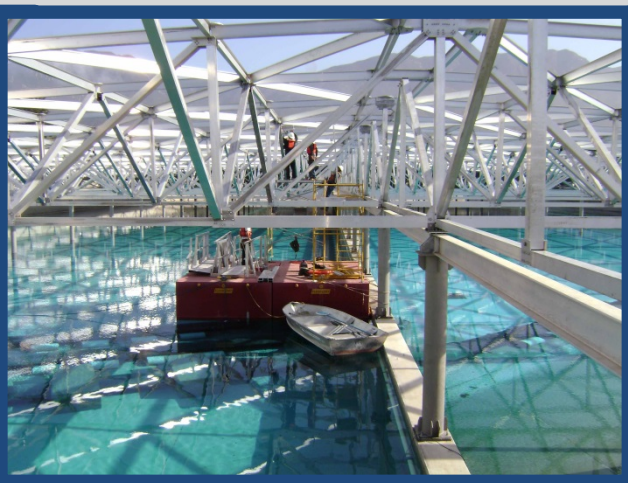
CACHUMA OPERATION AND MAINTENANCE BOARD

Infrastructure Improvement Plan FY 2021-2025



Engineering - Operations Division

EXECUTIVE SUMMARY

Protecting and Improving Water Conveyance Reliability

The Cachuma Project was constructed in the early 1950s by the United States Department of the Interior, U.S. Bureau of Reclamation under contract with the Santa Barbara County Water Agency on behalf of the Cachuma Member Units. Originally, the Cachuma Member Units consisted of the Goleta Water District, the City of Santa Barbara, Montecito Water District, Carpinteria Valley Water District, and the Santa Ynez River Water Conservation District-Improvement District No. 1.

The Cachuma Operation and Maintenance Board (COMB) is a California Joint Powers Agency formed in 1956 by the Cachuma Member Units pursuant to an agreement with the U.S. Bureau of Reclamation (Reclamation). The Member Agencies of COMB have changed since the original formation and currently consist of the Goleta Water District, the City of Santa Barbara, Montecito Water District, and Carpinteria Valley Water District. The agreement with Reclamation transferred to the Member Agencies the responsibility to operate, repair, and maintain all Cachuma Project facilities exclusive of Bradbury Dam. COMB is the mechanism through which the Member Agencies carry out that responsibility.

The Cachuma Member Units entered into contracts in 1949 (including ID#1 in 1954) with the Santa Barbara County Water Agency for the purpose of receiving water from the Cachuma Project for use and benefit of the Member Units. Over the past seventy years, the Project has been the principal water supply for the Santa Ynez Valley and the South Coast Communities, delivering water to approximately 200,000 people.

Water from Lake Cachuma is conveyed to the South Coast Member Agencies through the Tecolote Tunnel intake tower located at the east end of the reservoir. The Tecolote Tunnel extends from Lake Cachuma 6.4 miles west through the Santa Ynez Mountains to the western terminus (South Coast Conduit) located in the foothills of Goleta. The South Coast Conduit is a concrete-lined, concrete encased steel pipeline extending 26 miles from Goleta to Carpinteria. This conveyance system is comprised of the North Portal Intake Tower, the Tecolote Tunnel, the South Coast Conduit, the Sheffield Tunnel, four regulating reservoirs, flow control valves, meters, instrumentation at control stations, turnouts and appurtenant structures along the entire system.

The COMB Infrastructure Improvement Plan (IIP) outlines critical components of the system to be improved, repaired or replaced to ensure reliability of service and provides the tools necessary to determine project priority for budgetary decisions. The guiding principal contained within the IIP is to protect the dependent interest of the Member Agencies by ensuring each asset maintains regulatory compliance, reliability, and safety. The intent of the IIP is to set forth a reasoned decision-making methodology that will protect the asset and avoid increased future cost.

COMB management and staff developed this IIP to provide a methodology for COMB Directors to make cost effective capital improvement decisions. The Board of Directors and staff are proud to serve as the stewards of this public asset that provides the lifeline conveyance of water necessary for the economy and quality of life on the South Coast of Santa Barbara County.

Table of Contents

EXECUTIVE SUMMARY ..... **i**

CACHUMA PROJECT MAP ..... **iv**

ACRONYMNS AND ABBREVIATIONS ..... **v**

1. INFRASTRUCTURE IMPROVEMENT PLANNING

1.1. Introduction 2

1.2. Background 2

1.3. Purpose 3

1.4. Established Goals 4

2. SUMMARY OF COMB MANAGED ASSETS **5**

3. PROJECT IDENTIFICATION

3.1. Introduction 10

3.2. USBR Identified Projects 10

Inspection Recommendations 10

3.3. COMB Identified Projects 11

Asset Inventory Analysis 11

Slope Stabilization and Channel Protection Observations 12

Other Staff Recommendations 12

4. PROJECT SORTING

4.1. Introduction 13

4.2. Priorities 13

5. FUNDING

5.1. Introduction 15

5.2. Five-Year Budget Matrix 15

APPENDIX A: CRITICAL NEEDS PROJECT DESCRIPTIONS

South Coast Conduit AVAR Valve Replacement / Relocation 18

South Coast Conduit Blow-Off Nozzle / Valve Replacement 19

Rehabilitate South Coast Conduit Lateral Structures 20

Supervisory Control and Data Acquisition (SCADA) Upgrades 21

Lake Cachuma Emergency Pumping Facility (EPF) Pump Station Project 22

Lake Cachuma Emergency Pumping Facility (EPF) Secured Pipeline Project 23

Modular Office Building Replacement 24
South Coast Conduit Line Valve in Montecito Section for Repairs 25
Lake Cachuma Evaporation and Water Quality Buoy 26
North Portal Jet Flow Control Valve Replacement 27
Critical Control Valve Replacement 28
Meter Replacement Program 29
Sheffield Tunnel Evaluation and Repair 30
Lauro Reservoir Intake Assessment and Repair 31
North Portal Intake Tower Seismic Assessment 32
Tecolote Tunnel Concrete Deterioration Investigation 33

APPENDIX B: PROJECTS FOR FUTURE CONSIDERATION

Rebuild Inflow Rip Rap at Lauro Reservoir 35
Upper Reach Reliability Project Phase II 36
South Coast Conduit Booster Pump Station 37
Glen Anne Reservoir Safety of Dams Rehabilitation Project 38

List of Figures

Figure 1. *Cachuma Project Map* iv
Figure 2. *Summary of COMB Managed Assets* 5

List of Tables

Table 1. *Consequence of Failure (COF) Rating* 11
Table 2. *Condition Assessment Rating* 12
Table 3. *Project Priority Characterization* 14
Table 4. *Five-Year Budget Matrix for All Projects* 16

