EXHIBIT 3-A

Monterey Peninsula Water System

Operations Plan

FINAL

October 9, 2020

Prepared by Close & Associates
and MPWMD Staff

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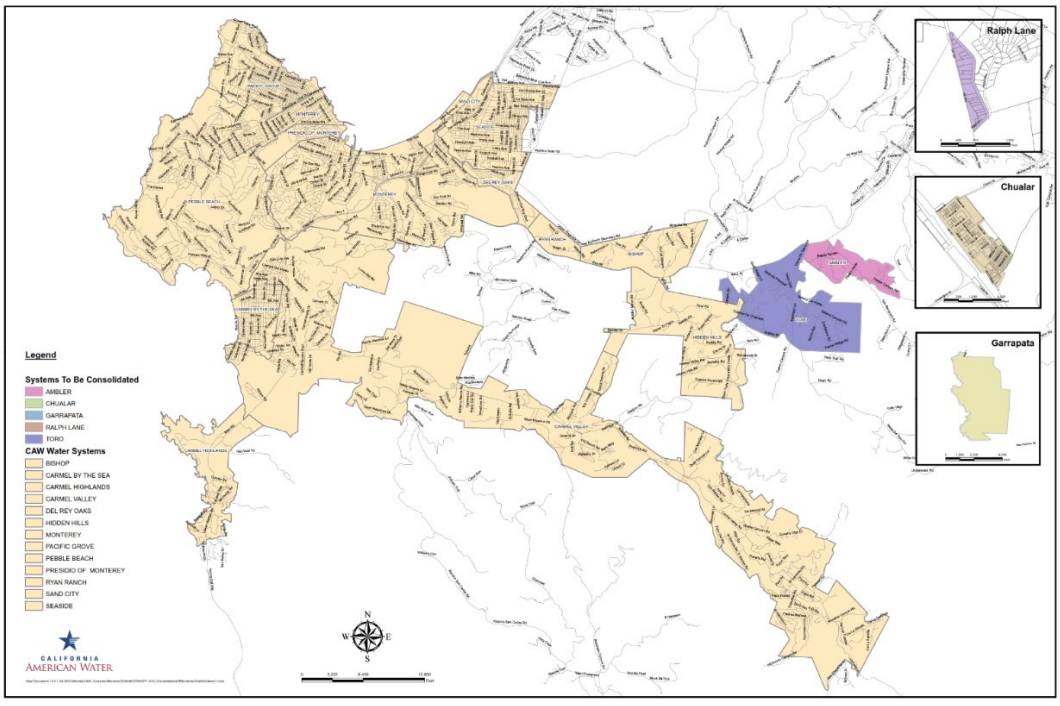
1. General Description

1.1. General Background

California American Water (Cal-Am) Company's Monterey Peninsula water system is located approximately 90 miles south of San Francisco, 300 miles northwest of Los Angeles and 70 miles southwest of San Jose. Cal-Am provides water and wastewater service to the Central Division. The Central Division is comprised of the Monterey County District, the Central Satellites, and the Monterey Wastewater District. The water system, which is comprised of the Monterey County District and the Central Satellites, serves approximately 40,000 customer connections and a population of approximately 99,794.[1]

The "Main" system within the Monterey County District serves approximately 39,730 customers and includes customers within the incorporated cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley and Pebble Beach. The Main system is generally located within the MPWMD boundaries. The Monterey County District also includes the service areas of Bishop (approx. 385 customers), Hidden Hills (approx. 454 customers), and Ryan Ranch (approx. 212 customers), that are also within the MPWMD boundaries. The Central Satellite areas, not subject to acquisition by MPWMD, include the areas of Ambler Park, Ralph Lane, Chualar, Toro, and Garrapata, which are located outside of MPWMD boundaries and serve a total of approximately 1,086 customers.

Figure 1-1: Cal-Am Central Division Water Systems[2]



[1] 2018 Annual Report of District Water System Operations for the Monterey County District, filed by Cal-Am for the CPUC, p.16 and 17.
[2] Cal-Am Service Area Map as of 2013.

1.2. MPWMD Boundaries and Cal-Am Service Territory

The overlap of the MPWMD boundary (dashed line) and Cal-Am service areas is shown in the figure below.

Figure 1-2: Overlap of MPWMD and Cal-Am

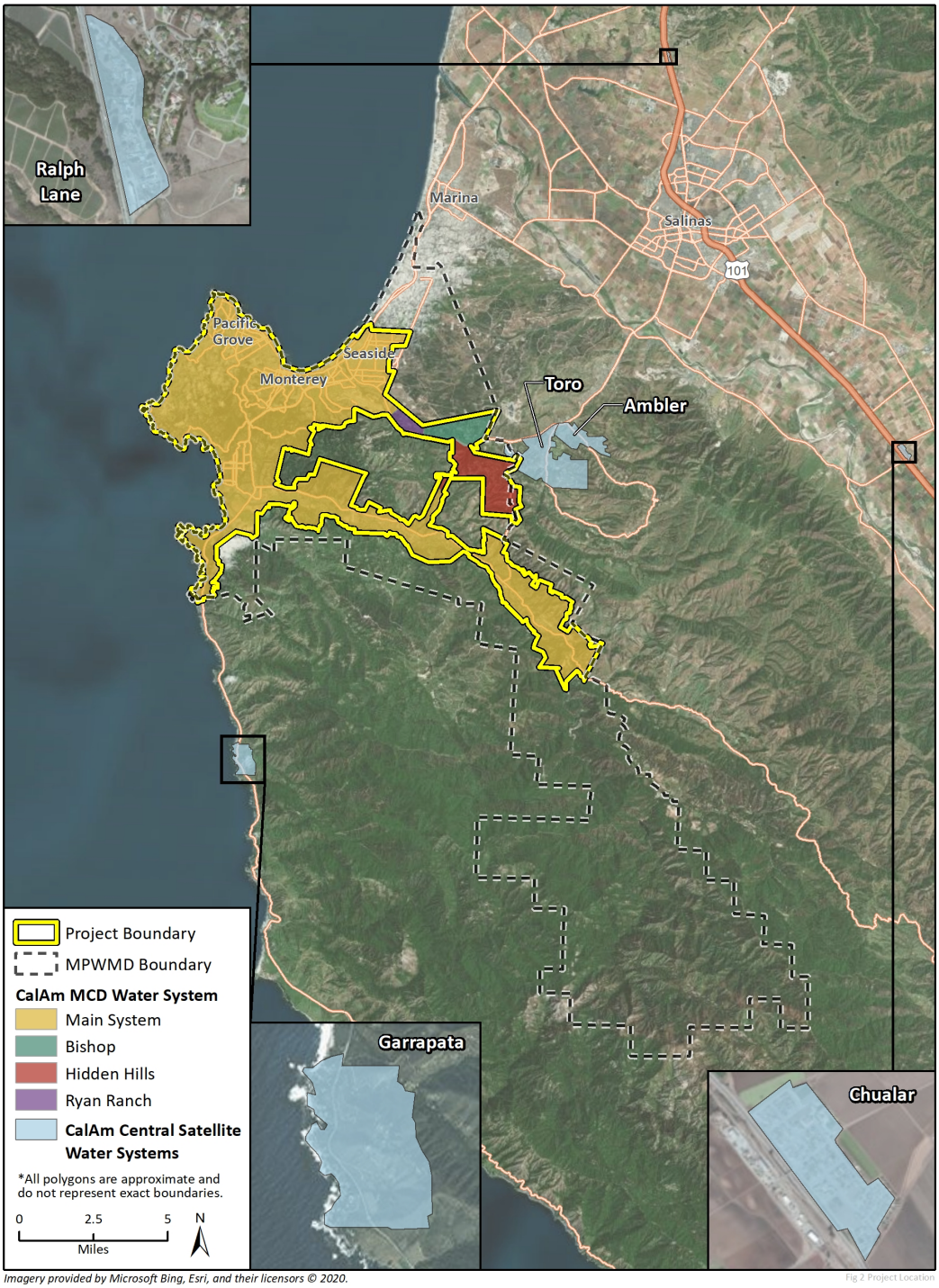


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Fig 2 Project Location

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Cal-Am 2019 water sales by customer class are shown below.[3]

Table 1-1: 2019 Water Sales (Gallons)

	Customer Class	Annual Usage	
2019 Water Sales	Residential	1,736,557,000	62.3%
	Commercial/Industrial/Public Authority/Irrigation	1,166,832,000	37.3%
	Fire Department	10,348,000	0.4%
Total 2019 Monterey Water Sales		**2,785,425,000**	100%

Active service connections by customer class are shown below.

Table 1-2: 2019 Active Service Connections

2019 Customers	Residential	34,114
	Commercial	5,052
	Industrial	4
	Public Authority	507
	Other	53
	Total Connections	**39,730**

[3] 2019 Annual Report of District Water System Operations for the Monterey County District, filed by Cal-Am for the CPUC

2. Transition Plan

The operational transition period for the District to assume the ownership and water service responsibility begins after the successful court decision of the Right-to-Take and continues through the initial six months of operation. To provide a smooth transition for the community there are several activities that are necessary to be completed prior to assuming the day-to-day operation of the Monterey Peninsula Water System.

2.1. Post-Successful Right-to-Take Court Decision

Upon receiving a favorable court decision that it is in the best interest of the customers and community for the District to own and operate the public water system, the District Management Team shall initiate several activities in advance of the Valuation Trial and continue through the duration of the Transition Period.

Organizational Realignment

To integrate the water utility operation several changes are required to existing departments within the District to provide an efficient transition. A few new divisions/departments along with new positions may be required. The performance of an organizational assessment to review current core functions, work tasks, and responsibilities for current departments and identifying the additional functions and work tasks that will be required to support the additional water system operation. A review and update of the Water System Operations Plan shall be completed to reflect any changes. The key departments affected will be the Water Resources/Engineering & Planning, Administration & Finance including Customer Service, and Information Technology (IT), however all departments and functions within the District will be impacted. See Chapter 14 herein "Organizational Structure & Staffing."

Key Management Positions: Based on the Organizational Assessment most likely several addition key management positions will be needed to be hired in advance of taking operational responsibility. Two of the key positions anticipated are the Assistant General Manager for Water Operations the Water Resources/Engineering & Planning Manager as those departments/divisions will have essential responsibilities during the transition period.

Water Utility Staff: The District's desire is to hire the current Cal-Am staff, other than state-level general office senior management, to operate the water system. If not adopted prior, the District Board shall approve a resolution to retain the current Cal-Am operations staff for up to five years and to make best efforts financial adjustments to compensate for any lost income, pension benefits, or other fringe benefits that may occur by being an employee of the District. The District shall hire a Human Resource consultant that specializes in pension, benefits, and other compensation issues to identify issues, recommend options, and calculate any potential compensation losses for each employee.

The District shall formally request Cal-Am to permit access to staff and discuss employment with District Staff. If denied by Cal-Am, then the District shall petition the Court to order such

access. If denied, the District shall establish job descriptions and post job requisitions for the various positions to operate the water system. This will allow for Cal-Am employees to inquire and apply for such positions on their own, unsolicited by the District. Any employment offers shall be contingent upon a successful completion of the Valuation Trial and approval by the Court for the District to take possession of the water system.

State and Federal Regulatory Agency Coordination

The District will conduct meetings with State and Federal regulatory agencies to discuss the operational transition plan identifying any concerns and coordination requirements during the transition period. Inquire whether there are any outstanding operational or regulatory issues from the agencies and priorities they will be focusing on over the next several years. The District will establish key points of contact between the District and each of the agencies and discuss the District's desire to have periodic coordination meetings with each agency going forward. The following are the key agencies, to coordinate with prior to the Transition period.

- National Marine Fisheries Service
- EPA Region 9
- US Fish & Wildlife
- CalEPA
- CA State Water Resources Control Board (SWRCB)
- CA Regional Water Quality Control Board
- CA Department of Water Resources (DWR)
- California Coastal Commission
- California Fish & Game
- CA Dept. of Public Health (CDPH)
- California Department of Consumer Affairs

Local Municipalities and Other Agency Coordination

The District will conduct meetings with local cities, agencies, and the County of Monterey to discuss the operational transition plan to identify any concerns or coordination issues during the transition period. The District will establish points of contact with each city and agency and discuss what coordination meetings and frequency of on-going meetings. The following are some of the local cities and agencies to coordinate with prior to the transfer of ownership.

- County of Monterey
- City of Monterey
- City of Pacific Grove
- City of Seaside
- City of Carmel by the Sea
- City of Del Rey Oaks
- City of Sand City
- Monterey One Water
- Marina Coast Water District

- Carmel Area Wastewater District
- Monterey Peninsula Airport District
- Fire Districts or Agencies

Monterey Peninsula Business and Developer Community Coordination

The District will meet with prominent business associations that have interest in the operation and improvements to the water system and potential impacts related to the transfer of ownership to the District. The objective is to present a high-level summary of the District's transition plan, strategic goals, and priorities. Some of the associations could include, but are not limited to:

- Monterey Peninsula Chamber of Commerce
- Monterey County Hospitality Association
- Coalition of Peninsula Businesses
- Monterey County Association of Realtors
- Chamber of Commerce from each City within the District's Service Area
- New Monterey Business Association
- Old Monterey Business Association
- Monterey Commercial Property Owners Association
- Monterey Bay Economic Partnership
- Cannery Row Business Improvement District
- Fisherman's Wharf Association
- Pacific Grove Downtown Business Improvement District
- Seaside Community Development
- Seaside Business & Resident Association

Community and Environmental Groups

The District will meet with active community and environmental groups that could have an interest in the water related issues and the potential impact on natural resources as a result of the transfer of ownership and operation of the Monterey Peninsula water system. The objective is to present a high-level summary of the District's strategic goals and receive input from the various groups as to their concerns and priorities. Some of the groups could include the following:

- Carmel Valley Association
- LandWatch
- Public Water Now
- League of Women Voters
- Carmel River Steelhead Association (CRSA)
- Big Sur Land Trust
- Nature Conservancy
- Carmel River Watershed Conservancy
- Surf Rider Foundation

- Sierra Club

IT Systems Assessment

The District will prepare a data request for Cal-Am to provide a complete summary of its IT systems, software platforms, and equipment. If Cal-Am denies providing information or is unresponsive, the District will petition the court to order Cal-Am to provide the information. Upon receipt of the data, the District will conduct an IT assessment as to the integration and compatibility of Cal-Am's information systems and data into the District's systems.

Note that a number of the needed information systems and software platforms/licenses are the property of Cal-Am and American Water corporate entities and are not included with the Monterey operation assets. These information systems and associated software will have to purchased and installed prior to the IT Systems Integration prior to assuming ownership.

Working with the District's third-party IT consultant, the District will prepare an interim IT plan during the first six months/year of ownership for information systems that need to be functional on day one. This would include phone systems, email system, District's intranet, financial systems, customer service systems, and other business systems. The existing IT operations systems should be capable of operating and maintaining the water system until they can be integrated into the District's overall IT system.

Contract Operations Firms

In the event that the some or all of the current Cal-Am operations staff elect not to join the District, the District will identify and prequalify a list of water system contract operations firms that have experience and a work history of operating other water systems in California. The District will develop a comprehensive list and definition of the risk allocation criteria, outlining the responsibility of both the District and the Contract Operator. The District will then prepare a detailed scope of work and Request for Proposal (RFP). In 2020, the District developed a Third-Party Operations Plan to prepare for the possibility that it will not be able to integrate all the Cal-Am employees. Such plan was expected to be separately adopted by the District Board prior to its filing of an application to the Local Agency Formation Commission (LAFCO) and is available for public review on the District website.

The District will meet with each prequalified firm to confirm their interest and to review the scope of service, the draft risk allocation criteria, operations responsibilities, and solicit comments or concerns from the firms prior to issuing the RFP, if needed. Interviews of prospective firms will be conducted.

Public Outreach

The District will hire an outside public relations firm to assist the District during the Post-Successful Court Decision period, as well as during the transition. The goal will be to inform the

public of the court decision and the status of the pending steps in the process including the key transition plans that may impact them. The District will create and maintain a section in the District's current website for the water system transition that includes the ability of the public to ask questions.

The District will expect its outreach consultant to prepare and implement an operations transition communication plan for informing the public of the transition status and any changes forthcoming.

2.2. Operations Staffing Job Posting

The District will reach out to current Cal-Am employees, if permitted by Cal-Am or authorized by the Court, to initiate discussions of joining the District to continue to operate the Monterey Peninsula Water System. The objective is to clarify any misinformation and desire of the District for each employee to accept an offer from the District.

2.3. Bargaining Unit Negotiations

Cal-Am personnel currently are members of the Utility Workers Union of America (UWUA) Local 511 or are members of the International Union of Operating Engineers (IUOE) Local 36. Meeting with the two union representatives and/or their bargaining units will be the District's initial step to communicate with the existing employees.

The goal is to inform the unions of the District's plan to hire the Cal-Am staff and to present the approach to ensure employees don't lose any salaries or benefits in transitioning from a private company to a public agency. A key issue will be the valuation of a private company pension and 401k retirement plan to the CalPERS pension system. Receiving local union leadership support and preliminary negotiation of a new contract will ease the transition and acceptance by employees to join the District.

2.4. Job Descriptions

The District will prepare job descriptions for each job classification/position to support the hiring of current Cal-Am employees. Existing Cal-Am job descriptions shall be requested from the company or the bargaining units for the District's review and use along with American Water Works Association (AWWA) and other industry information to create the new job descriptions. The job classifications/positions are planned to be based on the latest AWWA Compensation Survey classifications as a starting point for proposed salary ranges.

2.5. Job Position Postings

To demonstrate the District's desire to hire the current Cal-Am employees, water system administrative and operations job postings will be publicly opened to recruit the Cal-Am employees and to acquire additional resumes and potential new candidates, if needed. It is assumed that Cal-Am will not allow direct communication with their employees and request the Court to prevent the District from initiating any contact. However, if an employee applies for an

open position and on their own accord desires to meet with the District, there is nothing Cal-Am can do to counter such communication.

Given that the District will probably not have permission to directly communicate with current employees, the District can use communication through the bargaining units, print media, and social media to reach out to employees. This will have a secondary benefit of informing the public and other stakeholders of the District's efforts providing reassurance that the water system operation will continue without disruption. It will provide a counter to Cal-Am's public claims regarding the negative impacts of the District operating the water system. The objective is to assess the ability to retain the existing employees and determine the availability of qualified candidates in the region.

2.6. Employee Benefits Consulting Firm

The District desires to evaluate the compensation, including benefits, for each individual Cal-Am employee in an effort to offer a compensation package that will be equal to or better than they currently have with Cal-Am. To provide the assessment of the employee's current compensation, the District will hire an outside consulting firm that specializes in the economic valuation of individual's compensation. This will be used to negotiate with the candidate and provide an employment offer.

2.7. Cal-Am Employee Employment Offers

Current Cal-Am employees that apply to the District's open job requisitions will be reviewed and processed through the District's normal hiring practices using the job description and compensation valuation/comparison to prepare a formal offer to each Cal-Am employee that applies to join the District. The job offers will be contingent upon the potential hiring of the majority of Cal-Am employees and include a tentative and flexible start date. The offer and any acceptance shall remain confidential.

2.8. Post-Valuation Court Decision

The anticipated schedule is that the utility asset valuation trial will occur approximately 12 months, or longer, after the issuance of the Right-to-Take Court decision depending on whether Cal-Am submits an appeal to that decision. The activities discussed in subsections 2.1 and 2.2 above are planned to be conducted during this timeframe.

The District, upon receipt of the Court/jury's valuation of the water system, will proceed with acquiring bond financing to purchase the water system from Cal-Am and to fund the first two to three years of capital improvement funding. The District shall have minimal cash reserves at the time of ownership transfer and will need both bond financing for the acquisition and working capital, as well as potentially a line of credit or short-term financing to cover any lag in revenue. It is estimated that the timeframe from issuance of the valuation court order until receiving operational ownership and responsibility will be several months.

During this period the District will continue to resolve any outstanding legal issues that remain from the valuation trial including any appeals. The District organizational structure will be adjusted to accommodate the management and operation of the water system. Current District staff education and training shall be conducted as to the changes in business processes associated with operating the system.

