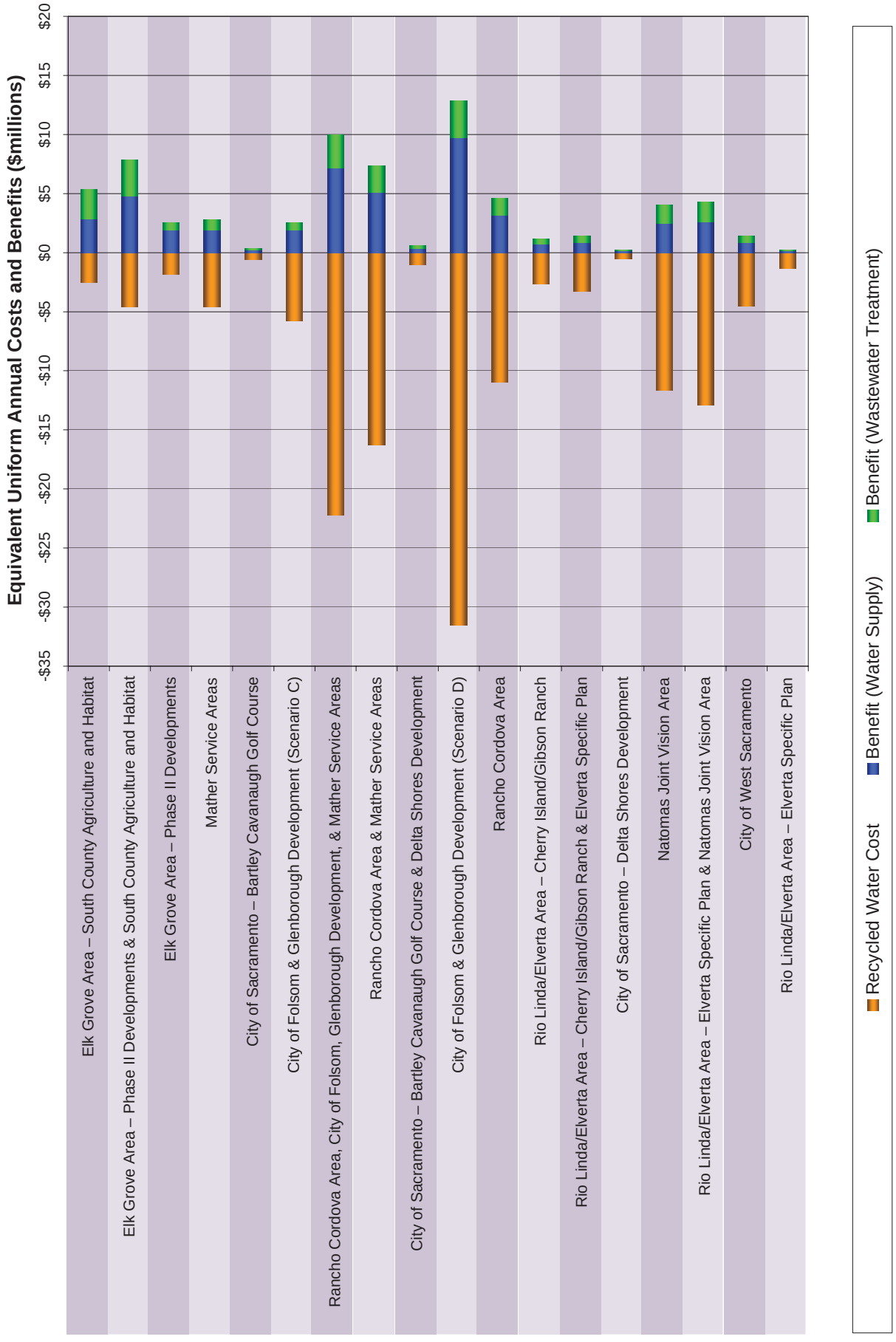



**Figure 5-2 | Water Recycling Benefits and Costs (Addition of Membrane Filtration)**

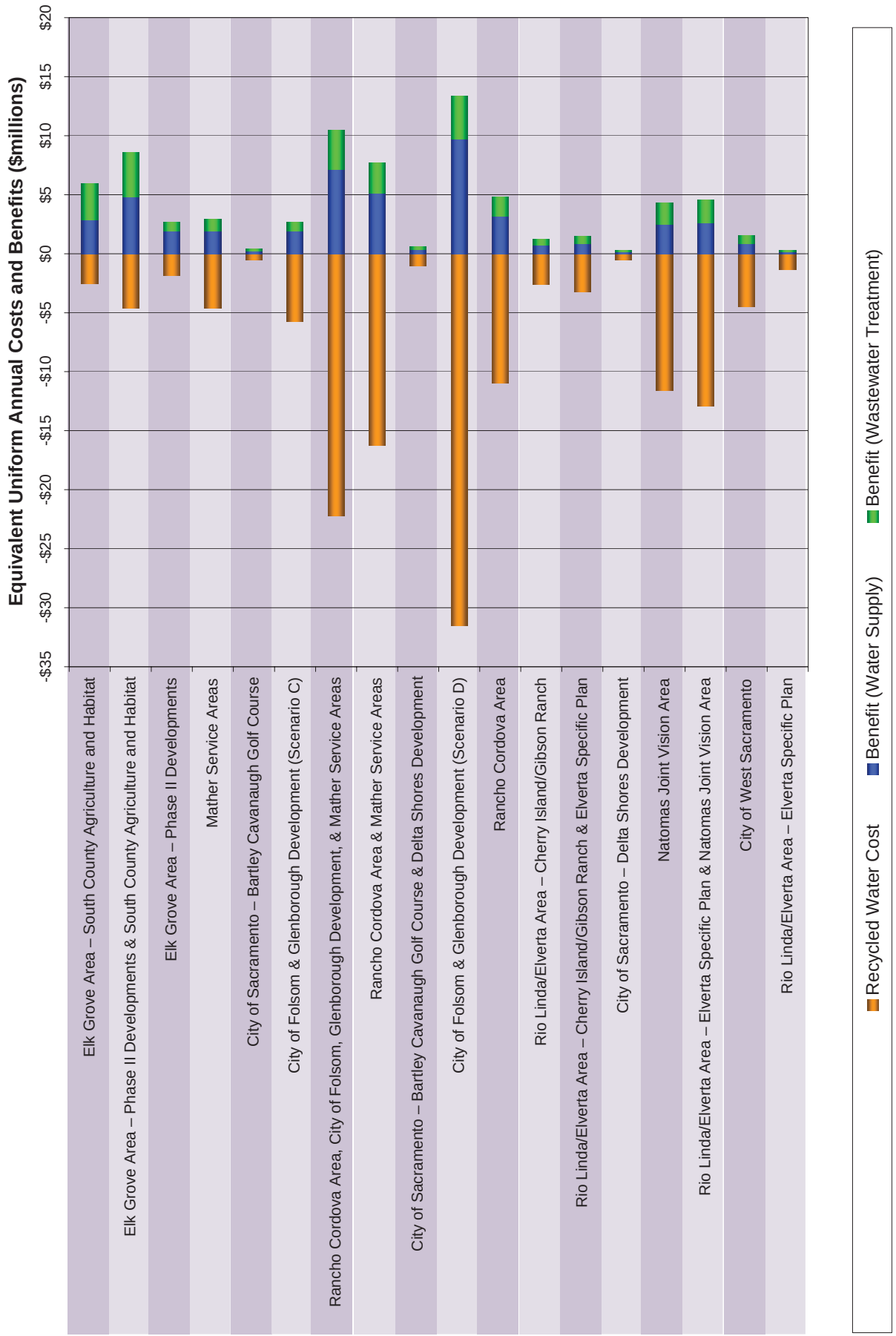



**Figure 5-3 | Water Recycling Benefits and Costs (Addition of Membrane Filtration + Nutrient Removal)**

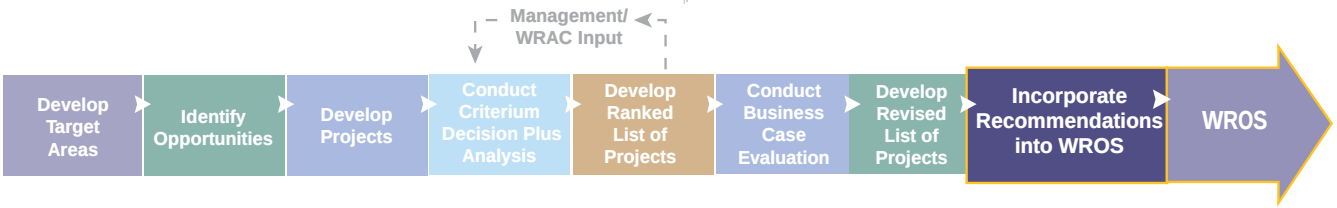
SECTION 6

# OBSERVATIONS AND CONCLUSIONS, RECOMMENDATIONS, AND IMPLEMENTATION PLAN

Key observations and conclusions of the WROS are summarized below; the recommendations and implementation plan were derived from these observations and conclusions.

## *Observations and Conclusions*

1. State law declares that the continued use of potable water for landscape irrigation and certain other non-potable water uses is an unreasonable use of potable water if recycled water is available and usable for such purposes (California Water Code section 13552.2). Further, California Water Code section 13577 calls for increasing water recycling statewide to 1 million af/year (or roughly 1 billion gallons per day) by 2010.
2. To justify a significant investment in water recycling, SRCSD, water purveyors, and land use authority decision-makers will need to look beyond today's economics and consider the social and environmental benefits associated with preserving the highest water quality sources for potable uses by providing recycled water for appropriate uses such as irrigation.
3. The economic analysis does not consider the cost of the next, as yet unidentified, increment of water supply that will be needed to meet the demands of the Sacramento region beyond the current planning horizon. It is anticipated that the future cost of water will be substantially greater than current costs.
4. A large-scale water recycling program could extend the Sacramento region's potable water supply.
5. Water purveyors in the Sacramento region have varying abilities to meeting future municipal and industrial demands. While some purveyors have sufficient water supplies in all year types (e.g., wet, dry) to meet projected demands, others have no identified water supply for projected growth through 2030 in all year types and/or beyond 2030.
6. Many opportunities exist within the Sacramento region to use recycled water in lieu of potable surface water or groundwater for irrigation and other non-potable uses.
7. It is likely that a group of three to six individual water recycling projects would be required to achieve 30 to 40 MGD of recycled water use. These projects would likely consist of centralized and satellite treatment facilities, and would collectively form a large-scale Water Recycling Program.
8. A large-scale Water Recycling Program would require a significant capital expenditure. Generally, the cost of potable water in the Sacramento region today is less expensive than the cost of producing recycled water. However, increased water demands due to population growth and changes in weather patterns are expected to make water recycling a more attractive commodity in the future.
9. The requirements contained in SRCSD's future NPDES permits could affect the economic attractiveness of a large-scale Water Recycling Program.



10. Retrofitting residential development with a purple pipe distribution system to supply recycled water to parks, landscape medians, and other large urban irrigation sites is 3 to 4 times more expensive than installing the system with the initial base infrastructure. Therefore, it is likely that any development built in the Sacramento region without purple pipe installed as part of the base infrastructure becomes a missed opportunity.
11. Based on the B/C ratios (see **Table 5-1**), the "Elk Grove Area – Phase II Developments" and the "Elk Grove Area – South County Agriculture and Habitat" are the recycled water projects that appear to be most economically attractive at this time. Other promising projects identified in the WROS include the East Area (Target Area 2) projects and the City of Sacramento projects.

## *Water Recycling Opportunities Study Recommendations*

The preceding observations and conclusions led to the following recommendations:

1. **Implement the Elk Grove Area – Phase II Developments Project.** This project was originally envisioned as an expansion to the small-scale Water Recycling Program completed in April 2003. However, challenges with the operation of the WRF at the SRWTP, development timing and transmission pipeline were outstanding issues. As part of the WROS process, these issues were resolved between meetings with SRCSD and SCWA staff, allowing the Elk Grove Area – Phase II Developments Project to proceed.
2. **Continue preparation of a Feasibility Study for the Elk Grove Area – South County Agriculture and Habitat Project.** The purpose of this study is to further develop the South County Agriculture and Habitat Project identified in the SRCSD WROS to provide SRCSD and its potential partners with sufficiently detailed project information to make a decision on whether to proceed with the recycled water transmission pipeline and necessary on-site improvements. This effort will:
    a. Confirm potential recycled water demand
    b. Identify potential recycled water transmission pipeline routes
    c. Identify likely on-site irrigation practices
    d. Confirm regulatory requirements
    e. Develop a conceptual operations plan
    f. Estimate the capital and operational cost of the required facilities
    g. Develop a financing plan and revenue program
3. **Continue preparation of a Feasibility Study for East Area (Target Area 2) Projects.** The purpose of this study is to further develop the east Sacramento County satellite treatment facility projects identified in the SRCSD WROS to provide SRCSD and its potential partners with sufficiently detailed project information to make a decision on whether to proceed with implementation of a satellite reclamation facility project. The feasibility study will:
    a. Confirm recycled water demands and place of use
    b. Explore options for interim alternative non-potable water supply to charge the purple pipe system prior to the satellite treatment facility coming online
    c. Identify potential sites for satellite treatment facilities
    d. Provide a feasibility-level design of required facilities
    e. Provide a conceptual operations plan
    f. Estimate the capital and operational cost of the required facilities
    g. Provide a financing plan and revenue program to allow SRCSD and its partners to determine if they wish to proceed with project implementation
4. **Continue preparation of a Feasibility Study for the City Projects.** The purpose of this study is to further develop the City of Sacramento recycled water projects identified in the WROS to provide SRCSD and its potential partners with sufficiently detailed project information to make a decision on whether to proceed with implementation. The feasibility study will:
    a. Confirm recycled water demands
    b. Provide a feasibility-level design of required facilities
    c. Estimate the capital and operational cost of the required facilities
    d. Provide a financing plan and revenue program to allow SRCSD and its partners to determine if they wish to proceed with project implementation

5. **Continue to coordinate with and, where appropriate, participate in other regional water recycling and integrated resources efforts (e.g., ARB IRWMP).**

# Implementation Plan

A general description of the steps necessary to implement the WROS recommendations is provided below.