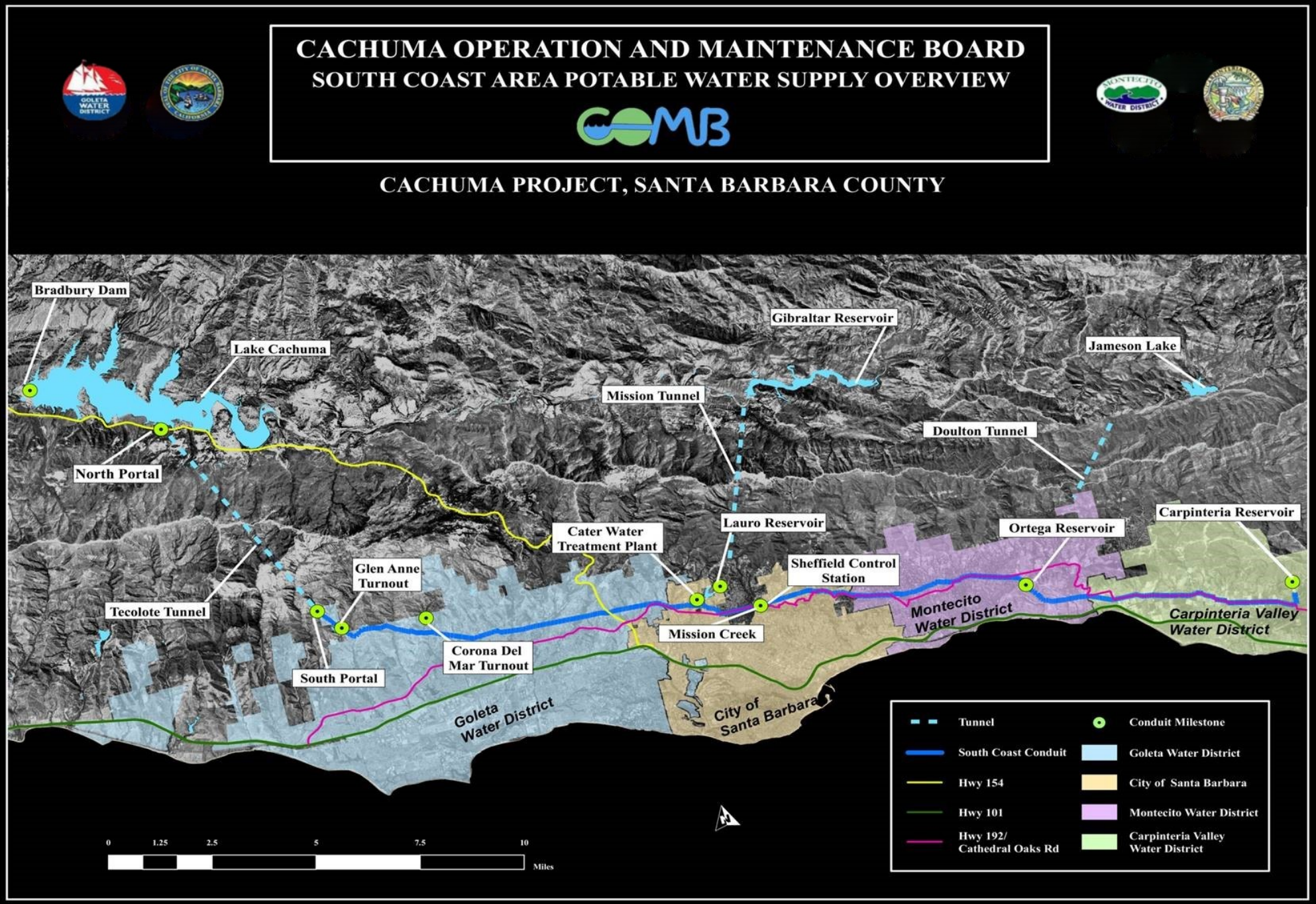


Figure 1. *Cachuma Project Map*

ACRONYMNS AND ABBREVIATIONS

AMS – Asset Management Spreadsheet
ASI – Annual Site Inspection
BA – Biological Assessment
BO – Biological Opinion
CCRB – Cachuma Conservation Release Board
CCWA – Central Coast Water Agency
CD – Carpinteria Dam
CFR – Comprehensive Facility Review
COMB – Cachuma Operation and Maintenance Board
CVWD – Carpinteria Valley Water District
EPA – United States Environmental Protection Agency
GAD – Glen Annie Dam
GWD – Goleta Water District
IIP – Infrastructure Improvement Plan
IRWMP – Integrated Regional Water Management Plan
LD – Lauro Dam
MA – Member Agencies
MU – Member Units
MURRP – Modified Upper Reach Reliability Project
MWD – Montecito Water District
OD – Ortega Dam
OSR – Other Staff Recommendations
PFR – Periodic Facility Review
RO&M – Review of Operation and Maintenance
SB –Santa Barbara
SBCWA – Santa Barbara County Water Agency
SCC – South Coast Conduit
SIR – Special Inspection Report
SSCPO – Slope Stabilization and Channel Protection Observations
ST – Sheffield Tunnel
SWP – State Water Project
SWRCB – State Water Resources Control Board
SYR – Santa Ynez River
SYRWCD – Santa Ynez River Water Conservation District, or Parent District
SYRWD, ID#1 – Santa Ynez River Water District, Improvement District No.1
TT – Tecolote Tunnel
USBR – United States Bureau of Reclamation, or Reclamation

COMB Infrastructure Improvement Plan
Fiscal Year 2021-25

1. INFRASTRUCTURE IMPROVEMENT PLANNING

1.1. Introduction

The Cachuma Operation and Maintenance Board (COMB) Infrastructure Improvement Plan formalizes the strategy for implementation of capital projects and programs needed to carry out the goals and policy objectives of the Board. The Infrastructure Improvement Plan (IIP) is organized and structured to identify and prioritize rehabilitation projects necessary to protect, improve, and sustain a reliable source of water conveyed from the Cachuma Project to the South Coast communities of Santa Barbara County. The plan will facilitate the decision-making process for allocation of resources to help ensure the delivery of quality, reliable water to our Member Agencies. The IIP spans a five-year planning horizon, and will be updated and annually submitted to the Operations Committee for review and comment. Following Committee review and recommendations, the IIP and its annual amendments will be presented to the Board of Directors for final approval.

1.2. Background

Rehabilitation and repair projects have historically been a component of the COMB annual budgetary planning process. The comprehensive identification of near and long-term projects over a five-year planning horizon is subject to annual amendments as the identification and analysis of rehabilitation and repair projects evolve and cost estimates are refined.

Prior to drafting this IIP, COMB conducted a critical needs assessment, which included an internal inventory of assets, conditions assessments, estimates of replacement costs, and the date by which assets require immediate or near-term replacement for major infrastructure and appurtenances. This assessment and documentation have been supplemented with the U.S. Bureau of Reclamation (Reclamation) site inspection recommendations (periodic and comprehensive reviews) of selected Cachuma Project facilities and components every 3rd and 6th year. This plan incorporates elements of COMB internal analysis and Reclamation site inspections to produce a list of projects for further consideration. The projects included in the IIP represent the minimal level of investment necessary to continue to meet regulatory requirements, critical needs, and sustain vital infrastructure.

1.3. Purpose

The IIP identifies the improvements needed in the Cachuma Project System and sets forth review criteria to enable the prioritization of projects for scheduling improvements during the five-year period. The IIP is intended to serve many purposes including:

- **Long Range Planning Document**

  As a long-range planning document, the IIP describes the key infrastructure improvements needed for a five-year horizon and identifies additional projects that should be evaluated on a regular basis for potential future inclusion. The goal of the five-year plan is to identify the critical needs projects for near-term implementation.

- **Cachuma Project Cost Analysis**

  The IIP provides an outline of costs associated with rehabilitation of the Cachuma Project which serves to provide guidance for longer term rate analysis efforts performed by our Member Agencies.

- **Budget Development**

  The annual COMB operating budget outlines discrete projects and affiliated costs to communicate needed investment for the forthcoming fiscal cycle. The IIP will provide detailed guidance on priority projects to be included in the annual operating budget.

- **Communication to Stakeholders**

  The IIP communicates to our stakeholders the array of infrastructure improvements necessary to maintain a reliable supply of water. Communicating the condition of assets and the challenges associated with competing financial resources provides a basis for our Member Agencies to consider COMB projects and their own priorities.

1.4. Established Goals

1) Carryout COMB Mission of providing a reliable source of water to our Member Agencies

2) Identify infrastructure vulnerabilities and operational deficiencies (Risk Management)

3) Provide for a systematic selection of critical projects

4) Maintain current level of service while allocating infrastructure improvement costs over time

5) Identify funding requirements for long term capital planning

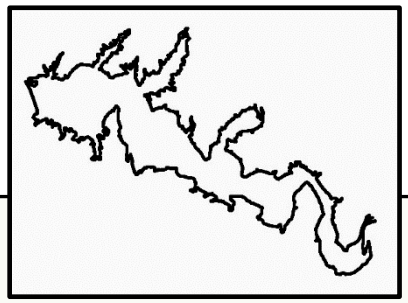
6) Serve as a basis for annual budget development

7) Create a framework for ensuring reliable and sustainable operations

8) Serve as a planning document for the Board of Directors

Note: the inclusion of a project in the plan does not authorize its implementation and construction. Funding is only authorized for projects in the upcoming FY 2021 in accordance with the adoption of the FY 2021 annual budget. Before each project is allowed to move forward, it must be demonstrated that the capital funding is assured and that the ongoing maintenance and operating requirements can be sustained within forecasted operating resources.

2. SUMMARY OF COMB MANAGED ASSETS



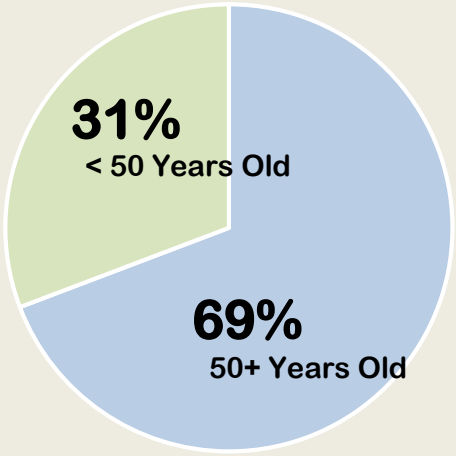
- 1 Intake Tower
- 80 Major Control Valves
- 7.7 Miles of Tunnels
- 28.4 miles of Pipeline
- 4 Regulating Reservoirs
- 28 Accounting Meters
- 62 Blowoff Vaults
- 57 AVAR Vaults
- 68 Turnout Vaults

Intake Tower

COMB operates and maintains the North Portal Intake Tower, which diverts water from Lake Cachuma into the Tecolote Tunnel and to the South Coast Conduit (SCC) for delivery to COMB Member Agencies. The vertical intake tower was built by the U. S. Bureau of Reclamation during construction of the Cachuma Project and stands 120 feet tall. The intake tower is located approximately mid-reservoir and contains five slide gates, each at varying levels on the pentagonal-shaped tower. The slide gates are used to manage the conveyance of water from the lake at various elevations depending on lake conditions.