Documentation of the modified business processes, including business process mapping, will be completed as part of this effort. Each department shall prepare a comprehensive transition plan identifying the integration activities between departments associated with the management and operation of the water system. Any new resolutions or ordinances that need to be prepared and adopted by the District Board shall be completed during this phase of the transition.

A robust public communications program will be implemented to educate and inform the public of activities and on-going status of the transition including any customer service changes that will occur as a result of the transition of ownership to the District. Customer service department systems and procedures will be set-up in preparation for receiving the customer account data during the upcoming 90-day data and information transfer. Accounting and billing systems will be set-up in preparation of receiving customer account data, including any 3rd-party payment centers (e.g. banks) and on-line and automatic payment capabilities.

Engineering and operations will prepare for a thorough review of Cal-Am's current comprehensive planning study (CPS), 5-year Capital Budget, Urban Water Management Plan, and establish protocols and staffing needs to perform an asset inventory of Cal-Am's facilities the District is acquiring. Linear feet of buried assets, pipes and valves, services and other appurtenances shall be confirmed through review of Cal-Am's GIS database in comparison to the utility plant accounts. Specific attention will be taken to review and verify the plant additions that have been constructed and placed in service since the water system field inspection and assessment effort was completed during the discovery phase of the right-to-take trial.

2.9. Prop 218 Process

Based on the water system valuation as determined by the Court and the planned capital improvement funding for the first 2 to 3 years of the District's ownership, an update of the financial proforma will be completed. The results will allow the District to decide if Cal-Am's current rates and rate structure will be maintained or if rates will be reduced or the rate structure modified. Public outreach effort to solicit input from stakeholders will be conducted as part of this process. Once there appears to be a majority of public and stakeholder support, a comprehensive rate study will be performed. New rates will be adopted by the District consistent with the public protest hearing process under Proposition 218 either before taking delivery of the system or within the first 90 days.

2.10. Staffing, Recruitment, and Interim Contract Operations

The status of the Cal-Am employee retention effort initiated during the post-Right-to-Take phase of the transition will allow the District to decide if a third-party contract operator is needed. It is the District's desire to continue with making offers to the remaining Cal-Am employees who haven't accepted prior to initiating a contract operations solicitation. If retaining a contract operator is needed, the preparation of a Request for Proposal and detailed scope of work shall be completed and the solicitation process initiated.

Finalization of all Cal-Am employee offers will be completed and the on-boarding process initiated by Human Resources. Concurrent with the hiring of Cal-Am employees is the negotiation of new bargaining unit contracts with those unions that have members who have accepted positions to join the District. These contracts need to be finalized prior to the District assuming operation of the system.

Contingency plans will be developed in the event only a portion of the Cal-Am employees join the District that is insufficient to adequately operate the water system. If insufficient management and supervisory Cal-Am employees are retained to operate the system, then a contract operator can augment the District's staff with field personnel with the District having operational responsibility. A sufficient contract duration with incentives would have to be agreed upon to interest contract operations firms to propose on this contract.

2.11. IT Systems Integration

The integration of the IT systems and data transfer/verification is the critical path activity that will be completed during this phase of the transition. If sufficient IT system, software platforms, data storage, IT equipment and other information, that was requested during the initial transition phase (Section 2.1 above), is provided by Cal-Am then the IT integration plan can be completed prior to the 90-day data and information transfer.

If additional information is needed after the valuation Court decision is received, then an aggressive effort to obtain that data and determine what IT equipment and software platforms need to be purchased or existing information systems require programming to accept the electronic data from Cal-Am. If it is determined that the electronic data is not compatible with the District's systems, a data conversion process may be required to accurately transfer all of the data for each system/platform. The purchase of any new hardware/software or the reprogramming/data conversion of any critical system (especially customer account data and meter reading systems) could take extended time to complete.

Assessment of information systems used by operations will be critical if Cal-Am corporate (General Office) and not the local Monterey Division owns the meter reading, SCADA, dedicated radio frequencies, Computer Maintenance Management System (CMMS), hydraulic modeling software, vehicle GPS tracking systems, and other engineering and technical software platforms. If Cal-Am's general office owns the software/licenses then the District will have to purchase new licenses and have them operational before the 90-day data transfer effort.

Upgrades and modifications to the phone systems, email, District intranet, and other District systems need to be implemented to integrate Cal-Am's existing operation. A review of Emergency Plan communication requirements and inter-agency coordination protocols will be assessed and accommodated in the various communication system modifications.

2.12. 90-Day Data & Information Transfer

The District and Cal-Am, as petitioned and ordered by the Court, will agree to conduct a 90-day data, records, and information transfer period after completion of the IT integration and testing, and prior to the transfer of ownership and operational responsibility. The primary objective is to transfer all customer account data, financial data, GIS, CMMS, and other electronic databases from Cal-Am to the District in order to test the data and verify the accuracy of all the IT related data and information.

Cal-Am shall transfer a complete list of all assets, including those located in the Cal-Am corporate (General office) that are included in the Utility Plant Accounts. The District, if permitted by the Court, will perform a facility inspection and asset inventory of the vertical assets that will be transferred as part of this transaction. Linear or buried assets, shall be verified through review of the GIS database, as-builts, capital work order records, and other files and records received from Cal-Am.

All non-essential software platforms/programs necessary to operate (e.g. SCADA and CMMS) and perform financial transactions (e.g. billing and accounting) shall be transferred to the District along with the associated data for testing and accuracy verification.

Paper records and files shall be compiled, categorized, documented, labeled, and delivered to the District that include, but not limited to following types of information;

- All property records,
- All regulatory and water quality records,
- All water right permits and documentation,
- All operating, regulatory and environmental permits,
- All environmental (CEQA, NEPA, etc.) documents and supporting environmental surveys, studies and other information,
- All current and historical capital and O&M budget files and records,
- Distribution system atlas maps,
- All project files,
- All asset records including assets located in Cal-Am/American Water corporate (General office) offices that were funded by Cal-Am ratepayers.
- All as-built drawings,
- Inspection and condition assessment reports
- Technical and engineering reports
- Engineering calculations and internal files including historical files from Corporate (System) Engineering (New Jersey)

- Comprehensive Planning Studies (CPS) and other planning documents, technical files, and analyses
- Non-completed or in-design drawings and calculations
- Financial files, asset registries, bond financing engineering reports and other technical documentation
- Depreciation studies, cost of service studies, rate studies, and prior CPUC rate applications, decisions, and supporting work papers for each application
- Construction contracts, developer agreements, vendor contracts, maintenance contracts, and other agreements, current and historical,
- All work orders, capital, maintenance, retirement, and other internal work authorization records
- All private and public damage, insurance claims, and other liabilities that Cal-Am incurred due to operational issues
- All meeting minutes and agendas
- All IT files and records including all back-up files

Operational systems such as SCADA (including historical trend data and analyses), CMMS, maintenance and testing databases, and other software programs and data shall be copied, but not operational, and delivered to the District prior to official transfer of operational responsibility.

Upon receipt of all data, records, files, and information the District shall review the contents and verify receipt and accuracy of the data and document such to the Court.

2.13. "Day One" Operations Plan

The District will prepare an operations plan for the initial day, week, and month of operational responsibility based on the review of data, records, and information received during the 90-day transfer. The 30-Day operational plan will include a detailed workplan for each department and field personnel. The workplan is anticipated to include:

- Operators will take water quality samples across the water distribution system following state-approved sampling plan and all facilities to verify the water quality, compliance with regulations, and establish a baseline;
- Inspection of all water system treatment, production, and distribution facilities and record technical operations data, not recorded by the SCADA system and identify any immediate maintenance requirements;
- Confirm all current contractor contracts, service contracts, vendor purchase orders, and other commitments prior to the operational transfer have been contacted and the contracts/agreements have been assumed by or transferred to the District and active;
- Review all open new customer connections/accounts, customer complaints, capital projects, maintenance work orders and other O&M activities that were in process or

uncompleted at the time of operational transfer, prioritize and schedule completion these activities;

- Review capital and O&M budget status, and identify potential budget issues/adjustments that may be needed to the budgets approved and adopted by the District Board;
- Prioritize replacement, repair, and maintenance tasks that need to be completed during the first six months of operation;
- Confirm all facilities being monitored by the SCADA system are active and operational including all operational set-points and alarm functions;
- Establish operations staff after-hours operational and emergency call-out procedures and protocols;
- Review and update the emergency response plan, agency coordination protocols, and points of contact. Contact all agencies included in the Emergency Response Plan (ERP) to confirm coordination protocols and procedures;
- Conduct inventory of existing spare parts, equipment, and other items in the warehouse and operations yard and order needed items;
- Review and update meter reading routes, schedules, and procedures including review of meter aging report and any testing records;

2.14. 12-Month Water System Management and Operational Assessment

The District will maintain the current policies, procedures, and practices that Cal-Am has implemented to operate the water system. During the first year of operation the District will assess the operational procedures and business processes comparing the performance to the Strategic Goals and level of service (LOS) metrics initially adopted by the Board.

The operational assessment will serve as guidance to update and refine the District's strategic goals, LOS standards, and performance metrics to provide a roadmap for the organization for continuous improvement of the water service it provides its customers and community. These goals, standards, and metrics will be used as the foundation to develop or update and document business processes, operations procedures and practices, and District policies and ordinances.

After the completion of the operational assessment and refinement of the goals and LOS standards, the District will prepare a comprehensive master plan based on those goals. Adjustments to the second-year capital and O&M budgets will also be adopted to work towards achieving the District's goals and service expectations.

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3. Governance and Local Coordination

3.1. Overview of Governance and Local Coordination Issues

The California Legislature created the District in 1977 for the purposes of "conserving and augmenting the supplies by integrated management of ground and surface water supplies, for control and conservation of storm and wastewater, and for the promotion of the reuse and reclamation of water." (Statutes 1977, ch. 527, section2, Deering's Water – Uncod. Acts (2008 Suppl.) Acts 5065, p.98-99 ("District Law").)

When the Legislature created the the District it was given the power, both express and implied, necessary to carry out the objects and purposes of its mandate (§ 118-301). This includes the power to enact ordinances and resolutions, adopt regulations to carry out its purposes, and fix charges (§ 118-308). The District's broadest power is provided in § 118-325, i.e., "The district shall have the power as limited in this law to do any and every lawful act necessary in order that sufficient water may be available for any present or future beneficial use or uses of the lands of inhabitants within the district …"

The District is governed by a seven-member Board of Directors, five of whom are elected by voter divisions within the District. The other two Directors include a Supervisor appointed by the County Board of Supervisors and a Mayor appointed by the City Selection Committee of Monterey County. The District's boundaries roughly align with those of Cal-Am's Monterey County District, exclusive of Toro, Ambler Park, Ralph Lane, Garrapata, and Chualar.

The District has performed many functions since inception including institution of the Monterey Peninsula's first stand-by rationing plan in 1981, establishment of limits to Cal-Am production from the Carmel River and subsequent allocation of water to jurisdictions in 1990. The 1990 Water Allocation Program was subject to an Environmental Impact Report as required by the California Environmental Quality Act, the certification of which included mitigation measures that became the District's Mitigation Program. In 1995, the State Water Resources Control Board ("SWRCB") issued Order 95-10, which among other things determined Cal-Am's legal right to water from the Carmel River. Order 95-10 also concluded that the District's Mitigation Program was effective and vital to counteracting Cal-Am's overdrafting of the river and determined that if the District should at some point in the future cease its Mitigation Program, Cal-Am would have to perform its duties.

The District also provided the leadership in developing certain water supplies including the research and development into the expansion of the Paralta Well in the Seaside Groundwater Basin ("Seaside Basin") in the late 1980s, a desalination facility rejected by the voters in 1993, the Los Padres Dam rejected by the voters in 1995, and the research, development, and construction of Aquifer Storage and Recovery ("ASR") in the 2000s. The District is a funding partner for low-cost public financing dedicated to the Cal-Am desalination facility contained in the Monterey Peninsula Water Supply Project subject of A.12-04-019. The District is also a co-

funding partner with Monterey One Water ("M1W") in the development of the Pure Water Monterey Groundwater Replenishment project ("GWR").

The Water Management District serves approximately 112,000 people within the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Seaside, Sand City, Monterey Peninsula Airport District and portions of unincorporated Monterey County including Pebble Beach, Carmel Highlands and Carmel Valley. The District has established five main goals:

1. Increase the water supply to meet community and environmental needs
2. Develop a legal water supply delivered to the community through cost effective and efficient water production and distribution system
3. Protect the quality of surface and groundwater resources and continue the restoration of the Carmel River environment
4. Instill public trust and confidence through public outreach and transparency
5. Manage and allocate available water supplies and promote water conservation

3.2. Current Governance and Local Coordination

Upon acquisition of the water system from Cal-Am, the District, per state and federal regulations and laws, will be responsible for financing, constructing, operating, and maintaining the water supply and resources, water production and distribution system infrastructure that produces, treats, and delivers potable water to the communities within the local cities.

The local cities and the District will collaborate, through established policies and protocols as well as customary procedures and relationships, on how District-owned infrastructure are integrated, maintained, and expanded. It is especially critical that those who govern, manage, operate, and maintain integrated systems that serve a community of 112,000 people work together closely and constructively.

The District does not expect to modify its governance structure to operate the acquired and integrated water system.

The District oversight is provided by a board of seven directors, five elected, and two appointed to represent the peninsula communities.

- District 1 represents approximately 2/3rds of the community of Seaside
- District 2 represents the remainder of Seaside, Sand City, Del Rey Oaks, and a portion of Monterey
- District 3 represents the majority of Monterey
- District 4 represents the City of Pacific Grove and Pebble Beach
- District 5 represents Carmel by the Sea and the unincorporated Carmel Valley
- Mayoral Representative appointed by the Monterey County Mayors Select Committee
- Monterey County Board of Supervisors appointed by the Board of Supervisors and residing in the District

The Board is supported by a professional staff managed by the General Manager with the following Department Managers:

- Administrative Services/Chief Financial Manager
- Environmental Resources Manager
- Water Resources Manager
- Water Demand Manager

Presently, the District outsources its Information Technology services, its human resources function, and public outreach. Each would be brought back in-house with an acquisition. See chapter 14 herein.

Public monthly District Board meetings are held that provide for public comment and authorization of business activities presented by the General Manager and staff. The District has several committees, with Board Director representation.

To encourage and solicit input from the Peninsula jurisdictions, the District maintains its Technical Advisory Committee comprised of staff from the jurisdictions and its Policy Advisory Committee comprised of elected representation of each jurisdiction.

3.3. Service Extensions

Each local government, per state law, must have a comprehensive plan for its intentions for the orderly physical growth in residential, commercial, industrial, institutional, agricultural, transportation, conservation and recreation, and other such development. Comprehensive plans must be reviewed at least every five years.

The District shall prepare and maintain a Water Master Plan with a forecast horizon of five, ten, and twenty years that is updated every five years. Annual review of the water master plan shall be conducted with close attention to a local jurisdictions' comprehensive plans to coordinate its service extensions and capital improvements with a city's service extensions. The Water Master Plan shall set forth the District's anticipated facility expansions over the next 5, 10, and 20 years, based on projected demands tied to population and employment projections, to meet the growing needs of the Monterey Peninsula region. Cities may submit requests to the District for a service area expansion. The District will adopt procedures to ensure all requests are considered and acted upon consistently, as well as ensure its engineers have all necessary information to determine the service area expansion's impact to the District's water system.

When a city requests a service area expansion, the District will conduct a preliminary water system capacity assessment and provides those results to the city. When there is sufficient water supply and transmission capacity in the system, the District notifies the city of service area expansion approval. However, if there is not sufficient capacity, then the District and the city collaboratively conduct alternative analyses to determine what system improvements are needed to accommodate additional demands from the service area expansion. Where service area requests involve large commercial or industrial customers, additional analyses must be

conducted to confirm the peak demands, water storage needs, fire flow requirements, and assess the impacts to other customers.

For individual projects, the District shall establish a "Development Review Process" that governs how proposed new connections and modifications to its water infrastructure and service areas, whether from private developers or local governments, are considered and implemented. The Development Review Process begins with the preliminary project plan review, technical review, and regulatory and standards compliance analysis.

The District shall interact with all individual city economic development agencies – local, regional, and county. The District works to provide objective, straightforward water infrastructure and capacity information to all economic development partners.

3.4. Communications and Outreach

The District has dedicated staff and consultants responsible for representing the District in communicating its mission, responsibilities, and operations to external stakeholders. Post-acquisition, the District's Community Outreach Manager will be the point person and responsible for external communication with the media and other stakeholders.

Generally speaking, the District's Public Relation activities focus on communicating the District's role in protecting public health and water quality. It also supports environmental protection, education and outreach projects. The District's communications and outreach efforts run the gambit: general customer service for billing-related inquiries (very common); information on capital infrastructure projects that impact residents, businesses and commuters, such as new construction, rehabs, and repairs (very common); health and public safety officials, especially in times of emergency; schools and other community groups; and the media.

The District vests government affairs in its General Manager's office, with support from other District staff. It is understood that the District has authority over the water infrastructure, thereby having comprehensive responsibility over water supply, treatment, and distribution systems, and local government to have increased and steady collaboration with the District.

To foster increased day-to-day communications between the District and local government staffs and officials, within six months of the acquisition the District will consider creation of a Government Affairs Liaison position to work with local governments on the Peninsula. The Liaison would be expected to develop close working relationships with local government utilities departments, administrative offices, and elected officials.

3.5. Rate-Setting Authority

The District shall have the sole rate-setting and approval authority for all water rates, water connection fees, surcharges, and other charges and fees for all water customers within the District's jurisdictional service area. The District's vision is to provide rate stabilization, adequate funding for capital expansion and asset renewal, and ratepayer equity based on the

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United States Conference of Mayors affordability analysis. All rate increases shall be in accordance with the California Prop 218 regulations and processes.

The Administrative Services/Chief Financial Manager under the direction of the General Manager shall have the responsibility for the financial security of the water system including the setting of water rates. The setting of water rates shall follow the AWWA M1 Manual – *"Principles of Water Rates, Fees, and Charges",* as the basis for any rate increases or decrease, including all fees and surcharges. The District's water rates are established on a Cost-Basis that will provide revenue stability and full cost recovery of all operating, capital, and interest costs. The following are some of the areas to support the water rates:

- Cost of Service Study
- Rate-Design Analysis
- Fire Service Rates
- Drought and Surcharges Rates
- Connection and Impact Fees
- Capacity and Development Charges
- System Capacity Charges
- Water Supply Availability Charges
- Reserve Account Allocation Analysis
- Permit Fees
- Asset Condition-Based Depreciation Analysis
- Capital Replacement Fund
- Capital Improvement Budget
- Operation and Maintenance Budget
- Rate Affordability Analysis
- Low-Income Affordability Program
- Rate Credits for the implementation of "Green" facility or property practices

The District shall coordinate with each local government as part of the overall affordability assessment and rate-design analyses as input to water rate-setting practices. Public outreach and involvement to solicit comments and input, especially on system improvement priorities, revenue allocation, and level of service goals from residents, businesses, developers, and other stakeholders is an essential component and transparency policy of the District's rate-setting process.

4. Financial Management

4.1. Financial Structure and Reporting

The District, like other special districts, uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. The District's funds are segregated into two categories: governmental funds and proprietary funds. Fund financial statements report essentially the same functions as those reported in the government-wide financial statements. The District maintains three individual governmental funds: the Water Supply Fund, the Conservation Fund, and the Mitigation Fund, all of which are considered to be major funds.

The Water Supply Fund is the chief operating fund of the District. It accounts for all financial resources except those required to be accounted for in another fund. This fund accounts for financial resources to be used for the acquisition of or construction of major capital facilities (other than those financed by Proprietary Funds and Special Assessments).

The Special Revenue Funds are used to account for specific revenue sources for which expenditures are restricted by law or regulation to finance particular activities of the District. The Conservation Fund accounts for financial resources used to fund water conservation activities mandated by District legislation including permit issuance and enforcement, jurisdictional water allocations, and public water conservation education. The Mitigation Fund accounts for financial resources used to finance work along the Carmel River carried out pursuant to the Mitigation Program designed to ameliorate impacts of pumping for water supply.