## Elk Grove Area – Phase II Developments

The primary steps for implementation of the "Elk Grove Area – Phase II Developments" project are as follows:

1. Modify existing SRCSD/SCWA Wholesale Agreement to address modifications to the Phase II facilities (SRCSD and SCWA activity)
2. Prepare the preliminary and final design to upgrade and expand the existing Water Reclamation Facility at the SRWTP (SRCSD activity)
3. Prepare the preliminary and final design of the Phase II recycled water transmission pipeline (SCWA activity)
4. Prepare preliminary and final design for the Phase II recycled water storage and pumping facilities (SCWA activity)
5. Prepare environmental document for project components (SRCSD and SCWA activity)
6. Acquire necessary rights-of-way for recycled water transmission pipeline construction, maintenance, and operation (SCWA activity)
7. Construct Phase II facilities (SRCSD and SCWA activity)
8. Prepare operation and staffing plan for the Phase II facilities (SRCSD and SCWA activity)
9. Acquire additional RWQCB and DHS approvals and permits to operate system (SRCSD and SCWA activity)
10. Continue public outreach campaign to inform constituents about construction and operation of the Phase II recycled water facilities (SRCSD and SCWA activity)

## Feasibility Study Projects

In addition to implementation of the "Elk Grove Area – Phase II Developments" project, the WROS recommends that three water recycling alternatives be developed to a feasibility-study level. These are the "Elk Grove Area – South County South County Agriculture and Habitat" project, the East Area (Target Area 2) projects, and the City of Sacramento projects.

Provided one or more of these alternatives proves favorable to SRCSD and associated water purveyors and land use authorities, the general steps for implementation of these water recycling projects are as follows:

1. Develop Principles of Agreement between project partners addressing:
    a. Apportionment of benefits
    b. Cost allocation
    c. Operational responsibilities
2. Implement financing plan and revenue program to fund the capital and operating costs of the recycled water facilities
3. Condition development to require use of recycled water and install necessary on-site facilities
4. Prepare preliminary and final design of required facilities
5. Prepare and certify project-specific EIR
6. Prepare Operating Agreement with project partners
7. Construct required recycled water facilities
8. Continue public outreach campaign to inform constituents about construction and operation of the recycled water system
9. Further evaluate financial and economic benefits

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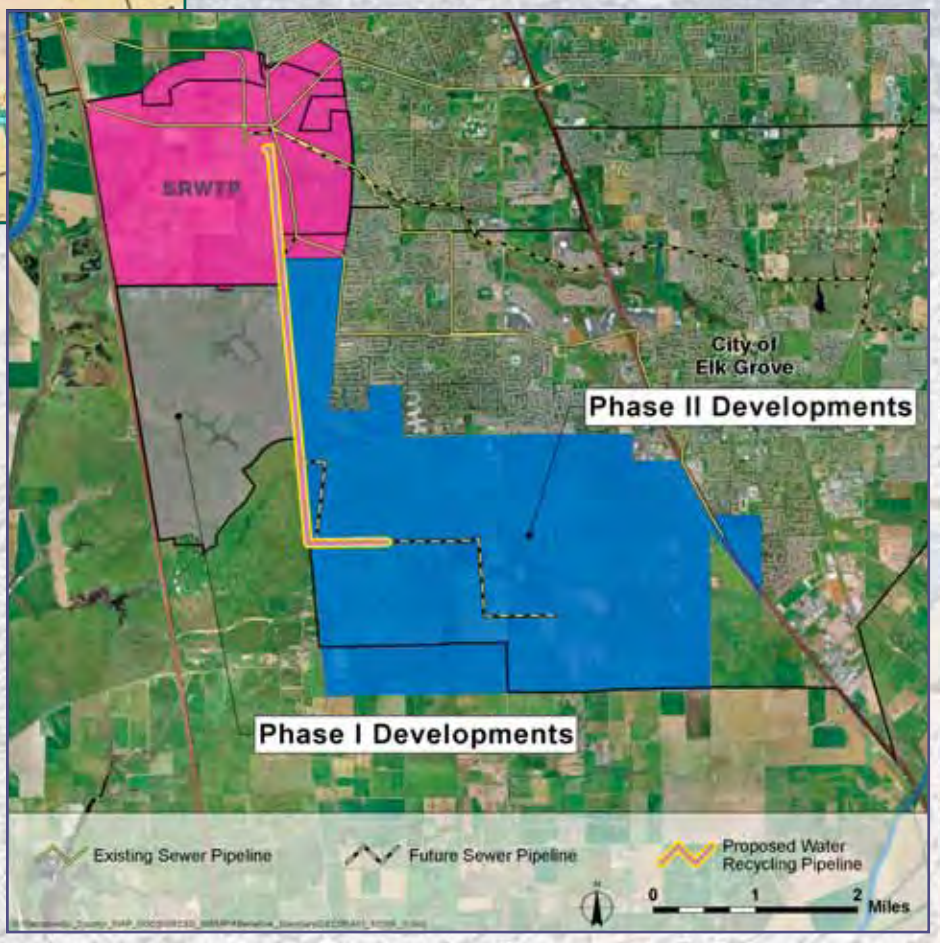
## ATTACHMENT 1

# POTENTIAL PROJECTS OVERVIEW

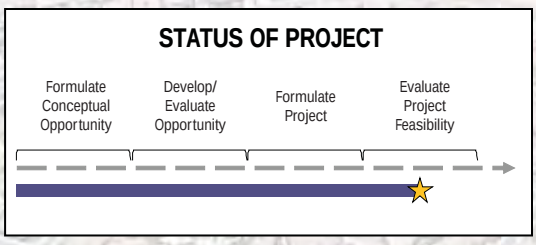
- Elk Grove Area – Phase II Developments
- Elk Grove Area – South County South County Agriculture and Habitat
- Elk Grove Area – Phase II Developments & South County Agriculture and Habitat
- City of Sacramento – Bartley Cavanaugh Golf Course
- City of Sacramento – Delta Shores Development
- City of Sacramento – Bartley Cavanaugh Golf Course & Delta Shores Development
- Rancho Cordova Area
- City of Folsom & Glenborough Development (Scenario C)
- City of Folsom & Glenborough Development (Scenario D)
- Mather Service Areas
- Rancho Cordova Area & Mather Service Areas
- Rancho Cordova Area, City of Folsom, Glenborough Development, & Mather Service Areas
- Rio Linda/Elverta Area – Cherry Island/Gibson Ranch
- Rio Linda/Elverta Area – Elverta Specific Plan
- Rio Linda/Elverta Area – Cherry Island/Gibson Ranch & Elverta Specific Plan
- Rio Linda/Elverta Area – Elverta Specific Plan & Natomas Joint Vision Area
- Natomas Joint Vision Area
- City of West Sacramento

# Elk Grove Area Phase II Developments




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Phase II Developments | Urban Irrigation | 2.3 | 5.8 |
| **Total** | | **2.3** | **5.8** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 47.5 M |
| EUAC/AF | $ 728 |



# *Elk Grove Area-Phase II Developments*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, SCWA, City of Elk Grove (Elk Grove)

## General Description of Potential Project and Operations

- This project would include service to Phase II of the SRCSD/SCWA Demonstration Project (East Franklin and Laguna Ridge).
- In all years, SRCSD would take effluent from the SRWTP and produce recycled water at the WRF using new membrane filtration capacity. The recycled water would be delivered to Phase II via existing and new transmission pipelines. New groundwater wells would be used to supplement Phase II recycled water deliveries in peak months.
- This would be a centralized recycled water project, and would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be less than 5 years.

## Project Elements

This project would require the following elements:

- 7 MGD expansion of the WRF at the SRWTP
- 105,153 linear feet of 6-inch to 20-inch diameter conveyance piping
  - 20,700 linear feet of transmission piping
  - 84,453 linear feet of in-track piping
  - On-site piping of 6,621 acres
- 5.0 million gallon (MG) aboveground storage facility
- 180 horsepower (hp) pump station capacity
- 20,700 feet of right-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- Phase II is within 2 to 3 miles of the SRWTP and WRF.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 2,576 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Phase I recycled water system is complete and operational. Phase II developments have been conditioned and built with recycled water infrastructure.
- Transmission corridor could accommodate required pipelines.
- Coordination with South Interceptor Project has started.
- There are 98 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the existing treatment facility.

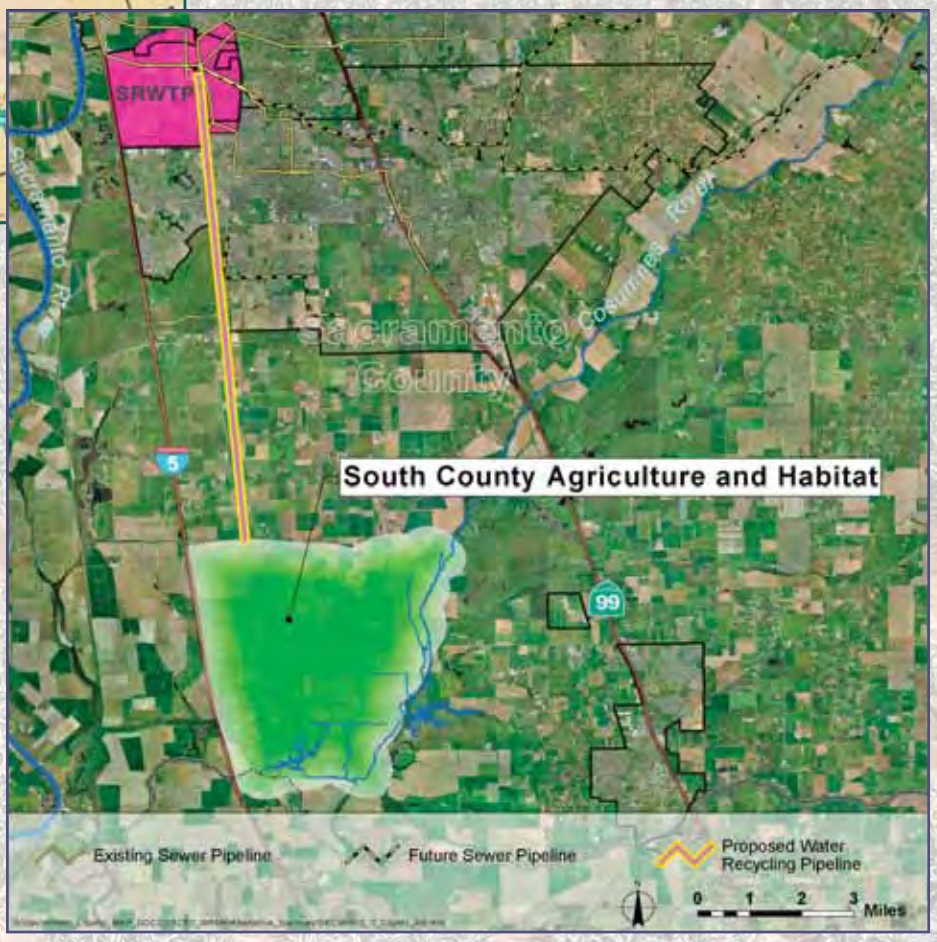
✔ **Willing Water Purveyors and Land Use Authorities**

- Phase II developments have been conditioned for recycled water delivery. Absent this supply, SCWA would need to identify and acquire an alternate water source for Scenario C uses.
- SRCSD and SCWA have entered into a contract (Wholesale Agreement) for delivery of recycled water to Phase I. The Wholesale Agreement would need to be amended to include Phase II.
- SRCSD, SCWA, and Elk Grove continue to discuss delivery of recycled water. Issues/topics include engineering refinements; cost/financing; application location(s); agreements; recycled water policy; legal, regulatory, environmental requirements; and stakeholder interaction.
- No other potential providers of recycled water were identified for this area.

## Outstanding Issues

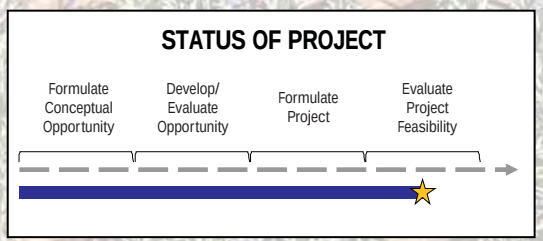
- SCWA staff indicate that iron/manganese issues with groundwater and recycled water mixing would need to be resolved.
- Funding through the Proposition 50 Integrated Regional Water Management (IRWM) Implementation grant program was approved by the California Department of Water Resources (DWR)/SWRCB.
- Wholesale Agreement between SRCSD and SCWA would need to be revised to account for 7-MGD total WRF capacity and 2-MGD supplemental water supplied by SCWA.

# Elk Grove Area
# South County Agriculture and Habitat




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| South County Agriculture and Habitat | Agricultural Irrigation | 9.3 | 16.5 |
| **Total** | | **9.3** | **16.5** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 47.9 M |
| EUAC/AF | $ 245 |



# *Elk Grove Area-South County Agriculture and Habitat*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, Elk Grove, The Nature Conservancy (TNC)

## General Description of Potential Project and Operations

- This project would include service to southern Sacramento County permanent agriculture and habitat). It is assumed to include 1,800 irrigated acres (2,000 acres total area of development).
- In all years, SRCSD would deliver disinfected secondary-23 recycled water (per DHS California Code of Regulations, Title 22) from the SRWTP to the agriculture and habitat areas via new transmission pipelines.
- This would be a centralized recycled water project. It would be an agricultural project; therefore, none of the available scenarios would be applicable.
- Direct environmental benefits to aquatic and/or terrestrial habitat would be anticipated.
- The implementation period for this project would be less than 5 years.