Valves

COMB operates and maintains over 80 large control valves and slide gates located within gate chambers, control stations, and dam inlet-outlet works. Most of the large control valves measure 30 inches or more in diameter. The large control valves are located throughout the system and allow distribution or service area isolation when maintenance on the system is required. COMB performs annual maintenance to ensure their operability. Sixty-nine percent of the valves existing in the system are over 50 years old and are subject to increased risk of inoperability.

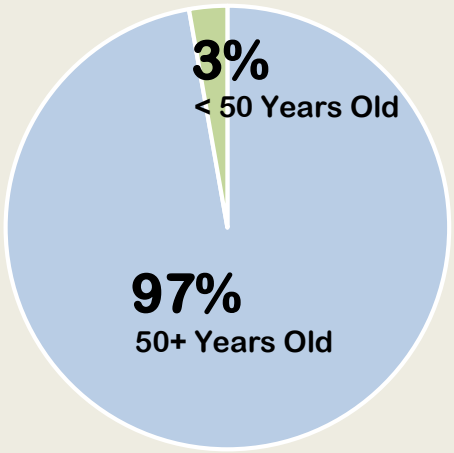


Tunnels

COMB maintains five separate tunnels covering over 7.7 miles throughout the Cachuma Project system. The tunnels vary in size, with the most significant being the 6.4 mile Tecolote Tunnel, which provides water conveyance from Lake Cachuma through the Santa Ynez Mountains to the South Coast Conduit where it is delivered to the water districts. The tunnels are seven foot tall, horse-shoe shaped, concrete walled tunnels and were built by Reclamation during the creation and installation of the Cachuma Project. The building of the tunnels required years of work under extreme temperatures and massive flooding conditions.

Pipeline

COMB operates and maintains over 28.4 miles of concrete conveyance pipeline throughout the system. The primary pipeline is referred to as the South Coast Conduit (SCC) and is composed of over 9.5 miles of 48-inch diameter reinforced concrete cylinder pipe in the upper reach of the system, and 17.0 miles of 27 to 36-inch bar-wrapped concrete cylinder pipe within the lower reach. The SCC is original with the exception of 330 feet installed as part of a Highway 154 realignment in 1970, 2,900 feet of welded steel pipe installed in 1980, and approximately 2,000 feet of welded steel pipe installed in the upper reach as part of the Modified Upper Reach Reliability Project (MURRP) in 2012. Ninety-seven percent of the South Coast Conduit is over fifty years old.

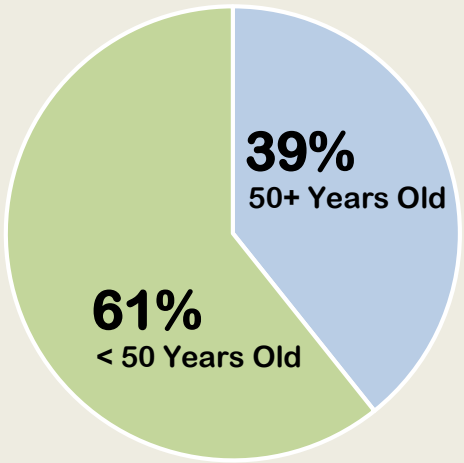


Reservoirs

COMB operates and maintains four regulating reservoirs which balance conveyance operations within the south coast area of the Cachuma Project system. Two of the reservoirs are zoned earth-filled embankment dams originally designed and installed by the Bureau of Reclamation. Lauro Dam has a structural height of 137 feet, a crest length of 540 feet, and a storage capacity of 518 acre-feet. Seismic safety modifications were completed in 2006, which brought the facility into seismic compliance. Glen Anne Dam located in the upper reach is currently non-operational. The two reservoirs located in the lower reach of the system are Ortega Reservoir and Carpinteria Reservoir. They are homogenous earth-filled structures and provide for over 100 acre-feet of storage capacity combined. Both Ortega and Carpinteria Reservoirs have two separate bays divided by a center wall and were covered with aluminum roofs in 2007 and 2005, respectively.

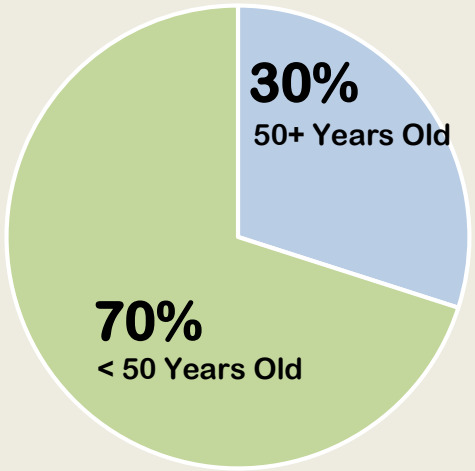
Meters

COMB reads and maintains 28 accounting meters throughout the system. Some of the meters are original venturi style meters installed in the early 1950s. Other meter styles found within the system include propeller, compound, and nine recently installed high accuracy mag-meters. Of the 28 meters, 11 are integrated with SCADA to allow remote tracking and historical logging of flow measurements. COMB also tracks pressure and water quality parameters such as turbidity, specific conductance, pH, and temperature using sensors located at the North Portal.



Structures

COMB operates and maintains approximately 200 SCC structures throughout the system. This includes 62 blow-off vaults, 57 air-vacuum air-release (AVAR) vaults, and 68 turnouts through the peaks and valleys of SCC system. Each structure is unique, but generally consists of a concrete vault structure, metal lid with lock box, ladder rungs, SCC access hole with lid, and either blow-off pipe plumbing, AVAR plumbing, or turnout plumbing with risers and valves. The purpose of these appurtenant structures is to allow staff access to system components, in order to release/admit air for pipeline protection, release water for maintenance purposes or emergencies, and to service internal assembly and/or valves. Thirty percent of these components are over fifty years old. Seventy percent of the structures have been rehabilitated as part of a structure rehabilitation program started in the early 2000s.



3. PROJECT IDENTIFICATION

3.1. Introduction

Projects outlined in the IIP have been identified based on U.S. Bureau of Reclamation (USBR, Reclamation) inspection recommendations, Cachuma Operation and Maintenance Board (COMB) asset inventory analysis, and other staff observations and recommendations. The identification of a project within the five-year plan does not guarantee construction. The initiation of any project requires other evaluations and approvals that must be completed for a project to advance to design and ultimately construction. Additionally, the Board of Directors has the ongoing ability to review and revise projects based upon unforeseen conditions, priorities, and financial resources.

3.2. USBR Identified Projects

Inspection Recommendations

The U.S. Bureau of Reclamation inspects selected Cachuma Project facilities and components operated and maintained by COMB as part of their Annual Site Inspections (ASI) every year, Periodic Facility Reviews (PFR) every three years, Comprehensive Facility Reviews (CFR) every six years, Review of Operation and Maintenance (RO&M) when needed, and Special Inspection Reports (SIR) when needed. After the inspections are completed, Reclamation provides a report to COMB summarizing the corrective actions recommended for implementation. The recommendations fall under three categories:

- **Category 1** recommendations involve the correction of severe deficiencies where immediate and responsive action is required to ensure structural safety, operational integrity of a facility, or operating personnel/public safety.

- **Category 2** recommendations cover a wide range of important matters where action is needed to prevent or reduce further damage, preclude possible operational failure of a facility, or reduce safety risks to operating personnel/public.

- **Category 3** recommendations cover less important matters but are believed to be sound and beneficial suggestions to improve or enhance the O&M of the project or facility.

3.3. COMB Identified Projects

Asset Inventory Analysis

The first step in identifying projects internally is to evaluate and record the current state of existing assets. Asset management plans assist agencies in maintaining a desired level of service at the most appropriate cost for rehabilitating, repairing or replacing an asset. The development of an asset management plan requires a comprehensive inventory and characterization of major assets, including valves, meters, blowoffs, air vents, and other important structures. COMB operates and maintains the Cachuma Project critical infrastructure assets which include the North Portal, Tecolote Tunnel, South Coast Conduit, Sheffield Tunnel, and Glen Anne, Lauro, Ortega, and Carpinteria Reservoir locations. A comprehensive inventory was assembled for COMB assets using the Gutteridge, Haskins & Davey (GHD) asset management spreadsheet available through the EPA website.[1] The GHD spreadsheet allows for organizing a hierarchy of assets, which can be characterized by asset class, original cost, replacement cost, effective life, probability of failure, and renewal strategy (abandon, maintain, repair, replace), among other inputs. It is useful for viewing assets and their current conditions in a single location, while identifying assets or categories of assets that will need near or long-term work. The consequence of failure was rated from 1 to 10 according to the expected impacts to the system according to Table 1. The condition of each asset was assessed utilizing a rating from 1 to 10 based on the conditions in Table 2. The assets were then sorted by the consequence of failure rating and then by the condition rating to determine project criticality.