The District maintains one type of proprietary fund, the enterprise fund. Proprietary funds are reported using the accrual basis of accounting. Enterprise funds are used to report the same functions presented as business-type activity in the government-wide financial statements, but provide more detail and additional information. The District uses an enterprise fund to account for the CAWD/PBCSD Reclamation Project.

After acquisition of the Monterey Peninsula water system from Cal-Am, it is expected that the District will realign into three funds: (i) the "General Fund" a governmental fund to collect the property taxes and other general revenues of the District, (ii) the "Water Utility Enterprise Fund" a proprietary fund for all utility operations, including conservation and mitigation, for which water volumetric rates and meter charges are collected, and (iii) the existing CAWD/PBCSD Reclamation Project enterprise fund.

The California Government Code requires an annual independent audit of MPWMD's financial statements by a Certified Public Accountant (CPA). The District's financial statements have been audited by Hayashi Wayland, Certified Public Accountants (auditor). The auditor's opinion is included in the financial section of the District's annual Comprehensive Annual Financial Report (CAFR). Following acquisition of the Monterey Peninsula water system from Cal-Am, the District will continue to file a CAFR. The CAFR is believed to be accurate in all material respects and

presented in a manner designed to fairly set forth the financial position, the changes in financial position, and cash flows for the District. All disclosures necessary to enable the reader to gain the maximum understanding of the District's financial activity will be included. It will bring needed transparency to the financial operations of the water utility in a manner that has proven inaccessible under Cal-Am ownership. Management assumes full responsibility for the completeness and reliability of the information contained in the report, based upon a comprehensive framework of internal control that it has established for such purpose. While the independent auditors will be expected to express an unmodified ("clean") opinion that MPWMD's financial statements are presented in conformity with generally accepted accounting principles (GAAP), responsibility for both the accuracy of the presented data and completeness and fairness of the presentation, including all disclosures, rests with the District.

4.2. Budget Process

Annually, the District prepares and adopts an operating budget and updates its three-year Capital Improvement Program (CIP). Both serve as the District's financial planning and fiscal control. Budgets are adopted on a basis consistent with governmental GAAP. Budgetary controls are set at the department level and are maintained to ensure compliance with the budget approved by the Board of Directors. The District's budget is a detailed operating plan that identifies estimated costs in relation to estimated revenues. The budget includes the projects, services and activities to be carried out during the fiscal year and the estimated revenue available to finance these operating and capital costs. The budget represents a process wherein policy decisions made by the Board of Directors are adopted, implemented and controlled. Budget control is maintained through the use of project codes and account appropriations. Actual expenditures are then compared to these appropriations on a monthly basis. The General Manager or the Administrative Services Manager/CFO has the discretion to transfer appropriations between activities. Board approval is required for any overall increase in appropriations or changes to the Capital Improvement Program. Additionally, a mid-year budget adjustment is prepared and presented to the District's Board for adoption.

4.3. Internal Control

District management is responsible for the establishment and maintenance of the internal control structure that ensures the assets of the District are protected from loss, theft or misuse. The internal control structure also ensures adequate accounting data is compiled to allow for the preparation of financial statements in conformity with generally accepted accounting principles. The District's internal control structure is designed to provide reasonable assurances that these objectives are met. The concept of reasonable assurance recognizes that (1) the cost of a control should not exceed the benefits likely to be derived, and (2) the valuation of costs and benefits requires estimates and judgments by management.

4.4. Investment Policy

The Board of Directors annually adopts an Investment Policy that conforms to California State Law, District ordinances and resolutions, prudent money management and the "prudent person" standards. The objectives of the Investment Policy are safety, liquidity and yield.

District funds are normally invested in the State Treasurer's Local Agency Investment Fund (LAIF), Certificates of Deposits, and Money Market accounts.

4.5. Rate Covenant and Debt Service Coverage

The acquisition of the Monterey Peninsula water system from Cal-Am is expected to be financed by installment purchase Certificates of Participation secured by the revenues of the Water Utility Enterprise Fund, primarily water rates and charges. Rates will be set in a publicly-transparent process based on periodic rate studies performed by the District's rate consultant within a Proposition 218 process. The Proposition 218 process allows the constituents to participate in the approval of water rates and charges. The District will covenant to set rates and charges such that net revenues of the utility (gross revenues minus operations and maintenance expenses) are at least 1.20 times annual debt service, but with an operating goal of at least 1.35 times. The excess, known as coverage, will be used to meet ongoing renewal and replacement funding and to establish rate stabilization funds.

5. Strategic Goals & Level of Service Standards

The Monterey Peninsula municipalities, businesses, community groups, and public governance leadership understand that to encourage and accommodate economic growth in the region it must have a reliable and efficient water system to support residential, commercial, industrial, and public needs providing safe drinking water and fire protection. The water industry in the United States does not have definitive operating standards consistent for all water utilities. Initially upon acquisition and early operation of the water utility, the District will assess the existing practices and level of service (LOS) being provided. It is subsequently the responsibility of the District, along with public input, to establish and adopt strategic goals and LOS standards for the water utility operation going forward.

5.1. AWWA Effective Utility Management Principles

The water utility industry has a variety of guidelines and recommended operational practices that are available for public water utilities. The District has decided to use the American Water Works Association (AWWA) Effective Utility Management (EUM) Program developed in collaboration with the EPA and six North American Water and Wastewater utilities in 2015. The AWWA EUM identifies ten effective management attributes that are the foundation of high performing and innovative water agencies in the industry.

AWWA Effective Utility Management Attributes

- Product Quality
- Customer Satisfaction
- Employee and Leadership Development
- Operational Optimization
- Financial Viability
- Infrastructure Strategy and Performance
- Enterprise Resiliency
- Community Sustainability
- Water Resource Sustainability
- Stakeholder Understanding and Support

The District management has developed and adopted a comprehensive Strategic Plan for the Monterey Peninsula water utility that establishes targeted strategic goals and level of service standards, for each of the ten EUM attributes, to implement and measure the performance of the water service to exceed the EUM benchmark metrics.

The District's Strategic Plan has been developed to initially adopt Cal-Am's current operating and management practices upon assuming ownership and operational responsibility of the Monterey Peninsula water system. As indicated in Section 2 – Transition Plan, the District will conduct a 12-month operational assessment to refine the strategic goals, management policies, operating procedures and practices, performance metrics (LOS), and establish a timeframe to work towards and achieve those goals.

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The following preliminary Strategic Plan has been developed based on adopting the AWWA Effective Utility Management Attributes as guidance and to utilize the AWWA Standards, G200, G400, G410, G420, G430, G440, and J100 as a foundation for the initial Strategic Plan. **AWWA G400 – Utility System Management** and **AWWA G410 – Business Practices for Operation and Management** specifically identify the requirement to adopt a Strategic Plan and implement written management policies, strategic goals, performance metrics, Level of Service (LOS) standards, and standard operating procedures (SOPs).

5.2. Water System Management and Operations Strategic Goals

The District's prevailing operational strategy is to review Cal-Am's existing goals, LOS metrics, programs, policies, and procedures and expand or improve them under the District's operation. New goals, metrics, programs, and policies, and procedures shall be adopted and implemented in the absence of needed documents and standards. The following Strategic Goals, Policies and Procedures (Section 5.3 below), and Operational LOS metrics (Section 5.4 below) are those the District would expect to be in place at the time of assuming operational responsibility.

Strategic Goal No. 1 - Improve Water Quality

Improve the Monterey Peninsula Water System water quality the is delivered to its customers and community beyond the state and federal water quality standards.

1A. Actively Engage and Meet with local, state, & federal regulatory agencies
1B. Improve Water Quality and Strive to Reduce Detected Contaminants Below State & Federal MCLs
1C. Customer Education & Involvement Program
1D. Receiving Water Quality Protection Program to monitor the water quality in the Carmel River and other community bodies of water that potentially could be impacted by scheduled and non-scheduled discharges from the water system and other utilities and property owners.

Strategic Goal No. 2 – Continuously Improve Customer Satisfaction of Water Service

Efficiently deliver water service and customer service to minimize customer complaints.

2A. Customer Service Performance Plan
2B. Improve Customer Service Representative Training
2C. Customer Outreach Policy
2D. Launch a Water System Informational Website for Public Access
2E. Improve Customer Communication
2F. Improve Operations Staff Customer Interaction Training

Strategic Goal No. 3 – Provide the Organizational Capacity and Technology to Achieve the Strategic Goals

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Ensure the District has sufficient qualified and trained staff to operate and maintain the water system to achieve the strategic goals and customer expectations.

3A. Maintain a Water System Staffing Succession Plan
3B. Continuous Improvement Policy
3C. Knowledge Retention & Transfer Program
3D. Employee Retention and Advancement Program
3E. Employee Certification and Training Program
3F. Employee Internal Education Program
3G. Employee Health and Safety Program

Strategic Goal No. 4 – Improve Water System Operations to Efficiently Provide Water Service

Develop and Implement Level of Service and Operational Performance Metrics, with input from Stakeholders, to continuously improve operations.

4A. Operations Performance Goals & Metrics
4B. Document Operational Procedures
4C. Preventive Maintenance Program
4D. Emergency Response Procedures
4E. Improve Fire Protection Capabilities
4F. Improve Stand-by Power Capabilities
4G. Reduce O&M Costs per MG

Strategic Goal No. 5 – Provide Financial Viability and Rate Stabilization

Provide the financial integrity and budget management effectiveness to achieve the strategic goals.

5A. Strategic Business Plan
5B. Fixed Asset Registry Integrated with the District's Asset Management Program
5C. Capital Replacement Fund
5D. Emergency Response Reserve
5E. Low-Income Assistance Program
5F. Debt Service Coverage Requirement and Rate Stabilization Fund
5G. Rate Affordability Analyses and Program

Strategic Goal No. 6 – Improve and Maintain the Condition and Level of Service of the Water System Facilities and Assets

Adopt a continuous facility and asset condition assessment and replacement program to cost-effectively maximize the useful life of all water system facilities and equipment.

6A. Five-Year Water Master Plan
6B. Asset Management Program
6C. Asset Renewal Forecast Plan
6D. Tank Inspection, Cleaning, and Safety Improvement Program
6E. Pump Testing, Inspection, and Replacement Program
6F. Water Treatment Performance Improvement Program
6G. Main Renewal and Replacement Program
6H. Electrical Equipment Testing, Inspection, and Replacement Program
6I. Water System Planning Criteria

Strategic Goal No. 7 – Adopt a Risk and Resilience Management Policy

Establish the acceptable risk and resilience levels, with stakeholder engagement, for potential threats/hazards exposure to the water system including water service recovery based on projected consequences of operational impacts and asset failures.

7A. Risk Management Program
7B. Utility Resiliency and Recovery Program
7C. Risk-Based Project Prioritization Process
7D. Information Technology and Document Protection and Recovery Program
7E. Consequence of Failure and Asset Criticality Assessment Program
7F. Water System Threat/Hazard Vulnerability Assessment Program

Strategic Goal No. 8 – Adopt an Environmental Compliance, Protection, and Sustainability Policy

Foster the scenic values, environmental qualities, native vegetation, fish and wildlife, and recreation on the Monterey Peninsula and in the Carmel River Basin.

8A. Incorporate System Operations into District's Carmel River Mitigation Program under its Environmental Resources Division
8B. Continue to engage California Department of Fish and Wildlife (CDFW) and National Marine Fisheries Service (NMFS) in Quarterly Water Budget Planning and Low-Flow Memorandum Compliance
8C. Continue Public Engagement with Quarterly Carmel River Task Force Stakeholder Meetings (District, CDFW, NMFS, Carmel River Advisory Committee, Carmel River Watershed Conservancy, Carmel River Steelhead Association, Coastal Conservancy, US Fish and Wildlife Service, Big Sur Land Trust, Monterey Peninsula Regional Park District)

Strategic Goal No. 9 – Provide Sustainable Long-Term Water Supply Adequacy

Augment the water supply through integrated development and management of ground water, surface water, reclaimed waste and storm water, and desalination water resources

9A. Complete and adopt the 5-Year Urban Water Management Plan (UWMP) required by CA DWR
9B. Secure reliable long-term water supplies to meet the full build-out and growth of the Peninsula's community as defined in the combined Peninsula Municipalities Comprehensive/General Plans
9C. Reduce water loss to exceed the AWWA 75th Benchmarks designated in the 2018 Utility Benchmarking Study
9D. Implement conservation measures tied to the state drought designation including adopting conservation water rate.
9E. Continued Participation on Seaside Groundwater Basin Watermaster

Strategic Goal No. 10 – Adopt a Policy of Water System Management and Operational Transparency and Stakeholder Engagement

Manage and operate the water system in a cost-effective and efficient manner to achieve the strategic goals and level of service accepted, understood, with input from all Community Stakeholders.

10A. Stakeholder Management Program
10B. Public Communications Program
10C. Public Outreach and Involvement Program
10D. Customer Water System Education Program

5.3. Water Operations Administrative and Management Policies

In the Governance Section 3.4 above, the District Board and management Team have the responsibility and authority to develop and adopt operations and management policies, procedures, strategic goals, and performance metrics necessary to provide oversight of the water system operation. As indicated in the Transition Plan Section 2.10, the District upon assuming ownership and operational responsibility of the water system, will initially maintain the current Cal-Am management and operational activities, policies, procedures, and practices for one year to provide a smooth transition of the water system operation.

During this initial 12-month transition period, the District shall conduct a management and operational assessment of the current management policies and procedures, operational activities and workplans, and maintenance practices. The goal is to assess the efficiency and overall customer service of the water system operation as a basis to update, revise, or develop written strategic goals, management policies, standard operating procedures, performance metrics and other documents in accordance with the District's current policies and procedures and AWWA Standards.

A list of anticipated policies and procedures are listed in Appendix 15-1 by Department and Operational Function.

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5.4. Operations Level of Service Standards and Performance Metrics

AWWA Standards G400 and G410 state to meet these standards that the water utility must have written procedures and performance standards. During the initial 12-month operational assessment effort, the District plans to use the latest version of the AWWA Utility Benchmarking Report as an initial performance indicator to compare current operational practices and performance.

The AWWA Utility Benchmarking data is based on an annual survey of water and wastewater utilities across the country and the performance indicators are summarized and presented in three measurements, 75th, Median, and 25th percentile of utilities that responded. The District will use the Median percentile as the basis for assessing acceptable performance with a goal of achieving the 75th percentile or greater for each performance metric.

Example Indicator: MGD of Water Produced Per Employee (ADD/FTE)

- 75th Percentile – 0.26 MGD
- Median – 0.19 MGD
- 25th Percentile – 0.14 MGD
- Cal-Am 2018 – (3,016 MG/365)/82 Employees = 0.1 MGD Below the 25th Percentile. At Median percentile – 43.5 FTEs

Operations Level of Service and Performance Metrics

Customer Service:

- 1.5 Total # of Customer Complaints per 1000 Customers per Month – (~60 Complaints)
- 1 Technical Service Complaint per 1000 Customers per Month – (~40 Complaints)
- 1.5 Meter Reading Errors per 10,000 accounts per Year – (~6 Meter Reading Errors per year)

Water Quality:

- 100% Water Quality Regulatory Compliance per Year
- Zero Water Quality Violations per Year
- 1 Secondary Contaminant Public Notification per Year
- Zero Boil Orders per year
- 1 Non-Violation Treatment Facility Shutdown due to Water Quality per Year

Employee Health, Safety, & Training:

- 60 Total Hours of Operations Training per FTE per Year
- 24 Hours of Safety Training per FTE per Year
- 5 Reportable Injury Accidents per Year
- 2 Vehicle Accidents per Year
- 24 Hours of Emergency Response Training per FTE per Year
- 5 Hours of Emergency Response Readiness Training per FTE per Year

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Water Service Interruptions:

- Planned Service Outages Less than 4 Hours – 0.9 per 1000 customers – (~36 per year)
- Planned Service Outages of 4 – 12 Hours – 0.2 per 1000 customers – (~8 per year)
- No Planned Service Outages over 12 Hours
- Unscheduled Service Outages Less than 4 Hours – 0.8 per 1000 customers – (~ 32 per Year)
- Unscheduled Service Outages of 4 – 12 Hours – 0.25 per 1000 customers – (~10 per year)
- Unscheduled Service over 12 Hours – 0.01 per 1000 customers – (~ 0.4 Annual Average or Maximum 1 per year)
- Average Service Outage Time – 4 Hours
- Maximum # of Total Outages – 3 per 1000 customers per year – (~120 outages per year)
- No Commercial Customer out of water for longer than 8 Hours
- Average # of Customers Out of Service per Outage – 10
- Maximum # of Customers Out of Service During an Outage – 20 (0.05%)
- No Hospital, First Responder Facility, Military, or Government Facility Service Interruptions – (Redundancy)

Water Loss:

- Annual Water Loss less than 5% of total production per year
- Infrastructure Leak Index (ILI) of 1.5 or Less
- Annual Completion of the AWWA Water Audit Analysis
- Annual Water Loss from Water Operation & Maintenance – 0.3% of total annual water production – (~10 MG)

Operation and Maintenance:

- O&M Cost per MG - $2,700/MG
- O&M Cost per Customer - $400/Customer
- O&M Cost per 100 Miles of Pipe - $2.5 Million per 100 miles per Year
- Average of 5 after-hours call-out per month
- 50 Percent of Program Maintenance of Total Maintenance Cost
- 60 Percent of Facility Maintenance of Total Maintenance Cost
- 40 Percent of Distribution (Buried/Linear Assets) Maintenance of Total Maintenance Cost
- 90 Percent of Program Maintenance Work Orders Completed within 40 hours of issuance
- 75 Percent of Unscheduled Maintenance Completed within 24 Hours
- 20 Percent of all Distribution System Valve Exercised per Year – (~ 2,650 Valves per year)
- Average # of Days to repair or replace inoperable valve or broken valve stem – 5 business days
- 20 percent of all Hydrants inspected and flow tested per Year
- Maximum of 1 percent of all hydrants inspected inoperable per year

- 24 Hour Notification of Appropriate Fire Department or Agency
- Average # of Days to repair or replace inoperable hydrant once detected – 5 business days
- 100 Percent of all Pumps inspected and tested per year
- 25 Percent of all Pumps taken out of service for longer than 6 hours, once per year for inspection, program maintenance, or replacement.
- Maximum of 5 Pumps out of service due to unscheduled maintenance or inoperable per year – (~ 3%)
- Average of 6 Main Breaks per 100 Miles per year
- Average of 10 Main Leaks per 100 Miles per year
- Average of 15 Breaks/leaks per 100 Miles per year
- Average response time and shut-down from reported break/leak notification – 1 hour
- 20 Percent of Mains flushed per year – (~125 miles)

Asset Renewal and Capital Improvements:

- 90 Percent of Planned Capital Projects/Improvements Completed per year
- Water Main Renewal Rate of 1%-2% per year based on a pipe renewal forecast using AWWA M77 methodology – (~6-12 Miles per year)
- Service Line Renewal Rate of 3%-5% per Year – (~1200-2000 services per year)
- 20 Percent of all Assets completed condition assessments – (~ 700 Assets per year)
- Maximum 1 Percent Equipment Failure Rate per year – (~350 Equipment "Failures" based on definition of failure for each asset class)

5.5. Stakeholder and Agency Communication & Outreach

A key District strategic goal is to improve transparency and engagement of all stakeholders in the challenges facing the community water system and solicit their input as to the District's plans and priorities including level of service expectations and costs/rates associated with those expectations and priorities.

To achieve stakeholder understanding and acceptance the Districts will implement a comprehensive outreach program to connect with the various community, county, state, and federal stakeholders and resource agencies. The following are, but not limited to, anticipated stakeholders that the District wants to build relationships with regarding the water system operation:

Resource Agencies

In addition to the regular stakeholder meetings described under Strategic Goal No. 8 above, the goal is to hold bi-annual meetings with key local, state, and federal resource agencies to discuss pending issues and the District's plans. One public workshop with representatives from some of the key agencies is anticipated to be held annually to jointly present current and future regulatory issues to stakeholders.

