A6. Monitoring, Assessment and Performance Measures

Attachment 6 describes the performance measures that each of the four projects will use to quantify and verify project performance in relation to each of the projects' stated benefits and objectives. This attachment graphically shows where data will be collected, the types of analyses used, and how the monitoring data will measure the performance in meeting the overall goals of the region's Integrated Regional Water Management (IRWM) Plan.

Each project has provided a table that addresses project objectives, desired outcomes, targets (measureable targets that are feasible to meet during the life of the Proposal), performance indicators (measures to evaluate change that is a direct result of the work), and measurement tools and methods.

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Project 1: Recycled Water Enhancement Project, City of Santa Barbara

Monitoring, Assessment, and Performance Measures

This section presents the planned project monitoring, assessment, and performance measures that will demonstrate that the City of Santa Barbara (City), Recycled Water Enhancement Project (Project 1 or Project) will meet its intended goals, achieve measurable outcomes, and provide value to the State of California. The purpose of this section is to provide information that will be used in the monitoring plan for the Project.

The Project meets five of the nine Santa Barbara County Integrated Regional Water Management Plan 2013 (IRWM Plan 2013) Objectives. The IRWM Plan 2013 has identified objectives but does not use the term goal. The five IRWM Plan 2013 objectives that are met by the Project are as follows:

- Maintain and enhance water and wastewater infrastructure efficiency and reliability
- Protect, conserve, and augment water supplies
- Protect and improve water quality
- Address climate change issues
- Increase emergency preparedness.

The Project objectives (which are more detailed than the IRWM Plan 2013 objectives) are listed in Figure 6.1-1 with the appropriate performance measures that will be used to quantify and verify Project performance.

FIGURE 6.1-1

Project Objectives

Project Objectives	Performance Measure
Provide restored and enhanced recycled water supply to meet IRWM Regional targets and increase local water supplies	Meet IRWM Regional target to provide 1,400 acre-feet (AFY) of recycled water by 2035
Improve water quality	Meet Title 22 recycled water quality requirements
Increase operational efficiency	Reduce the need to use potable water for blending to 20% of total produced
Conserve water supply	Achieve City of Santa Barbara 20x2020 goal
Promote education and public outreach through school tour programs	Include info and tours of new facility in City Conservation Program
Protect and enhance local groundwater supply during drought conditions	Build storage in local groundwater basin by offsetting demands with recycled water use
Replace deteriorated infrastructure at the end of its useful life cycle	Replace the existing failed tertiary treatment facilities with microfiltration technology

FIGURE 6.1-1
Project Objectives

Project Objectives	Performance Measure
Reduce wastewater discharge to the ocean	Reduce wastewater discharge into the ocean by producing and using recycled water
Reduced Energy Use and Avoided Greenhouse Gas Emissions	Energy savings from using recycled water (compared to using SWP supplies)

Provide Recycled Water Supply

Since 1989, the City of Santa Barbara has been providing recycled water to offset potable water demands. The existing recycled water distribution system serves approximately 80 accounts with 800 acre-feet per year (AFY) of non-potable demands. The City is continually working to increase the number of recycled water customers, and recycled water demands are expected to grow to 1,400 AFY by 2035.

However, the City's existing tertiary treatment facilities are failing and do not reliably meet Title 22 water quality requirements for turbidity. This requires the City to use potable water to meet recycled water demands.

The City of Santa Barbara Recycled Water Enhancement Project will replace the existing failing tertiary treatment facilities with microfiltration technology, allowing the City to reliably meet Title 22, Division 4, California Code of Regulations (Title 22) water quality standards for turbidity. The Project will allow the City to provide a recycled water supply to existing and planned recycled water demands, in alignment with adopted policies in the City's 2011 Long-Term Water Supply Plan and 2010 Urban Water Management Plan.

Meet Title 22 Water Quality Requirements

Recycled water quality criteria and usage are specified in Title 22. Depending on the groundwater basin and recycled water usage location, the Regional Water Quality Control Board (RWQCB) can include additional requirements to Title 22. The Central Coast Region of the RWQCB lists the current recycled water requirements in the Waste Discharge Requirements and Master Reclamation Permit Order No. 97-44.

The City of Santa Barbara Recycled Water Enhancement Project will replace the existing failed tertiary filtration system with microfiltration technology, and will meet Title 22 requirements for filtered wastewater using microfiltration as follows:

> Filtered wastewater means an oxidized wastewater that meets the criteria…
>
> (b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:
>
> (1) 0.2 nephelometric turbidity units (NTU) more than 5 percent of the time within a 24-hour period; and
>
> (2) 0.5 NTU at any time.

Increase Operational Efficiency by reducing Potable Water needed for Blending

By reducing the need for potable water blending, the City's facility operations will be more efficient. The tertiary treatment plant will run more continuously and will not require a frequent shutdown/startup mode of operation. With the implementation of Project 1, no more than 20% potable water will be required for blending.

Achieve City of Santa Barbara 20x2020 Goal

In 2008, the governor initiated a goal of 20 percent reduction per capita of urban water use by 2020 (20x2020). In 2009, the legislature adopted this goal into law by passing the Water Conservation Act of 2009 (SBX7-7). The focus is on public potable water distribution systems only. As such, the use of recycled water (enabled by the Recycled Water Enhancement Project) helps meet the requirement. Targets were established by hydrologic regions, with several options for defining the baseline and the eventual 2020 target of per capita water use. The most suitable option for the City is "Method #3" in the legislation. This results in a baseline of 154 gallons per capita per day (gpcd) and a 2020 target of 117 gpcd.

Promote education and public outreach through youth education

A youth education program for elementary and secondary students is a significant part of the City's current Water Conservation Program. Project 1 will be featured in classroom presentations, curriculum, treatment plant tours, and assemblies.

The Water Conservation Program is carried out as a part of the City's commitment to implementing the California Urban Water Conservation Council's (CUWCC) Best Management Practices and because of the City's dedication to water conservation as an element of the City's water supply plan.

Protect and enhance local groundwater resources during drought conditions

Recycled water supply is critical to the City's water supply reliability. Recycled water is available every year, which allows the City to build cumulative storage in its surface reservoirs and groundwater. By preserving potable water supplies, potential supply shortages are reduced during extended drought periods, and groundwater basins are protected from overdraft and seawater intrusion.

Without recycled water supplies, the City is at risk of greater shortages during extended drought periods, and would be more reliant on imported water, groundwater, and other alternative supplies.