Table 1. *Consequence of Failure (COF) Rating*

CoF Rating	Description	Percent Affected	Level
1	Minor Component Failure	0-25%	Asset
2	Major Component Failure	25-50%	Asset
3	Major Asset	0-25%	Asset
4	Multiple Asset Failure	25-50%	Facility / Sub-System
5	Major Facility Failure	50-100%	Facility
6	Minor Sanitary System Failure	20-40%	Total System
7	Medium	40-60%	Total System
8	Intermediate	60-80%	Total System
9	Significant	80-90%	Total System
10	Total	90-100%	Total System

[1] EPA. 2016. https://www.epa.gov/sites/production/files/2016-01/epa_smsm.xls

Table 2. *Condition Assessment Rating*

Condition Rating	Description	Maintenance Level
1	New or Excellent Condition	Normal periodic maintenance (PM)
2 to 3	Minor Defects Only	Normal PM , Minor corrective measures (CM)
4 to 5	Moderate Deterioration	Normal PM, Major CM
6 to 7	Significant Deterioration	Major repair, rehabilitate
8 to 9	Virtually Unserviceable	Rehabilitation unlikely
10	Unserviceable	Replace

Slope Stabilization and Channel Protection Observations

The South Coast Conduit (SCC) is a 26-mile water conveyance pipeline that delivers Cachuma Project water to approximately 200,000 residents along the South Coast of Santa Barbara County. Strategically located along the foothills, the pipeline crosses drainages, culverts, creeks, and other vulnerable areas where downcutting and/or aggradation occurs. COMB staff monitors these areas frequently, looking for signs of SCC exposure, in order to protect exposed pipeline as soon as possible and to avoid subsequent damage and weathering. Key slope stabilization and channel protection projects have been included as an important mode of project identification and characterization. Historically, field observations by COMB staff have been instrumental for protecting the system.

Other Staff Recommendations

COMB staff may identify projects that are not included in the Asset Management Spreadsheet or the slope stabilization and channel protection observations. These projects typically represent improvements to the system that could increase system capacity, efficiency, flexibility, or reliability. These projects could include the installation of new line valves, new meters, or other new elements or upgrades. COMB Staff is constantly brainstorming ideas to improve operations and/or decrease costs by making the system more efficient.

4. PROJECT SORTING

4.1. Introduction

To evaluate projects systematically, COMB created project priorities and ranked the projects in order of criticality. The purpose of utilizing this methodology was to accurately separate the projects into a categories from high to low priority category. The ranking informs the Board of Directors when reviewing, approving, and budgeting for implementation of important infrastructure improvement projects. COMB staff prioritized a comprehensive list of proposed projects using six priority categories described below.

4.2. Priorities

Priority 1: Regulatory or Legal Requirement
These projects are subject to the requirements of federal, state, or local regulatory agencies, with noncompliance resulting in fines or other adverse actions.

Priority 2: Required to Maintain Current Level of Service
These projects maintain the current level of service to COMB's Member Agencies. These projects reduce potential disruptions, water loss, property damage that could occur without replacement. In general, these projects replace valves and infrastructure that are currently inoperable and whose failure would result in an unplanned shutdown of deliveries or disruption in the transmission of critical operations data.

Priority 3: Addresses Critical Deficiency
A critical deficiency has the potential to significantly jeopardize COMB's ability to serve its Member Agencies. These deficiencies have been identified by Bureau of Reclamation, COMB staff, or outside experts. Projects under Priority 3 address known critical deficiencies that could result in major infrastructure failure, deteriorated water quality, limited water production, or unsafe working conditions.

Priority 4: Evaluates Critical/Significant Deficiency
Potential critical/significant deficiencies have been identified which require further engineering investigation and design. These projects would evaluate the criticality of the deficiency and potential solutions to mitigate the deficiency.

Priority 5: Proactive Aging/Deficient Infrastructure Replacement
These projects provide funding for the proactive replacement, upgrade, or improvement of a facility that is at the end of its useful service life. Although an asset may be at its assumed

end of useful life, it may remain functional for many years; therefore, the replacement is considered proactive until the asset becomes inoperable.

Priority 6: System Reliability and Resilience Improvements
These projects consist of system improvements which improve system reliability providing backup systems to better maintain levels of service during and after emergency events events (i.e., wildfires, earthquakes, floods).

The project priorities are summarized in Table 3 below, which also provides the project identifier and project name. For additional information on these projects, please see Appendix A: IIP Project Descriptions and Appendix B: Projects for Future Consideration. For ease of use, the order in which the projects are listed in Table 3 is mirrored in Appendix A, Appendix B, and later in this report within the 5-year budget matrix.

Table 3. *Project Priority Characterization*

Priority	Project ID*	Project Name
Priority 1: Regulatory or Legal Requirement	2012-1-A	SCC AVAR Valve Replacement / Relocation
Priority 2: Required to Maintain Level of Service	2004-2-I	SCC Blow-Off Nozzle / Valve Replacement
	2004-2-B	Rehabilitate SCC Lateral Structures
	2014-C-61	SCADA Upgrades
	2019-C-1	Lake Cachuma EPF Pump Station (if required)
Priority 3: Addresses Critical Deficiency	2018-C-1	Lake Cachuma EPF Secured Pipeline Project
	2019-C-2	Modular Office Building Replacement
	2018-C-2	SCC Line Valve in Montecito Section for Repairs
	2019-C-3	Lake Cachuma Water Quality and Evaporation Buoy
	2013-C-1	North Portal Jet Flow Control Valve Replacement
	2019-C-4	Critical Control Valve Replacement
	2013-C-1	Meter Replacement Program
Priority 4: Evaluates Potential Critical Deficiency	2007-2-B	Sheffield Tunnel Evaluation and Repair
	2013-2-C	Lauro Reservoir Intake Assessment and Repair
	2016-C-1	North Portal Intake Tower Seismic Assessment
	1999-2-A	Tecolote Tunnel Concrete Deterioration Investigation
Priority 5: Proactive Aging Infrastructure Replacement	2013-C-15	Rebuild Inflow Rip Rap at Lauro Reservoir
Priority 6: System Reliability and Resilience Improvements	2017-C-1	Upper Reach Reliability Project Phase II
	2019-C-5	SCC Booster Pump Station
	2011-C-57	Glen Anne Reservoir Rehabilitation Project

**Project ID: Year – Source [USBR Category 1,2, or 3 or C for COMB] – Tracking Code [USBR letter or COMB number])*

5. FUNDING

5.1. Introduction

Funding of projects identified in the IIP will be determined annually by the COMB Board of Directors as a component of the development and approval of the annual budget. Fund sources for IIP implementation will be derived from either long-term or short-term financing, grants or ongoing assessments from each of the participating Member Agency Agencies. The cost estimates included for each IIP project are derived from internal estimates or developed by professional engineering consultants. Estimates may change as more precise information becomes available.

The allocation of IIP funds is a separate component of the annual COMB Budget. Amendments to the IIP during the budget-year will be reviewed by the COMB Operations Committee and require approval by the Board of Directors for any expenditure modification exceeding ten percent of the project amount, per the COMB procurement policy. Expenditure authority for individual projects, unless otherwise directed, is available for the current fiscal year following the date of approval.

5.2. Five-Year Budget Matrix

The five-year budget matrix represent important projects to be completed within the five-year planning horizon outlined in this document. Accordingly, COMB has prepared a proposed Five-Year Budget Matrix for Infrastructure Improvement Projects (Table 4). For planning purposes, the projects were sorted in priority categories by the condition rating and then by the consequence of failure rating. Projects that are proposed to occur earlier have been scheduled as such due to high criticality. Projects have been scheduled in a manner that reduces risk and spreads costs across fiscal years, taking advantage of grant opportunities when available. The Emergency Pumping Facility Pump Station is a significant capital expenditure that is required to maintain service during drought conditions. The pump station is included in the five-year budget process but would only be required if drought conditions occur.

Table 4. *Five-Year Budget Matrix for All Projects*

Priority	Project ID	Project Name	2020-21	2021-22	2022-23	2023-24	2024-25	5-yr Total
1	2012-1-A	SCC AVAR Valve Replacement/Relocation	$240,000	$130,000				$370,000
2	2004-2-I	SCC Blow-Off Nozzle/Valve Replacement	$200,000	$160,000				$360,000
2	2004-2-B	Rehabilitate SCC Lateral Structures	$150,000	$150,000	$100,000			$400,000
2	2014-C-61	SCADA Upgrades	$150,000	$150,000	$100,000			$400,000
2	2019-C-1	Lake Cachuma EPF Pump Station (if required)				$1,125,000	$1,125,000	$2,250,000
3	2018-C-1	Lake Cachuma EPF Secured Pipeline Project	$300,000	$1,725,000				$2,025,000
3	2019-C-2	Modular Office Building Replacement	$300,000					$300,000
3	2018-C-2	SCC Line Valve in Montecito Section for Repairs	$190,000					$190,000
3	2019-C-3	Lake Cachuma Water Quality and Evaporation Buoy*	$100,000		$60,000			$160,000
3	2013-C-1	North Portal Jet Flow Control Valve Replacement			$300,000			$300,000
3	2019-C-4	Critical Control Valve Replacement			$100,000	$150,000	$150,000	$400,000
3	2013-C-1	Meter Replacement Program			$100,000		$100,000	$200,000
4	2007-2-B	Sheffield Tunnel Evaluation and Repair			$200,000	$200,000		$400,000
4	2013-2-C	Lauro Reservoir Intake Assessment and Repair			$130,000			$130,000
4	2016-C-1	North Portal Intake Tower Seismic Assessment			$100,000			$100,000
4	1999-2-A	Tecolote Tunnel Concrete Deterioration Investigation			$100,000			$100,000
		Subtotal	**$1,630,000**	**$2,315,000**	**$1,290,000**	**$1,475,000**	**$1,375,000**	**$8,085,000**
		Grant Funding		**$-750,000**				**$-750,000**
		Total	**$1,630,000**	**$1,565,000**	**$1,290,000**	**$1,475,000**	**$1,375,000**	**$7,335,000**

*Water quality monitoring buoy installation may occur in FY 2019-20.