## Project Elements

This project would require the following elements:

- No additional treatment capacity
- 47,300 linear feet of 36-inch diameter conveyance piping
  - 47,300 linear feet of transmission piping
  - 0 linear feet of in-track piping
  - $2,000,000 for conversion of on-site piping
- 16.5 MG aboveground storage facility
- 301 hp pump station capacity
- 20,700 feet of right-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- South County Agriculture and Habitat is within 9 to 10 miles of the SRWTP.

Appropriate Potential Recycled Water Demand

- Annual Yield: 10,438 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Transmission corridor could accommodate required pipelines.
- Coordination with South Interceptor Project has started.
- There are 147 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the existing treatment facility.

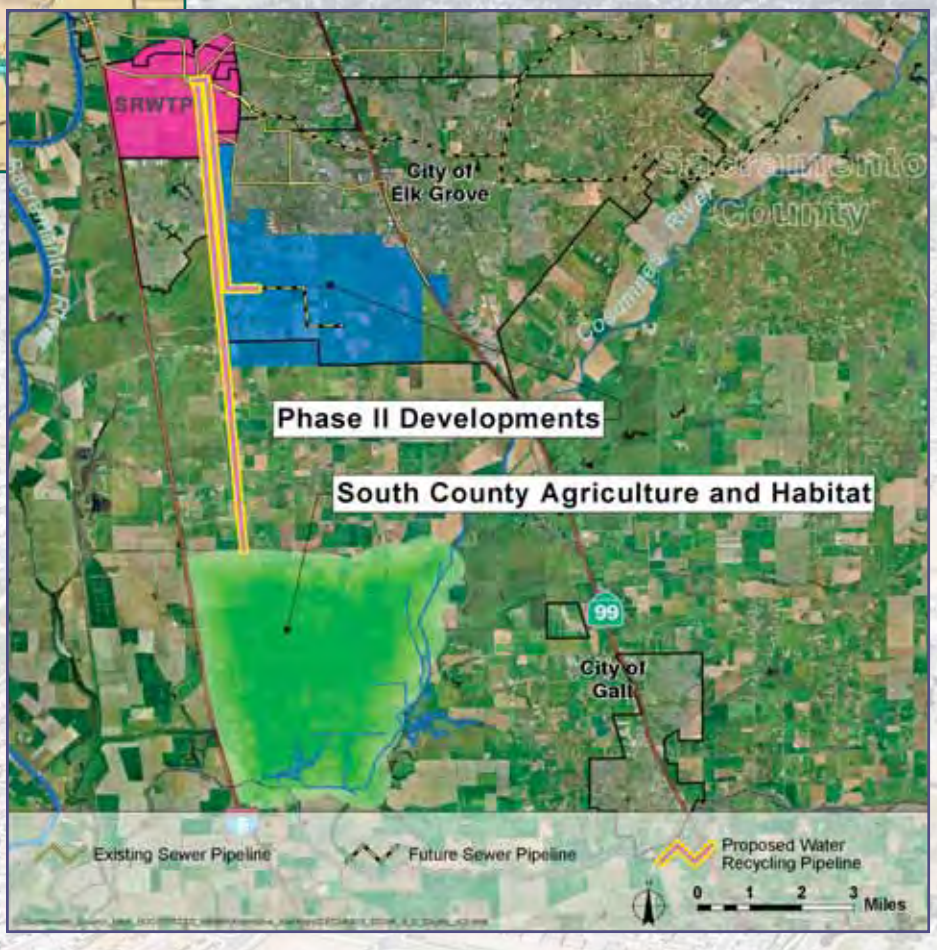
✔ **Willing Water Purveyors and Land Use Authorities**

- At present, South County Agriculture and Habitat is primarily irrigated using groundwater. This area is located within the Central Sacramento County Groundwater Basin and subject to the Sacramento Area Water Forum Agreement.
- SRCSD, Elk Grove, and TNC continue to discuss delivery of recycled water to South County Agriculture and Habitat. Issues/topics include engineering refinements; cost/financing; application location(s); agreements; recycled water policy; legal, regulatory, environmental requirements; stakeholder interaction.
- No other potential providers of recycled water were identified for this area.

## Outstanding Issues

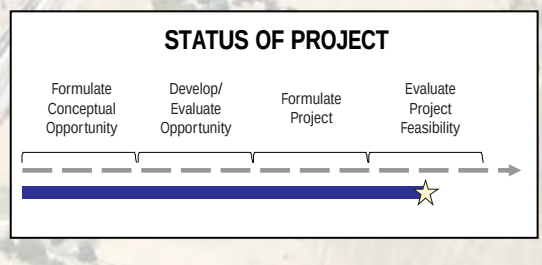
- Banking and exchange opportunity with South County Agriculture and habitat needs to be considered.
- Elk Grove purchase of mitigation lands and agreement with TNC would be required.
- Memorandum of Understanding (MOU) or Principles of Agreement (POA) between Elk Grove and SRCSD would need to be prepared.

# Elk Grove Area - Phase II Developments & South County Agriculture and Habitat




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Phase II Developments | Urban Irrigation | 2.3 | 5.8 |
| South County Agriculture and Habitat | Agricultural Irrigation | 9.3 | 16.5 |
| **Total** | | **11.6** | **22.3** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 89.1 M |
| EUAC/AF | $ 354 |



# *Elk Grove Area-Phase II Developments & South County Agriculture and Habitat*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, SCWA, Elk Grove, TNC

## General Description of Potential Project and Operations

- This project would include service to the following:
  - Phase II of SRCSD/SCWA Demonstration Project (East Franklin and Laguna Ridge).
  - South County Agriculture and Habitat assumed to include 1,800 irrigated acres (2,000 acres of total area of development).
- In all years, SRCSD would perform the following:
  - Take effluent from the SRWTP and produce recycled water at the WRF using new membrane filtration capacity. The recycled water would be delivered to Phase II via existing and new transmission pipelines. New groundwater wells would be used to supplement Phase II recycled water deliveries in peak months.
  - Deliver disinfected secondary-23 recycled water (per DHS Title 22) from the SRWTP to South County Agriculture and Habitat areas via new transmission pipelines.
- This would be a centralized recycled water project. There would be no applicable scenario for South County Agriculture and Habitat. Phase II would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would be anticipated.
- The implementation period for this project would be less than 5 years.

## Project Elements

This project would require the following elements:

- 7 MGD expansion of the WRF at the SRWTP
- 152,453 linear feet of 6-inch to 36-inch diameter conveyance piping
  - 68,000 linear feet of transmission piping
  - 84,453 linear feet of in-track piping
  - On-site piping of 6,621 acres (Phase II Developments) and $2,000,000 for conversion of on-site piping (South County Agriculture and Habitat)
- 21.5 MG aboveground storage facility
- 481 hp pump station capacity
- 20,700 feet of right-of-way

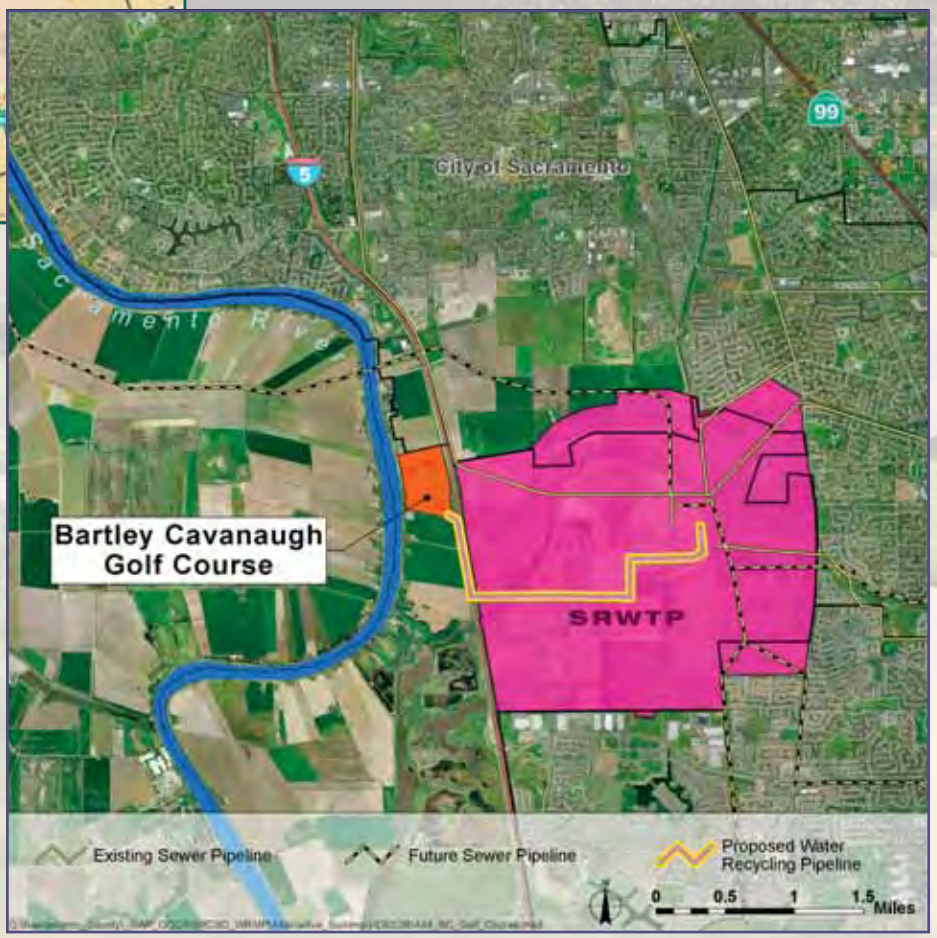
## Screening Measures

✔ Met the individual screening measures discussed for “Elk Grove Area – Phase II Developments” and “Elk Grove Area – South County Agriculture and Habitat”.

## Outstanding Issues

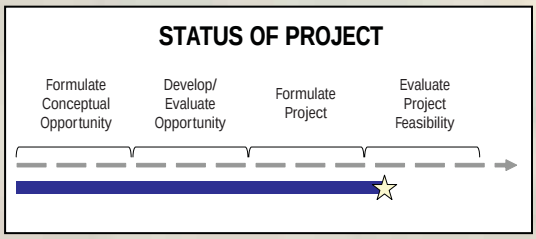
- Since this would be a combined project, the same issues discussed for “Elk Grove Area – Phase II Developments” and “Elk Grove Area – South County Agriculture and Habitat” would exist.

# City of Sacramento - Bartley Cavanaugh Golf Course




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Bartley Cavanaugh Golf Course | Urban Irrigation | 0.3 | 0.7 |
| **Total** | | **0.3** | **0.7** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 5.5M |
| EUAC/AF | $ 966 |



# *City of Sacramento Bartley Cavanaugh Golf Course*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, City of Sacramento, Capital Golf Department (Capital Golf)

## General Description of Potential Project and Operations

- This project would include service to the existing Bartley Cavanaugh Golf Course (Bart Cavanaugh).
- In all years, SRCSD would take effluent from the SRWTP and produce recycled water at the WRF using new membrane filtration capacity. The recycled water would be delivered to Bart Cavanaugh via new transmission pipelines. Within Bart Cavanaugh, existing pipelines (currently distributing groundwater) would be used to supply recycled water for irrigation uses. Groundwater would continue to be used for potable needs.
- This would be a centralized recycled water project. It would involve retrofitting an existing golf course, so none of the available scenarios would be applicable.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be less than 5 years.

## Project Elements

This project would require the following elements:

- 0.8 MGD expansion of the WRF at the SRWTP
- 14,700 linear feet of 10-inch diameter conveyance piping
  - 14,700 linear feet of transmission piping
  - 0 linear feet of in-track piping
  - On-site piping of 95 acres
- No storage facility would be required
- 128 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- Bart Cavanaugh is within 2 miles of the SRWTP and WRF.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 591 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Existing Bart Cavanaugh groundwater distribution pipelines would be used for recycled water. Design of a transmission pipeline crossing beneath Interstate 5 is at the 90 percent stage and has been environmentally reviewed.
- There are 10 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the existing treatment facility.