- State Water Resources Control Board (SWRCB)

- Department of Water Resources (DWR)
- Environmental Protection Agency (EPA) Region 9
- California EPA
- California Coastal Commission
- California Fish and Game
- US Fish and Wildlife

Level of Service Metric – Prepare and Maintain a Regulatory Agency Management Plan
Level of Service Metric - Conduct Regularly Scheduled Meetings and Communications with Regulatory Agencies
Level of Service Metric- Post all current permits and regulations on the Public Website and provide a link to each agency.

Local Municipalities and Agencies

The goal is to quarterly meetings with local cities and agencies to discuss pending issues city priorities and the District's plans including collaboration on capital improvements, emergency response coordination, and District policy and procedures. Issues would include coordination of the cities' general plans with the District's Water Master Plan, water service expansion, business and economic development support, and other inter-agency coordination.

- County of Monterey
- City of Monterey
- City of Pacific Grove
- City of Carmel
- City of Seaside
- City of Carmel by the Sea
- City of Del Rey Oaks
- City of Sand City
- Monterey One Water
- Carmel Area Wastewater District
- Monterey Peninsula Airport District
- Fire Districts or Agencies

Level of Service Metric – Establish and document meeting objectives and priorities with each city and public agency and schedule the quarterly meetings.
Level of Service Metric – Establish protocols for coordination for integrating the city or agency general/master plans with the District's Water System Master Plan.
Level of Service Metric – Develop and implement a procedure for review and approval of general construction, developer project, and service extensions between each city/agency and the District.

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Business and Developer Stakeholders

The business communities in each city and municipality have considerable interest in the District's operational and construction project plans in their respective community. The District's support of commercial economic growth and residential development expansion and the District's priorities forecast in the Water System Master Plan. The District's communication and outreach plan provides for routine attendance at Chamber of Commerce and developer group meetings and conducting bi-annual workshops with these groups. Regular presentations to the government affairs committees of the Coalition of Peninsula Businesses and the Monterey County Association of Realtors will be made.

Level of Service Metric – Establish objectives and priorities with appropriate business organizations and a forum for developers to provide information on potential future development and impacts with the water system to accommodate such expansion.
Level of Service Metric – Assign a District point of contact for the business community and developers. Identify and schedule attendance at business association meetings and developer forum/workshops.

Environmental Groups

The District's stewardship of the environmental resources and habitat on the Monterey Peninsula is of great interest by local, regional, state, and national environmental groups. The District will provide specific information on its website with links to each of the environmental groups. A goal is to periodically attend the various group/association meetings, or conference calls and to conduct an annual environmental association workshop to present the District's plans to protect and monitor receiving water quality, environmental habitat, fisheries, and other resources present on the peninsula.

Some of the environmental associations and groups that the District will provide outreach to are:

- Carmel River Steelhead Association (CRSA)
- Big Sur Land Trust
- Nature Conservancy
- Carmel River Watershed Conservancy
- Surf Rider Foundation
- Sierra Club

Level of Service Metric – Identify and contact interested environmental associations and groups and create an outreach plan.
Level of Service Metric – Meet with each identified group to understand their objectives and priorities as it pertains to the water system.
Level of Service Metric – Create and maintain a section in the water system website for environmental issues and related environmental groups including a link to each of their websites.

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Public Advocate and Community Group/ General Public Stakeholders

There are various public and community groups in support and opposing the District on a number of water-related issues that its responsible for. To improve public transparency and engage the community to educate and inform them of regulatory issues, improvement plans, and active construction projects the District will create and maintain a water system website for the public.

The website will include information regarding the water system configuration, water consumption, supply, demand forecasts, system improvement plans, and construction project locations and status. The webpage will be updated at a minimum once a month and include a schedule of upcoming workshops and public outreach activities.

Key documents will be made publicly available, including rate studies, capital improvement plans, budgets, and annual financial statements.

Level of Service Metric - Create and maintain a Stakeholder Management Plan.
Level of Service Metric - Adopt a Public Communications Plan and procedures that address the methods for communicating issues specific for each department and public outreach approach to solicit comments and priorities from stakeholders
Level of Service Metric – Develop and maintain a water system website for public access that includes a water education section on various topics.

6. Planning Process & Criteria

To achieve the strategic goals and level of service standards (LOS) outlined in the previous section, the District shall initially maintain Cal-Am's existing planning methodology and criteria that will be reviewed during the initial 12-month transition operational assessment phase as described in Section 2 above. Based on the understanding of the Cal-Am planning approach, the District has summarized below the planning process and criteria that is anticipated to be adopted under District ownership.

6.1. Planning Process

A Water Master Plan (WMP) will provide a comprehensive analysis of the operation and regulatory compliance of the Monterey Peninsula Water System over a 20-year planning horizon. The objective is to forecast the operation, maintenance, asset management and renewal, and capital improvement needs to meet or exceed the LOS standards adopted by the District that provides reliable, safe, and affordable water service to the Monterey community.

The planned improvements to operational practices, preventive maintenance programs, asset condition assessment and renewal forecasting, and a 20-year capital improvement plan to meet residential, commercial, government/public, and industrial water demands, provide adequate fire protection, meet or exceed all state and federal regulatory requirements, and to protect the environmental resources on the peninsula. The recommended operation, maintenance, asset management, and capital projects will be prioritized and summarized in 5-year, 10-year, and 20-year planning periods.

The master plan will be a "living" document that is reviewed and updated annually with revisions documented as an appendix to the report. After five years, a complete update of the master plan will be prepared incorporating the annual updates and extending the 20-year planning horizon. Service extensions, capacity analyses, development plans, and other technical reviews during the year will also be included as appendices to the master plan.

The WMP is an integrated risk-based assessment process that balances the water supply and system capacity current and future needs with the regulatory compliance requirements, asset condition and renewal forecasts, operational and maintenance impacts, environmental impacts, and long-term affordability. Recommended projects, both construction and operational, shall be prioritized using a weighted risk-based "triple bottom line" type of methodology.

The intended use of the WMP is to provide the District Board and management team with the information necessary to make informed business decisions including business and operational processes, customer service and staffing needs, capital improvement projects, and financial and rate impacts.

6.2. Population and Customer Demand Forecasts

The water master plan will incorporate the general or comprehensive plans adopted by the cities, county, and regional planning agencies as the basis for forecasting water demands over the 20-year horizon. The general plans include land use, population and density projections, economic and employment forecasts (local and regional), commercial and industrial expansion, tourism growth, traffic impacts, and environmental/sustainability goals. This data and other planning information shall be incorporated into the GIS system and maintained to provide historical trends of these planning attributes.

Population and customer historical demand data will be used along with the 5, 10, and 20-year population and other general plan attributes to forecast future water supply needs and customer demands. Typically, 10-year historical peak customer demand data is used for peak supply planning, however, for baseline current demand more recent data can be used. Historical data can also be normalized by the water year designation: extremely wet, wet, normal, dry, and extremely dry water years. Historical demand trends by water year will also be performed to consider adjustments to future demand projections.

Climate change impacts will be assessed based on national weather data specific to the Monterey region to project the probability and severity of droughts, major storm events, and even local micro-burst rainfall conditions. A statistical analysis providing a 95 percent confidence level for demand projections, by customer class, incorporates the historical, water year and climate impacts, and general planning data will be the basis for assessing the water supply and system capacity needs over the 20-year horizon and build-out.

Table 6.1: Peaking Factors for Planning Purposes

Planning Demand Criteria	Peaking Factor from ADD
Minimum Day Demand (Min DD)	0.5
Average Day Demand (ADD)	1.0
Maximum Day Demand (MDD) – System Wide	1.5
Maximum Day Demand (MDD) – Upper Pressure Zones	1.75
Peak Hour Demand (PHD) – System Wide	3.0
Peak Hour Demand (PHD) – Upper Pressure Zones	3.5

A current analysis and demand forecast are summarized in Section 8 of this report.

6.3. Sustainable Water Supply & Quality

The Monterey Peninsula community expects the District to have sustainable water supplies to meet current and future demands, in normal conditions and in extreme or emergency conditions. The lead time to develop and construct additional water supplies can be considerable. The District has adopted a policy to develop and maintain a forecasted twenty-

year water supply, in service, to meet the future community needs. Maintaining projected in-service water resources provides the community of reliable water supply and reserves to meet extended drought and emergency conditions.

The location of the District's diverse existing and future water supplies are distributed around the Peninsula as described in Section 7 of this report. Having a 20-year water supply reserve along with adequate distribution storage provides increased flexibility to maximize conjunctive use operational practices, and minimize local water service interruptions due to extended emergencies.

The District's long-term goal is to eliminate the pumping of the Carmel River underflow from the lower Carmel Valley wells to protect and restore the environmental habitat and fisheries. To replace that supply in the near term, the District will expand the use of reclaimed water and groundwater injection in the Seaside basin. Long-term, in approximately 30 years, a small desalination plant may be constructed to meet future build-out demands, if needed. A detailed description of the District's water supply development plan is discussed in Section 7 below.

The water quality delivered to customers is equally important as having sufficient water supply capacity to meet demands. The water quality priorities for operating the system is 100 percent compliance with all primary and secondary water quality Maximum Contaminant Levels (MCLs) regulated by the state and federal agencies.

The District's Strategic Goal No. 1 – Improve Water Quality, as summarized in Chapter 5 above, is to strive to reduce all detected contaminants, even those below the MCL, in the raw water sources to non-detectable levels in the water delivered to customers. The Water Master Plan will evaluate the impacts of all potential new contaminants that may be promulgated within the 10-year planning horizon. Recommended solutions and projects will be identified within the 5 & 10-year planning periods, even if it becomes a regulated contaminant in that timeframe.

Any production facilities, wells, or treatment plants that a finished water detection of a primary or secondary contaminant that reaches 90 percent of the MCL will be evaluated in the master plan to compare treatment or source replacement alternatives to be implemented within the 5-year planning period.

The presence of microbial contaminants, bacteria, and viruses in water systems is the primary purpose for disinfection of raw water in the production process prior to the first customer in the distribution system. Surface water or groundwater under direct influence of surface water are required to provide a 4-log inactivation of viruses prior to the first water connection and maintain a 0.2 mg/L chlorine residual through-out the distribution system. Groundwater sources currently are not required to maintain a 0.2 mg/L residual; however, EPA has been considering the adoption of a Groundwater Rule that would require it. The District will adopt the water industry best practice of achieving a 4-log inactivation of viruses and maintaining a minimum 0.2 mg/L residual in the distribution system.

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To provide a 4-log inactivation each production facility, well, or treatment plant must feed a disinfectant, chlorine or sodium hypochlorite, at a sufficient concentration for a long enough contact time in the discharge piping before the first connection. The following is a brief overview of the "Chlorine Contact Time" or CT value verification method.

4 - Log inactivation is based on the **Delivered Dose**, "***Ct***"

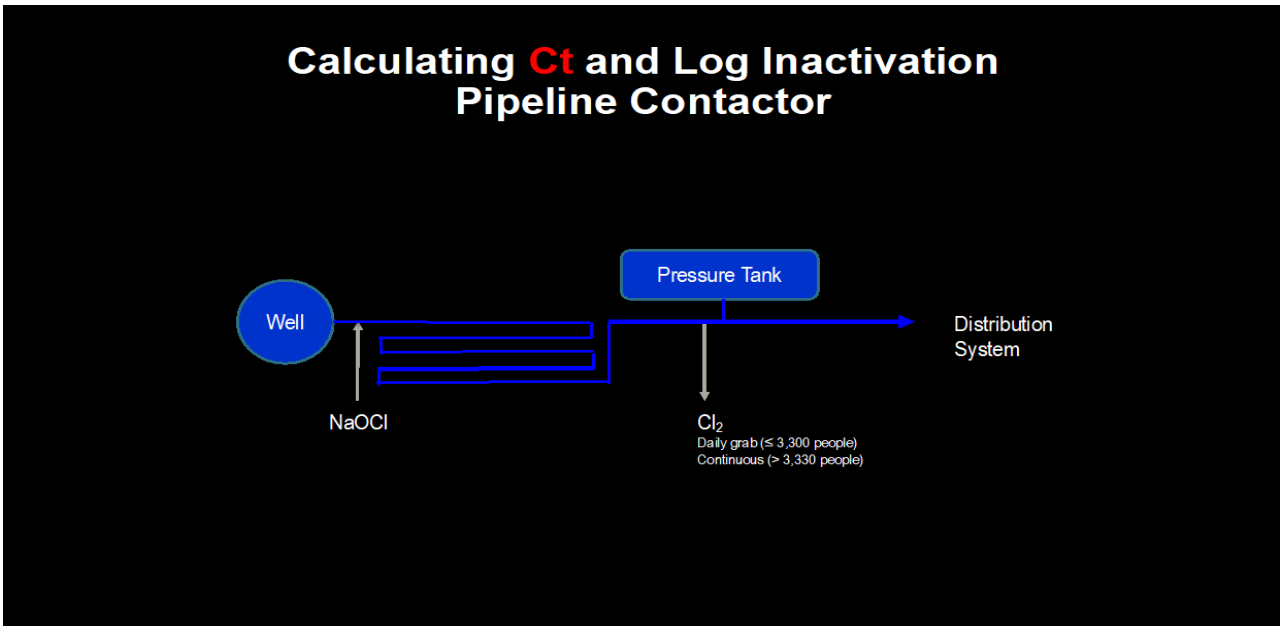
"**C**" is the disinfectant residual (mg/L)

"**t**" is the exposure or contact time (minutes)

Multiply them:

C **•** ***t*** = mg/L • min **(delivered dose)**

The calculated *Ct* value is looked up in **EPA** ***Ct*** tables to determine the log inactivation based on specific monitoring parameters (pH, disinfectant residual and/or temperature).



Distribution system water quality is an increasing concern and focus within the water industry. Aging distribution mains, tanks, and other assets especially unlined metallic pipes have deteriorated due to internal corrosion creating sediment that collects in pipes and storage tanks. Unlined metallic assets in contact with chlorinated distribution water releases carbon compounds in the sediment that absorbs the chlorine in the water reducing the residual in the water system. Surface water or groundwater have organic material that is measured by the Total Organic Compound (TOC) levels adding to the carbon content in the distribution system.

To minimize the internal corrosion of unlined metallic pipes, the District will dose finished water with a corrosion inhibitor, such as zinc orthophosphate, that coats the metallic surfaces reducing the deterioration of the pipes. The corrosion inhibitor provides other benefits such as

reducing the corrosion of customer's internal copper piping helping minimize the lead and copper levels that leach into the potable water delivered. The reduction in corrosion potential in the distribution water also extends the service or useful life of the water pipes minimizing main and service line leaks and breaks.

There must be assured a balancing of providing adequate disinfection of water for microbial protection versus increasing the formation of disinfection by-products, Trihalomethanes (THMs) and Haloacetic Acids (HAAs), that are known carcinogens with prolonged exposure. Disinfection by-products are formed through chlorine contact with primarily highly organic content (TOC) that is slightly acidic (pH), bromide ion concentration, and elevated temperatures.

Increasing chlorine residual in the system, although beneficial for microbial control such as biofilm bacteria that can form on the walls of unlined metallic pipe, also increases the formation of disinfection by-products. The use of corrosion inhibitor reduces the carbon content minimizing the loss of chlorine residual resulting in lower chlorine dosing at the source resulting in lower disinfection by-product levels.

The growth of biofilm bacteria in distribution piping systems is prevalent in systems that have unlined metallic pipe materials. The presence of organic material and carbon compounds that reduce the chlorine residual in the water allows for the growth of bacteria along the walls of the pipe. To prevent biofilm bacteria contamination, the District will analyze the water system operation for age of water to identify areas of the system that have low demands, poor circulation (lack of pipe looping), and dead-end mains.

Routine water quality testing of the distribution, especially in known "hot spots" by taking Heterotrophic Plate Counts (HPC) samples daily through-out the service area. There is no MCL for HPC levels, however HPC levels above 500 Colony-Forming Units (CFU)/mL is a threshold of a potential biofilm problem. The District's goal will be to maintain HPC levels at 10 CFU/mL or lower. A HPC sampling survey will be conducted as part of the master plan to establish a CPU/mL baseline for the distribution system. A HPC testing database shall be maintained with "hot spots" highlighted in the GIS system.

Included in the planning criteria for assessing the water quality of the system are thresholds/indicators that identify potential impacts that require further evaluation. The key indicators are:

- 90% detection of the MCL for any primary or secondary regulated contaminant in finished water
- Calculated "Ct" values of 90% of the EPA required Ct requirements to achieve a 4-log inactivation of viruses
- Portions of the distribution piping system that have age of water projections greater than 7 days
- Portions of the distribution system that routinely have HPC levels above 100 CPU/mL or an increase above baseline levels of 20% or more within one quarter timeframe

- Portions of the distribution system that chlorine residual decreases below 0.3 mg/L or drops by more than 50% from the average chlorine residual from active production facilities.
- 80% detection of the MCL for disinfection by-products in portions of the distribution system
- Shutdown of any production or treatment facility due to treatment process or water quality problem
- 10% annual Increase in raw water detected contaminants from any source

6.4. Production and Distribution Facility Capacity Assessment and Reliability

To meet maximum day customer demands the District will have sufficient well production and treatment capacity to deliver potable drinking water throughout the service area. Compliance with California Title 22 requires that the water system shall have adequate capacity to meet Maximum Day Demands (MDD) at all times in every pressure zone.

The water system is also required to meet 4-hours of Peak Hour Demand (PHD) in all pressure zones with consideration of the total combined capacity from water sources or pumped sources, storage capacity, and any interconnections (which can be between pressure zones). These requirements shall be met including redundancy criteria, the largest well, pump, or PRV out of service that supplies that pressure zone.

For planning purposes, the District's long-term goal will be to provide sufficient water source, booster pump, and storage capacity to meet 110 percent of the Title 22 requirements (see below) in each pressure zone and the entire water system.

The production from wells degrades over time due to deterioration of the well casing and screen, sand and fines compacting around the screen and the gravels within the cone of depression, iron bacteria growth, and pump capacity. The water system has historically experienced an annual loss of well capacity of approximately 3 percent overall. In determining the well source capacity over the planning horizons (5, 10, 20 years) the annual loss of well capacity shall be accounted for in the capacity projections. Annual well capacity data shall be maintained for each well to evaluate the actual capacity reduction compared to forecasted capacity.

Wells that are treated for removal of contaminants (e.g. iron, manganese, hydrogen sulfide, arsenic) at water treatment facilities shall be limited to the reliable treatment facility capacity. The Monterey system treatment facilities all include the use of pressure filters (with exception to the Ord Grove facility), either for removal of oxidized precipitate or absorption of soluble contaminants. The reliable treatment capacity for these facilities is determined based on the largest filter out of service and 90 percent of the permitted hydraulic loading on the remaining filters. For facilities that treat groundwater from one well source do not require redundant filters if the service area it serves has alternate/redundant water sources and production capacity to comply with Title 22.

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As discussed in Sections 9 and 12 below, the Upper Carmel Valley wells have good water quality and only require chemical treatment for disinfection (4-log inactivation of viruses), pH adjustment/stabilization, and corrosion inhibitor to protect deterioration of unlined metallic mains to prevent dirty water and bio-film bacteria from forming as well corrosion of customer's copper pipes with lead joints to comply with the lead and copper regulations. The Upper CV wells have a capacity of 2.53 MGD, however these wells cannot be operated during summer months to maintain river flows in the Carmel River and cannot be included as available source to meet Title 22 regulations.

The Lower Carmel Valley wells have naturally occurring soluble iron and manganese present in the groundwater and are treated at the Begonia Iron Removal Plant (BIRP). The lower Carmel Valley aquifer water quality has an elevated level of Total Organic Carbon (TOC) that creates an environment with the presence of iron for the formation of iron bacteria growth in the well screens and casings. Routine maintenance of the wells is necessary to minimize the loss of capacity from the Lower CV wells. The BIRP removes the iron and manganese from the raw water via the dosing of sodium hypochlorite chemical treatment to oxidize the contaminants and absorption of remaining soluble iron and manganese in the greensand pressure filters. Potassium Permanganate is fed to recharge the greensand filters. Caustic Soda and Zinc Orthophosphate is fed post filtration for pH adjustment and corrosion control.