APPENDIX A: IIP PROJECT DESCRIPTIONS

South Coast Conduit AVAR Valve Replacement / Relocation (2012-1-A)

Background

Combination air vacuum air release valves (AVARs) are located at high points along the pipeline and act to automatically expel air and relieve vacuum accumulation in pipes. If air is not adequately expelled, air pockets can constrict flows. If the vacuum is not relieved, serious damage or collapse of the pipeline can occur. If AVAR vaults become flooded or if a negative pressure is experienced within the pipeline, the AVAR valves could allow contaminated water to enter the pipeline. It is now required to install these valves above grade, where flooding is less likely. COMB has been upgrading the AVAR valves in the system such that all are above grade. The AVAR valve structures consist of a manhole cover, riser pipe, valve, and AVAR valve. Over time, the original valves, riser, and manhole covers have also been corroded and pose an operational risk.

Need

Fifteen AVAR valves were rehabilitated in 2018 and 2019 on the Lower Reach. There are six remaining AVAR valve structures that need rehabilitation as they pose an operational risk and/or do not meet Section 64576 of Titles 17 and 22 California Code of Regulations, which requires "each new air-release, air vacuum, or combination valve, and any such valve installed to replace an existing valve shall be: (a) installed such that its vent opening is above grade." In addition, there are nine AVAR located on the lateral turnouts that require replacement. Replacement and/or relocation of the AVARs and riser pipes will ensure the functionality of this system component. The consequence of not completing this project may be major facility failure in multiple locations and potential water contamination.

Description

Replace and relocate to above ground AVARs, and replace riser pipes in the Lower Reach. Consistent with other AVAR replacements, manhole covers, valves, risers, laterals would be replaced at the same time. The project would require coordination with impacted Member Agencies during the required shutdown of the SCC. For efficiency and to minimize cost, phases of this project will be performed concurrently with similar phases of the South Coast Conduit Blow-Off Nozzle/Valve Replacement. Project implementation will occur over time and during low water demand months to reduce the impact of system shutdown.

PRIORITY CATEGORY

1. Regulatory or Legal Requirement

ESTIMATED COST

$370,000

Fiscal Year	Phase	Cost
2020-21	1 (Toro Cyn - Carp HS)	$240,000
2021-22	2 (Carp HS - Carp Res)	$130,000

This project has been identified by the USBR as a Category 1 recommendation.

South Coast Conduit Blow-Off Nozzle / Valve Replacement (2004-2-I, 2013-2-L)

Background

Blow-off structures exist on all low points of a water distribution system. The components included in these structures include access-hole covers, blow-off nozzles, a gate valve and blow-off piping. There are a total of sixty-five blow-off structures in South Coast Conduit system.

Need

The existing blow-off components are in need or rehabilitation due to extensive corrosion. The dependability of these components is necessary to allow the system to be dewatered for maintenance and response to an emergency break in the pipe. Blow-off valves and piping have been replaced in the Upper Reach and 11 blow-off nozzles/valves have been replaced in the Lower Reach. Fifteen blow-off nozzles in the Montecito and Carpinteria areas are in need of replacement. The original nozzles and valves are in need of replacement because of corrosion. The consequence of not completing this project could result in a major facility failure in multiple locations and potential risk of water contamination.

Description

The project consists of replacing the man hole covers, blow-off nozzles, gate valves, upper spools, and discharge piping within the Lower Reaches of the SCC. The project would be completed in conjunction with the AVAR valve replacement and relocation project and coordinated with the affected Member Agencies during the required system shutdown. The design for this project is complete. Six scheduled shutdowns remain to be completed to replace 15 remaining blow-off nozzles and valves.

PRIORITY CATEGORY
2. Required to Maintain Level of Service

ESTIMATED COST
$360,000

Fiscal Year	Phase	Cost
2020-21	1 (Toro Cyn - Carp HS)	$200,000
2021-22	2 (Carp HS - Carp Res)	$160,000

This project has been identified by the USBR as a Category 2 recommendation.

Rehabilitate South Coast Conduit Lateral Structures (2004-2-B)

Background

There are forty-four lateral connections housed in concrete cylinder structures on the Lower Reach of the South Coast Conduit. The function of these connections is to provide water to sections of the Montecito Water District and Carpinteria Valley Water District. Each connection generally contains two gate valves, a meter, and an air vent component. Most laterals have been abandoned and air gapped in the Upper Reach of the South Coast Conduit with the exception of the Goleta West Conduit.

Need

Thirty-five of the existing lateral appurtenances in the lower reach pose an operational risk due to age, corrosion, and unreliable valve operating conditions. The dependability of these valves is necessary to provide reliable water service to customers served in sections of the Montecito and Carpinteria Water District Boundary areas. The consequence of not completing this project could result in lateral failure/inoperability limiting deliveries to customers served by those laterals or complicating operations if leak-by or a major failure occurred. The lateral valves need to be replaced prior to anticipated shutdowns of the South Coast Conduit in the Carpinteria area.

Description

This project would replace corroded pipe and inoperable valves and air vents on lateral connections. The project will require shutdowns for the specified turnout distribution supply areas and would be coordinated with the impacted Member Agencies. The project requires retention of engineering and contractor services. Due to each site's differing conditions, engineering would be required for each individual structure. The initial phase of the project is to perform an engineering assessment and design for all lateral structures.

PRIORITY CATEGORY

2. Required to Maintain Level of Service

ESTIMATED COST

$300,000

Fiscal Year	Phase	Cost
2020-21	Construction	$150,000
2021-22	Construction	$150,000
2022-23	Construction	$100,000

This project has been identified by the USBR as a Category 2 recommendation.

Supervisory Control and Data Acquisition (SCADA) Upgrades (2014-C-61)

Background

The "Supervisory Control and Data Acquisition" system (SCADA) serves to collect important monitoring data on flows, reservoir elevations, alarms, communication, turbidity, pH, temperature, and valve positions. The SCADA system increases the efficiency of COMB staff by providing notification alarms for operational staff to investigate, which enhances system reliability. Installation of the COMB Supervisory Control and Data Acquisition (SCADA) system began in 2003. The programmable logic controllers (PLC) COMB owns and operates are in need of upgrade to maintain system functionality.

Need

The programmable logic controllers (PLC) COMB owns are obsolete and no longer available. They are very difficult and time consuming to re-program the existing PLC's in the event of a failure or simple program modification. If a failure occurs and a suitable computer and software cannot be located, then there is no option but to upgrade to get the site back on line.

Description

This project would involve the replacement of all legacy PLC(s) in their existing control panels. New PLC processors, software, and I/O modules. COMB has a total of nine PLCs. As part of the upgrades, additional sensors will be added to monitor to the system for potential leaks or breaks. Several of these PLCs are also locations were data is shared with COMB's Member Agencies. Upgrades at these sharing locations would need to be coordinated with each Member Agency. The project would also involve upgrading the SCADA server hardware and software to support the latest operating system and version of the SCADA software.

PRIORITY CATEGORY
2. Required to Maintain Level of Service

ESTIMATED COST
$400,000

Fiscal Year	Phase	Cost
2020-21	Replace 4 PLCs	$150,000
2021-22	Replace 4 PLCs	$150,000
2022-23	Upgrade System	$100,000

This project has been identified by the USBR as a Category 2 recommendation.

Lake Cachuma Emergency Pumping Facility Pump Station Project (2019-C-1)

Background

The proposed Pump Station Project would include a land-based pump station component instead of the existing temporary floating pumping barge, which would provide a lifeline delivery of Cachuma Project water and imported State Water Project (SWP) water to 200,000 residents on the South Coast of Santa Barbara County during times of drought.

Need

A land-based pump station has cost advantages over time, as each installation of the current temporary floating pumping barge is costly and equipment storage when not in use is expensive. Key components of the EPF are currently being stored at a storage facility in Paso Robles. In addition, a land based pump station would allow more decision-making time for EPF deployment.

Description

A contractor provided COMB with a Long-Term Pumping Facility Alternatives Study in March 2017 which discusses two concepts for a new secured pump station: (1) a shore-mounted, slant-well facility and (2) a prefabricated submerged facility. The shore-mounted slant-well facility would include placing vertical turbine pumps with submersible motors at the bottom of a slanted steel casing pipe, which draws water from the lake through fish screens. Six 100-HP pumps are envisioned. The pumps would be powered by the same variable-frequency drives (VFD) and electrical switchgear used to power the existing barge.