Replace Deteriorated Infrastructure at the End of its Useful Life Cycle

Since 1989, the City of Santa Barbara has been providing recycled water to offset potable water demands. However, existing tertiary filtration facilities have reached the end of their useful life and have not produced recycled water that meets Title 22 water quality standards since May 2012. As such, the City uses potable water to meet recycled water system demands. The proposed Recycled Water Enhancement Project will replace the existing failing filtration system with a microfiltration treatment system. Microfiltration

technology will meet Title 22 requirements, and provide sufficient pre-treatment for a future reverse osmosis process to reduce total dissolved solids.

Reduce Wastewater Discharge to the Ocean

The City owns a wastewater collection, treatment, and disposal system to provide sewerage service to the City and portions of Santa Barbara County, serving a population of approximately 96,000. The City's El Estero Wastewater Treatment Plant (WWTP) has a secondary treatment system consisting of screening and grinding, aerated grit removal, primary sedimentation, activated sludge stabilization, secondary clarification, disinfection by chlorination, and dechlorination facilities. Treated secondary effluent is discharged through an 8,720-foot ocean outfall to the Pacific Ocean. The wastewater discharge is regulated under National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R3-2010-0011) issued by the RWQCB.

The Recycled Water Enhancement Project will allow recycling through tertiary treatment, allowing the City to reduce wastewater discharges to the ocean, beneficially reuse treated wastewater, and offset demands on potable water supplies.

Reduce Energy Use and Avoided Greenhouse Gas Emissions

Energy use to produce tertiary recycled water is approximately 1340 kilowatt hour (kWh) per AF (for treatment and distribution) compared with the energy use of imported water from the SWP at 3250 kWh per acre-foot (including pumping from the Delta, treatment, and distribution) (Moffitt and Mosley, 2001). Assuming 0.827 lbs of CO2 per kWh and recycled water use of 1,400 AFY (planned recycled water demands by 2035) this would result in a total reduction of 2.2 million pounds of carbon dioxide (CO2) emissions per year.

Monitoring System to Verify Project Performance

Performance measures apply to the benefits identified in Figure 6.1-2.

FIGURE 6.1-2
Monitoring System to Verify Project Performance per Project Benefits

	Performance Measures	Monitoring System
1	Meet Title 22 recycled water quality requirements	Report annual recycled water production in acre-feet per year (AFY)
2	Meet Title 22 recycled water quality requirements	Report monthly average and maximum turbidity concentrations in units of NTU of recycled water effluent
3	Reduce the need to use potable water for blending	Report average annual percentage of blended potable water in deliveries to recycled water customers
4	Achieve City of Santa Barbara 20x2020 goal	Report average annual per capita potable water use per day
5	Promote education and public outreach through school tour programs	Report annual number of participants on educational tours to recycled water facilities and applications

FIGURE 6.1-2
Monitoring System to Verify Project Performance per Project Benefits

	Performance Measures	Monitoring System
6	Store carry-over supplies in groundwater basin	Report current and historic groundwater levels to show protection of groundwater resources during drought conditions
7	Replace the existing failed tertiary treatment facilities with microfiltration technology	Report notice of project completion to demonstrate replacement of corroded and deteriorated infrastructure
8	Reduce wastewater discharge to the ocean by producing and using recycled water	Report annual discharge in AFY to ocean before and after project
9	Reduced Energy Use and Avoided Greenhouse Gas Emissions	Report annual energy savings in kWh from using recycled water (compared to using imported water supplies)

Data Collection

Data collection will be conducted as follows:

- Recycled water production (flow volume per unit time) will be collected by City operations staff at the tertiary filtration facilities.
- Recycled water quality (e.g. turbidity concentrations in NTU) will be collected by City operations staff at the tertiary filtration facilities and reported monthly to the Central Coast RWQCB through self-monitoring reports.
- Percentage of potable water used for blending will be calculated based on measurements of amount of potable water used (flow volume per unit time) and total water delivered to recycled water customers (flow volume per unit time). Measurements will be taken by City operations staff at the proposed tertiary filtration facilities.
- The City's per capita water use will be tracked according with 20x2020 requirements
- The City's water conservation staff will track the number of participants on education tours to recycled water facilities and applications
- As part of DWR's CASGEM program, the City has agreed to serve as monitoring entity for the Santa Barbara and Foothill Basins. The City has been monitoring groundwater levels for decades in partnership with the U.S. Geological Survey (USGS), and regularly collects data at existing monitoring wells. Proposed monitoring locations for DWR's CASGEM program (14 monitoring wells) are shown in Figures 6.1-1 and 6.1-2.
- The City's project manager will prepare a notice of project completion for record files.
- The City's wastewater operations staff will collect data for annual discharge in acre-feet per year (AFY) to ocean before and after project.
- Annual energy use in kWh for production of recycled water will be tracked by City operations staff. The energy requirements to deliver an equivalent annual volume of SWP water to the City will be estimated using the best available information.

FIGURE 6.1-3

Proposed Casgem Groundwater Level Monitoring Wells In Santa Barbara Groundwater Basin