Treatment facilities that remove arsenic from the groundwater typically use ferric chloride to oxidize the arsenic prior to filtration.

The reliable capacity of the BIRP and other water treatment facilities are dependent on the total well capacity with the largest well out of service, total hydraulic capacity with the largest filter out of service and 90 percent of the remaining filter hydraulic loading, and reliable capacity of each chemical feed system. Smaller water treatment facilities that only have two pressure filters, the reliable plant capacities are limited to 75 percent of the rated hydraulic loading of the one remaining filter with the largest filter out of service. This is to account for the reduction in production due to filter backwashing when the other filter is out service, particularly during media replacement.

Liquid chemical storage capacity shall be a minimum of 30 days of plant maximum day demand and day tank storage equivalent to 5 days of the plant maximum day demand. Redundant chemical feed or metering pumps are required to feed the plant maximum day demand with the largest pump out of service. Redundant chemical feed lines, injectors, and chemical feed booster pumps are required.

Dry chemical feed systems, potassium permanganate, and on-site sodium hypochlorite generators shall have a minimum of 30 days of plant dry storage. A dry chemical feed hopper storage and day tank storage shall have a minimum of 5 days of plant maximum demand. Redundant chemical mixers, feed/booster pumps, and chemical feed lines/injectors are required to meet the plant maximum day demand.

Wells that have on-site chlorine or sodium hypochlorite generators shall have 30 days of salt storage capacity with a day tank storage of a minimum of 5 days of well pumping capacity. Redundant chemical booster pumps, chemical feed lines, and injectors are required. The chlorine/sodium hypochlorite generator and booster pumps shall have 115 percent of the maximum day chemical demand.

All liquid chemical storage tanks, including day tanks shall have chemical spill containment of 110 percent of the total maximum chemical storage on-site. All chemical feed equipment shall be located within the spill containment area. Chemical spill containment shall be provided at all chemical supply delivery locations including chemical supply trucks. Chemical feed lines shall be dual-wall for spill prevention, and injectors shall have spill containment with equivalent of 12 hours of maximum chemical feed rates. All spill containment areas shall have spill detection devices connected to the SCADA system. Proper wall separation of chemicals, especially acids and bases, and separate spill containment areas for each chemical is required for safety protection.

The reliable capacity of all treatment facilities is dependent on the reliability of incoming electrical service, electrical equipment (MCC or switchgear), and the reliability of the discharge pipe lines. All treatment facilities shall be equipped with on-site permanent emergency generators and automatic transfer switches, or smaller facilities shall, at a minimum, have manual transfer switches with electrical quick-disconnections for portable emergency generators. If a well or treatment facility does not have emergency generator capabilities, it will not be included in the overall reliable production capacity.

Where reasonably feasible, redundant process and discharge piping shall be installed sufficient to convey the maximum capacity of the facility. Determination of which facilities are recommended to have redundant piping systems will be based upon a comprehensive facility/asset criticality assessment.

6.5. Distribution Water Storage Capacity Assessment and Reliability

Adequate distribution storage capacity is required to supply the maximum day demand, peak hour demand, fire flow storage volume, and dead storage in each pressure zone. The Monterey water system has 74 pressure zones, of which 14 pressure zones are supplied solely from pressure Reducing Valve (PRV) stations. Distribution storage capacity in pressure zones that supply the PRV zones are required to meet the storage requirements for both the zone the tank(s) are located and the PRV zone(s) it supplies.

The Monterey water system has historically experienced multiple consecutive maximum day demand periods of 3 to 4 days. To meet this multiple maximum day events, storage tanks must have the ability to refill the entire pressure zone capacity within 8 hours to have the tanks full at the start of the next day. The actual refill rate required will be determined based on the diurnal demands in each pressure zone during a maximum day event. If there is insufficient

hydraulic capacity to refill the tanks within the required refill period, then additional storage or pumping/pipeline capacity shall be provided.

The long-term goal will be to have adequate storage capacity to meet a 110 percent of consecutive 4-day maximum day event in each pressure zone. In the main or gravity pressure zone, the long-term goal is to have 5-days of maximum day demand storage capacity for the entire system to meet both multiple maximum day demand events and to have reserve capacity during an emergency or extended power outage as the Monterey water system does not have sufficient interconnections with other water systems capable of supporting the Monterey Peninsula customers.

Upper pressure zones supplied by pump stations from the lower pressure zone must have 120 percent of the reliable capacity to meet the maximum demand and storage requirement for that upper zone. If a by-pass pipe is located at the pump stations(s) that service the upper zone, allowing stored water to be supplied back to the lower zone by gravity, then this additional storage requirement shall be accommodated in the upper zone. Excess storage in upper zones that have by-pass piping capabilities, can be considered in meeting the storage requirement for the lower zone.

The reliable storage capacity in each zone is the total available storage in that zone with the largest tank out of service. Where feasible dual tanks at each tank site is the preferred approach to providing redundant storage capacity. Multiple distributed tanks serving a pressure zone are included in the reliable storage capacity provided that the remaining tank(s) can meet a single maximum day demand storage requirement and have the distribution piping capacity to deliver the demands and fire flows with a tank out of service.

If reliable storage capacity is unavailable in an upper pressure zone, then piping connections and other appurtenances for the connection and temporary storage tanks shall be provided to supply the pressure zone when a tank is taken out of service.

The capacity requirements for storage facilities that supply critical customers such as hospitals, first responder facilities, public emergency shelters, and other essential public buildings shall provide additional redundancy in the event of a major fire or emergency event.

The storage classifications are shown in the figure on the next page and are highlighted below:

- Operational Storage – Maximum Day Demand
- Equalizing Storage – Peak Hour Demand
- Fire Storage – Required Fire Flow for Designated Timeframe
- Dead Storage – Tank Level based on 20 psig in the Distribution System and the Volume Remaining in the Tank

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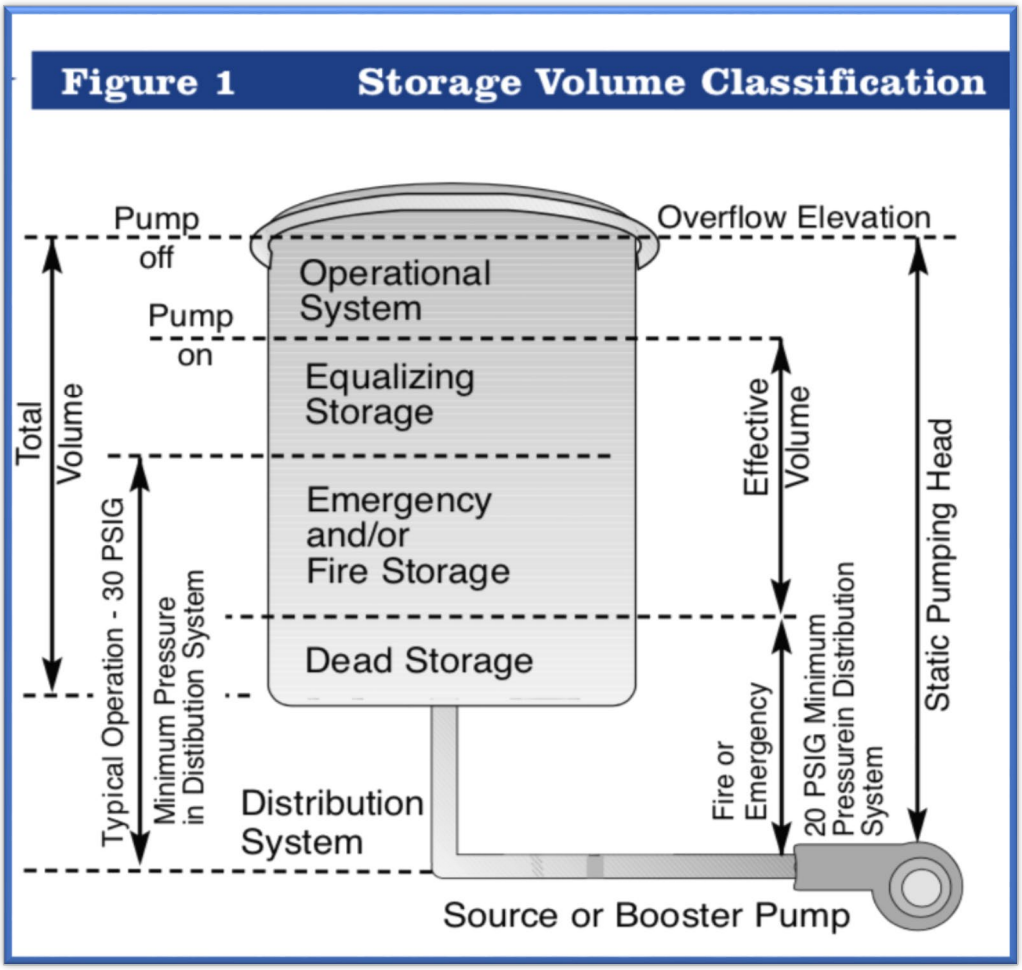
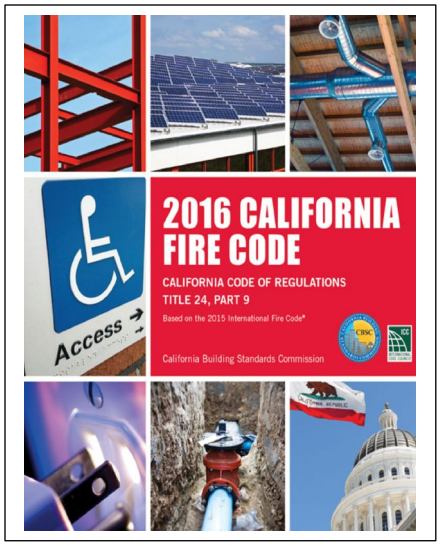


6.6. Fire Flow Requirements and Reliability

The District will coordinate with the local cities, fire agencies, and the county to review current fire flow conditions within their jurisdiction and to update requirements. However, fire flow requirements in the Monterey water system service area will not be less than the California Fire Code Regulations.



The District's long-term objective will be to coordinate with each city, fire department, and other jurisdictions to obtain a Insurance Services Office (ISO) Public Protection Classification (PPC) program, PPC-3001, rating of 5 or better.

Most U.S. insurers of home and business properties use ISO's PPC in calculating premiums. In general, the price of insurance in a community with a good PPC is lower than in a community with a poor PPC, assuming all other factors are equal. One of the

District's first missions upon taking ownership will to be to confirm the system's ability to meet minimum fire flow requirements.

A community's PPC depends on:

- emergency communications systems, including facilities for the public to report fires, staffing, training, certification of telecommunicators, and facilities for dispatching fire departments
- the fire department, including equipment, staffing, training, and geographic deployment of fire companies
- the water supply system, including the inspection and flow testing of hydrants and a careful evaluation of the amount of available water compared with the amount needed to suppress fires
- community efforts to reduce the risk of fire, including fire prevention codes and enforcement, public fire safety education, and fire investigation programs

Table 6-2: Minimum Fire Flow Requirements

Customer Class	CA Fire Code[1]
Residential	< 3,600 Sq. Ft.
Low Density	1500 – 3000 GPM – 2 hours
Medium Density	1500 – 3000 GPM – 2 hours
High Density	1500 - 3000 GPM – 3 hours
Multi Family	2500 – 6000 GPM – 3 to 4 hours
Commercial	3500 – 8000 GPM – 3 to 4 hours
Public	3500 – 8000 GPM – 3 to 4 hours
Industrial	4000 – 8000 GPM - 4 hours
Hospital	4000 – 8000 GPM - 4 hours

1. Varies with footage of facility and construction type

6.7. Pump Station Capacity Assessment and Reliability

The Monterey water system has 65 pump stations (excluding production wells) directly supplying 58 pressure zones and 14 zones indirectly through Pressure Reducing Valve (PRV) stations. In general, each pump station shall be capable of supplying water from a lower zone to

meet Maximum Day Demands (MDD) of the upper zone. If multiple upper pressure zones are distributed, the pump stations shall have sufficient capacity to meet MDD of the total combined pressure zones with the largest pump out of service.

If multiple pump stations provide water to the same pressure zone(s), then the combined capacity of the stations shall meet the MDD with the largest pump out of service. Additionally, each pump station shall have sufficient capacity to meet the Average Day Demand (ADD) with the other pump station(s) out of service. Provisions to prevent high surge pressures and power outages shall be evaluated for all pump stations as part of the planning process.

Table 6-3: Pump Station Planning Criteria

Pump Station	**Water System Assessment & Reliability Criteria**	
Single Pressure Zone Capacity	Provide MDD in Pressure Zone with the Largest Pump Out of Service	Single PS, and does not include fire pumps
	Tank(s) Refill Rate – in 8 hours after being empty	
Multiple Pressure Zone Capacity	Provide combined MDD of all pressure zones with the largest pump out of service	Single PS, and does not include fire pumps
	Tank(s) Refill Rate – in 8 hours of all tanks in upper zones after being empty	
Multiple Pump Station Capacity	Provide MDD in Pressure Zone(s) with the largest pump out of service	
	Each pump station suppling the pressure zone(s) deliver ADD with other pump stations out of service	
	Sufficient pumping capacity to deliver the maximum fire flow required in the pressure zone(s) with the largest pump out of service	This includes any fire pumps
	Tank(s) Refill Rate – in 8 hours after being empty with the largest pump out of service	Does not include fire pump capacity
Surge/Water Hammer Protection	All pump stations that have a TDH of 250 ft. or greater (~108 psi) shall have a surge anticipator valve or surge tank to prevent peak transient pressures	This includes all pumps that have control valves on the discharge line
	All pumps with a TDH of 200 ft (~86 psi) or greater shall have soft start/stop motor starter or VFD	This does not apply to pressure zones with less than 50 customers
	All pumps that have a TDH of 100 – 200 ft. shall have pump control valves	
Emergency Power	All pump stations shall have either a permanent on-site generator with automatic transfer switch or electrical quick-disconnections for	Electrical quick-disconnectors and manual transfer switches shall be provided on all hydro-

	portable diesel generators with manual transfer switches	pneumatic and "grinder" pumping facilities
	Pressure Zone(s) with multiple pump stations – at least one PS shall have a permanent on-site generator	
	Pump Stations that supply multiple pressure zones shall have permanent on-site generators	This does not apply to multiple pressure zones that serve 50 customers combined
	All generators shall have a minimum of 12-hours of fuel storage at ADD. Main zone pump stations with generators shall have a minimum of 24 hours of fuel storage at ADD.	All portable generators shall have belly tanks with 12-hours of fuel capacity at the rated kW generator capacity
Pump and Asset Redundancy/Reliability	Redundant pumps to meet MDD with the largest pump out of service	
	If the average runtime cycle is less than 1 hour, consider adding smaller multiple pumps or VFDs	Average start/stop runtime of pump over 12-hour (typically ~ 6 am – 6 pm) period
	Critical assets in pump stations are electrical MCC and motor switchgear and suction/discharge headers. Consider dual/redundant suction and discharge headers	Consider dual electrical feeds, having motor starters on separate feeds or ability to use motor starters on alternate pumps
	Remote and/or upper pressure zones are impacted by seasonal demands. Minimum Day Demand is approximately 50% of ADD. To minimize loss of chlorine residual in these zones consider chlorine residual analyzers and sodium hypochlorite generators in critical pump stations	

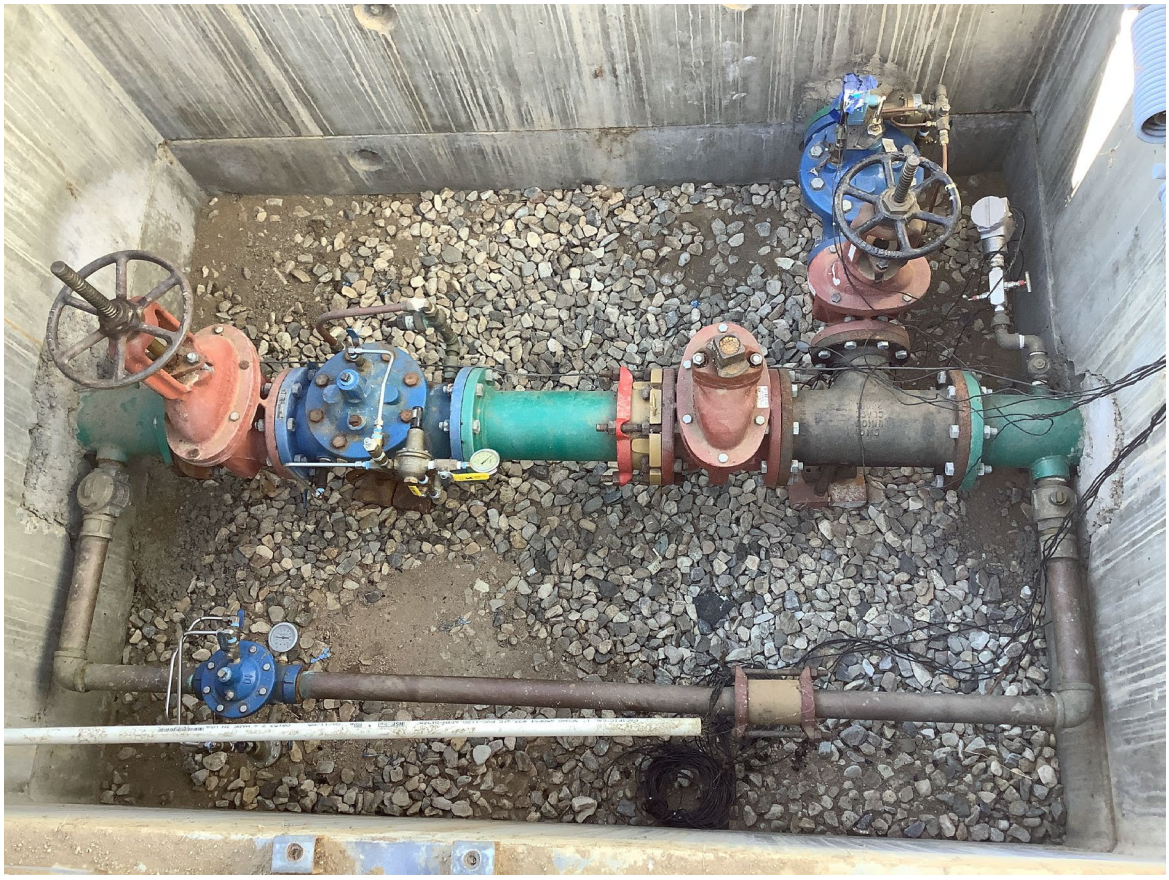
6.8. Pressure Reducing Valve (PRV) Station Capacity Assessment and Reliability

The Monterey water system has 16 pressure reducing valve (PRV) stations that supply water to lower or intermediate zones as a result of the topographic configuration of the water system. Historically, PRV stations were utilized to either reduce high operating pressures to customers, increase customer operating pressures by connecting them to an upper zone, or for new customer service extensions.

The PRV stations can have 1 or multiple valves, some set at different operating pressures. Typically, the PRV stations are located underground installed in vaults, many in roadways or rights-of-way. The PRVs are hydraulically controlled diaphragm valves, usually CLA-Val, as most stations do not have electrical power. In general, the PRV stations are in precast concrete vaults with gravel bottoms for drainage, isolation valves, and PRV by-pass line to allow maintenance

to be performed. The PRV vaults are confined spaces, and access must comply with OSHA 29CFR 1910.146 regulations.

Example of a PRV Shown Below



Annual maintenance is required on the pressure reducing valves, as described in Chapter 12 below, to replace the diaphragm, seals, and pilot valves. Pressure settings are periodically adjusted for seasonal demand changes.

The PRV must have sufficient capacity to deliver the PHD flows to the pressure zone it supplies or the maximum fire flow required for the zone, whichever is greater. A PRV pressure zone shall have redundant valves to meet PHD with the largest PRV out of service. The PRV shall have the capacity range to deliver minimum daily flows up to PHD/fire flows, but the flow range cannot exceed 80% the maximum rated capacity of the valve, nor can the minimum or maximum pressure settings be set at the valve rated minimum/maximum pressure range. As stated in section 6.8 below, the PRV pressure settings cannot allow operating pressures in the zone to drop below 40 psig or exceed 90 psig.