The prefabricated submerged facility is an alternative concept, which would be assembled on shore, floated into position, and then lowered to the lake bottom. The advantage of such a facility is that it could be constructed well in advance of when it is needed, however, the pumping equipment would not be as easily accessible.

PRIORITY CATEGORY
2. Required to Maintain Level of Service

ESTIMATED COST
$2,250,000

Fiscal Year	Phase	Cost
2023-24	Environmental/Design	$1,125,000
2024-25	Construction	$1,125,000

Permits will need to be renewed or applied for redeployment of the EPF with a secured pumping station.

Lake Cachuma Emergency Pumping Facility Secured Pipeline Project (2018-C-1)

Background

The Emergency Pumping Facility (EPF) Secured Pipeline Project is a highly critical operational infrastructure project, which will provide a lifeline delivery of Cachuma Project water and imported State Water Project (SWP) water to 200,000 residents on the South Coast of Santa Barbara County during times of drought. In addition, significant water quality benefits could be achieved by using the pipeline as an alternate intake. An emergency pumping facility was temporarily installed and operated in the 1957-1958, 1990-1991, and in 2014-2017.

Need

Over time, sedimentation buried the lowest gate (5) on the North Portal Intake Tower. Without a pipeline and pumping system, Cachuma Project and State Water Project (SWP) water is unable to be transported to the South Coast when the water levels recede below Gate 4 (678'), interrupting water service and causing widespread immediate threat to public health during drought. The EPF Secured Pipeline Project makes available an additional 20,500 AF of reservoir/imported water until inflow and reservoir levels return. In addition, water quality data collected by COMB over the last 2 years demonstrated that water temperature, total organic carbon, boron, and sulfate are consistently lower at depth. Lower water temperatures are associated with decreased THM formation during treatment and lower boron and sulfate levels will help Member Agencies meet aquifer storage and recovery (ASR) injection requirements when the pipeline is used as an alternate intake.

Description

The project would consist of a 36-inch diameter, 3,700' DR-17 HDPE pipeline secured to the lake bottom with concrete pipe weights. A fish screen could be installed at the end of the pipeline to allow water deliveries from a deeper portion of the lake for better management of delivered water quality. In times of drought, the pipeline would be connected to a pumping system to allow deliveries of water to the Tecolote Tunnel. The preferred elevation to install the pipeline is at 700', although deeper install may be possible. The project could be installed during the next drought when the appropriate lake level is reached for construction (Makai Ocean Engineering, Inc. 2019).

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$2,025,000

Fiscal Year	Phase	Cost
2020-21	Env/Eng	$300,000
2021-22	Construction	$1,725,000

*USBR Drought Resiliency Grant preliminarily awarded to COMB in the amount of $750,000 for this project

Environmental review will be required and permits will need to be renewed or applied for redeployment of the EPF with a secured pipeline.

Modular Office Building Replacement
(2019-C-2)

Background

As staff increased, COMB purchased used mobile units and converted them into office spaces to house administrative and fisheries division personnel. In FY 2014-15, after significant rainfall, water had leaked through the administration office roof and into the electrical light system. The Operations staff took immediate and temporary remedial measures to protect the roof by using a foil-type roof blanket application which is still in place today. The Operations Division Manager indicated that the roof was deteriorated and structurally unsafe. Additionally, during a recent walk-thru inspection, a representative from Atlas Performance, Inc. determined that the Fisheries mobile office was in severe dry-rot stages and had an oak tree seedling growing out of the fascia trim board from woodpecker activity. Because the structural integrity of the mobile offices is at risk, it has become necessary to replace the units completely.

Need

The COMB Administration and Fisheries mobile offices are aging and in various stages of deterioration. The Administration office is a 1979 model (41 years old), purchased used in 1993 and the Fisheries office is a 1997 model (23 years old), purchased used in 1999. These offices are deteriorating and have multiple leak points, various unidentifiable smells emanating within the interior of the buildings, and severe rotting discovered on the roof and interior/exterior walls. These buildings have long outlived their life expectancy and have become a personnel safety issue due to the extent of deterioration. These outdated temporary buildings do not contain ADA compliant features and have become obsolete.

Description

Work would include the manufacturing and purchase of two mobile offices totaling 1,680 square feet of office space (1 double wide and 1 single wide), delivery charges, tie downs, skirting, steps and ADA ramp, license and transfer charges, removal and disposal of current buildings, and installation on site. In addition, the deck and patio cover currently connected to the existing mobile units is decayed and will need to be dismantled and rebuilt.

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$300,000

Fiscal Year	Phase	Cost
2020-21	Purchase/Installation	$300,000

New construction and alterations must be in compliance with the 2010 ADA Standards for Accessible Design. COMB may be required to remove architectural barriers if "readily achievable" for existing facilities.

South Coast Conduit Line Valve in Montecito Section for Repairs (2018-C-2)

Background

To allow for shutdown repairs and continued water delivery in the event of disruption of service in the South Coast Conduit, an isolation line valve is needed in the Montecito Reach between the Montecito Office Pump station and the East Valley Pump station.

Need

Along the South Coast Conduit (SCC), there are no isolating line valves installed between Sheffield Control Station (Station 82+36) and Toro Canyon (Station 598+44), approximately 50,000 feet of conduit. Without a line valve in this section, a pipeline break due to natural disaster could result in escaping flows. In an emergency scenario such as this, a line valve would divide the conduit, limiting outflow. In addition, several blow-offs and air vacuum air release (AVAR) structures on the South Coast Conduit are in disrepair and need periodic rehabilitation requiring a shutdown of the SCC. A line valve would allow COMB to rehabilitate these important structures without ceasing deliveries to Montecito Water District in this section.

Description

A line valve between the Montecito Water District (MWD) Office Pump Station and East Valley Pump Station would allow the SCC to be isolated in the Montecito reach while continuing to allow water service from the SCC to MWD customers. A new 30 inch butterfly valve would be installed at South Coast Conduit (SCC) Lower Reach Station 494+54, separating the pipeline into two reaches. The 30 inch bar-wrapped concrete cylinder pipe in this section is assembled in bell and spigot segments. Line stops would be installed and the segment at Station 494+54 would be removed. 12-inch port plugs with a bypass line would be installed on either side of the removed segment to avoid need for a service outage. A new segment with butterfly valve would be inserted and the pipeline would be disinfected, tested, and put back in service.

PRIORITY CATEGORY

3. Addresses Critical Deficiency

ESTIMATED COST

$190,000*

Fiscal Year	Phase	Cost
2020-21	Construction	$190,000*

*A subapplication has been submitted for competitive grant funding (FEMA Pre-Disaster Mitigation Grant) in the amount of $126,000 (pending)

An environmental/historic preservation review is required for all activities for which FEMA funds are being requested

Lake Cachuma Water Quality and Evaporation Buoy (2019-C-3)

Background

The Lake Cachuma Evaporation and Water Quality Buoy is envisioned to be a buoy-based weather station for improved water quality and environmental monitoring, including an estimation of evaporative losses from the reservoir. Chlorophyll, phycocyanin, and nutrient concentration probes would allow for the advanced indication of Harmful Algal Blooms (HABs) for quick response. In addition to a monitoring buoy, the installation of a land-based weather station could compliment water measurements. The land-based station would serve as a secondary data source and provide a redundant check of reservoir evaporation numbers.

Need

Some species of cyanobacteria are capable of releasing harmful cyanotoxins, which can impact recreation and drinking water if not detected and treated early. This project addresses a critical deficiency for water quality management, specifically, continuous and more granular water quality data is needed from Lake Cachuma to inform critical decision making at member unit treatment facilities, including toxic algal bloom detection monitoring for early warning and proactive treatment and total organic carbon for management of trihalomethane formation. Also, during the most recent drought from 2014 to 2017, the evaporation measurements from the evaporation pan at Lake Cachuma significantly increased (46% higher historical average in 2017), which was not consistent with the surrounding evaporation measuring stations. Historically, pan-based evaporation estimates have been used to track and manage evaporative losses. The Lake Cachuma Evaporation and Water Quality Buoy will increase environmental monitoring accuracy.

Description

Setting up the anchoring system, evaporation buoy and sensors, and safety buoys is expected to take 1-2 weeks. A consultant would initiate the web portal and data relay system approximately 2-3 weeks after buoy installation. The relative ease of installation would allow Reclamation, COMB, and Member Agencies to begin using the buoy system immediately. Specific variables to be monitored could include, water temperature profiles (4 units down to 70 feet), dissolved oxygen, chlorophyll, phycocyanin, nutrients, wind speed, humidity, air temperature, barometric pressure, and incoming solar radiation.

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$160,000*

Fiscal Year	Phase	Cost
2020-21	Installation	$100,000*
2022-23	Evap Instrmt	$60,000

*Annual Maintenance Cost of $20,000

The installation of a buoy-station in Lake Cachuma would require environmental review by the Bureau of Reclamation.