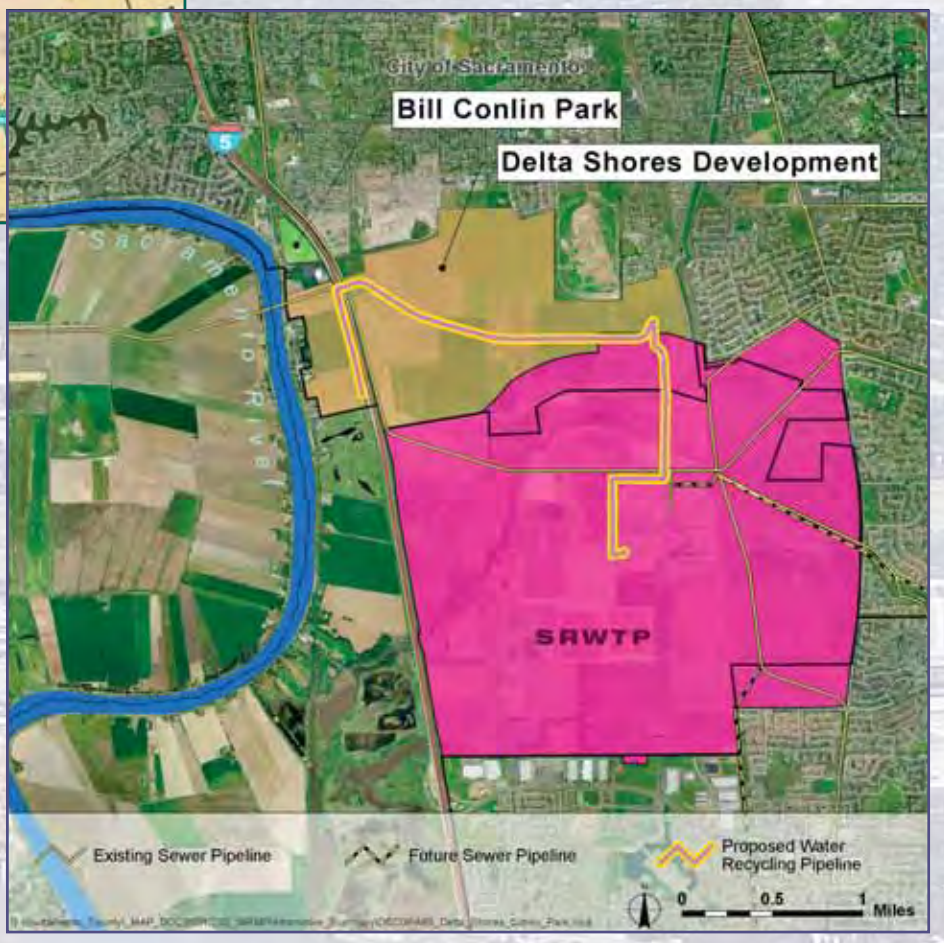
✔ **Willing Water Purveyors and Land Use Authorities**

- Bart Cavanaugh is currently supplied with groundwater. However, recent problems associated with groundwater pumping have prompted Capital Golf to investigate alternate sources of water for this facility. This area is located within the Central Sacramento County Groundwater Basin and subject to the Sacramento Area Water Forum Agreement.
- SRCSD, the City of Sacramento, and Capital Golf have developed water recycling planning studies, preliminary designs, and other documentation for Bart Cavanaugh. These entities continue to discuss delivery of recycled water to Bart Cavanaugh. Issues/topics include engineering refinements; cost/financing; agreements; recycled water policy; legal, regulatory, and environmental requirements; and stakeholder interaction. SRCSD, the City of Sacramento, and Capital Golf are expected to enter into a formal agreement on the terms and conditions of recycled water usage, if the project is determined to be feasible.
- No other potential providers of recycled water were identified for this area.

## Outstanding Issues

- Ongoing discussions with City of Sacramento staff on costs, SRCSD effluent benefits, etc.
- Funding through the Proposition 50 IRWM Implementation grant program was approved by DWR/SWRCB.

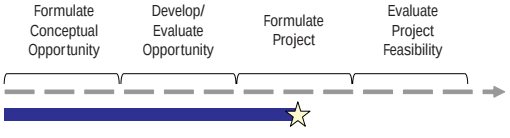
# City of Sacramento - Delta Shores Development




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Delta Shores Development | Urban Irrigation | 0.6 | 1.4 |
| Bill Conlin Park | Urban Irrigation | 0.1 | 0.1 |
| **Total** | | **0.6** | **1.5** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 13.1M |
| EUAC/AF | $ 1,284 |

**STATUS OF PROJECT**



# *City of Sacramento-Delta Shores Development*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, City of Sacramento, City of Sacramento Parks & Recreation Department (Parks & Rec)

## General Description of Potential Project and Operations

- This project would include service to the existing Bill Conlin Park (Bill Conlin), the new Delta Shores Development (Delta Shores), and a proposed regional park (in Delta Shores).
- In all years, SRCSD would take effluent from the SRWTP and produce recycled water at the WRF using new membrane filtration capacity. The recycled water would be delivered via the new transmission pipelines. Throughout Delta Shores, "purple pipe" would be installed by the developer(s), and it would be used to distribute recycled water for irrigation uses. Within Bill Conlin, existing pipelines (currently distributing surface water) would be used to supply recycled water for irrigation uses, and surface water would continue to be used for potable needs.
- This would be a centralized recycled water project. Delta Shores would be Scenario C. Bill Conlin would involve retrofitting areas; therefore, none of the available scenarios would be applicable.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 1.4 MGD expansion of the WRF at the SRWTP
- 42,300 linear feet of 6-inch to 18-inch diameter conveyance piping
  - 10,100 linear feet of transmission piping
  - 32,200 linear feet of in-track piping
  - On-site piping of 1,000 acres
- 1.5 MG aboveground storage facility
- 196 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- Delta Shores is within 2 miles of the SRWTP and WRF.
- Bill Conlin is within 3 miles of the SRWTP and WRF.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 394 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Delta Shores is estimated to start construction in the 2008 to 2010 time frame. During this time, the developer(s) would install the recycled water distribution system. Preliminary routing for the transmission pipeline parallels the Union Pacific Railroad tracks.
- The existing Bill Conlin surface water distribution pipelines would be used for recycled water.
- There are 34 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the existing treatment facility.

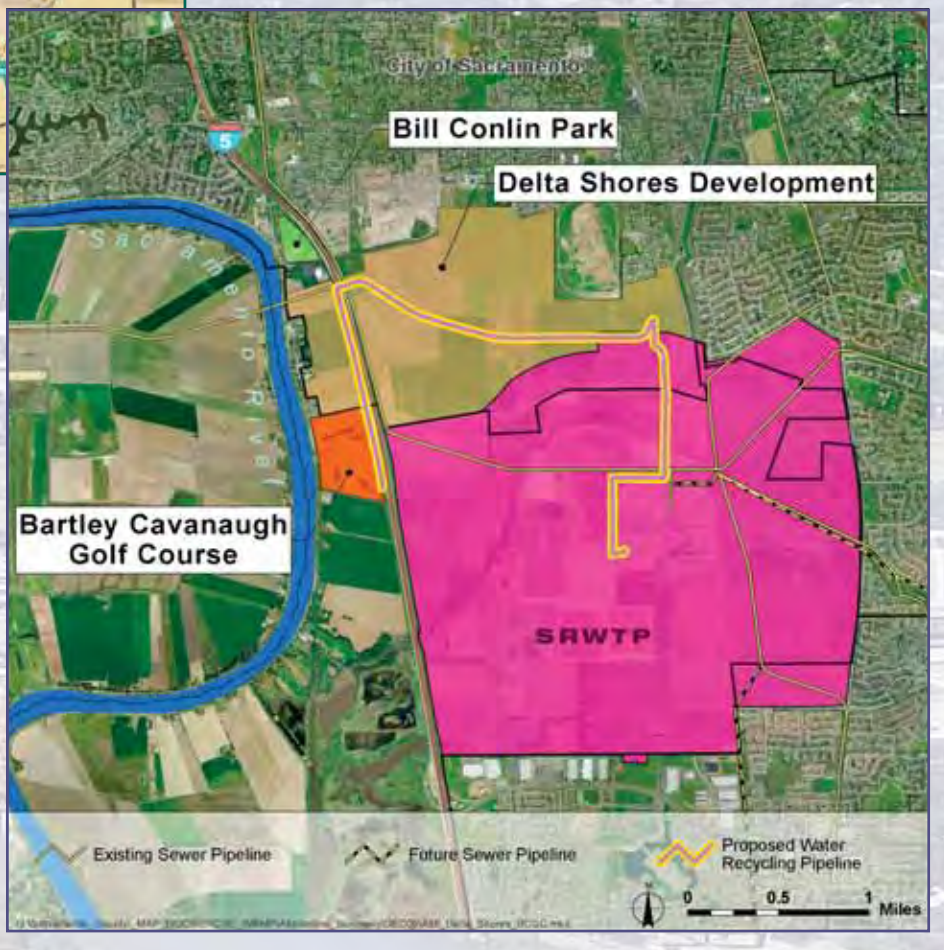
✔ **Willing Water Purveyors and Land Use Authorities**

- Although the City of Sacramento has sufficient water rights on the American and Sacramento rivers to serve Delta Shores and Bill Conlin with surface water only, it is exploring the use of recycled water for irrigation of parks, schools, business landscapes, streetscapes, and residential front and back yards.
- These areas are located within the Central Sacramento County Groundwater Basin and subject to the Sacramento Area Water Forum Agreement.
- SRCSD and the City of Sacramento have developed water recycling planning studies and other documentation, and these entities continue to discuss delivery of recycled water. Issues/topics include engineering refinements; cost/financing; agreements; recycled water policy; legal, regulatory, and environmental requirements; and stakeholder interaction.
- No other potential providers of recycled water were identified for this area.

## Outstanding Issues

- Ongoing discussions with City of Sacramento staff on costs, SRCSD effluent benefits, etc.

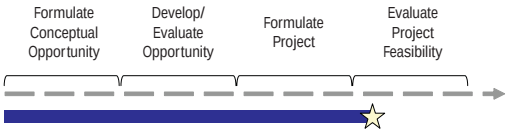
# City of Sacramento Bartley Cavanaugh Golf Course & Delta Shores Development




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Bartley Cavanaugh Golf Course | Urban Irrigation | 0.3 | 0.7 |
| Delta Shores Development | Urban Irrigation | 0.6 | 1.4 |
| Bill Conlin Park | Urban Irrigation | 0.1 | 0.1 |
| **Total** | | **1.0** | **2.2** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 15.5M |
| EUAC/AF | $ 1,025 |

**STATUS OF PROJECT**



# *City of Sacramento-Bartley Cavanaugh Golf Course & Delta Shores Development*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, City of Sacramento, Capital Golf, Parks & Rec

## General Description of Potential Project and Operations

- This project would include service to the existing Bart Cavanaugh, existing Bill Conlin, new Delta Shores, and a proposed regional park (in Delta Shores).
- In all years, SRCSD would take effluent from the SRWTP and produce recycled water at the WRF using new membrane filtration capacity. The recycled water would be delivered via the new transmission pipelines to the following locations:
  - Bart Cavanaugh, where existing pipelines (currently distributing groundwater) would be used to supply recycled water for irrigation uses. Groundwater would continue to be used for potable needs.
  - Delta Shores, where "purple pipe" would be installed by the developer(s). This pipe would be used to distribute recycled water for irrigation uses. Recycled water would be stored in a new aboveground storage tank for system peaking.
  - Bill Conlin, where existing pipelines (currently distributing surface water) would be used to supply recycled water for irrigation uses, and surface water would continue to be used for potable needs.
- This would be a centralized recycled water project. Bart Cavanaugh and Bill Conlin would involve retrofitting an existing golf course and park (respectively); therefore, none of the available scenarios would be applicable. Delta Shores would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be less than 5 years.

## Project Elements

This project would require the following elements:

- 2.2 MGD expansion of the WRF at the SRWTP
- 42,300 linear feet of 6-inch to 20-inch diameter conveyance piping
  - 10,100 linear feet of transmission piping
  - 32,200 linear feet of in-track piping
  - On-site piping of 1,095 acres
- 1.5 MG aboveground storage facility
- 251 hp pump station capacity
- No additional rights-of-way

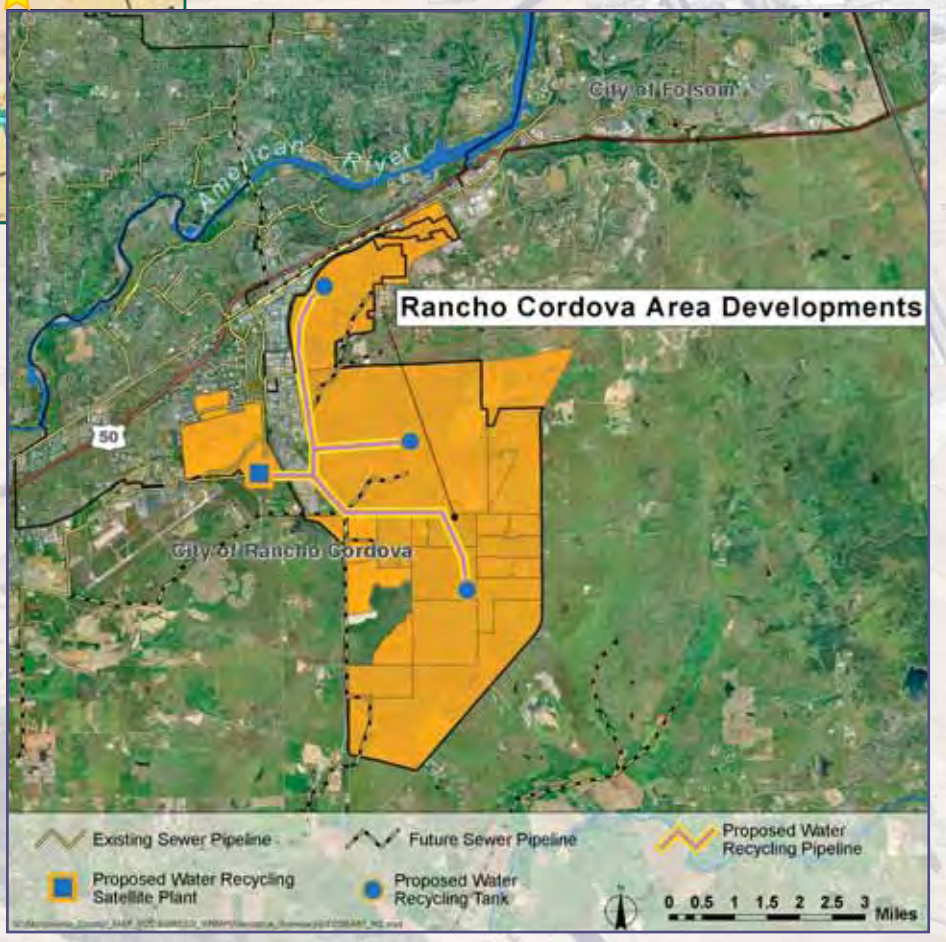
## Screening Measures

✔ Met the individual screening measures discussed for "City of Sacramento – Bartley Cavanaugh Golf Course" and "City of Sacramento – Delta Shores Development".