6.9. Distribution System Main Capacity Assessment and Reliability

The capacity assessment and sizing of new and replacement mains shall be based on the Extended Period Simulation (EPS) hydraulic model. The model will include all 4-inch diameter

and larger pipes, with exception where smaller pipes are necessary for the configuration and connectivity. Diurnal usage curves will be developed for each pressure zone based on the SCADA system and field collected data. Hazen-Williams "C" Factor testing shall be performed on primary transmission mains and the remaining pipes shall use the values listed in Table 6-4, below.

Table 6-4: "C" Factor Criteria

Pipe Type	Hazen-Williams "C" Value
Unlined Metallic	100
Concrete	120
Cement Lined Cast Iron	110
PVC	130
Asbestos Cement	120
Existing Cement Lined Ductile Iron	110
Existing Cement Lined Welded Steel	110
Life-Cycle Planning Value for All New PVC Pipe	130
Life-Cycle Planning Value for All New Cement-Lined Metallic Pipe	120

Pipe nodes in the model shall be located at each pipe connection point, branch, and isolation valve. Wells, WTPs, tanks, pumps (with integrated pump curves, adjusted to reflect latest pump test), PRVs, and all fire hydrants shall be included in the hydraulic model. The long-term objective is to simulate the water system and integrate it with the asset registry in the GIS system.

ADD, MDD, PHD, and minimum day demands shall be developed for each pressure zone by meter route and adjusted for seasonal conditions. Customer demands shall be equally distributed on the model nodes based on customer class within each pressure zone. Model simulations shall be run for all demand parameters for current system conditions, 5, 10, and 20-year demand forecasts and emergency scenarios.

A 4-day consecutive MDD scenario shall be analyzed for all planning periods. Fire flow analyses shall be evaluated for each planning horizon under MDD conditions. Specific fire flow analyses will be performed at critical facilities, such as hospitals, medical facilities, first responder facilities, public emergency shelters, and other public building locations.

Age of water analyses shall be performed in all pressure zones over a 30-day simulation for all demand parameters and planning horizons.

EXHIBIT 3-A

Distribution system deficiencies will be identified based on the hydraulic model simulations as compared to the planning parameters listed in Table 6-5. Field verification of the identified deficiencies will be conducted where feasible.

Table 6-5: Distribution System Evaluation Criteria

Planning Parameter		Value
Minimum Pressure (psi)	ADD	40
	MDD	40
	PHD	35
	MDD plus fire flow	20
Maximum Pressure (psi)		90
Design Pipeline Velocity (fps)	ADD & MDD	2-3
Maximum Desirable Pipeline Velocity (fps)	PHD; higher allowed during fire flow	5
Maximum Headloss	Pipe diameter < 16 inches	6 ft per 1000 ft
	Pipe diameter > 16 inches	2 ft per 1000 ft
Age of Water	Minimum Day Demand, ADD, MDD	Desired Maximum Age of Water in Tanks and Mains is 7 days
Pipe Sizes	Nominal Pipe Diameter, no longer use 10", 14" or 20" pipes for new or replacement. Minimum pipe size for new mains is 6-inch and 4-inch for replacement mains. Exceptions for use of 2-inch mains.	Min. 6-inch 8-inch 12-inch 16-inch 18-inch 22-inch 24-inch 30-inch 36-inch
Pipe Material	4" to 12" diameter	PVC Preferred unless near gas stations, fuel storage facilities, or in soils contaminated with hydrocarbon fluids/materials due permeation potential
	16" to 36" diameter	Ductile Iron Pipe (DIP) Preferred unless in highly corrosive soils, then Reinforced Concrete Pipe (RCP)
	Asbestos Cement, Cast Iron, Riveted Steel, and Galvanized Steel pipes will no longer be used.	

EXHIBIT 3-A

<table>
<tr><th colspan="2">Planning Parameter</th><th>Value</th></tr>
<tr><td rowspan="4">Water Main Separation</td><td>• Untreated sewage,
• Primary or secondary treated sewage,
• Disinfected secondary-2.2 recycled water,
• Disinfected secondary-23 recycled water,
• Hazardous fluids such as fuels, industrial wastes, chemicals and wastewater sludge.</td><td>6.3.1 Water mains shall not be installed in the same trench and shall be at least 10 feet horizontally from and 2 feet vertically above, any parallel pipeline conveying these substances</td></tr>
<tr><td>• Disinfected tertiary recycled water,
• Storm drainage,
• Raw Drinking Water</td><td>7.3.1 New water mains and new supply lines shall be installed at least 5 feet horizontally from, and one foot vertically above, any parallel pipeline conveying these substances</td></tr>
<tr><td colspan="2">8.3.1 If crossing a pipeline conveying a fluid listed above, a new or replacement water main shall be constructed no less than 45-degrees to and at least 2 feet above that pipeline. No connection joints shall be made in the water main within ten horizontal feet of the fluid pipeline.</td></tr>
<tr><td colspan="2">9.3.1 Water mains shall not be installed within 100 horizontal feet of the nearest edge of any sanitary landfill, wastewater disposal pond, stormwater retention pond, or hazardous waste disposal site, or within 25 horizontal feet of the nearest edge of any cesspool, septic tank, sewage leach field, seepage pit, underground hazardous material storage tank, or groundwater recharge project site.</td></tr>
<tr><td>Water Main Looping & Isolation Valves</td><td>Adequate looping of water mains and location of water mains</td><td>Maximum of 20 customers connected to a dead-end main or in between 2 isolation valves on a looped main where reasonably feasible. Maximum spacing of isolation valves is 1000 feet</td></tr>
<tr><td>Fire Hydrant</td><td>Follow CA Fire Code Spacing Requirements, (see below), as reasonably feasible</td><td>Maximum hydrant spacing is 750 Feet</td></tr>
</table>

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Planning Parameter		Value
	All hydrants shall be Dry Barrel and have an isolation valve on the bury	Two isolation valves on the main at the hydrant bury connection is desired
Air-Release (AR), Air Vacuum (AV), & Combination Valves	All wells shall have AR and AV or combination valves on the pump discharge. All highpoints in the distribution system mains that have the potential of air accumulation shall have AR and AV valves. Based on specific surge analyses, AR and AV valves shall be install at locations in the distribution piping system that have the potential for water column separation caused by a water transient event.	

Condition assessment ratings shall be designated on each pipe segment or asset (node to node) based on the Desktop Condition Assessment methodology outlined in Chapter 4 of *AWWA M77 – Condition Assessment of Water Mains.*

Distribution main improvement projects will be developed through a weighted integrated risk-based evaluation of alternate solutions to resolve the identified deficiency. This risk scoring, in general, includes factors for water service interruption, environmental impacts, social & community impacts, service reliability to critical customers, funding, O&M cost impacts, and life-cycle cost benefits. Defining these risk factors and the weighting will be developed with input from the public and other stakeholders.

Title 22 Regulations

§64602. Minimum Pressure.

(a) Each distribution system shall be operated in a manner to assure that the minimum operating pressure in the water main at the user service line connection throughout the distribution system is not less than 20 pounds per square inch at all times.

(b) Each new distribution system that expands the existing system service connections by more than 20 percent or that may otherwise adversely affect the distribution system pressure shall be designed to provide a minimum operating pressure throughout the new distribution system of not less than 40 pounds per square inch at all times excluding fire flow.

§64573. Minimum Water Main Size for Community Water Systems.

Newly installed water mains in a community water system shall have a nominal diameter of at least four inches.

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California Fire Code Regulations

TABLE C102.1
REQUIRED NUMBER AND SPACING OF FIRE HYDRANTS

FIRE-FLOW REQUIREMENT (gpm)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS[a, b, c, f, g] (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT[d, f, g]
1,750 or less	1	500	250
2,000-2,250	2	450	225
2,500	3	450	225
3,000	3	400	225
3,500-4,000	4	350	210
4,500-5,000	5	300	180
5,500	6	300	180
6,000	6	250	150
6,500-7,000	7	250	150
7,500 or more	8 or more[e]	200	120

For SI: 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

a. Reduce by 100 feet for dead-end streets or roads.

b. Where streets are provided with median dividers that cannot be crossed by fire fighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis.

c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.

d. Reduce by 50 feet for dead-end streets or roads.

e. One hydrant for each 1,000 gallons per minute or fraction thereof.

f. A 50-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 of the *California Fire Code*.

g. A 25-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 of the *California Fire Code* or Section P2904 of the *California Residential Code*.

6.10. Water System Risk Assessment Criteria

Preparing a comprehensive Water Master Plan providing an assessment of the water system and a roadmap for operational, maintenance, and capital improvements will include performing a risk assessment of the water system operation, facilities, and cyber-security. The findings from the risk assessment are added to the risk score for all facilities/assets and integrated into the improvement recommendations. Risk is defined as:

Risk = (Likelihood of Occurring) x (Vulnerability or Condition) x (Consequence or Impact)

Generally, risks to a water system could include the impacts from:

- Earthquakes
- Severe Storm Events (Local Micro-bursts)
- Floods
- Droughts (Climate Change)
- Vandalism or Terrorist Act

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- Customer Information Data Breach
- SCADA Security Breach
- Power Outage
- Facility Failure
- Asset Failure
- Transmission Main Failure
- Water Storage Tank Failure
- Chemical Spills
- Water Service Interruption – Customer Impact (Capacity Deficiency, Main Break, etc.)
- Water Source Contamination

The District, as owner, intends to expand the risk assessment methodology outlined in *AWWA Standard J100 - Risk Analysis and Management for Critical Asset Protection (RAMCAP) Standard for RISK AND RESILIENCE MANAGEMENT OF WATER AND WASTEWATER SYSTEMS* to include water operational risks, asset consequence of failure, and environmental impacts risks in the overall risk assessment. The resilience or recovery from a risk impact is incorporated into the risk score of the operational activity, facility, and asset. Operational resilience is defined as:

Operational Resilience = Duration x Severity x Vulnerability x Likelihood x Cost Rating

The results of the water system risk assessment will be foundational for preparing a Risk Management Plan as outlined in Section 4.13 Risk Management of *AWWA G410 – Business Practices for Operation and Management*. The District will seek to maintain a risk register and matrix to prioritize and mitigate risks within the water system. The operational, facility, and asset risks are defined in the risk register associated with the likelihood of occurring, risk exposure (vulnerability), and consequence of failure (impact) ratings. The risk matrix integrates the operational resilience rating providing an overall risk score associated with mitigation measures to minimize the risk.

The risk assessment findings will also be integrated into the District's Emergency Response Plan (ERP) which will implement the practices outlined in *AWWA Standard G440 - Emergency Preparedness Practices.*

The objective of the risk assessment process is to integrate the risk scores in the alternative analysis of operational or improvement project resolution of identified deficiencies. The risk scores of the recommended improvements will be combined with the asset condition rating in the risk-based project prioritization process described in Chapter 13 – Capital Improvement Plan.

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6.11. Asset Condition Assessment and Reliability Criteria

The District has adopted an asset management program as indicated in the Strategic Goal No. 6 summarized in Chapter 5 above. A description of the Asset Management Program is presented in Chapter 13. The Water Master Plan integrates the asset condition rating as a component of the project alternative analysis and recommended improvement projects.

The District's Asset Management Plan (AMP) will be prepared based on the *AWWA Standard G410, Section 14; AWWA M77; and AWWARF Research Project No. 4002 - Asset Management Roadmap*. Some of the key attributes of the AMP and process are:

- Defining assets and asset classes
- Implement asset numbering system
- Create asset database platform, data requirements, and IT interfaces
- Defining "failure" of each asset type
- Define asset data collection requirements
- Create asset inventory and registry
- Establish asset condition assessment rating criteria and associated remaining useful life estimates for each asset class
- Create condition assessment inspection, testing, and methodology for each asset type
- Prepare facility and asset class criticality analyses and rating
- Combine asset condition rating with criticality rating and rank assets

The asset condition ranking is defined as:

Equipment Asset Ranking = Facility Criticality x Asset Criticality x Asset Condition

Pipeline Asset Ranking = Main Criticality x Condition Rating x Customer Impact

The Water Master Plan shall identify the facilities and assets impacted by each operational deficiency/resolution resulting from the water system planning process and combine the Asset Ranking and Asset Risk Score to prioritize the recommended improvements.

Recommended Project Ranking = Asset Ranking x Risk Score

The text box on the next page shows an exercise in ranking asset needs for pump station capacity based on scoring incoming Power equipment, suction/Discharge Piping, Pumps/Motors, and Switchgear.

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Project Example: Pump Station Capacity Deficiency in 5 Years

1. Impacted Assets – Two booster pumps, electrical switchgear, incoming electrical power facilities, and suction and discharge piping
    a. Capacity of incoming electrical equipment and suction/discharge headers is sufficient – Condition rating – 1.5 and 2 respectively
    b. Pumps, motors, and switchgear have insufficient capacities – Condition rating, Pump #1 – 4.2, Pump #2 – 3.8, switchgear #1 – 2.5, #2 – 3.5
2. Facility Criticality Rating (1 to 10) – 7
3. Asset Criticality Rating (1 to 10):
    a. Incoming Power equipment – 10
    b. Suction/Discharge Piping – 8
    c. Pumps/Motors – 5 (Has Redundancy)
    d. Switchgear – 6
4. Risk Score (Asset Failure & Service Interruption – 1 to 20):
    a. Incoming Power Equipment – 1
    b. Suction/Discharge Piping – 5
    c. Pumps/Motors – 15
    d. Switchgear – 10
5. Asset Ranking (Condition Rating x Criticality Rating):
    a. Incoming Power Equipment = 7 x 1.5 x 10 = 105
    b. Suction/Discharge Piping = 7 x 2 x 8 = 112
    c. Pump/ Motor #1 = 7 x 4.2 x 5 = 147
    d. Pump/ Motor #2 = 7 x 3.8 x 5 = 133
    e. Switchgear #1 = 7 x 2.5 x 6 = 105
    f. Switchgear #2 = 7 x 3.5 x 6 = 147
6. Project Ranking:
    a. Incoming Power Equipment = 105 x 1 = 105
    b. Suction/Discharge Piping = 112 x 5 = 560
    c. Pump/ Motor #1 = 147 x 15 = 2205
    d. Pump/Motor #2 = 133 x 15 = 1995
    e. Switchgear #1 = 105 x 10 = 1050
    f. Switchgear #2 = 147 x 10 = 1470
7. Project Prioritization:
    a. Replace Pump/Motor #2 & Switchgear #2 = 1995 + 1470 = 3465
    b. Replace Pump/Motor #1 & Switchgear #1 = 2205 + 1050 = 3255

- Highest Rating Value = Worst Condition, Most Critical, & Highest Risk
- A Total Facility Ranking = Addition of all asset class rankings

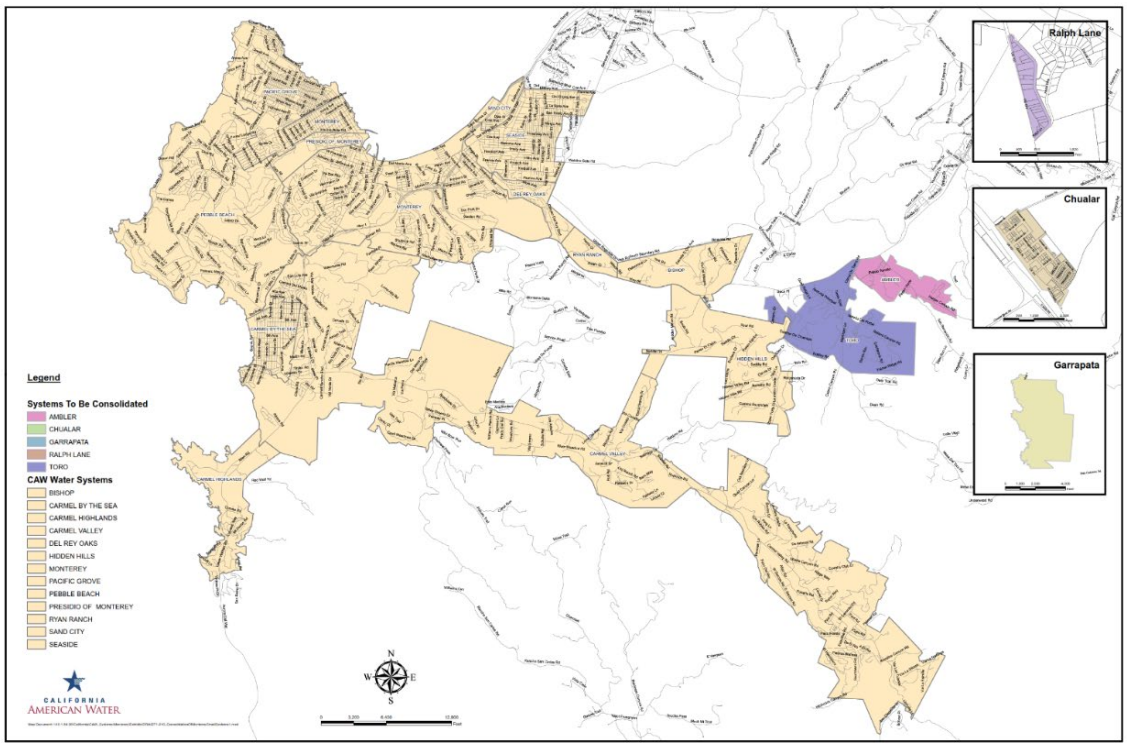
7. Monterey Peninsula Water Supplies

7.1. General

Cal-Am provides water and wastewater service to the Central Division. The Central Division is comprised of the Monterey County District, the Central Satellites, and the Monterey Wastewater District. The water system, which is comprised of the Monterey County District and the Central Satellites, serves approximately 40,000 customer connections and a population of approximately 99,794.[4]

The "Main" system within the Monterey County District serves approximately 39,730 customers and includes customers within the incorporated cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley and Pebble Beach. The Main system is generally located within the MPWMD boundaries. The Monterey County District also includes the service areas of Bishop (approx. 385 customers), Hidden Hills (approx. 454 customers), and Ryan Ranch (approx. 212 customers), that are also within the MPWMD boundaries. The Central Satellite areas, not subject to acquisition by MPWMD, include the areas of Ambler Park, Ralph Lane, Chualar, Toro, and Garrapata, which are located outside of MPWMD boundaries and serve a total of approximately 1,086 customers. A map depicting Cal-Am's water system areas within the Central Division is provided in Figure 7-1.

Figure 7-1: Cal-Am Central Division Water Systems[5]



[4] 2018 Annual Report of District Water System Operations for the Monterey County District, filed by Cal-Am for the CPUC, p.16 and 17.
[5] Cal-Am Service Area Map as of 2013.

7.2. Sources of Supply

Currently, water supply for most customers comes from: (a) underflow in the Carmel River Alluvial Aquifer withdrawn from shallow wells in Carmel Valley, (b) mid-depth and deep wells in the Seaside Basin, and (c) deep wells along Highway 68 corridor. Since 2003, Cal-Am has not pumped any of its supply directly from the Carmel River. Most of the Carmel River withdrawal comes from shallow wells located near the river in its lower reaches.[6]

Carmel River

The Carmel River is a 38-mile river that flows through Monterey County and into the Pacific Ocean. Historically, damming of the river and diverting its flow for municipal use spurred developments on the Monterey Peninsula, including the Del Monte Hotel (now part of the Naval Support Activity, Monterey), the Pebble Beach area, and Cannery Row in Monterey. The river was dammed at three locations upstream of the present-day Carmel Valley Village between 1883 and 1948; until the late 1950s, surface flow in the river supplied most of the municipal demand of the Monterey Peninsula.

Severe declines in returning steelhead numbers and significant degradation of the river's resources occurred over several decades beginning in the late 1970s. Municipal demand and sediment accumulation in the reservoirs accelerated in the 1970s along with the impacts of direct diversion of surface flow, which became unacceptable. The portion of municipal demand met by direct diversion of surface flow at San Clemente Dam was initially ratcheted down in the early 1980s by agreement between Cal-Am, California Department of Fish and Wildlife ("CDFW"), and MPWMD.