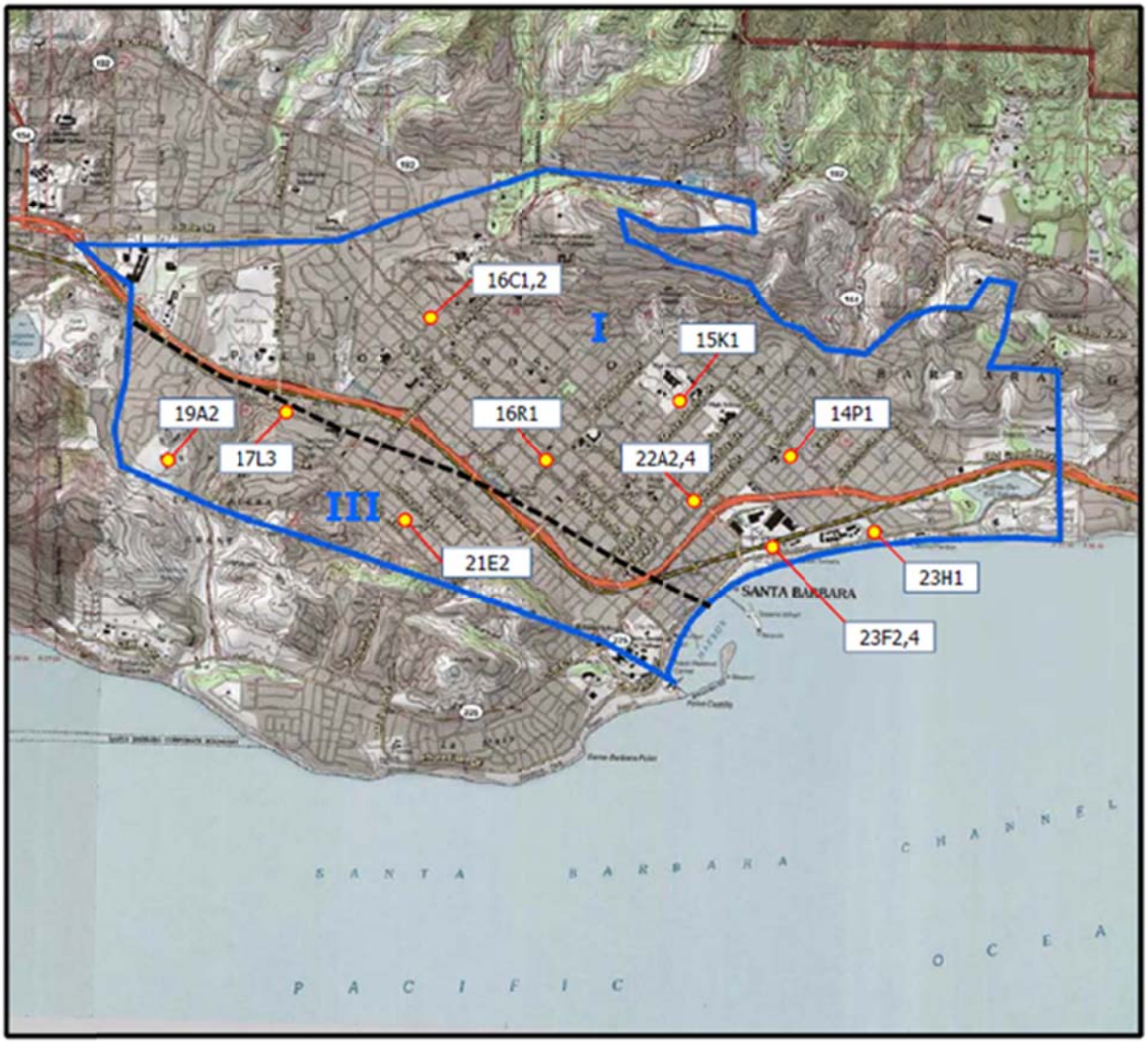


FIGURE 6.1-4

Proposed Casgem Groundwater Level Monitoring Wells In Foothill Groundwater Basin

Types of Analyses

- Report annual recycled water production in AFY, and compare with targets outlined in the City of Santa Barbara's 2010 Urban Water Management Plan and 2011 Long Term Water Supply Plan.

FIGURE 6.1-5
Recycled Water Use Reporting

Planned Recycled Water Use (AFY) over Time					
Year	2015	2020	2025	2030	2035
Recycled Water Use (AFY)[1]	875	950	1,025	1,100	1,400
Actual Recycled Water Use (AFY)	0 (Project not constructed)	TBD	TBD	TBD	TBD

[1] *Based on City of Santa Barbara's 2010 Urban Water Management Plan and 2011 Long Term Water Supply Plan*
TBD: To be determined upon Project completion.

- Report monthly average and maximum turbidity concentrations of recycled water effluent in units of nephelometric turbidity units (NTU), and compare with Title 22 turbidity limit of <0.5 NTU.

FIGURE 6.1-6
Turbidity Reporting

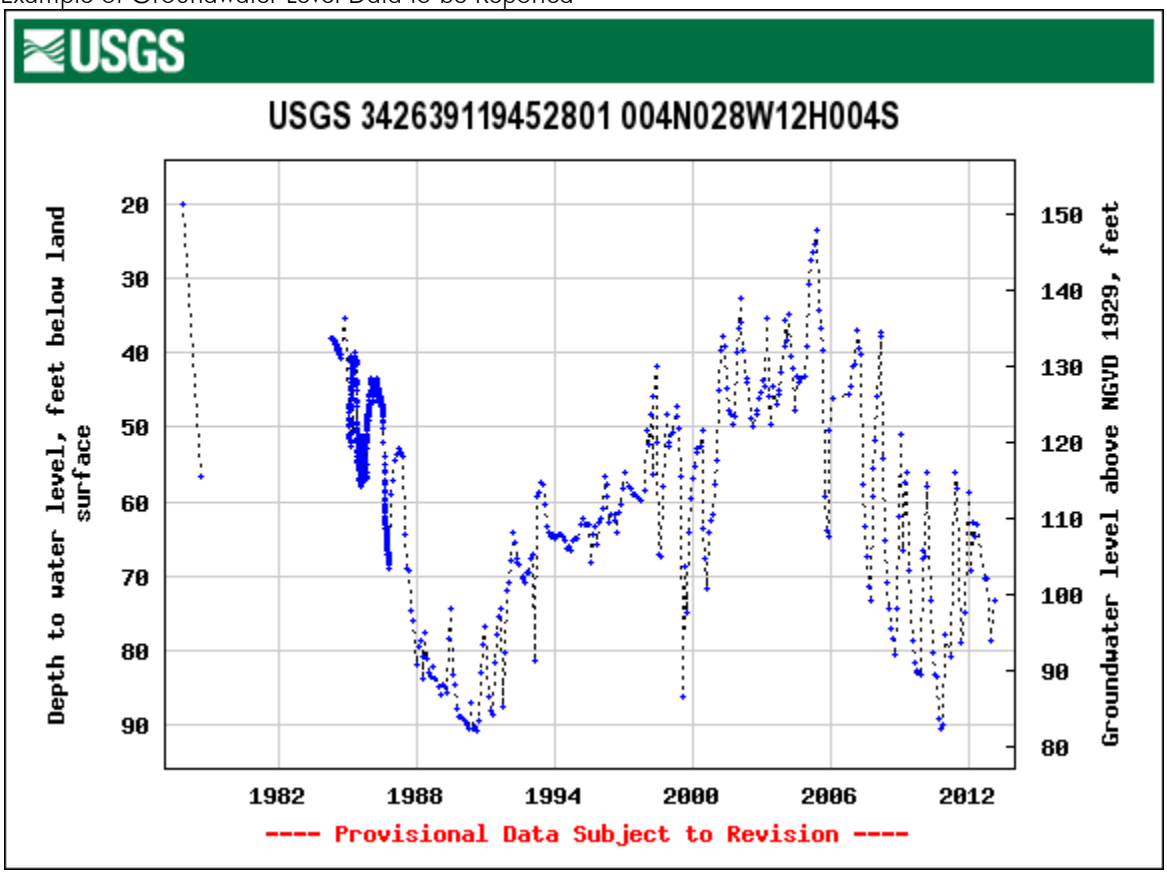
	Jan.	Feb.	Mar.	Apr.	May	June	….	Dec.	Annual
Title 22 Turbidity Limit at any time (NTU)	0.5	0.5	0.5	0.5	0.5	0.5	…	0.5	0.5
Observed Average Monthly Turbidity Concentration (NTU)	TBD	TBD	TBD	TBD	TBD	TBD	…	TBD	TBD
Observed Maximum Turbidity Concentration (NTU)	TBD	TBD	TBD	TBD	TBD	TBD	…	TBD	TBD

TBD: To be determined upon project completion.