## Outstanding Issues

- Since this would be a combined project, the same issues discussed for "City of Sacramento – Bartley Cavanaugh Golf Course" and "City of Sacramento – Delta Shores Development" would exist.

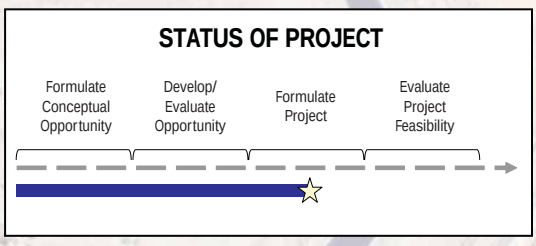
# Rancho Cordova Area




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| North Area | Urban Irrigation | 0.7 | 1.9 |
| Central Area | Urban Irrigation | 1.8 | 4.7 |
| South Area | Urban Irrigation | 1.3 | 3.2 |
| **Total** | | **3.8** | **9.8** |

- Peak-to-average ratio: 2.5

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 89.2M |
| EUAC/AF | $ 2,554 |



# *Rancho Cordova Area*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, SCWA, Golden State Water Company (GSWC), California-American Water Company (Cal-Am), City of Rancho Cordova (Rancho Cordova), City of Folsom (Folsom)

## General Description of Potential Project and Operations

- The configuration being evaluated would include service to three areas of new development within Rancho Cordova.
- In all years, SRCSD would divert wastewater from the Bradshaw/Folsom Interceptor System to a new satellite plant in Rancho Cordova. The satellite plant would provide tertiary treated recycled water to be delivered to three service areas via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. New groundwater wells would be used to supplement recycled water deliveries in peak months.
- This would be a decentralized recycled water project, and would be Scenario C. (Scenario D was also reviewed.)
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 8 MGD satellite MBR treatment facility
- 49,300 linear feet of 12-inch to 24-inch diameter conveyance piping
  - 49,300 linear feet of transmission piping
  - In-track piping of 8,680 acres
  - On-site piping of 8,680 acres
- 6.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 1,560 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- North service area is within 3 miles of the proposed satellite plant.
- Central service area is within 1.5 miles of the proposed satellite plant.
- South service area is within 3.5 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 4,301 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Water supply and general planning has already taken place for the new developments, with water supplies identified without recycled water.
- However, the opportunity exists to install recycled water infrastructure for future use. Possibilities include Rio del Oro ("Non-Potable Water Study for Rio Del Oro Specific Plan"), Sunrise Douglas ("Recycled Water Master Plan for the Sunrise Douglas Community Plan Area"), and Westborough Development.
- There are 34 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the proposed treatment facility.

✔ **Willing Water Purveyors and Land Use Authorities**

- SRCSD, SCWA, and Rancho Cordova continue to discuss recycled water delivery to Rancho Cordova, but no specific Scenario C projects have been selected for further evaluation.
- No other potential providers of recycled water were identified for this area.

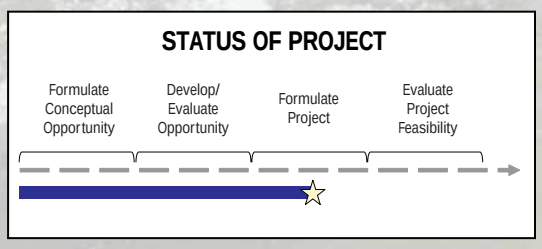
## Outstanding Issues

- Rancho Cordova, SRCSD, and water purveyors are continuing efforts, as appropriate, and in conjunction with development of the WROS.
- Appropriate level of water recycling infrastructure (or "purple pipe") with new development conditioning is under discussion.

# City of Folsom & Glenborough Development (Scenario C)


| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Folsom Sphere of Influence | Urban Irrigation | 1.4 | 3.5 |
| Glenborough Development | Urban Irrigation | 0.3 | 0.9 |
| **Total** | | **1.7** | **4.4** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 82.7M |
| EUAC/AF | $ 3,010 |



# *City of Folsom & Glenborough Development (Scenario C)*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, Folsom, Sacramento County Board of Supervisors (BOS)

## General Description of Potential Project and Operations

- The configuration being evaluated would include service to new developments within the South Folsom Sphere of Influence (SOI) area and Glenborough Development (aka Glenborough Place at Easton).
- In all years, SRCSD would divert wastewater from the Bradshaw/Folsom Interceptor System to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines to the place of use. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. Where appropriate, new groundwater wells would be used to supplement recycled water deliveries in peak months.
- This would be a decentralized recycled water project, and would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 3.5 MGD satellite MBR treatment facility
- 36,250 linear feet of 8-inch to16-inch diameter conveyance piping
  - 36,250 linear feet of transmission piping
  - In-track piping of 5,000 acres
  - On-site piping of 5,000 acres
- 3.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 830 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- Folsom SOI area is within 5.5 miles of the proposed satellite plant.
- Glenborough Development is within 2.5 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 1,920 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- This would require conditioning through the land use approval process.
- There are 10 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the proposed treatment facility.

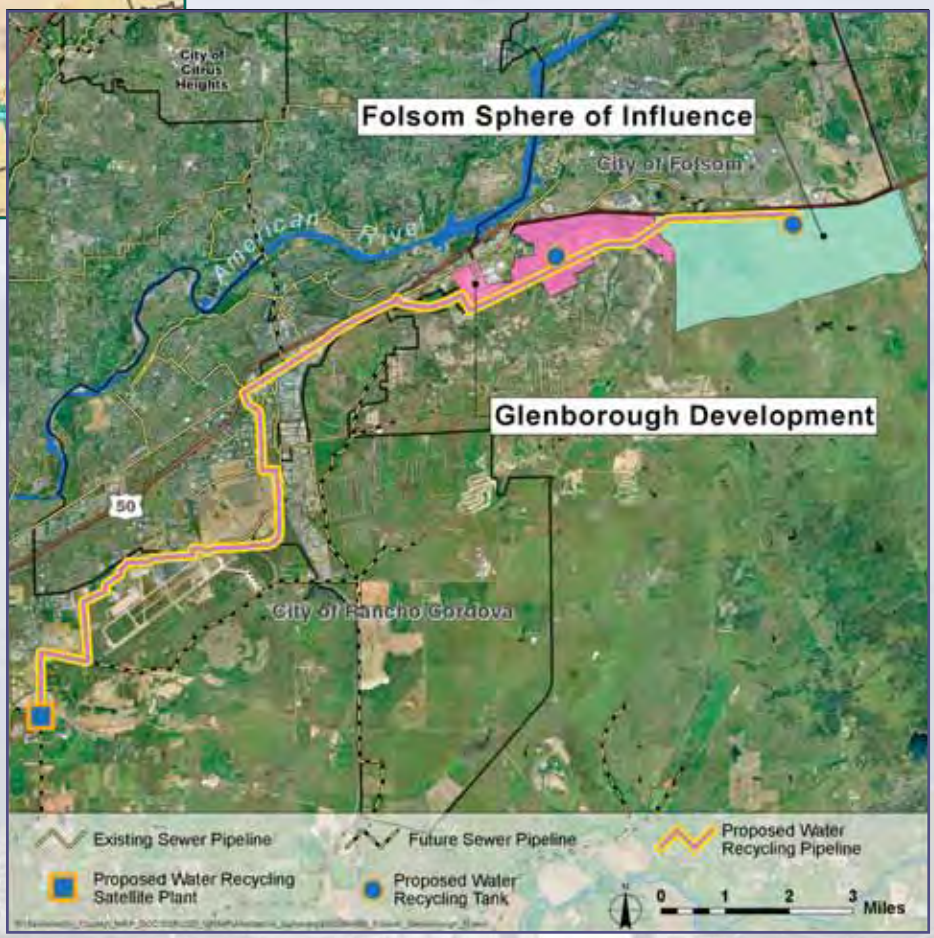
✔ **Willing Water Purveyors and Land Use Authorities**

- Because of the limited geographic extent of the groundwater basin, Folsom does not have direct access to groundwater. Thus, Folsom relies exclusively on diversions of surface water from Folsom Lake to meet its water demands in all year types. Folsom is subject to the Sacramento Area Water Forum Agreement. In the future, Folsom may not have adequate surface water available in drier years to meet demands within its existing service area boundaries.
- The Glenborough Development is outside Folsom's existing service area boundaries, and is awaiting finalization of Folsom as a water purveyor. Water recycling opportunities are currently being discussed with Glenborough developers and Sacramento County Planning.
- The water supply portfolio for the SOI area has not been identified.
- SRCSD and Folsom have preliminarily discussed delivery of recycled water to Folsom's new developments.
- Folsom is also considering recycled water from EID as an alternative supply, as described in the EID Water Recycling Master Plan (EID WRMP).

## Outstanding Issues

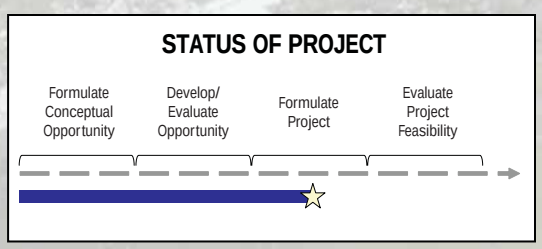
- Recycled water usage (sites and flow) estimates are being defined by Folsom's consultants.
- Source of adequate recycled water supply needs to be identified from Folsom or Bradshaw Interceptor.
- Discussion with Folsom Utilities Department management and Folsom City Council.
- For the Glenborough Development, coordination with Folsom should occur (when appropriate), and interaction with the Sacramento County planning process should continue.

# City of Folsom & Glenborough Development (Scenario D)




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| City of Folsom Sphere of Influence | Urban Irrigation | 6.7 | 17.0 |
| Glenborough Developments | Urban Irrigation | 1.9 | 4.9 |
| **Total** | | **8.6** | **21.9** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 465.1M |
| EUAC/AF | $ 3,252 |



# *City of Folsom & Glenborough Development (Scenario D)*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, Folsom, Sacramento County BOS

## General Description of Potential Project and Operations

- The configuration being evaluated would include service to new developments within the South Folsom SOI area, and Glenborough Development (aka Glenborough Place at Easton).
- In all years, SRCSD would divert wastewater from the Bradshaw/Folsom Interceptor System to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines to the place of use. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. Where appropriate, new groundwater wells would be used to supplement recycled water deliveries in peak months.
- This would be a decentralized recycled water project, and would be Scenario D.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 18 MGD satellite MBR treatment facility
- 124,950 linear feet of 18-inch to 36-inch diameter conveyance piping
  - 124,950 linear feet of transmission piping
  - In-track piping of 5,000 acres
  - On-site piping of 5,000 acres
- 10.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 3,530 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- Folsom SOI area is within 13.5 miles of the proposed satellite plant.
- Glenborough Development is within 10.5 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 9,701 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- This would require conditioning through the land use approval process.
- There are 10 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the proposed treatment facility.

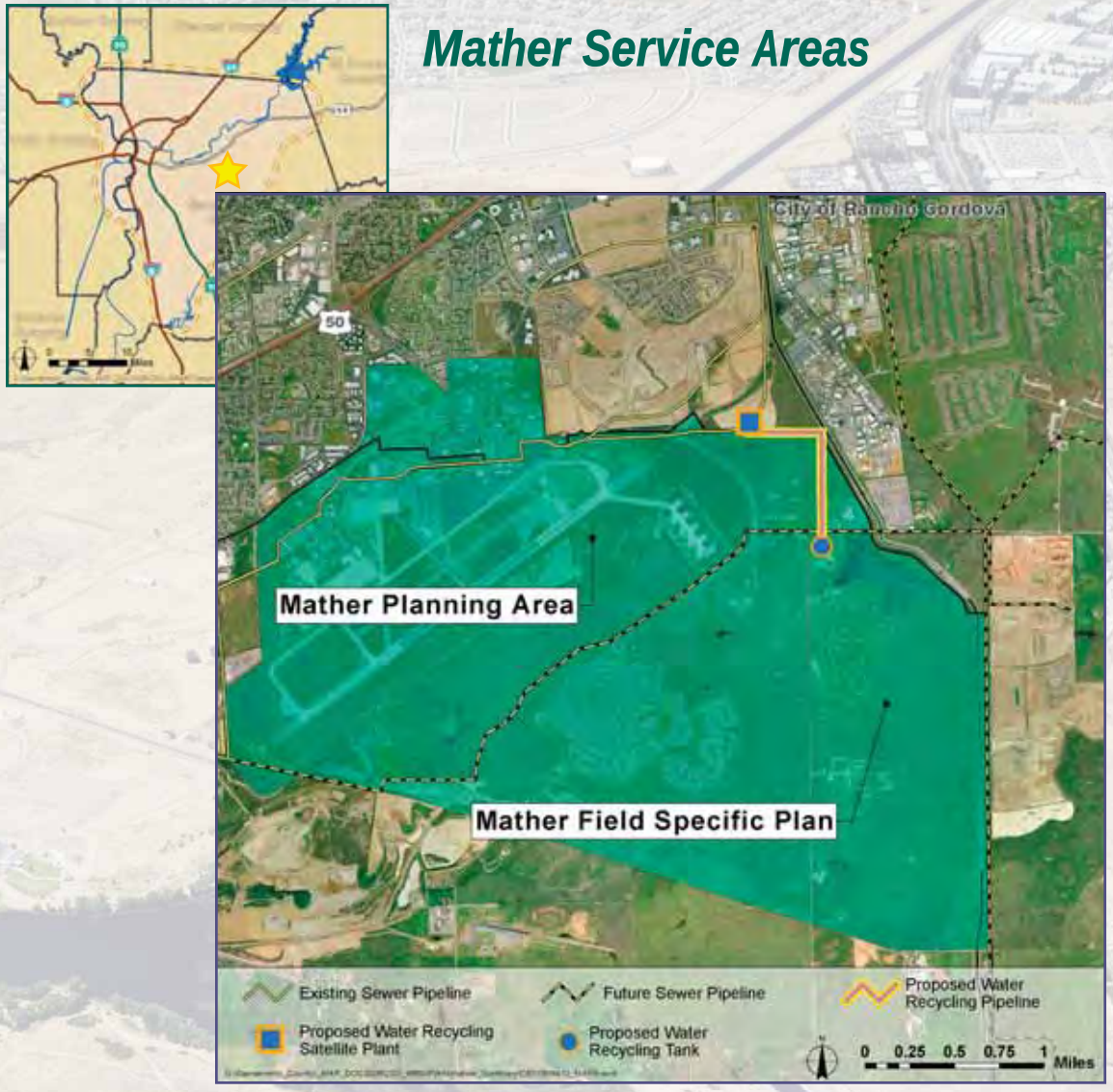
✔ **Willing Water Purveyors and Land Use Authorities**

- Because of the limited geographic extent of the groundwater basin, Folsom does not have direct access to groundwater. Thus, Folsom relies exclusively on diversions of surface water from Folsom Lake to meet its water demands in all year types. Folsom is subject to the Sacramento Area Water Forum Agreement. In the future, Folsom may not have adequate surface water available in drier years to meet demands within its existing service area boundaries.
- The Glenborough Development is outside Folsom's existing service area boundaries, and is awaiting finalization of Folsom as a water purveyor. Water recycling opportunities are currently being discussed with Glenborough developers and Sacramento County Planning.
- The water supply portfolio for the SOI area has not been identified.
- SRCSD and Folsom have preliminarily discussed delivery of recycled water to Folsom's new developments.
- Folsom is also considering recycled water from EID as an alternative supply, as described in the EID WRMP.