As a result of four complaints filed against Cal-Am in the 1980s about impacts to Carmel River resources from diversions, the State Water Resources Control Board ("SWRCB") determined in 1995 that Cal-Am was diverting about 10,730 acre-feet per year (AFY or AFA) from the Carmel River and its underflow without a valid basis of right. The SWRCB ordered the company to replace the unlawful diversions with lawful sources. SWRCB WR Order 95-10 described that Cal-Am's withdrawals from the Carmel River constituted the largest single impact to instream beneficial uses of the river.

The SWRCB action reduced Cal-Am's rights to diversion to storage at Los Padres Reservoir to 2,179 AFY[7] and recognized other riparian and pre-1914 water rights associated with Cal-Am property along the river and San Clemente Dam. Surface diversions to the Carmel Valley Filter Plant at San Clemente Dam ceased in 2002. Since that time, surface flow impounded along the river has been used to augment dry season flows in the Carmel River to benefit threatened Carmel River steelhead and other species dependent on river flows.

In 2013, the National Marine Fisheries Service determined that all the dams on the river blocked passage for steelhead listed as threatened under the Endangered Species Act and

[6] Cal-Am 2019 General Rate Case Proposed Application, Exhibits A-D, Chapter 1, pg 1.

[7] SWRCB Order 95-10 limited Cal-Am's diversion right due to siltation in the reservoir (see footnote 15, p. 25). San Clemente Dam is the only described point of re-diversion in License 11866 and this point of re-diversions has been removed; however, Order 95-10 requires Cal-Am to divert at the lower-most wells along the river.

needed to be removed or modified.[8] Two dams were removed after they were determined to be obsolete and/or unsafe.[9]

Cal-Am is the current owner of the remaining Los Padres Dam and Reservoir at approximately 25 miles upstream of the ocean. The reservoir, built in 1948 by California Water & Telephone, had an original storage capacity estimated at 2,709 acre-feet. [10] By 2017, storage capacity was reduced to 1,679 acre-feet due to sediment accumulation over its nearly 70 years of operation.[11] Cal-Am currently relies on a portion of the water rights associated with the dam to provide about 20% of the Monterey Peninsula's existing demand. Cal-Am has legal rights to 3,376 AFA from the Carmel River comprised of 2,179 AFA from License 11866, 1,137 AFA of pre-1914 appropriative rights, and 60 AFA of riparian rights. This does not include what is referred to as Table 13 rights, discussed under "*Other Available Supplies*" below.

The watershed contributing to Los Padres Reservoir is highly erosive and subject to periodic wildfires followed by intense rainfall that have resulted in about a 40% reduction in surface storage capacity over the 70-year life of the reservoir. In 2013, it was estimated that the reservoir has a useful life between 20 and 134 years. More recent analysis based on periodic bathymetric surveys indicates that at the present long-term sedimentation rate, reservoir capacity in the year 2100 may approach 1,000 acre-feet, or less than one-third of original capacity.[12]

Sediment removal alternatives were investigated to increase the reservoir's capacity to as high as 95% of its original storage capacity. These alternatives are costly, however, with plans ranging between $47-$90 million and would cost $53,000-$112,000 per acre-foot removed.[13] These costs exclude the costs for steelhead passage improvements that could range from under $10 million to over $100 million.[14] With a height differential of just over 120 feet from the dam spillway to its plunge pool, Los Padres Dam and Reservoir remains a challenge to provide adequate facilities to freely pass steelhead. MPWMD and Cal-Am continue to investigate alternatives to improve passage and manage sediment at the site.

[8] P. 7-12, National Marine Fisheries Service. 2013. South-Central California Coast Steelhead Recovery Plan. West Coast Region, California Coastal Area Office, Long Beach, California.

[9] San Clemente Dam and Reservoir, which was built in 1921 at RM 18.6 and originally stored up to 1,810 acre-feet with flashboards installed, stored 70 acre-feet of water as of 2008 after years of severe sediment accumulation. It was removed in 2015 in response to public safety concerns about the dam's resiliency to earthquakes and major floods. It was the largest dam removal in California history at the time. The Old Carmel River Dam, built in 1883 with Chinese laborers at RM 18.3, was removed in 2016.

[10] Prior to 2017, estimates of the original storage capacity of the reservoir cited in the record varied from 3,030 acre-feet to 3,200 acre-feet. The SWRCB licensed a storage right of 3,030 AFY in 1986. In 2017, it was determined that the original capacity was incorrectly estimated. See Los Padres Dam and Reservoir Alternatives and Sediment Management Study Final Sediment Characterization Technical Memorandum, Prepared by: AECOM, prepared for MPWMD in cooperation with California American Water, December 2017.

[11]Smith, D.P., Kvitek, R., Iampietro, P., and Consulo, P., 2018, Fall 2017 Stage-Volume Relationship for Los Padres Reservoir, Carmel River, California: Prepared for the Monterey Peninsula Water Management District. The Watershed Institute, California State University Monterey Bay, Publication no. WI-2018-05, 21 pp.

[12] MPWMD analysis of historical bathymetric survey data.

[13] Los Padres Dam Sediment Removal Feasibility Study, dated April 2013, pg. 1 (2013) https://www.mpwmd.net/wp-content/uploads/MWH-Cal-Am-LPD-Study-Report-Final-20130425.pdf

[14]Los Padres Dam Fish Passage Study Technical Review Committee Meeting No. 3, Evaluate Alternatives, January 17, 2018.

Seaside Basin

The Seaside Basin underlies the cities of Seaside, Sand City, Del Rey Oaks, Monterey, and portions of unincorporated county areas, including the southern portions of Fort Ord, and the Laguna Seca Area. Generally, the Seaside Basin is bounded by the Pacific Ocean on the west, although it is recognized that the aquifer extends offshore under the seafloor, the Toro Park area on the east, Highways 68 and 218 on the south, and the northern boundary of the basin follows a groundwater flow divide separating groundwater flowing toward the Salinas Valley from groundwater flowing toward the coastal subareas of the Seaside Basin. Flow divides are hydraulic features that develop between two centers of concentrated pumping. The divide acts like a ridge in the regional water-level surface much like the way a topographic ridge separates two surface watersheds. The Seaside Basin consists of subareas, including the Coastal subarea and the Laguna Seca subarea in which geologic features form partial hydrogeologic barriers between the subareas. The Seaside groundwater basin has been pumped by Cal-Am to a degree that exceeds the basin's sustainable yield.[15]

Cal-Am filed the action which initiated adjudication on August 14, 2003. The defendants were the City of Seaside, the City of Monterey, the City of Sand City, the City of Del Rey Oaks, Security National Guaranty, Inc., Granite Rock Company, D.B.O. Development Company No. 27, Muriel E. Calabrese 1987 Trust, Alderwoods Group (California), Inc., Pasadera Country Club, LLC, Laguna Seca Resort, Inc., Bishop, McIntosh & McIntosh, and The York School, Inc. A decision was entered March 2006 and was amended in February 2007 to allow Cal-Am to combine its production from the Coastal Subareas and Laguna Seca Subarea in determining its compliance with its assigned production allocation.

Based on estimates of then-recent basin extractions of approximately 5,600 AFY, the Court concluded that the basin was in overdraft. That conclusion was confirmed in the adjudication decision which established a "Natural Safe Yield" for the Seaside Basin of 3,000 AFY. The 2006 Seaside Groundwater Basin adjudication imposed triennial reductions in operating yield for Standard Producers such as Cal-Am until the basin's Natural Safe Yield is achieved. The last reduction will occur in 2021 and Cal-Am will have rights to 1,474 AFA. However, with the delivery of a long-term permanent water supply, the company would like to begin replacing its accumulated deficit of over-pumping through in-lieu recharge by leaving 700 AFA of its production right in the basin for 25 years. Hence, only 774 AFA is reflected as long-term supply available, although the additional 700 AF becomes available again in the future.

Aquifer Storage and Recovery

MPWMD developed an Aquifer Storage and Recovery ("ASR") program utilizing available storage in the Seaside Basin. The ASR program entails diversion of excess winter flows from the Carmel River for storage in injection/recovery wells in the Seaside Aquifer for withdrawal in the summer months to reduce pumping from the river. Winter flows are considered excess only when they surpass what is necessary to shelter the river's threatened steelhead trout population. Phase 1 of the ASR project was completed in 2008 and allows for a maximum

[15]Todd Groundwater http://www.toddgroundwater.com/seaside-injection.html

annual diversion of about 2,400 AFY from the Carmel River, and an average yield of approximately 920 AFY. Phase 2 of the project, completed in 2013, involved constructing two ASR wells designed to store up to 2,900 AFY and provide an average yield of 1,050 acre-feet of additional water supply.[16] For water supply planning purposes, ASR is estimated to produce an average of 1,300 acre-feet annually.

Sand City Desalination Plant

Sand City Coastal Desalination Plant is a brackish seawater desalination facility. It was designed to be capable of producing 300 acre-ft of water (98 million gallons approximately) per year and uses reverse osmosis (RO) process to desalinate brackish seawater. The Sand City plant has failed to achieve more than the 276 AF in 2011. Due to source water quality issues and discharge permit requirements the plant has averaged 188 AFA the four years ending water year 2019. The intakes will likely be augmented and production increased (see "*Other Available Supplies*", below.) Here only the 94 AFA of long-term production legally committed to offset Carmel River pumping is included in the combined supply availability.

The plant became operational in April 2010. The facility includes four brackish water feed wells, a concentrate disposal well and associated pipelines and components. Of the four wells that are used to pump sea water to the plant, two are in use at any given time. These are over 18 meters (m) deep and located 61m from the surf line and over 760m from the plant. Cal-Am operates the plant under a lease with the City of Sand City, the developer of the project.

Monterey Peninsula Water Supply Project

The Monterey Peninsula Water Supply Project ("MPWSP") is an initiative to create an ocean desalination plant with sub-surface intake wells, as well as related desalination facilities such as source pipelines, water product pipelines, and brine disposal systems. This project resulted from Court-ordered reductions in water sourcing from the Carmel River and as a safeguard against drought and basin overuse that could result in seawater intrusion. This desalination plant will use reverse-osmosis technology and use slant wells to avoid the impacts to marine life that are posed by open ocean intakes. The 7-mile pipeline to deliver water from the desalination plant and Pure Water Monterey projects has already been constructed. The desalination plant is expected to be able to deliver 6.4 MGD or 6,252 acre-feet of water annually and is expected to cost $322 million to complete.[17] The brine resulting from the desalination process will be discharged to the ocean through Monterey One Water's existing outfall. Monterey One Water is a regional agency providing wastewater treatment services in the region. The desalination facilities are anticipated to be commissioned in 2022 or 2023. In June 2019, it was announced that The California Department of Water Resources will provide a $10 million grant to the utility to help fund this desalination project.[18]

[16] https://www.mpwmd.net/water-supply/aquifer-storage-recovery/
[17] Water Supply Project https://www.watersupplyproject.org/about
[18] Water Supply Project Update (2019) https://www.watersupplyproject.org/single-post/2019/06/20/CALIFORNIA-AMERICAN-WATER-DESALINATION-PROJECT-AWARDED-10-MILLION-STATE-GRANT

Pure Water Monterey Project

The Pure Water Monterey ("PWM") project is a water supply project jointly developed by MPWMD and Monterey One Water that will provide purified recycled water for recharge of the Seaside Basin that serves as a drinking water supply, and recycled water to augment the existing Castroville Seawater Intrusion Project's crop irrigation supply. By sourcing reclaimed wastewater, stormwater, food processing water, and impaired surface water, this initiative seeks to replenish groundwater, as well as provide water for domestic and irrigating uses.[19] This program became operational in 2020 and will yield 3,500 acre-feet of potable water annually.[20]

An expansion of PWM has been contemplated as a less expensive and more appropriately sized alternative to the desalination plant, as discussed in more detail below. The expansion of Pure Water Monterey is expected to yield 2,250 AFA.[21] The source waters for the expansion are secure: In multiple presentations by the staff of Monterey One Water (M1W)[22] it has been shown that none of the source water for expansion of Pure Water Monterey is speculative, nor comes from Salinas valley sources for which M1W doesn't already have rights. In one example, source water for the expansion would come from ocean discharge from the Regional Treatment Plant (54%), the Reclamation Ditch (5%), Blanco Drain (10%), wastewater outside the prior M1W boundaries (30%), and summer water rights from the County Water Resource Agency (1%). This project could come online by late 2022.

Other Available Supplies

There also exists approximately 406 additional acre-feet of other available supplies. In 2013, Cal-Am received Permit 21330 from the State Water Board for 1,488 AFA from the Carmel River. However, the permit is seasonally limited to December 1 through May 31 each year and subject to instream flow requirements. As a result, actual production will vary by water year. Here, we have assumed 300 AFA on average. For the Sand City desalination plant the amount produced in excess of 94 AFA is available for general Cal-Am use and eventually to serve growth in Sand City. With new intakes, we have assumed average production of 200 AFA or 106 AFA of other available supply. There is also available unused capacity in the Seaside Basin which annually is reallocated to the Standard Producers such as Cal-Am as "Carryover Credit" under the adjudication decision. Such Carryover capacity has been on the order of 400 AFA recently. While not insignificant, Carryover Credit has not been included in the 406 AFA of "Other Available Supplies" stated earlier.

7.3. Combined Supply Availability

Available sources of supply are shown in Table 7-1 below. Supply is shown with both desalination and with PWM expansion as a back-up.

[19] MPWMD Website https://www.mpwmd.net/water-supply/pure-water-monterey/
[20] Water Supply Project https://www.watersupplyproject.org/about
[21] Notice of Preparation of a Supplemental Environmental Impact Report and Public Scoping Meeting Notice, page 4, May 15, 2019
[22] For example, November 12, 2019 M1W presentation to the Monterey County Farm Bureau and the Grower-Shipper Association and the September 30-2019 M1W board meeting

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Table 7-1
Monterey Peninsula Available Supply
(Acre-Feet Annually)

Supply Source	w/ Desalination	w/ PWM Expansion
MPWSP Desalination Plant	6,252	0
Pure Water Monterey	3,500	3,500
PWM Expansion	0	2,250
Carmel River	3,376	3,376
Seaside Basin	774	774
Aquifer Storage & Recovery (ASR)	1,300	1,300
Sand City Desalination Plant	94	94
Total Available Supply	**15,296**	**11,294**

8. Economic & Population Growth

8.1. Demand Forecast

The MPWSP was initially sized solely as a replacement supply[23] for current customer demand, but this has changed over time as described below. Consideration was also given to peak month and peak day. Additional demand was recognized to accommodate legal lots of record, a request by the hospitality industry to anticipate a return to occupancy rates similar to that which existed prior to the World Trade Center tragedy, and to shift the buildout of Pebble Beach off the river.[24] Table 8-1 below shows the demand assumptions originally used in sizing the MPWSP in the April 2012 application to the California Public Utilities Commission (CPUC). Each component is discussed below.

Table 8-1
Water Demand Assumed in Sizing the MPWSP
(Acre-Feet Annually)

Demand Component	Acre-Feet Annually
Average Current Customer Demand	13,290
Legal Lots of Record	1,181
Tourism Bounce-Back	500
Pebble Beach Buildout	325
Total Water Demand	**15,296**

The District recently adopted a demand forecast that reviewed the demand components. Table 8-2 shows the range of demand estimates have been revised. These long-term demand estimates can be compared to existing current demand to determine how much water supply is needed.

Table 8-2
Range of Potential Demand Scenarios in MPWSP Sizing
(Acre-Feet)

Demand Component	Revised High	Revised Low
Average Current Customer Demand	10,863	9,817
Legal Lots of Record	1,014	864
Tourism Bounce-Back	250	100
Pebble Beach Buildout	160	103
Total Water Demand	**12,287**	**10,884**

[23] Direct Testimony of Richard C. Svindland, April 23, 2012, pages 4,5,7
[24] Supplemental Testimony of Richard C. Svindland, January 11, 2013, pages 4-5

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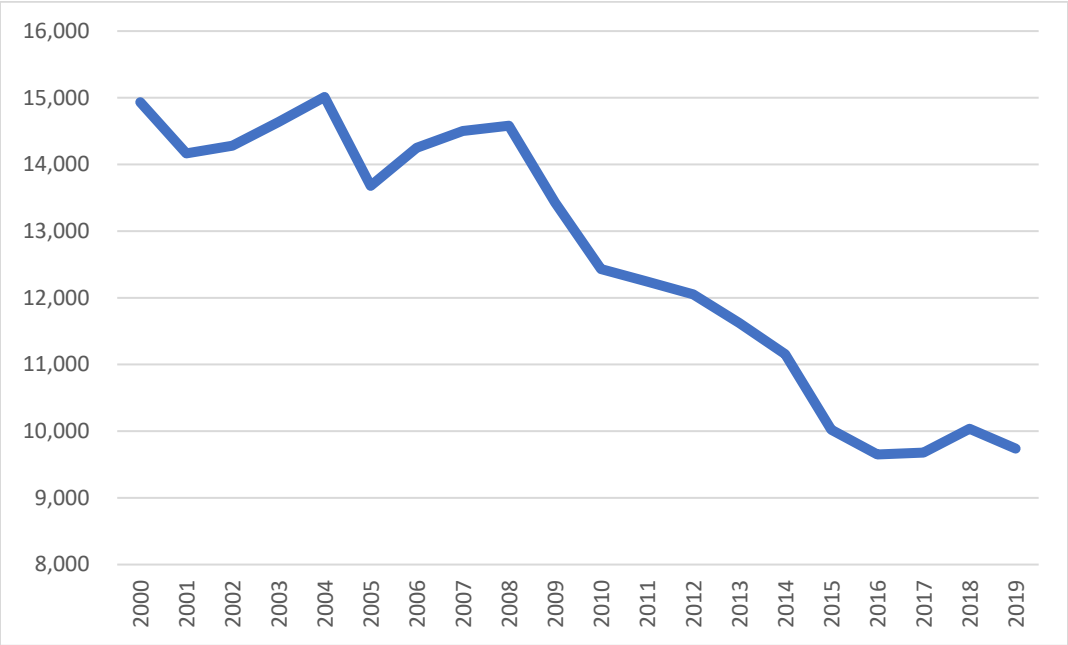
Figure 8-1 below shows water production for customer service, a proxy for customer demand, for the past twenty-one-year period, through Water Year 2019. As can be seen, demand has been in decline, but somewhat leveled out over the last five years.

Figure 8-1
Annual Water Production for Customer Service (Demand)
Last 21 Years
(Acre-Feet)



As a measure of existing demand, Table 8-3 shows the 10-, 5-, and 3-year average demand.

Table 8-3
Alternate Average Current Customer Demand Assumptions
Updated for 2019 Water Year
(Acre-Feet)

Period	Amount
10-Year Average - Actual	10,863
5-Year Average - Actual	9,825
3-Year Average - Actual	9,817

Hence, the case could be made that the average existing customer demand assumption in the sizing of new water supply should be 9,817 to 10,863 AFA.

The trend is similar for peak month demand: 10-year maximum month through 2018 was 1,111 AF, the 5-year max was 966 AF, and the 3-year max was 950 AF. By comparison, the maximum month at the time the plant was first sized was 1,532 AF. The proposed desalination plant, in conjunction with the other production facilities can meet peak month/peak day requirements.