North Portal Jet Flow Control Valve Replacement (2013-C-1)

Background

Located at the base of the Tecolote Tunnel, the Jet Flow Control Valve is the primary control for flow from Lake Cachuma into the South Coast Conduit. The valve is located within the red piping component as pictured to the right. The adjacent gate valve (black) is utilized to shutdown flows from Lake Cachuma. The Jet Flow Control valve was replaced in 1990 and has a useful life of approximately thirty years. As part of this project, COMB would purchase new parts and utilize previously acquired internal components to build a new valve to be installed during a planned shutdown. The current valve, after being removed, would be rebuilt using new components and would be kept on site and used as a redundant valve in case of failure.

Need

The consequence of not completing the project includes using a valve beyond the expected useful life, coupled with a lack of redundancy for one of the most critical flow control valves within the system. Because the North Portal Jet Flow Control Valve controls the flow into the Tecolote Tunnel, failure could prevent or impact water deliveries to the cities of Goleta, Santa Barbara, Montecito, Summerland and Carpinteria. This is a proactive replacement based upon the expected service life at purchase, as the valve in its current state is functioning adequately. Because of the important function of the valve, it is critical that it not be used beyond the manufacturer's recommended service life, and that redundancy exists on site.

Description

This project consists of producing designs and specifications to manufacture a new valve body and to rebuild using new and previously purchased internal components. Once the jet flow valve is ready for installation, a coordinated shutdown would occur using the gate valve. The current jet flow valve would be removed from service and the new valve would be lowered by crane into the lower gallery of the North Portal through the elevator shaft for installation.

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$300,000

Fiscal Year	Phase	Cost
2022-23	Installation	$300,000

This project requires approval from Reclamation.

Critical Control Valve Replacement (2019-C-4)

Background

A majority of the valves located at control stations along the South Coast Conduit are original and were installed in the 1950s. There are over 50 large diameter valves in the system, ranging in size from 24" to 48". Several of these valves are critical for operations, but many of the valves are obsolete and are not utilized for operations. During previous maintenance work and shutdowns, key valves in the system have been characterized as exhibiting excessive leak-by. This program would replace critical valves in the system at key control station locations.

Need

In-line isolation and control valves are needed to properly operate and maintain the system. Valves with excessive leak-by or poor operability impact system operations. The system is operated differently than designed with the installation of Cater Treatment Plant. Many of the system valves are no longer needed for operations. Obsolete valves and piping are potential points of failure and increase maintenance needs. The consequences of not completing this project could include loss of control within control stations and excessive leak-by, which could especially impact operations during repair work requiring pipeline shutdown.

Description

This project would involve the systematic replacement of key control valves in the system with known operational deficiencies. Control station piping would be streamlined to reflect current operations and obsolete valving would be removed from the control stations.

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$400,000

Fiscal Year	Phase	Cost
2022-23	Eng/Construction	$100,000
2023-24	Eng/Construction	$150,000
2024-25	Eng/Construction	$150,000

Changes to the South Coast Conduit system to remove obsolete valves and piping would require Bureau of Reclamation review and approval.

Meter Replacement Program (2013-C-1)

Background

COMB is responsible for accurate water accounting on behalf of the Cachuma Project Member Agencies to the U.S. Bureau of Reclamation on a monthly basis. The process of water accounting entails recording data from twenty-eight meters located along the conveyance system from the North Portal of Lake Cachuma to the Carpinteria Reservoir. In an effort to identify the accuracy of meters within the system, COMB hired Water System's Optimization (WSO), Inc. to conduct a system meter evaluation and water audit. The results of the water audit indicated that several meters require additional testing and replacement.

Need

COMB's water meters are critical to the water accounting and system operations. Several meters in the system have reached limited-life cycle phase and are likely in need of replacement in the next five years. Not completing the project could impact system operations and water accounting accuracy and jeopardize compliance with Section 64561 of Titles 17 and 22 California Code of Regulations, which states "each water system shall: (b) meter the quantity of water flow from each source, and record the total monthly production each month."

Description

COMB operates several electronic mag-meters that are critical to the water accounting and system operations that have reached limited-life cycle phase and are likely in need of replacement in the next five years. COMB operates electronic magmeters at Glen Anne Turnout Meter, Goleta West Meter, Ortega Inflow meter, Ortega Southflow meter, and the Boundary meter which are utilized to manage system operations on a day to day basis and for monthly accounting of water use.

PRIORITY CATEGORY

3. Addresses Critical Deficiency

ESTIMATED COST

$200,000

Fiscal Year	Phase	Cost
2022-23	Construction	$100,000
2024-25	Construction	$100,000

No regulatory compliance measures are expected for this project.

Sheffield Tunnel Evaluation and Repair (2007-2-B)

Background

The Sheffield Tunnel is a concrete tunnel housing the 30" South Coast Conduit (SCC) that extends 6,100 feet between the Mission Creek area and Parma Park. Within the tunnel, sections of concrete pipe are connected and joined with steel bands and mortar joints to maintain the integrity of the pipe collar connections.

Need

The USBR inspection report of the Sheffield Tunnel identified and recommended remediation of cracked pipe collars and adjoining deterioration of mortar joints and pipe supports. Deterioration potentially compromises the integrity of the tunnel and poses an operational risk. Heavy seepage appears to be a contributing factor to deterioration.

Description

An engineering firm would conduct a condition assessment to determine the structural integrity and reliability of the connecting and support structures of the Sheffield Tunnel. The engineering evaluation will include recommended repairs and determine how to eliminate areas of heavy seepage. It is possible the engineering evaluation could find a lower cost remedy to that recommended by USBR. Upon completion of the evaluation, COMB would retain a qualified contractor to repair the deteriorated mortar joints and pipe supports at locations identified.

PRIORITY CATEGORY
4. Evaluates Potential Critical Deficiency

ESTIMATED COST
$400,000

Fiscal Year	Phase	Cost
2022-23	Engineering	$200,000
2023-24	Construction	$200,000

This project has been identified by the USBR as a Category 2 recommendation.

Lauro Reservoir Intake Assessment and Repair (2013-2-C, 2018-2-A)

Background

The Lauro Reservoir intake structure was modified in 1981 by adding a stainless steel circular intake screen connected to a steel pipe which was inserted in the original concrete intake structure. A 1/2 inch thick steel circular bearing plate was installed on top of the existing concrete intake structure to cover the opening between the intake structure and vertical pipe and provide structural support. The 2018 dive report, prepared by USBR, states the intake structure is in satisfactory condition with the exception of the bearing plate. The bearing plate was observed to be fully covered with corrosion and rust nodules.

Need

The steel bearing plate on the intake structure has deteriorated because of corrosion and poses an operational risk for both the protection against outside intrusion of elements penetrating through the opening or structural support of the intake pipe and screen.

Description

Engineering services will be retained to determine the expected level of performance from the steel bearing plate (protection from outside element intrusion or structural). Engineering will need to be conducted by a structural engineer to determine if the steel bearing plate is necessary for support, and if required, a method to design a repair that will allow for continued structural support of intake structure. The reservoir may need to be lowered to accommodate inspections and repairs.

PRIORITY CATEGORY
4. Evaluates Potential Critical Deficiency

ESTIMATED COST
$130,000

Fiscal Year	Phase	Cost
2022-23	Eng/Construction	$130,000

This project has been identified by the USBR as a Category 2 recommendation.

North Portal Intake Tower Seismic Assessment (2016-C-1)

Background

Water diversions from Lake Cachuma occur from the North Portal Intake Tower facility into the Tecolote Tunnel and to the South Coast Conduit for water delivery to the Cachuma Project Member Agencies. The vertical intake tower stands 120 feet tall located approximately mid-reservoir and contains five slide gates, each at varying levels on the pentagonal shaped tower. The slides gates are covered with mesh fish screens to prevent fish and debris from entering the tunnel.

Need

The North Portal Intake Tower was constructed by the Bureau of Reclamation in the 1950's, at which time, the standards for structural design requirements were not as stringent as today's compliance requirements. Structural elements of the intake structure would be examined to determine the general reliability of the tower, and recommendations for upgrades and refurbishments would be provided if needed. The consequence of not completing this project would be uncertainty in structure reliability during a seismic event, which could result in losing ability to deliver water to the South Coast while emergency repairs are made.

Description

This initial phase of the project consists of acquiring the consulting services of a qualified structural engineering firm to perform a Seismic Reliability Analysis and Physical Condition Assessment of the North Portal Intake Tower located at the North Portal of the Tecolote Tunnel. It shall include a report of all findings and propose recommendations for structural rehabilitation to increase and/or ensure continued reliability of the structure in the occurrence of a large seismic event. An assessment of the tower is easier to perform when the lake level is low. This project is scheduled to be performed when the lake level exposes a large portion of the intake tower.

PRIORITY CATEGORY
4. Evaluates Potential Critical Deficiency

ESTIMATED COST
$100,000

Fiscal Year	Phase	Cost
2022-23*	Engineering	$100,000

**A condition assessment of the North Portal Intake Tower is ideally completed when the lake level is low exposing for examination.*

No regulatory compliance measures are expected for this project.