## Outstanding Issues

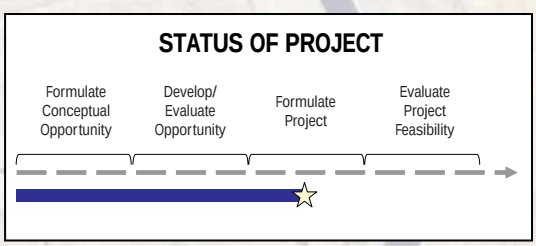
- Recycled water usage (sites and flow) estimates are being defined by Folsom's consultants.
- Source of adequate recycled water supply needs to be identified from Folsom or Bradshaw Interceptor.
- Discussion with Folsom Utilities Department management and Folsom City Council.
- For the Glenborough Development, coordination with Folsom should occur (when appropriate), and interaction with the Sacramento County planning process should continue.

# Mather Service Areas




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Mather Parks | Urban Irrigation | 1.9 | 4.7 |
| Mather Golf Course | Urban Irrigation | 0.5 | 1.2 |
| **Total** | | **2.4** | **5.9** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 55.4M |
| EUAC/AF | $ 1,781 |



# Mather Service Areas

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, SCWA, Sacramento County, County of Sacramento Department of Regional Parks (Regional Parks), Sacramento County BOS

## General Description of Potential Project and Operations

- This project would include delivery of recycled water for irrigation of existing and proposed soccer fields and other recreational facilities at Mather Parks and the existing Mather Golf Course.
- In all years, SRCSD would divert wastewater from the Bradshaw/Folsom Interceptor System to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. Water deliveries would include the following:
  - Mather Golf Course – Existing pipelines (currently distributing groundwater) would be used to supply recycled water for irrigation uses, and groundwater would continue to be used for potable needs and to supplement recycled water in peak months.
  - Mather Parks – "Purple pipe" would be installed for distribution of recycled water for irrigation uses and new groundwater wells would be installed to be used for potable water needs.
- This would be a decentralized recycled water project. None of the available scenarios would be applicable.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 5 MGD satellite MBR treatment facility
- 6,100 linear feet of 18-inch diameter conveyance piping
  - 6,100 linear feet of transmission piping
  - 0 linear feet of in-track piping
  - On-site piping of 789 acres
- 3.0 MG aboveground storage facility
- $500,000 for supplemental water supply
- 990 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- Mather Parks are within 0.5 miles of the proposed satellite plant.
- Mather Golf Course is within 1.5 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 2,598 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- This would require conditioning through the land use approval process.
- There are 5 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the proposed treatment facility.

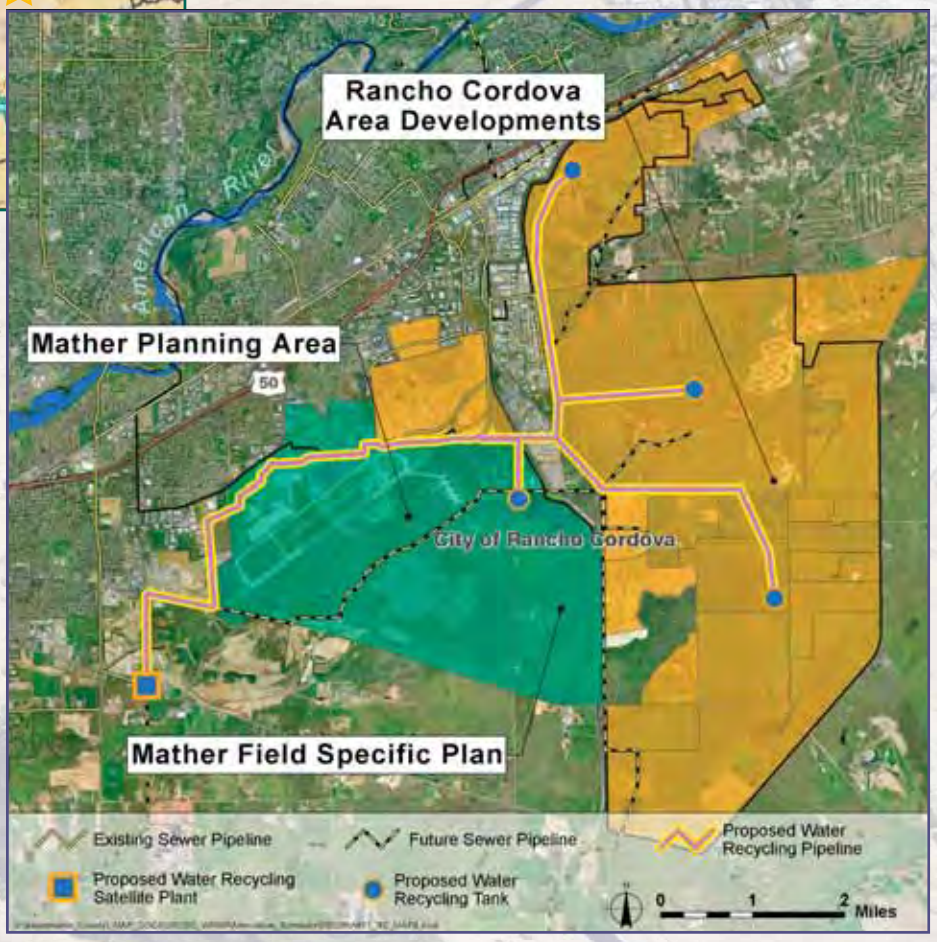
✔ **Willing Water Purveyors and Land Use Authorities**

- Water supplies (both potable and irrigation) for Mather Parks have not been identified but would be needed for development. Mather Golf Course is currently self-supplied with groundwater. However, the Mather Service Areas are located within the Central Sacramento County Groundwater Basin and are subject to the Sacramento Area Water Forum Agreement.
- Discussion of recycled water service to the Mather Service Areas has been initiated and involves Sacramento County and Regional Parks.
- No other potential providers of recycled water were identified for this area.

## Outstanding Issues

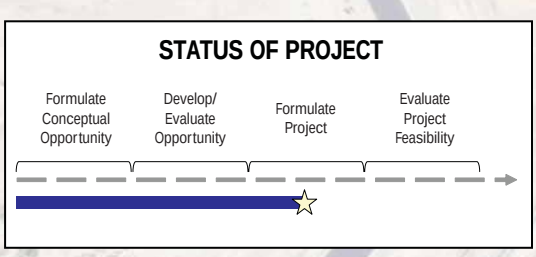
- Quantify water recycling usage and existing groundwater extraction capacity estimates. Determine extent of adjacent contaminant plumes.
- Determine water purveyors for the service areas.

# Rancho Cordova Area & Mather Service Areas




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Rancho Cordova Area (North) | Urban Irrigation | 0.7 | 1.9 |
| Rancho Cordova Area (Central) | Urban Irrigation | 1.8 | 4.7 |
| Rancho Cordova Area (South) | Urban Irrigation | 1.3 | 3.2 |
| Mather Parks | Urban Irrigation | 1.9 | 4.7 |
| Mather Golf Course | Urban Irrigation | 0.5 | 1.2 |
| **Total** | | **6.2** | **15.7** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 224.2M |
| EUAC/AF | $ 2,357 |



# *Rancho Cordova Area & Mather Service Areas*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, SCWA, GSWC, Cal-Am, Rancho Cordova, Folsom, Regional Parks, Sacramento County BOS

## General Description of Potential Project and Operations

- This project would include delivery of recycled water to three areas of new development within Rancho Cordova, and for irrigation of existing and proposed soccer fields and other recreational facilities at Mather Parks and the existing Mather Golf Course.
- In all years, SRCSD would divert wastewater from the Bradshaw/Folsom Interceptor System to a new satellite plant located along Bradshaw Road south of Highway 16. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. Water deliveries would include the following:
  - Rancho Cordova – "Purple pipe" would be installed for distribution of recycled water for irrigation uses, and new groundwater wells would be used to supplement recycled water deliveries in peak months.
  - Mather Golf Course – Existing pipelines (currently distributing groundwater) would be used to supply recycled water for irrigation uses, and groundwater would continue to be used for potable needs and to supplement recycled water in peak months.
  - Mather Parks – "Purple pipe" would be installed for distribution of recycled water for irrigation uses, and new groundwater wells would be installed to be used for potable water needs.
- This would be a decentralized recycled water project. Rancho Cordova would be Scenario C. There would be no applicable scenario for the Mather Service Areas.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 13 MGD satellite MBR treatment facility
- 89,860 linear feet of 10-inch to 30-inch diameter conveyance piping
  - 89,860 linear feet of transmission piping
  - In-track piping of 8,680 acres
  - On-site piping of 9,469 acres
- 9.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 2,100 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- North service area is within 7.5 miles of the proposed satellite plant.
- Central service area is within 6.5 miles of the proposed satellite plant.
- South service area is within 7.0 miles of the proposed satellite plant.
- Mather Parks are within 4.5 miles of the proposed satellite plant.
- Mather Golf Course is within 5.0 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 6,899 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Rancho Cordova area – Water supply and general planning has already taken place for the new developments, with water supplies identified without recycled water. However, the opportunity may still exist to install recycled water infrastructure for future use. (Per SCWA, Rio Del Oro would be a possibility.)
- Mather Service Areas would require conditioning through the land use approval process.
- There are 35 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the proposed treatment facility.

✔ **Willing Water Purveyors and Land Use Authorities**

- Met the same measures individually discussed for "Rancho Cordova Area" and "Mather Service Areas".

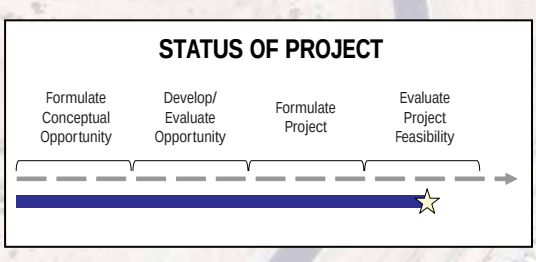
## Outstanding Issues

- Since this would be a combined project, the same issues discussed for "Rancho Cordova Area" and "Mather Service Areas" would exist.

# Rancho Cordova Area, City of Folsom, Glenborough Development, & Mather Service Areas


| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Rancho Cordova Area (North) | Urban Irrigation | 0.7 | 1.9 |
| Rancho Cordova Area (Central) | Urban Irrigation | 1.8 | 4.7 |
| Rancho Cordova Area (South) | Urban Irrigation | 1.3 | 3.2 |
| Folsom Sphere of Influence | Urban Irrigation | 1.4 | 3.5 |
| Glenborough Development | Urban Irrigation | 0.3 | 0.9 |
| Mather Parks | Urban Irrigation | 1.9 | 4.7 |
| Mather Golf Course | Urban Irrigation | 0.5 | 1.2 |
| **Total** | | **7.8** | **20.0** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 318.2M |
| EUAC/AF | $ 2,515 |



# *Rancho Cordova Area, City of Folsom, Glenborough Development, & Mather Service Areas*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, SCWA, GSWC, Cal-Am, Rancho Cordova, Folsom, Regional Parks, Sacramento County BOS

## General Description of Potential Project and Operations

- Delivery of recycled water to new development in Rancho Cordova, Folsom SOI, Glenborough Development (aka Glenborough Place at Easton), and for irrigation of existing and proposed soccer fields and other recreational facilities at Mather Parks and the existing Mather Golf Course.
- Divert wastewater from the Bradshaw/Folsom Interceptor System to a new satellite plant located along Bradshaw Road south of Highway 16. New satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. New groundwater wells would be used to supplement recycled water deliveries in peak months. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP.
- Water deliveries would include the following:
  - Rancho Cordova – "Purple pipe" would be installed for distribution of recycled water for irrigation uses.
  - Folsom – "Purple pipe" would be installed for distribution of recycled water for irrigation uses.
  - Mather Golf Course – Existing pipelines (currently distributing groundwater) would be used to supply recycled water for irrigation uses.
  - Mather Parks – "Purple pipe" would be installed for distribution of recycled water for irrigation uses.
- This would be a decentralized recycled water project. Rancho Cordova and Folsom would be Scenario C. There would be no applicable scenario for the Mather Service Areas.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 16 MGD satellite MBR treatment facility
- 150,925 linear feet of 8-inch to 36-inch diameter conveyance piping
  - 150,925 linear feet of transmission piping
  - In-track piping of 13,680 acres
  - On-site piping of 14,469 acres
- 13.0 MG aboveground storage facility
- $500,000 for supplemental water supply
- 3,430 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- North service area is within 7.5 miles of the proposed satellite plant.
- Central service area is within 6.5 miles of the proposed satellite plant.
- South service area is within 7.0 miles of the proposed satellite plant.
- Folsom SOI area is within 13.5 miles of the proposed satellite plant.
- Glenborough Development is within 10.5 miles of the proposed satellite plant.
- Mather Parks are within 4.5 miles of the proposed satellite plant.
- Mather Golf Course is within 5.0 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 8,819 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Rancho Cordova area – Water supply and general planning has already taken place for the new developments, with water supplies identified without recycled water. However, the opportunity may still exist to install recycled water infrastructure for future use. (Per SCWA, Rio Del Oro would be a possibility.)
- Folsom SOI area, Glenborough Development, and Mather Service Areas would require conditioning through the land use approval process.
- There are 97 parcels within a 100-foot offset of construction areas.
- There are no residential parcels within a 1,000-foot radius of the proposed treatment facility.