- Report average annual percentage of blended potable water in deliveries to recycled water customers, and compare to desired target of 20 percent potable blend water for the microfiltration system (based on ratio of blended potable water used to total amount of water delivered to recycled water customers). Note that the need for blended potable water is expected to be eliminated with a proposed future sidestream reverse osmosis system to remove total dissolved solids.
- Report average annual water use in gallons per capita per day (gpcd), and compare with the target of 117 gpcd by 2020 based on the 2010 Urban Water Management Plan and in compliance with the state's 20x2020 requirements
- Report annual number of participants on educational tours to recycled water facilities and applications according with CUWCC's Best Management Practices

- Report current and historic groundwater levels at 14 proposed monitoring locations to show protection of groundwater resources during drought conditions. An example of groundwater level data to be reported is shown in Figure 6.1-3. The City has been monitoring groundwater levels in partnership with USGS for decades.
- Report notice of project completion to demonstrate replacement of corroded and deteriorated infrastructure

FIGURE 6.1-7
Example of Groundwater Level Data to be Reported



- Report the City's El Estero WWTP annual treated wastewater discharges to the Pacific Ocean in acre-feet before and after the Project.
- Annual energy use in kilowatts for production of recycled water will be tracked by City operations staff. The annual energy use will be compared with the annual volume of recycled water produced to calculate the per unit energy requirements of recycled water production. The energy requirements to deliver an equivalent annual volume of SWP water to the City will be estimated using the best available information. The annual energy requirements for recycled water production will be compared with estimated energy requirements for SWP deliveries to calculate the annual energy savings from using recycled water.

Project Performance Measures

Figure 6.1-5 includes Project objectives, desired outcomes, measurable targets that are feasible to meet during the life of the Project, performance indicators to evaluate change that is a direct result of the Project being built, and measurement tools and methods so that the Project performance can be effectively tracked.

FIGURE 6.1-8

Project Performance Measures

	Project Objectives[1]	Desired Outcomes	Targets[2]	Performance Indicators[3]	Measurement Tools and Methods[4]
1	Increase water supply reliability by producing recycled water to meet IRWM Regional targets and offset use of potable supplies	Provide recycled water supplies that are available every year, helping to build cumulative storage in local surface reservoirs and groundwater basins and reduce potential supply shortages during droughts and emergencies.	Provide recycled water supply to meet 700 AFY of existing recycled water demands (and 1,400 AFY of projected 2035 recycled water demands)	Report annual recycled water production in AFY, and compare with targets outlined in the City of Santa Barbara's 2010 Urban Water Management Plan and 2011 Long Term Water Supply Plan	Data collected by City operations staff at the tertiary treatment plant
2	Improve water quality of recycled water effluent	Produce high quality recycled water that achieves Title 22 water quality requirements	Meet Title 22 recycled water quality requirements for turbidity	Report monthly average and maximum turbidity concentrations of recycled water effluent in units of NTU, and compare with Title 22 turbidity limit of <0.5 NTU	Data collected by City operations staff at the tertiary treatment plant
3	Improve operational efficiency of the existing system.	Produce high quality recycled water that meets Title 22 water quality equirements, and reduce the need to blend with potable water	Reduce percentage of potable water used for blending to 20 percent	Report average annual percentage of blended potable water in deliveries to recycled water customers	Data collected by City operations staff at the tertiary treatment plant
4	Conserve limited potable water supplies	Offset use of limited potable water resources such as groundwater, imported water, and other alternatives supplies.	Achieve 117 gpcd by 2020	Report average annual per capita potable water use per day, and compare with targets outlined in the City's 2010 UWMP	Data collected by City water conservation program staff

[1] Same as objectives listed in the Work Plan.

[2] Measureable targets that are feasible to meet during the life of the Project.

[3] Measure to evaluate change that is a direct result of the Project being built.

[4] To effectively track performance.

FIGURE 6.1-8
Project Performance Measures

	Project Objectives[1]	Desired Outcomes	Targets[2]	Performance Indicators[3]	Measurement Tools and Methods[4]
5	Promote education and public outreach through school tour programs	Help achieve "20x2020" compliance	Outreach and education programs that comply with the CUWCC's BMPs	Report annual number of participants on educational tours to recycled water facilities and applications	Data collected by City water conservation program staff
6	Protect and enhance local groundwater supply during drought conditions	Provide recycled water supplies that are available every year, offsetting the need to use potable resources and helping to protect groundwater supplies from overdraft and seawater intrusion	Maintain groundwater levels to preclude seawater intrusion during drought conditions	Report historical and current groundwater levels at proposed monitoring locations for DWR's CASGEM program (14 monitoring wells), and compare with critical drawdown levels as determined in USGS studies	As part of DWR's CASGEM program, the City will serve as monitoring entity for the Santa Barbara and Foothill Basins. The City has been monitoring groundwater levels for decades in partnership with USGS, and regularly collects data at existing monitoring wells.
7	Replace corroded and deteriorated infrastructure	Replace failed existing tertiary treatment facilities with microfiltration technology, enabling to reliably supply recycled water to the existing recycled water distribution system	Complete construction and testing of proposed Project	Notice of completion	Notice of completion will be prepared by City engineering staff
8	Reduce wastewater discharge to the ocean	Beneficially reuse treated wastewater to offset demands on potable supplies	Reduce wastewater discharges by providing recycled water supply to meet 700 AFY of existing recycled water demands (and 1,400 AFY of projected 2035 recycled water demands)	Report annual wastewater discharges in AFY before and after project	Data collected by City operations staff at the wastewater treatment plant

FIGURE 6.1-8
Project Performance Measures

	Project Objectives[1]	Desired Outcomes	Targets[2]	Performance Indicators[3]	Measurement Tools and Methods[4]
9	Reduce Energy Use and Avoided Greenhouse Gas Emissions	Reduce energy consumption of water resources by using local recycled water instead of imported SWP water	Energy savings of 1.4 GWh per year (assuming 700 AFY of supply and a difference of 1910 kWh per AF in energy requirements between recycled water and imported SWP water)	Report estimated annual energy savings in kWh from using recycled water instead of SWP imported water	Energy use for recycled water production collected by City operations staff at the wastewater treatment plant

Project 2: Twitchell Reservoir Sedimentation Management and Groundwater Recharge Project, Santa Maria Valley Water Conservation District

This section presents the planned project monitoring, assessment, and performance measures that will demonstrate that the Twitchell Reservoir Sedimentation Management and Groundwater Recharge Project (Project 2 or Project) will meet its intended goals, achieve measurable outcomes, and provide value to the Santa Maria Groundwater Basin (Basin) and State of California. The purpose of this section is to provide information that will be used in the monitoring plan for the Project.