Tecolote Tunnel Concrete Deterioration Investigation (1999-2-A)

Background

The Tecolote Tunnel was completed in 1956 to divert water from Lake Cachuma to the South Coast Conduit. The tunnel provides water delivery through the mountain to the South Portal. The tunnel structure consists of a modified circular horse-shoe shaped cross section constructed of steel encased in 12 inches of concrete, and operates in open channel flow that is approximately 7' inside and is 6.4 miles long with a gradual shallow slope to enable gravity feed. The only ingress and egress are at the North Portal and South Portal. During periodic inspections by the USBR, deteriorations have been observed in the tunnel lining due to long-term exposure to hydrogen sulfide gas.

Need

Hydrogen sulfide has caused some deterioration of the concrete lining of the tunnel. In areas, the interior concrete surface has peeled in sheets approximately 3/8 of an inch thick and fallen into the invert, creating sediment. The majority of the tunnel is in acceptable condition, however, a few locations have small areas where leaching could affect the structural integrity of the concrete. Review is necessary, as the consequence of not completing this project is uncertain in terms of structure reliability. A tunnel failure could interrupt 40 MGD during peak demand time if not addressed, and would be very technically difficult to repair.

Description

The project requires engineer evaluation of concrete deterioration, and recommended remediation. A thorough investigation and monitoring program needs to be implemented to determine if the concrete deterioration presents risk of structural failure. The program should be designed to address the specific questions raised by the 1999 RO&M Reclamation Report, action 2012-2-Q, which recommends COMB "prepare and implement a repair plan to perform all necessary repairs to address all damaged concrete and remediate the widespread concrete deterioration in the Tecolote Tunnel to restore safe and reliable service of the facility."

PRIORITY CATEGORY

4. Evaluates Potential Critical Deficiency

ESTIMATED COST

$100,000

Fiscal Year	Phase	Cost
2022-23	Engineering	$100,000

This project has been identified by the USBR as a Category 2 recommendation.

APPENDIX B: PROJECTS FOR FUTURE CONSIDERATION

Rebuild Inflow Rip Rap at Lauro Reservoir (2013-C-15)

Background

The inflow into Lauro Reservoir from the South Coast Conduit commences with water flow on a channel composed of rip rap rock installed to slow and aerate the inflow of water and prevent erosion to reservoir side walls. The rip rap structure is composed of rock and concrete and is designed to prevent scour or erosion of the adjacent side walls.

Need

The lower portion of the rip rap apron has been undermined across the base of the reservoir. The rip rap apron measures approximately twenty-five feet in length and is in need of repair. Without repair of the apron, water flow will erode the embankment and the base of the channel will become unable to support the rip rap structure. Loss of the rip rap would make the inflow structure unable to fulfill its required function.

Description

A structural engineering firm would conduct an evaluation to determine an appropriate repair to maintain the essential support and integrity of the rip rap channel. The reservoir would need to be lowered to accommodate inspections and repairs.

PRIORITY CATEGORY

5. Proactive Aging Infrastructure Replacement

ESTIMATED COST

$200,000

Fiscal Year	Phase	Cost
Year 1	Eng/Construction	$200,000

This project requires approval from Reclamation.

Upper Reach Reliability Project
Phase II (2017-C-1)

Background

The Upper Reach Reliability Project was designed to provide a redundant pipeline from the South Portal of the Tecolote Tunnel to the Corona del Mar Water Treatment Plant (CDMWTP). The second pipeline would provide increased operational flexibility and reliability, as well as additional conveyance capacity to help meet peak system demands.

Need

The completion of Phase II is essential in order to benefit from the project as it was originally designed. The project would improve both reach and region-level drought resiliency during summer peak demand, and would allow for routine maintenance on the existing pipeline. In addition, the operational flexibility of emergency failure response along the SCC Upper Reach would improve. Currently, COMB heavily relies on storing water in Lauro, Ortega, and Carpinteria Reservoirs to meet the full water needs of the region. Because the Upper Reach of the SCC has the largest demand deficit, a redundant pipeline would safeguard downstream users as well, improving the water supply reliability for recipients along the Lower Reach.

Description

Completed in 2012, Phase I of the Upper Reach Reliability Project installed a new 48" diameter pipeline from the South Portal of the Tecolote Tunnel to the Glen Anne Turnout structure. Phase II will complete the project, installing approximately 10,000 additional linear feet of 48" diameter welded steel pipe from the Phase I endpoint at the Glen Anne Turnout structure, through to the Corona del Mar Filtration Treatment Plant.

PRIORITY CATEGORY

6. System Reliability and Resilience Improvements

ESTIMATED COST

$8,000,000

Fiscal Year	Phase	Cost
Year 1	Environmental/Design	$500,000
Year 2	Construction	$3,500,000
Year 3	Construction	$4,000,000

An EIR/EIS was prepared for this project in 2009 which may require an update.

SCC Booster Pump Station (2019-C-5)

Background

In the 1980s, an isolation valve was installed at Station 598+44 as part of the re-location of the South Coast Conduit in the Greenwell Canyon area. During the 1990-1991 drought, Santa Barbara County Water Agency designed a series of projects which would allow the backflow of Casitas MWD water into Santa Barbara County. This involved the installation of a pipeline to connect CVWD to Casitas Valley Municipal Water District. The Toro Canyon Isolation Valve which was installed in the 1980s was converted into a temporary booster pump station in 1991. The 10" connections to the SCC and butterfly valves for the suction and discharge points of the pump station are currently blind flanged but still in place. The current iteration of the booster pump station would once again allow water from Carpinteria Reservoir, CVWD wells, or from Casitas Municipal Water District to be delivered to Ortega Reservoir. This could be utilized in times of a drought or during disruption in flow from Lake Cachuma.

Need

A booster pump is needed to deliver water from Carpinteria Reservoir, CVWD wells, or from Casitas Municipal water district to Ortega Reservoir. This would allow water to be supplied to Montecito Water District when there is a disruption in the system. With temporary booster pump stations it would be possible to deliver water from Casitas, Carpinteria, and Montecito to portions of Santa Barbara in emergency situations. This adds another layer of resilience to the entire system and protects the South Coast from sole reliance on deliveries from the South Coast Conduit Upper Reach.

Description

The project would include the installation of two parallel and similar pumping units, complete with electrical controls for variable speed pumping and appurtenant piping, wiring, and mountings. Each pumping unit will be a split-case, horizontal centrifugal pump designed for operation up to 1150 RPM. In addition, a new flow meter and pressure transducer on the discharge of the booster pump station will be installed.

PRIORITY CATEGORY

6. System Reliability and Resilience Improvements

ESTIMATED COST

$325,000

Fiscal Year	Phase	Cost
Year 1	Engineering	$25,000
Year2	Construction	$300,000

An updated booster pump station at Toro Canyon would require Bureau of Reclamation engineering and environmental review.

Glen Anne Reservoir Safety of Dams Rehabilitation Project (2011-C-57)

Background

Glen Anne is one of four regulating reservoirs on the Cachuma Project facilities. Glen Anne Reservoir had an initial storage capacity of 500 AF. Due to seismic stability requirements and risk of failure potentially causing catastrophic damage downstream, the maximum capacity was limited to 375 acre feet in 1988. In 2002 it was limited again to 175 AF maximum capacity. Glen Anne Reservoir is no longer in service, but COMB continues regular maintenance and inspections as required by the USBR.

Need

The ability to store water in all system reservoirs is critical to water delivery during a shutdown of the Tecolote Tunnel. Further, Glen Anne is important as a balancing reservoir to enable work on other system reservoirs and appurtenances to the SCC. The inoperability of Glen Anne impacts all Member Agencies. Raw water storage in the Upper Reach is critical to allow the Tecolote Tunnel to shut down for repairs while allowing Goleta Water District to continue to deliver water to their customers. This can be accomplished by upgrading Glen Anne Reservoir and Dam. This project will benefit all of the Member Agencies on the South Coast, by providing additional storage capacity, increased efficiency and reliability of COMB facilities, reduced complexity of shut-downs, simplified and scheduled repairs of the Tecolote Tunnel, and aid in fire protection and flood control.

Description

Dam seismic safety and other operational problems that exist because of deterioration would be addressed. Adjacent pumps and delivery system piping will be restored to operability. Remediation components will likely include removing the silt to allow operation at designed capacity and replacement of deteriorated 12 inch thick asphaltic concrete liner. Seismic retrofit will like include installation of shear key and berm installed down to the bedrock to resolve the existing potential for liquefaction.

PRIORITY CATEGORY

6. System Reliability and Resilience Improvements

ESTIMATED COST

$10,500,000

Fiscal Year	Phase	Cost
Year 1 - 3	Eng/Construction	10,500,000

This project may be considered categorically exempt because it involves the replacement/reconstruction of an existing facility without increasing capacity. Necessary permits will include RWQCB's Storm Water Pollution Prevention Plan, Section 401 permit, MP 620, and County of SB haul permits.