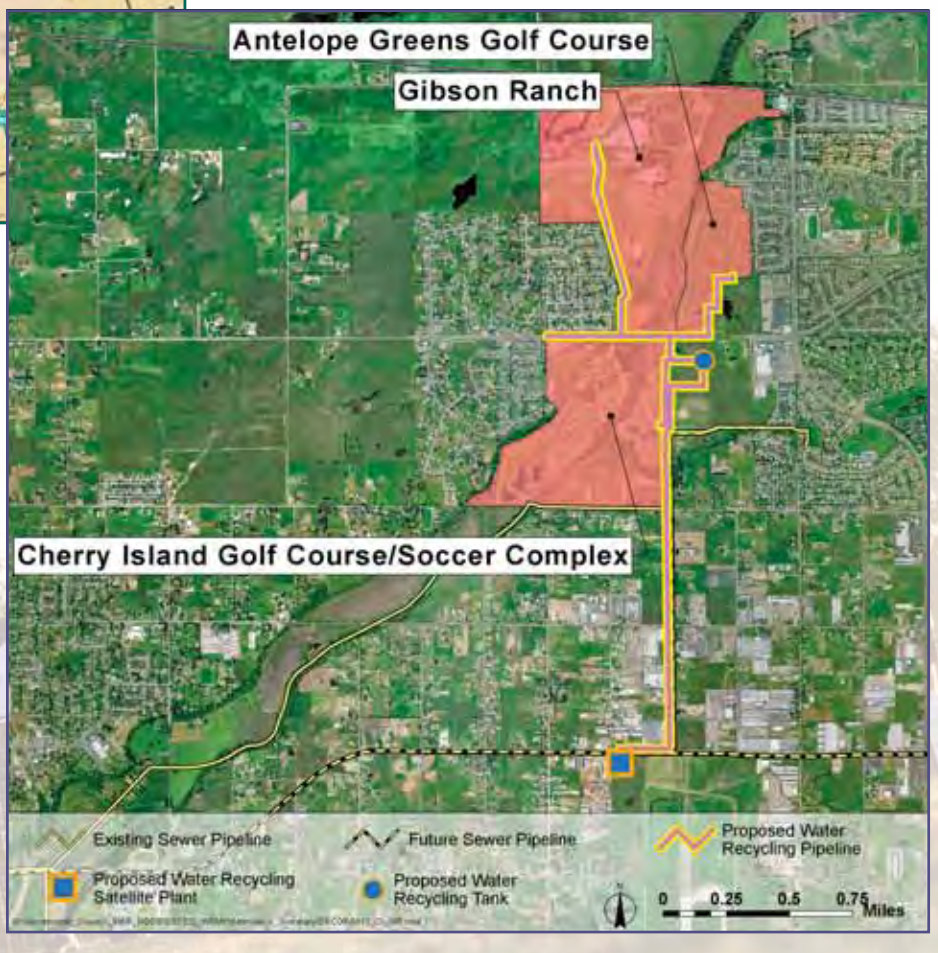
✔ **Willing Water Purveyors and Land Use Authorities**

- Met the individual screening measures for "Rancho Cordova Area", "City of Folsom & Glenborough Development (Scenario C)", and "Mather Service Areas".

## Outstanding Issues

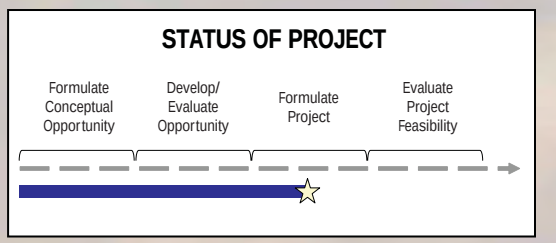
- Since this would be a combined project, the same issues discussed for "Rancho Cordova Area", "City of Folsom & Glenborough Development (Scenario C)", and "Mather Service Areas" would exist.

# Rio Linda/Elverta Area - Cherry Island/Gibson Ranch




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Cherry Island/ Gibson Ranch | Urban Irrigation | 1.3 | 3.2 |
| **Total** | | **1.3** | **3.2** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 32.3M |
| EUAC/AF | $ 1,866 |



# *Rio Linda/Elverta Area - Cherry Island/ Gibson Ranch*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, Rio Linda/Elverta Community Water District (RLECWD), Sacramento Groundwater Authority (SGA), Regional Parks, Sacramento County BOS

## General Description of Potential Project and Operations

- This project would include service to the existing Cherry Island Golf Course, Cherry Island Soccer Field Complex, Gibson Ranch County Park, Antelope Greens Golf Course, and Northbrook Park (Cherry Island/Gibson Ranch).
- In all years, SRCSD would divert wastewater from the Upper Northwest Interceptor (UNWI) to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. Existing pipelines (currently distributing groundwater) would be used to supply recycled water for irrigation uses, and groundwater would continue to be used for potable needs and to supplement recycled water in peak months.
- Nearby development in the Elverta Specific Plan (ESP) area would require a water supply from RLECWD. This water supply portfolio has not been identified. Through PF-8, Sacramento County has required, and would likely continue to require, conjunctive use as a means to curb groundwater impacts in unincorporated portions of the North Sacramento County Groundwater Basin. "In lieu" banking of groundwater by Regional Parks could create a banking credit with SGA. RLECWD could then extract groundwater using new wells, and use the new banking credit to provide a potable water supply to a portion of the ESP.
- This would be a decentralized recycled water project. It would involve retrofitting existing areas; therefore, none of the available scenarios would be applicable.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 2.5 MGD satellite MBR treatment facility
- 21,913 linear feet of 12-inch-24-inch diameter conveyance piping
  - 10,800 linear feet of transmission piping
  - 11,113 linear feet of in-track piping
  - On-site piping of 390 acres
- 1.0 MG aboveground storage facility
- $500,000 for supplemental water supply
- 326 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- Cherry Island/Gibson Ranch is within 2.0 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 1,411 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Existing groundwater distribution pipelines would be used for recycled water.
- There are 112 parcels within a 100-foot offset of construction areas.
- There are 8 residential parcels within a 1,000-foot radius of the proposed treatment facility.

✔ **Willing Water Purveyors and Land Use Authorities**

- Regional Parks currently supplies groundwater to Cherry Island/Gibson Ranch.
- RLECWD is supportive of recycled water and would collaborate in policy development through Sacramento County. RLECWD is open to operating needed recycled water facilities on a retail basis.
- The City of Roseville has approached Sacramento County, Regional Parks, and RLECWD regarding service of recycled water. Discussions continue.

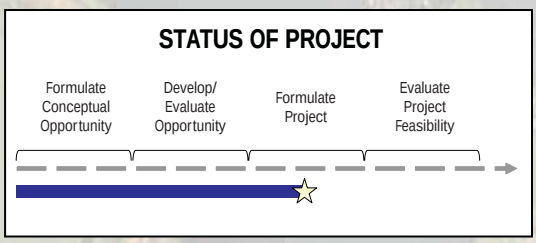
## Outstanding Issues

- Groundwater banking and exchange policy (Water Accounting Framework) through SGA is in development.
- Would require coordination with the UNWI program and would require a nearby satellite plant.
- Need to request a letter from City of Roseville stating its intentions to deliver water to the parks and golf courses.

# Rio Linda/Elverta Area - Elverta Specific Plan


| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Elverta Specific Plan Area | Urban Irrigation | 0.3 | 0.7 |
| **Total** | | **0.3** | **0.7** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 16.9M |
| EUAC/AF | $ 4,430 |



# *Rio Linda/Elverta Area - Elverta Specific Plan*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, RLECWD, SGA, Sacramento County, Sacramento County BOS

## General Description of Potential Project and Operations

- This project would include service to development in the ESP area.
- In all years, SRCSD would divert wastewater from the UNWI to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP.
- This would be a decentralized recycled water project, and would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 1 MGD satellite MBR treatment facility
- 31,443 linear feet of 8-inch-14-inch diameter conveyance piping
  - 10,800 linear feet of transmission piping
  - 20,643 linear feet of in-track piping
  - On-site piping of 534 acres
- 0.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 126 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- The ESP area is within 2.0 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 302 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- This would require conditioning through the land use approval process. RLECWD would likely support such conditioning, and may be willing to lead the effort from a water supply perspective.
- There are 186 parcels within a 100-foot offset of construction areas.
- There are 8 residential parcels within a 1,000-foot radius of the proposed treatment facility.

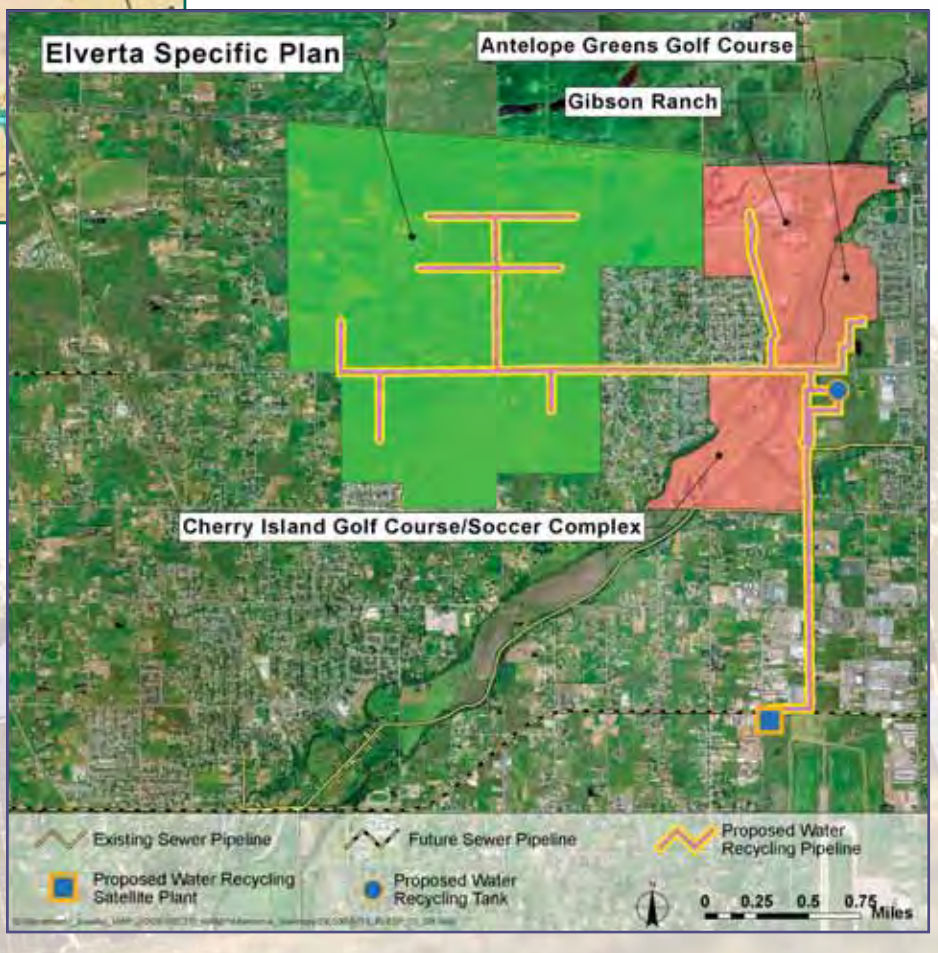
✔ **Willing Water Purveyors and Land Use Authorities**

- Development in the ESP area would require a water supply from RLECWD. This water supply portfolio has not been identified. Through PF-8, Sacramento County has required, and would likely continue to require, conjunctive use as a means to curb groundwater impacts in unincorporated portions of the North Sacramento County Groundwater Basin.
- RLECWD is supportive of recycled water and would collaborate in policy development through Sacramento County. RLECWD is open to operating needed recycled water facilities on a retail basis.
- No other potential providers of recycled water were identified for this area.

## Outstanding Issues

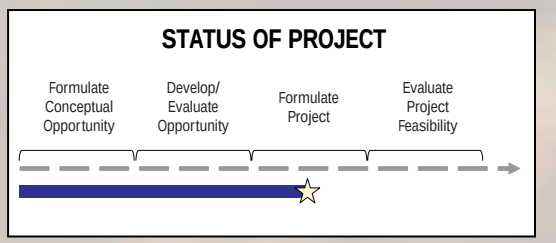
- Would require coordination with the UNWI program and would require a nearby satellite plant.