Performance Measures

Project 2 has identified four main project goals that are integrated with the regional objectives. These project goals have corresponding performance measures that will be used to quantify and verify the performance of the Project, and provide assurance that several of the IRWM Plan 2013 Objectives will be met. The project goals and performance measures are:

- Increase groundwater supplies by maintaining groundwater recharge
- Provide natural habitat stewardship by preventing sediment accumulation in downstream wetland habitats
- Improve water quality by maintaining groundwater recharge
- Improve flood management by maintaining flood control operation flexibility.

Increase Groundwater Supplies

In order to meet this goal, the Project will provide much-needed sedimentation management and improve operational reliability by removing 9,000 cubic yards of sediment. By strategically removing sediment from the Twitchell Reservoir (Reservoir), the Project will maintain groundwater recharge provided by Reservoir operations.

Provide Natural Habitat Stewardship

The Project's main sediment removal activity will prevent sediment from flowing downstream through the outlets works of the Twitchell Dam (Dam). Therefore, the Project prevents sediment from settling, accumulating, and harming downstream wetland habitats for many sensitive species.

Improve Ground Water Quality

The Project improves the operation of the Reservoir by preventing sediment obstructions in the Dam's outlet works. Thus, the Project supports the Reservoir's function to replenish the region's groundwater with high quality, natural rain water,

which improves the Basin's water quality and helps the Basin meet the Water Quality Objectives in the Water Quality Control Plan for the Central Coastal Basin (Basin Plan).

Improve Flood Management

The Project will improve flood management by allowing for additional stormwater storage in the Reservoir and preventing potential flood and sediment damage to downstream vineyards and agricultural properties. Be preventing sediment impacts in the Dam outlet works, flow through the dam stays unimpeded, Reservoir storage is available for stormwater, and ordered releases from the Army Corps of Engineers due to increasing water levels in the Reservoir will be less frequent. Thus, Reservoir operations will maintain flexibility for flood control.

Monitoring Systems to Verify Project Performance

Details regarding the measurement tools and methods used to measure performance to meet project goals are discussed below.

Increase Groundwater Supplies

The Dam Tender will prepare daily reports per existing policy and procedure to confirm with Santa Maria Valley Water Conservation District (SMVWCD) and the United States Bureau of Reclamation (USBR) that the Reservoir is functioning properly.

In addition, these reports will also provide operating data as water is released from the Reservoir. To ensure that the released water properly represents the volume of groundwater recharged, a visual inspection will be conducted per existing policy and procedure.

Furthermore, an annual assessment of groundwater levels is developed in the *Santa Maria Valley Management Area Annual Report of Hydrogeologic Conditions, Water Requirements, Supplies and Disposition* (Annual Report) as part of the Santa Maria Valley Management Area (SMVMA) Monitoring Plan (see Appendix 3-2 for 2011 Annual Report). The groundwater monitoring network includes 149 wells that have been classified by depth and activity, as shown in Figure 6.2-1.

FIGURE 6.2-1
Number of Groundwater Level Monitoring Wells by Depth and Activity

	Shallow	Deep	Unclassified
Active	42	28	21
Inactive	25	23	8
New	1	1	0
Total	68	52	29

Provide Natural Habitat Stewardship

The Project Inspector will investigate the stockpile area to confirm that stockpiled sediment from the Project does not enter the Cuyama River and associated wetlands.

Improve Ground Water Quality

The water quality of the Santa Maria Groundwater Basin will continue to be measured and assessed in the Annual Report as part of the SMVMA Monitoring Program. Water quality parameters include general minerals (total dissolved solids, electrical conductivity, pH, sodium, calcium, magnesium, potassium, chloride, sulfate, carbonate), nitrate (as NO_3^-), and bromide. The groundwater monitoring networks include 79 wells that have been classified by depth, activity, and current monitoring status, as shown in the Figure 6.2-2.

FIGURE 6.2-2
Number of Groundwater Quality Monitoring Wells by Depth and Activity

		Shallow	Deep	Unclassified
Monitored for Water Quality	Active	4	9	1
	Inactive	17	14	3
Not (yet) Monitored for Water Quality	Constructed and Planned for Monitoring	16	14	0
	Planned for Monitoring	0	1	0
	Total	37	38	4

The Annual Report as part of the SMVMA Monitoring Program will assess the need for additional monitoring each year.

Improve Flood Management

Periodic visual inspections of downstream properties will be conducted by Reservoir operators during winter months or when the dam is releasing. The road along the Cuyama River will be used for access. Agricultural properties, crops, and improvements will be inspected for damage.

Data Collection

As detailed in the section above, the Dam Tender will record information about the verification of the proper Reservoir operations, amount of water released from the Reservoir, and confirmation that the released water represents the volume of recharge in daily reports. Annual assessments of groundwater levels and groundwater quality throughout the Basin will be reported as part of the SMVMA Monitoring Plan. Furthermore, the Project Inspector will perform visual inspections of the stockpile and downstream lands to protect wetland habitats and improve flood management.

Figures 6.2-3 and 6.2-4 illustrate the shallow and deep water monitoring locations as part of the SMVMA Monitoring Program (provided as Appendix A of the 2011 Annual Report in Appendix 3-2).