# Rio Linda/Elverta Area - Cherry Island/ Gibson Ranch & Elverta Specific Plan




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Cherry Island/ Gibson Ranch | Urban Irrigation | 1.3 | 3.2 |
| Elverta Specific Plan Area | Urban Irrigation | 0.3 | 0.7 |
| **Total** | | **1.6** | **3.9** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 40.6M |
| EUAC/AF | $ 1,902 |



# *Rio Linda/Elverta Area - Cherry Island Gibson Ranch & Elverta Specific Plan*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, RLECWD, SGA, Sacramento County, Regional Parks, Sacramento County BOS

## General Description of Potential Project and Operations

- This project would include service to (1) the existing Cherry Island Golf Course and Cherry Island/Gibson Ranch, and (2) development in the ESP area.
- In all years, SRCSD would divert wastewater from the UNWI to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. For Cherry Island/ Gibson Ranch, existing pipelines (currently distributing groundwater) would be used to supply recycled water for irrigation uses, and groundwater would continue to be used for potable water needs and to supplement recycled water in peak months. For the ESP area, "purple pipe" would be installed for distribution of recycled water for irrigation uses.
- The ESP area would require a water supply from RLECWD. This water supply portfolio has not been identified. Through PF-8, Sacramento County has required, and would likely continue to require, conjunctive use as a means to curb groundwater impacts in unincorporated portions of the North Sacramento County Groundwater Basin. "In lieu" banking of groundwater by Regional Parks could create a banking credit with SGA. RLECWD could then extract groundwater using new wells, and use the new banking credit to provide a potable water supply to a portion of the ESP.
- This would be a decentralized recycled water project. There would be no applicable scenario for Cherry Island/ Gibson Ranch. The ESP area would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would between 5 to 10 years.

## Project Elements

This project would require the following elements:

- 3.1 MGD satellite MBR treatment facility
- 46,560 linear feet of 8-inch to 24-inch diameter conveyance piping
  - 10,800 linear feet of transmission piping
  - 35,760 linear feet of in-track piping
  - On-site piping of 940 acres
- 1.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 430 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ Met the screening measures of "Rio Linda/Elverta – Cherry Island/Gibson Ranch" and "Rio Linda/Elverta – Elverta Specific Plan".

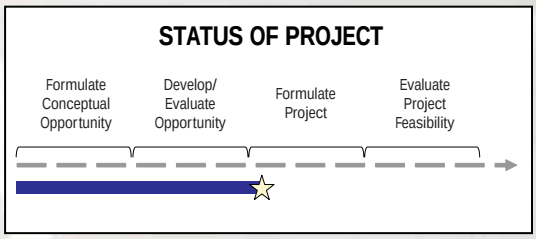
## Outstanding Issues

- Since this would be a combined project, the same issues discussed for "Rio Linda/Elverta – Cherry Island/Gibson Ranch" and "Rio Linda/Elverta – Elverta Specific Plan" would exist.

# Natomas Joint Vision Area


| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Natomas Joint Vision Area | Urban Irrigation | 4.4 | 11.1 |
| **Total** | | **4.4** | **11.1** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 157.5M |
| EUAC/AF | 2,358 |



# Natomas Joint Vision Area

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, Sacramento County BOS, City of Sacramento, Natomas Central Mutual Water Company (NCMWC)

## General Description of Potential Project and Operations

- This project would include service to potential development within the Urban Reserve Area of the Natomas Joint Vision (NJV) area. (Service to Metro Airpark, Sacramento International Airport, and agricultural areas would not be included.)
- In all years, SRCSD would divert wastewater from the UNWI to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP.
- This would be a decentralized recycled water project, and would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be greater than 10 years.

## Project Elements

This project would require the following elements:

- 9 MGD satellite MBR treatment facility
- 22,500 linear feet of 30-inch diameter conveyance piping
  - 22,500 linear feet of transmission piping
  - In-track piping of 10,000 acres
  - On-site piping of 10,000 acres
- 4.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 1,115 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- The NJV area is within 2.0 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be not required.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 4,928 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Development timing in the NJV area is unknown.
- Conditioning through the land use approval process would be required.
- There are 23 parcels within a 100-foot offset of construction areas.
- There are 31 residential parcels within a 1,000-foot radius of the proposed treatment facility.

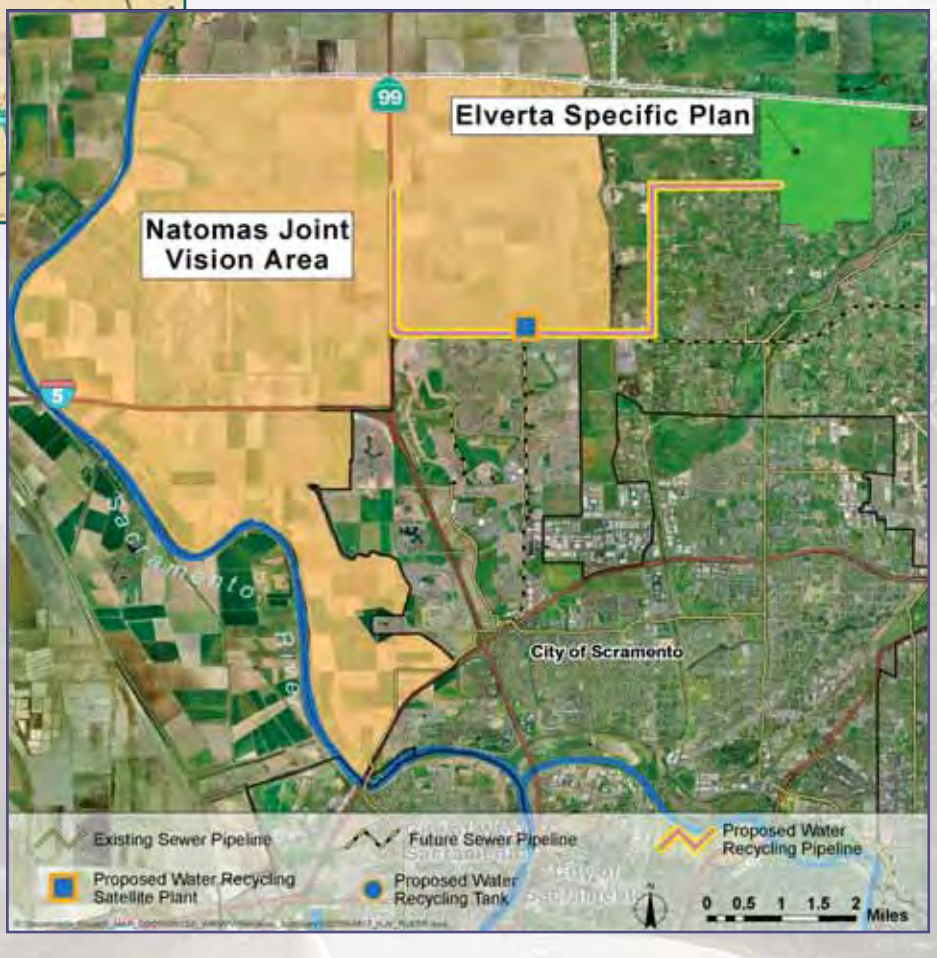
✔ **Willing Water Purveyors and Land Use Authorities**

- Water supply and general planning have not taken place for this area which is outside the existing Urban Services Boundary.
- Both the City of Sacramento and NCMWC have sufficient water available from their water rights to serve future development within the NJV area. However, the development area is outside the City of Sacramento limits, its SOI, and its American River and Sacramento River water rights. The development area is within NCMWC's water rights, but permitted use of that water is primarily agricultural in nature.
- This area is located within the North Sacramento County Groundwater Basin and subject to the Sacramento Area Water Forum Agreement.
- Because the water purveyor(s) and land use authority(ies) are unknown at this time, SRCSD has not initiated project-specific discussions with any agency.
- No other potential providers of recycled water were identified for this area.

## Outstanding Issues

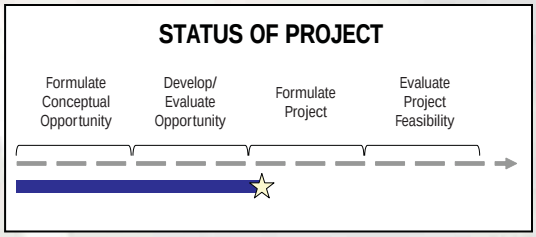
- Water purveyor(s) and land use authority(ies) would need to be determined.
- Would require coordination with the UNWI program, and would require a nearby satellite plant.
- Water rights issues would need to be resolved prior to SRCSD's involvement in project implementation.

# Rio Linda/Elverta Area-Elverta Specific Plan & Natomas Joint Vision Area




| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Elverta Specific Plan Area | Urban Irrigation | 0.3 | 0.7 |
| Natomas Joint Vision Area | Urban Irrigation | 4.4 | 11.1 |
| **Total** | | **4.7** | **11.8** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 177.1M |
| EUAC/AF | 2,469 |



# *Rio Linda/Elverta Area-Elverta Specific Plan & Natomas Joint Vision Area*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, RLECWD, SGA, Sacramento County, Sacramento County BOS, City of Sacramento, NCMWC

## General Description of Potential Project and Operations

- This project would include service to development in the ESP area and potential development within the Urban Reserve Area of the NJV area. (Service to Metro Airpark, Sacramento International Airport, and agricultural areas would not be included.)
- In all years, SRCSD would divert wastewater from the UNWI to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP.
- This would be a decentralized recycled water project, and would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be greater than 10 years.

## Project Elements

This project would require the following elements:

- 10 MGD satellite MBR treatment facility
- 55,300 linear feet of 10-inch to 30-inch diameter conveyance piping
  - 55,300 linear feet of transmission piping
  - In-track piping of 10,534 acres
  - On-site piping of 10,534 acres
- 5.0 MG aboveground storage facility
- $500,000 for supplemental water supply
- 1,229 hp pump station capacity
- No additional rights-of-way

## Screening Measures

✔ Met the screening measures of “Rio Linda/Elverta – Elverta Specific Plan” and “Natomas Joint Vision Area”.

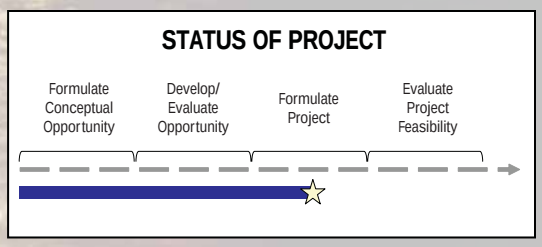
## Outstanding Issues

- Since this would be a combined project, the same issues discussed for “Rio Linda/Elverta – Elverta Specific Plan” and “Natomas Joint Vision Area” would exist.

# City of West Sacramento


| Description | Demand Type(s) | Average Day Demand (MGD) | Peak Day Demand (MGD) |
|---|---|---|---|
| Southport Framework Plan Area | Urban Irrigation | 0.8 | 2.1 |
| University Park | Urban Irrigation | 0.1 | 0.3 |
| Central Park | Urban Irrigation | 0.4 | 1.1 |
| Sports Complex | Urban Irrigation | 0.1 | 0.3 |
| **Total** | | **1.4** | **3.8** |

| Estimated Costs | |
|---|---|
| Probable Capital Costs | $ 62.8M |
| EUAC/AF | 2,609 |



# *City of West Sacramento*

## Principal Potential Participants, Water Purveyors, Land Use Authorities

SRCSD, City of West Sacramento (West Sacramento)

## General Description of Potential Project and Operations

- This project would include service to new developments in West Sacramento.
- In all years, SRCSD would divert wastewater from the Lower Northwest Interceptor (LNWI) to a new satellite plant. The satellite plant would provide tertiary treated recycled water to be delivered via new transmission pipelines to the place of use. Solids from the satellite plant would be returned to the interceptor for eventual treatment at the SRWTP. New groundwater wells or other supplies would be used to supplement recycled water deliveries in peak months.
- This would be a decentralized recycled water project, and would be Scenario C.
- Direct environmental benefits to aquatic and/or terrestrial habitat would not be anticipated.
- The implementation period for this project would be between 5 and 10 years.

## Project Elements

This project would require the following elements:

- 3.1 MGD satellite MBR treatment facility
- 38,300 linear feet of 12-inch to 18-inch diameter conveyance piping
  - 38,300 linear feet of transmission piping
  - In-track piping of 3,503 acres
  - On-site piping of 3,503 acres
- 1.5 MG aboveground storage facility
- $500,000 for supplemental water supply
- 591 hp pump station capacity

## Screening Measures

✔ **Geographical Proximity to Recycled Water Supply**

- West Sacramento is within 7.8 miles of the proposed satellite plant.
- Proximity to the SRWTP and the WRF would not be required.
- West Sacramento Wastewater Treatment Plant was considered as a satellite plant site possibility; however, the manner in which West Sacramento sewers will be rerouted to connect to the LNWI does not make this an attractive option.

✔ **Appropriate Potential Recycled Water Demand**

- Annual Yield: 1,736 AF/year

✔ **Feasibility of Installing Recycled Water Distribution Infrastructure**

- Providing recycled water to West Sacramento from a Water Reclamation Facility at the SRWTP was considered and deemed not cost-effective.
- One option discussed with West Sacramento staff was to locate a satellite treatment facility at the Southport Pump Station site and to use the existing West Sacramento outfall as the recycled water transmission facility.
- There are 163 parcels within a 100-foot offset of construction areas.
- There are no residential parcels are within a 1,000-foot radius of the proposed treatment facility.

✔ **Willing Water Purveyors and Land Use Authorities**

- Thorough review of West Sacramento's Water Supply Master Plan has shown that West Sacramento has ample surface water supplies for new development.
- Discussions continue with West Sacramento.
- West Sacramento is pursing the use of Reclamation District 900 canals to deliver untreated surface water for irrigation of new development.

## Outstanding Issues

- Appropriate level of water recycling infrastructure (or "purple pipe") with new development conditioning is under discussion.

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**Sacramento Regional County Sanitation District**
10545 Armstrong Avenue | Suite 101 | Mather, California

916 876 6000
www.purplepipes.com

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