FIGURE 6.2-3

Well network for Monitoring Shallow Groundwater in the Santa Maria Valley Management Area

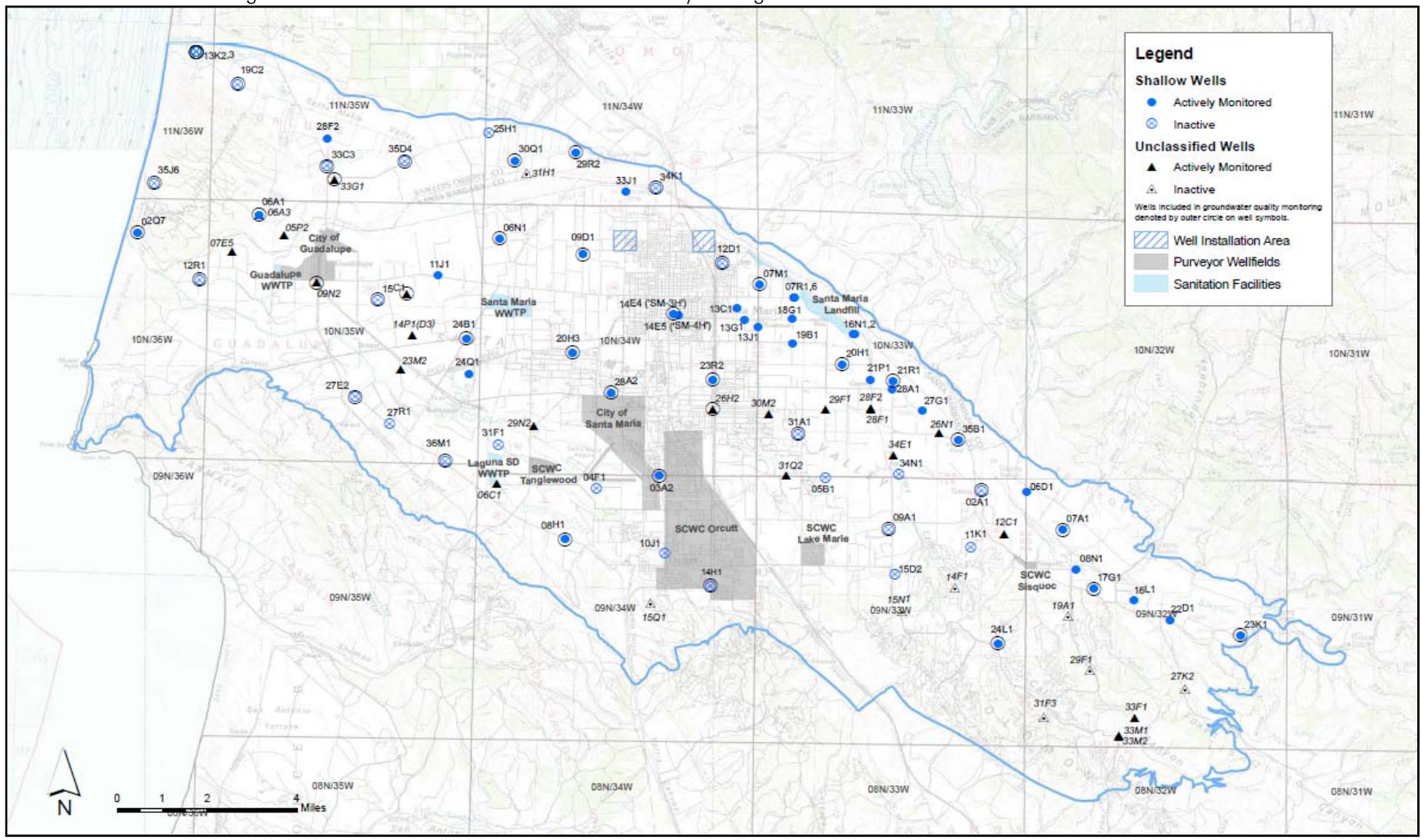
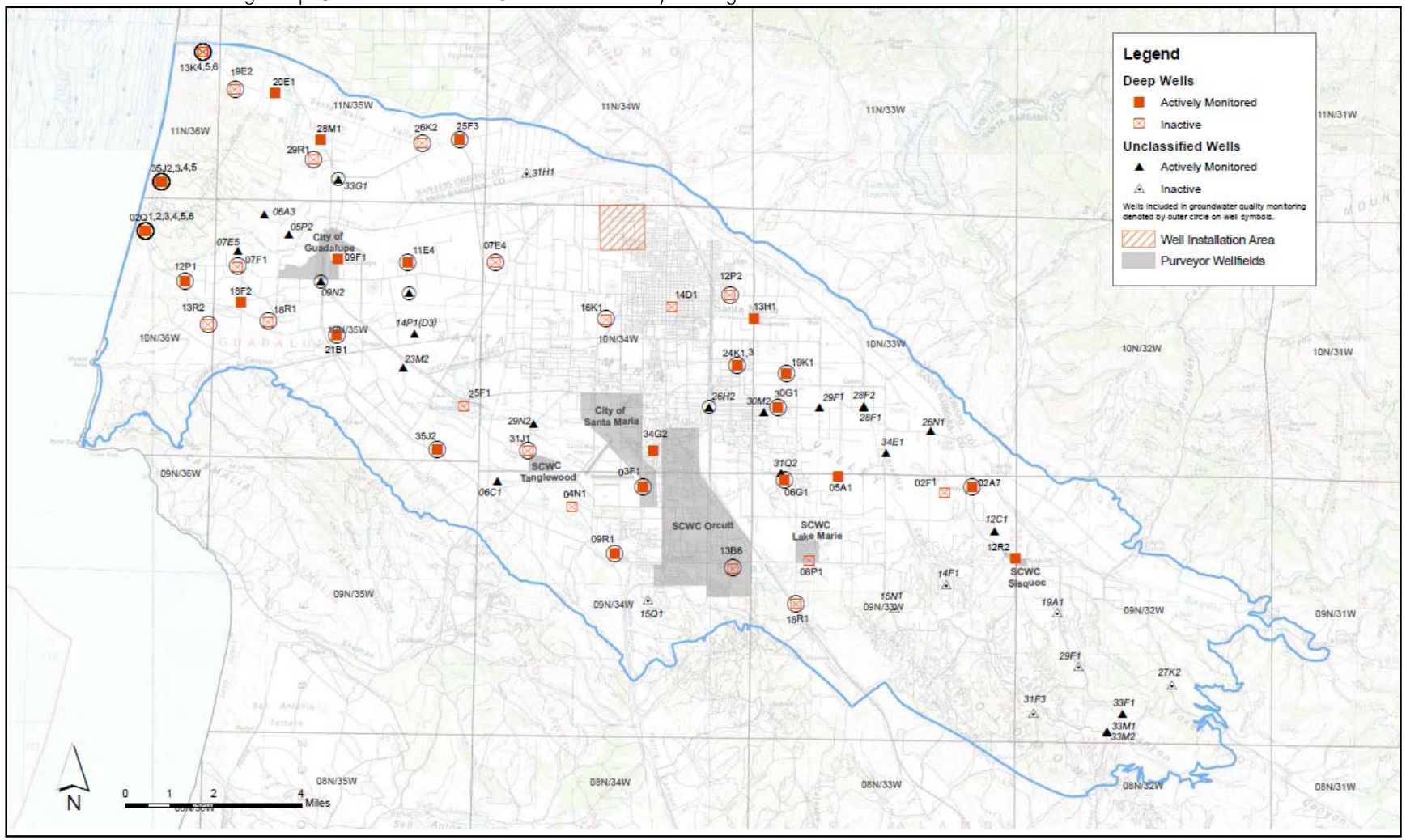


FIGURE 6.2-4

Well network for Monitoring Deep Groundwater in the Santa Maria Valley Management Area



Use of Monitoring Data to Measure Project and IRWM Plan Objectives

Monitoring data will be used to measure performance in meeting the following IRWM Plan 2013 objectives:

FIGURE 6.2-5
Project Performance and Regional Plan Objectives

Regional Objectives	Monitoring Data
Protect, conserve, and augment water supplies	• Confirmation that the reservoir is functioning properly. • Acre-feet per day of water released from the Reservoir. • Confirmation that water released from the Reservoir is recharging the Basin. • Levels of groundwater monitored as part of the SMVMA Monitoring Program.
Protect, manage, and increase groundwater supplies	• Confirmation that the reservoir is functioning properly. • Acre-feet per day of water released from the Reservoir. • Confirmation that water released from the Reservoir is recharging the Basin. • Levels of groundwater in the monitoring wells in the Basin as part of the SMVMA Monitoring Program.
Practice balanced natural resource stewardship	• Confirmation that dredged sediment is confined to the stockpile area.
Protect and improve water quality	• Acre-feet per day of water released from the Reservoir. • Concentrations of general minerals (total dissolved solids, electrical conductivity, pH, sodium, calcium, magnesium, potassium, chloride, sulfate, carbonate), nitrate (as NO^{-3}), and bromide.
Improve flood management	• Confirmation of the lack of flood damage to downstream properties.

Project Performance Measures

The Project Performance Measures figure below includes Project objectives, desired outcomes, measurable targets that are feasible to meet during the life of the Project, performance indicators to evaluate change that is a direct result of the Project being built, and measurement tools and methods so that the Project performance can be effectively tracked.

FIGURE 6.2-6
Project 2 Project Performance Measures

Project Goal	Desired Outcome	Target	Performance Indicator	Measurement Tools and Method
 Increase groundwater supplies	Maintain infiltration of water in Twitchell Reservoir into the Santa Maria Groundwater Basin	Infiltration of 32,000 acre-feet annually	Verification of proper operation of Twitchell Reservoir's outlet works Infiltration into the Basin at the Santa Maria River	Confirmation of proper operation with reservoir operators Daily measurement of water released from the Reservoir Visual inspection to confirm that all dry weather Santa Maria River flow is recharging the groundwater per existing policy and procedures of the Santa Maria Valley Water Conservation District Annual assessment of groundwater level data
 Natural habitat stewardship	Do not allow sedimentation to settle into the sensitive habitat below Twitchell Dam	No sediment accumulation in the sensitive habitats downstream of the Twitchell Reservoir	Confirmation that stockpiled sediment does not enter the Cuyama River and flow into wetland habitats	Inspection of stockpile to confirm no movement or release of sediment
 Improve water quality	Maintain infiltration of water in Twitchell Reservoir into the Santa Maria Groundwater Basin	Infiltration of 32,000 acre-feet annually	Infiltration into the Basin at the Santa Maria River Groundwater continues to comply with the Water Quality Control Plan for the Central Coastal Basin (Basin Plan)	Daily measurement of infiltration Standard methods for the sampling and analysis of groundwater as part of the Santa Maria Valley Management Area (SMVMA) Monitoring Program
 Improve flood manage-ment	Maintain flood control operation flexibility to release water from Twitchell Reservoir in a controlled release rate to reduce downstream flooding	No flood damage to downstream properties	Lack of property damage downstream	Visual inspection of downstream properties for flood damage

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Project 3: Recycled Water Expansion and Golf Course Retrofit Project, Laguna County Sanitation District

Performance Measures

Project 3 has identified two performance measures that will be used to quantify and verify the performance of the Project. The performance measures below will provide assurance that several of the Integrated Regional Water Management (IRWM) Plan 2013 Objectives will be met. The performance measures are:

- Reduction in groundwater use
- Expansion and increase of recycled water use.

Reduction in Groundwater Use

Project 3 has implemented an impressive plan for the treatment and reuse of recycled water in the Santa Maria Valley. The Laguna County Sanitation District (LCSD) has made great strides in putting Title 22 recycled water to good use but is looking to expand the use of recycled water. The Project will put into place a 2-mile recycled water pipeline extension in roadways to serve the Rancho Maria Golf Course. The Project will provide an annual average of approximately 500,000 gallons per day of discharge capacity. This amount equates to about 537 acre-feet per year (AFY) and offsets existing groundwater extraction from the Santa Maria Groundwater Basin (Basin), which has been adjudicated by court stipulation.

Expansion and Increased Use of Recycled Water

As discussed above, the Project will directly offset groundwater use by the golf course and not only provide for discharge capacity, but expand recycled water use. The pipeline is critical infrastructure needed to further increase the use of recycled water to more recipients and further offsets groundwater pumping in the impacted and adjudicated Basin. With the extended backbone infrastructure in place, LCSD can continue to connect more recycled water users to the system.

Monitoring Systems to Verify Project Performance

The following actions or systems will be in place and will provide for verification of Project performance. Specifically, these are:

- The performance standard for groundwater use reduction will be established using a baseline of the current usage. A well-researched and documented baseline will be estimated, as existing groundwater usage is not metered.
- The performance standard for recycled water use will be measured via a meter and recorded monthly.

Data Collection

Data collection to track soil conditions will be coordinated with the golf course. Groundwater usage for the existing condition has already been estimated by the golf course owner and corroborated by agronomic calculations. The use of recycled water will be metered monthly and will also indicate the amount of groundwater use reduction.

Use of Monitoring Data to Measure Performance in Meeting Project and IRWM Plan Objectives

The recycled water meter will be read monthly and this data will show how much recycled water was used. The usage levels will then be compared to historical groundwater use data to confirm if an overall reduction in groundwater usage is occurring. The estimated annual recycled water use is 537 AFY (see Figure 6.3-1).

FIGURE 6.3-1
Project Performance and Regional Plan Objectives

Regional Objectives		Monitoring Data
	Protect, Conserve, and Augment Water Supplies	Recycled water and estimated groundwater usage will be used to assess the Project's performance, including meeting the projected 537 AFY of recycled water use.
	Protect, Manage, and Increase Groundwater Supplies	Recycled water and estimated groundwater usage will be used to assess the Project's performance, including meeting the projected 537 AFY of recycled water use.

The monitoring data collected will directly measure the Project's outcomes and success in meeting its objectives. In addition, the Project will be able to provide information demonstrating the Project's contribution to sub-regional and overall IRWM Plan goals and objectives.

Figure 6-3.2 summarizes the overall project performance.

FIGURE 6.3-2
Project Performance

	Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
1	Reduce groundwater use	Reduction	537 AFY	Reduced groundwater pumping	Subtract metered amount of recycled water
2	Increase recycled water use	Increase	537 AFY	Measure amount of recycled water used	Meter

Project 4: Secondary Treatment Reliability Project, City of Guadalupe

Performance Measures

Project 4 has identified a series of performance measures that will be used to quantify and verify the performance of the Project. The performance measures below will provide assurance that several of the Integrated Regional Water Management (IRWM) Plan 2013 Objectives will be met. The performance measures are:

- Higher effluent quality
- Pumping efficiency that will reduce energy usage by 90 kilowatt hours (kWh) per day at full plant capacity (960,000 gallons per day)
- Elimination of the accumulation of grit and the elimination of abrasion in the piping, pumps and aeration equipment.

Higher Effluent Quality

Project 4 includes the installation of new and superior influent pumps. Along with a new grit removal system, the overall reliability of the treatment system will result in a consistently higher effluent quality and consistent attainment of waste discharge requirements. This higher effluent quality will also be a benefit to the pasture that is being irrigated by the effluent and will percolate into the groundwater basin.

Pumping Efficiency and Energy Efficiency

The Project will install new influent pumps that will be vastly more energy efficient and will reduce the energy usage of the wastewater treatment plant (WWTP). Prior to the installation of the new influent pumps, the amperage will be measured on the existing pump. After the new influent pumps are installed, the amperage of the new pumps will be measured and the results will show a reduction on energy, measured in amperes. It is anticipated that the new influent pumps will be reduced by 5 horsepower from the existing 20 to 15.

Increased Operation Efficiency and Decreased Maintenance

Without the installation of the grit removal system, it is anticipated that the Biolac ponds will need to be dredged every 8 years. With the installation of the new grit removal system, there will be less accumulation of grit, and therefore, the frequency of grit removal and the need for dredging of the ponds will be much less frequent.

Monitoring Systems to Verify Project Performance

The following actions or systems will be in place and will provide for verification of Project performance. Specifically, these are:

- Monthly Self-Monitoring Reports – the State Waste Discharge Requirement (WDR) necessitates monthly reports and the WWTP Operator does conduct these reports. Use of the information contained in these reports will clearly identify any failures in meeting the effluent discharge requirements, therefore effluent quality is directly measured and can be compared to ascertain the consistency and higher quality of the effluent leaving the facility.
- Measurements of the amperage of the existing and the new influent pumps will be taken during the construction phase of the project and a comparison in horsepower requirements of the pumps will be verified based on the final design the completion of the project.
- The frequency and the need for dredging the Biolac pond will be identified during the actual performance of the treatment system. The Biolac ponds have been in operation for less than one year.

Data Collection

All of the data will be collected at the WWTP. All data will be monitoring, recorded, and kept on file.

Use of Monitoring Data to Measure Performance in Meeting Project and IRWM Plan Objectives

The Project has a set of goals and objectives that it will attain and the Project will provide progress in meeting the overall IRWM Plan Objectives. The 2013 IRWM Plan's Objectives include:

- Maintaining and enhancing water and wastewater infrastructure efficiency and reliability
- Ensuring equitable distribution of benefits: Two of the strategies to accomplishing this include supporting projects in disadvantaged communities (DACs) and enabling and supporting participation of DACs in the IRWM process.
- Protecting and improving water quality
- Addressing climate change: One of the strategies to accomplish this is by reducing energy use by water and wastewater systems.

The monitoring data collected will directly measure the projects outcomes and success in meeting its individual objectives, In addition, the project will be able to provide information demonstrating the project's contribution to sub-regional and overall IRWM Plan goals and objectives.

Figure 6-1.1 summarizes how monitoring data will be used to measure performance in meeting project and regional objectives.

FIGURE 6.1-1
Project Performance and Regional Plan Objectives

Regional Objectives		Monitoring Data
	Protect and Improve Water Quality	Regional Water Quality Control Board (RWQCB) Self- Monitoring reports
	Maintain and Enhance Water and Wastewater Infrastructure Efficiency and Reliability	The pumping system and aeration system life should be 20 years. The Biolac pond should not require dredging every 8 years. In addition, the project will improve pumping efficiency and reduce energy consumption by 90 kilowatt-hours per day.
	Address Climate Change	5 horsepower reduction in pump sizing, 90 kwh per day reduction in electrical consumption at full plant flow, Based upon final design, measured amperage during the construction phase.
	Ensure Equitable Distribution of Resources	The Project is in a DAC. No monitoring data is required

The monitoring data collected will directly measure the projects outcomes and success in meeting its individual objectives, In addition, the project will be able to provide information demonstrating the project's contribution to sub-regional and overall IRWM Plan goals and objectives.

Figure 6-1.2 summarizes the overall project performance.

FIGURE 6.1-2
Project Performance

Project Goals		Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
	Maintain and Enhance Water and Wastewater Infrastructure Efficiency and Reliability	Cost efficiency to the rate payers	1) Reduction of grit abrasion in the plant system 2) Reduction in the frequency of dredging the Biolac pond	1) The pumping system and aeration system life should be 20 years 2) The Biolac pond should not require dredging every 8 years.	Maintenance requirements should verify the expected results
	Protect and Improve Water Quality	Consistent quality treatment plant effluent.	Meeting the State Waste Discharge Requirements	RWQCB monthly report compliance.	RWQCB monthly report compliance
	Address Climate Change Issues	Reduction of green house gasses and conservation of energy	Reduction of pump horsepower requirements	1) 5 horsepower reduction in pump sizing 2) 90 kwh per day reduction in electrical consumption at full plant flow	1) Based upon final design 2) Measured amperage during the construction phase

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