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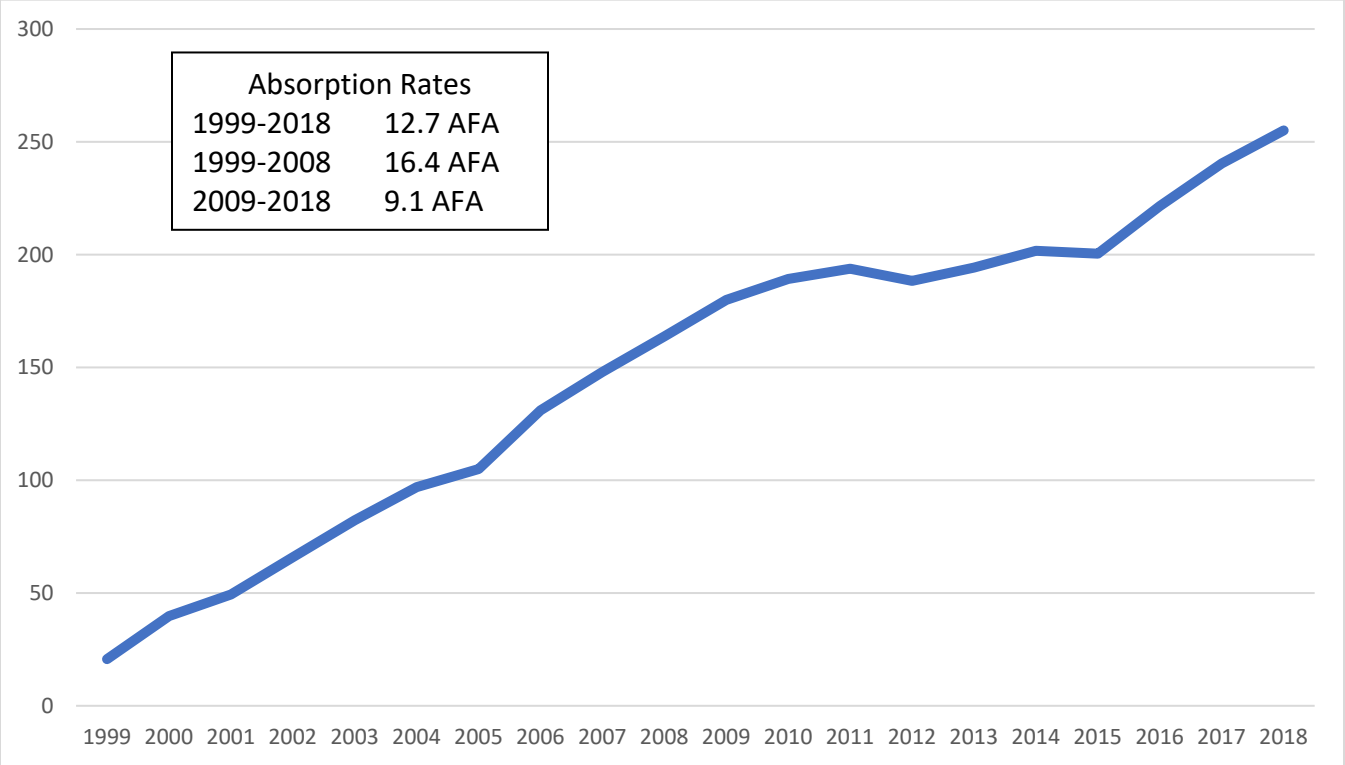
Pure Water Monterey expansion adds 4 new extraction wells, two for production and two for redundancy. Analysis shows that peak month/peak day can also be met with Pure Water Monterey expansion.

However, the ability of the Monterey Peninsula to generate or "absorb" the housing and commercial growth will help determine when such water supply is needed. Figure 8-2 shows the past 20 years of market absorption of water demand based on water permits issued. The average growth or absorption in water use was 12.7 AF per year. The first decade preceded the CDO and was a period of relative economic stability, available property, no moratorium on new service connections, and lower water rates resulting in 16.4 AF per year of absorption. The second decade was after the CDO and moratorium on service connections and understandably had a lower absorption rate of 9.1 AF per year.

Figure 8-2
Market Absorption of Water Demand
Last 20 Years
(Acre-Feet)

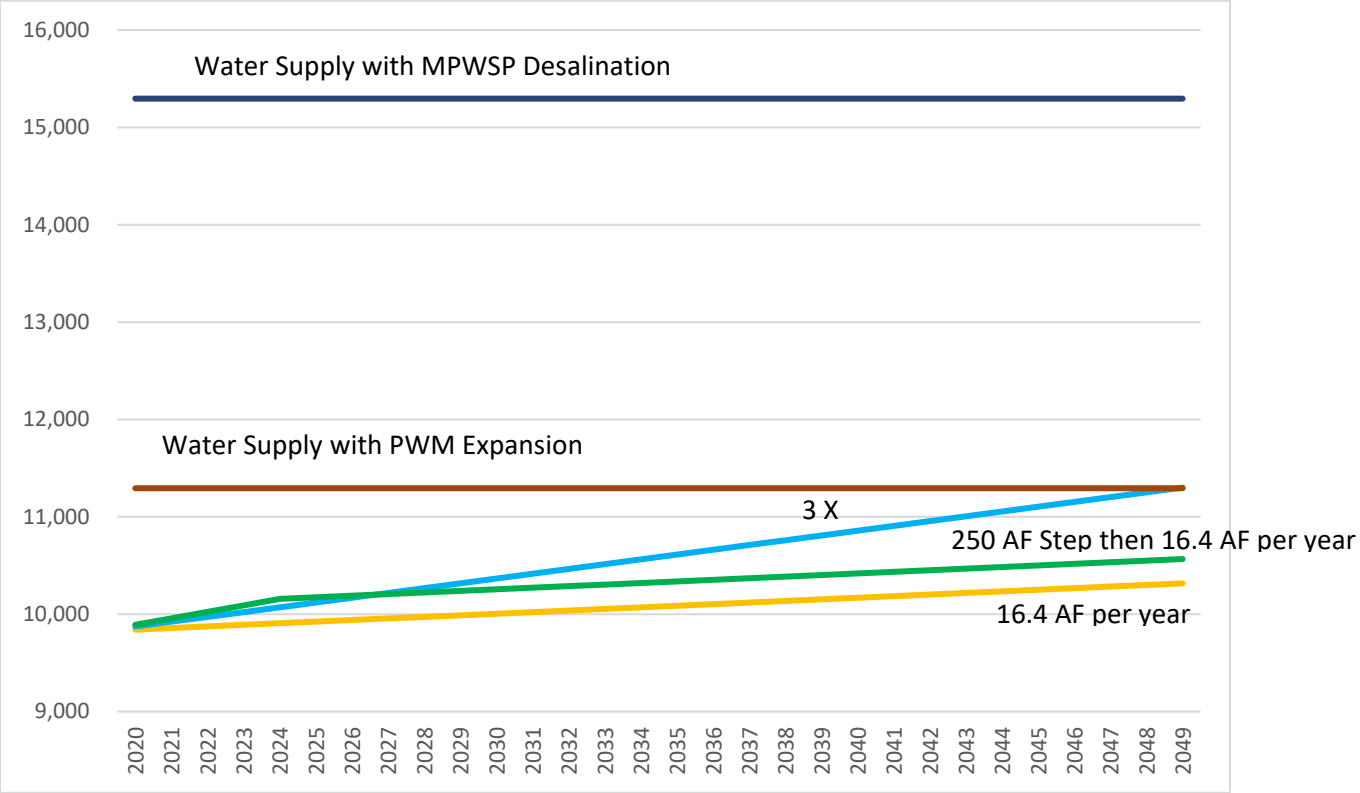


By adopting assumptions about current demand and market absorption rates, it can be determined the sufficiency of certain supply alternatives over time.

Scenario 1: Supply v Demand Using Pre-CDO Absorption Rate Scenarios: In Figure 8-3, the current demand assumption of 9,825 AF (most recent 5-year average) is shown with three market absorption rates: (a) 16.4 AF per year (pre-CDO decade rate), (b) three times that rate,

and (c) 250 AF over the first five years on top of the pre-CDO rate. These are also compared to the two supply alternatives in Table 7-1.

Figure 8-3
Market Absorption of Water Demand Compared to Water Supply
Current Demand at 5-Year Average
Pre-CDO Growth Rate Alternatives
(Acre-Feet)



This chart shows that, assuming a starting current demand at the 5-year average, both water supply alternatives meet 30-year market absorption at the historical rate, 250 AF in the first 5 years on top of the historical rate, and at 3-times the historical absorption rate.

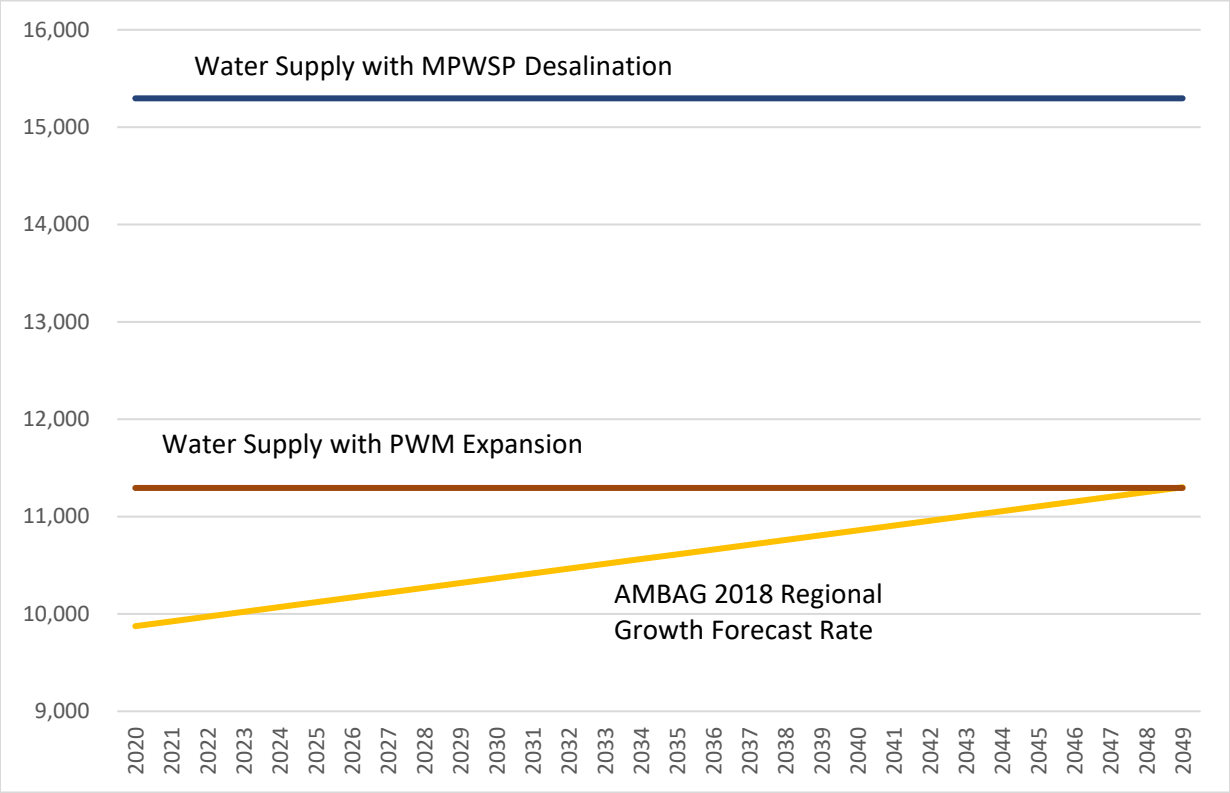
Scenario 2: Supply v Demand Using 3rd-Party Growth Forecast Absorption Rate: Rather than to rely on pre-CDO absorption of water demand or alternative theoretical future demand scenarios, as was done in the September report, it is instructive to instead look at a regional growth forecast by an objective third-party. Here, we evaluated AMBAG's 2018 Regional Growth Forecast, specifically the subregional population forecast as a proxy for residential water demand, and the subregional employment forecast, using job growth as a proxy for commercial water demand. (Certainly, other factors could be considered.)

AMBAG implemented an employment-driven forecast model for the first time in the 2014 forecast and contracted with the Population Reference Bureau (PRB) to test and apply the model again for the 2018 Regional Growth Forecast (RGF). To ensure the reliability of the

population projections, PRB compared the employment driven model results with results from a cohort-component forecast, a growth trend forecast, and the most recent forecast published by the California Department of Finance (DOF). All four models resulted in similar population growth trends. As a result of these reliability tests, AMBAG and PRB chose to implement the employment-driven model again for the 2018 RGF.[25]

Using this methodology, the total water demand increase in the 20 year study period is 984 AF or 49.2 AFA. Applying the 49.2 AFA linearly across a 30-year horizon results in the demands shown in Figure 8-4.

Figure 8-4
Market Absorption of Water Demand Compared to Water Supply
Current Demand at 5-Year Average
AMBAG 2018 Regional Growth Forecast
(Acre-Feet)



This chart shows that, assuming a starting current demand at the 5-year average (inclusive of water year 2019), both water supply alternatives meet 30-year market absorption at the AMBAG 2018 Regional Growth Forecast rate.

Scenario 3: Supply v Demand Using "Pent-Up Demand" Plus AMBAG Growth Forecast Absorption Rate: The Regional Growth Forecast is intended to include new housing starts for increasing population, and new commercial businesses for job formation. However, several

[25] 2018 Regional Growth Forecast, Technical Documentation, Association of Monterey Bay Area Governments (AMBAG), June 2018, page 5

cities have approved and unbuilt projects that might happen more quickly once a permanent water supply becomes available and new meters can be set.

Examples of housing projects include Garden Road and Strangio in Monterey, Del Dono in Carmel, South of Tioga in Sand City, and various mixed-use projects and ADUs throughout the service area. Example non-residential projects include almost 120,000 square feet of commercial space at Ocean View Plaza in Monterey, approximately 1,250 rooms across five hotels in Pacific Grove (2) and Sand City (3). Hotels have their own demands and the guests can increase demand at local establishments. There can also be variability in students and service members attending MIIS, MPC, NPS, DLI, or living in the service area attending other institutions.

There is little likelihood that the market can absorb all of this quickly, but if it did there might be assumed to be something similar to the following pent-up near-term demand:

Table 8-4
Potential Near-Term Demand
(Acre-Feet)

Type of Demand	Acre Feet Required
1,250 Hotel Rooms X 0.064 AF/room	80
1.5 guests/room X 1,250 rooms X 75% occupancy X 0.02 AF/restaurant seat	28
200,000 new square feet of commercial space X 0.00007 AF/sq.ft.	14
1,000 new students X 57 gal/day X 260 days/Year	45
Approved but Unbuilt Housing	100
TOTAL Near-Term Demand	267

Figure 8-5 shows what the supply and demand relationship would be if this 267 AFA is added to the first five years, on top of the AMBAG Growth Forecast. The chart shows that, assuming a starting current demand at the 5-year average (inclusive of water year 2019), Pure Water Monterey Expansion meets 24-year market absorption, and the MPWSP desalination plant exceeds 30-year demands.

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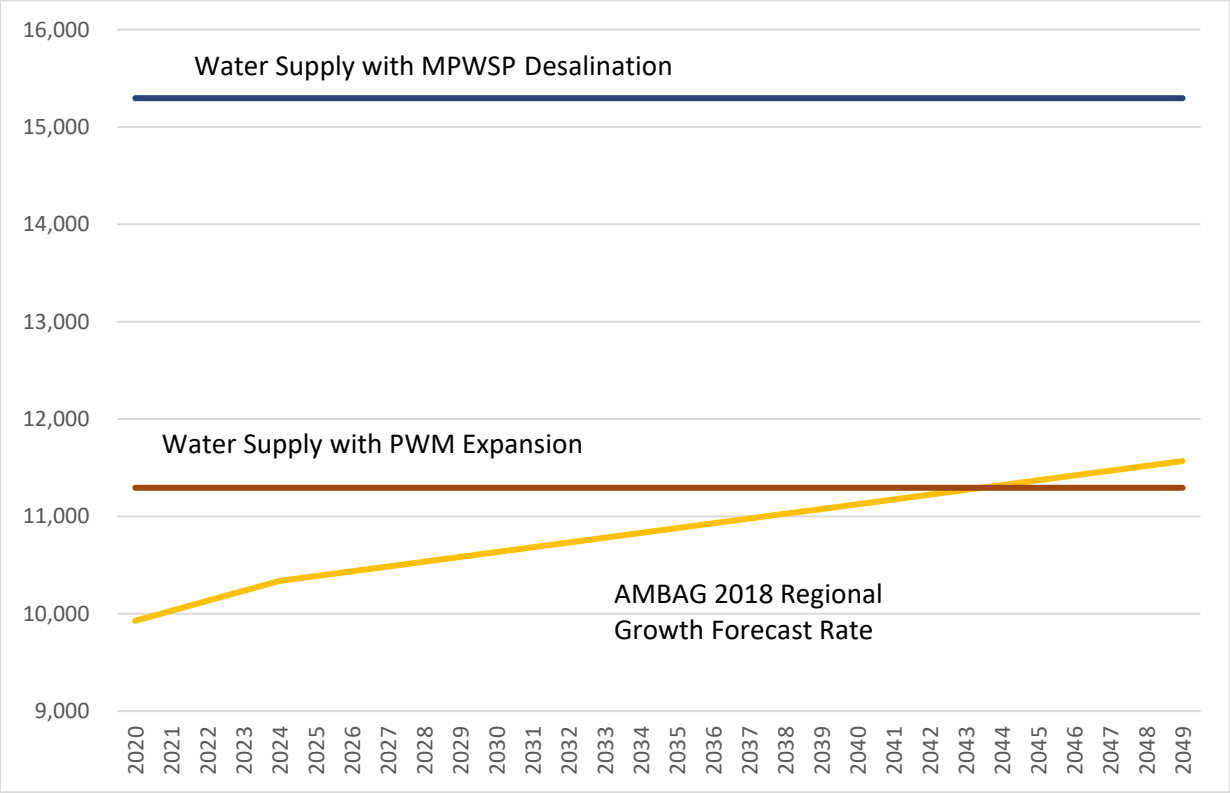
Figure 8-5
Market Absorption of Water Demand Compared to Water Supply
Current Demand at 5-Year Average
"Pent-Up" Demand in first 5 Years plus AMBAG 2018 Regional Growth Forecast
(Acre-Feet)



Principal conclusions of the demand projections are:

- Either supply option can meet the long-term needs of the Monterey Peninsula
- Either supply option is sufficient to lift the CDO
- The long-term needs of the Monterey Peninsula may be less than previously thought

Several factors will contribute to pressure on decreasing per capita water use, as discussed in the next section.

8.2. Water Conservation & Demand Management

The District conducts a number of programs to reduce potable water use and increase water efficiency. These programs include mandatory requirements for new construction, remodels/additions, changes in use/ownership, and efficiency requirements for all residential and non-residential users. The District enforces prohibitions on water waste and inefficient use of water. Enforcement is achieved through site inspections and deed restrictions, through permit coordination with local land-use agencies, and by partnerships with Cal-Am. The District

also administers a comprehensive and aggressive rebate program and offers water saving devices and equipment free of charge. The rebate program and devices are funded primarily by Cal-Am ratepayers and will be easily folded into District operations after acquisition. Similarly, Cal-Am's Waterwise house call program will dovetail nicely into the District's Water Demand Division. The District and Cal-Am already coordinate on public outreach and training in the conservation area.

The effectiveness of the District's conservation programs, combined with a tiered rate structure, is shown in Figure 8-6 on the next page.

On May 31, 2018, Governor Brown signed two bills which build on the ongoing efforts to "make water conservation a California way of life." SB 606 (Hertzberg) and AB 1668 (Friedman) reflect the work of many water suppliers, environmental organizations, and members of the Legislature. The mandates will fall on urban water suppliers – not customers.

Specifically, the bills call for creation of new urban efficiency standards for indoor use, outdoor use, and water lost to leaks, as well as any appropriate variances for unique local conditions.

Each urban retail water agency will annually, beginning November 2023, calculate its own *objective*, based on the water needed in its service area for efficient indoor residential water use, outdoor residential water use, commercial, industrial and institutional (CII) irrigation with dedicated meters, and reasonable amounts of system water loss, along with consideration of other unique local uses (i.e., variances) and "bonus incentive," or credit, for potable water reuse, using the standards adopted by the State Water Board.

The indoor water use standard will be 55 gallons per person per day (gallons per capita daily, or GPCD) until January 2025; the standard will become stronger over time, decreasing to 50 GPCD in January 2030. For the water use objective, the indoor use is aggregated across population in an urban water supplier's service area, not each household. Presently, the average June 2014-May 2019 gallons per capita per day for the Cal-Am Monterey system is 57 GPCD. Hence, existing users are unlikely to increase their water consumption with the availability of new water supply.

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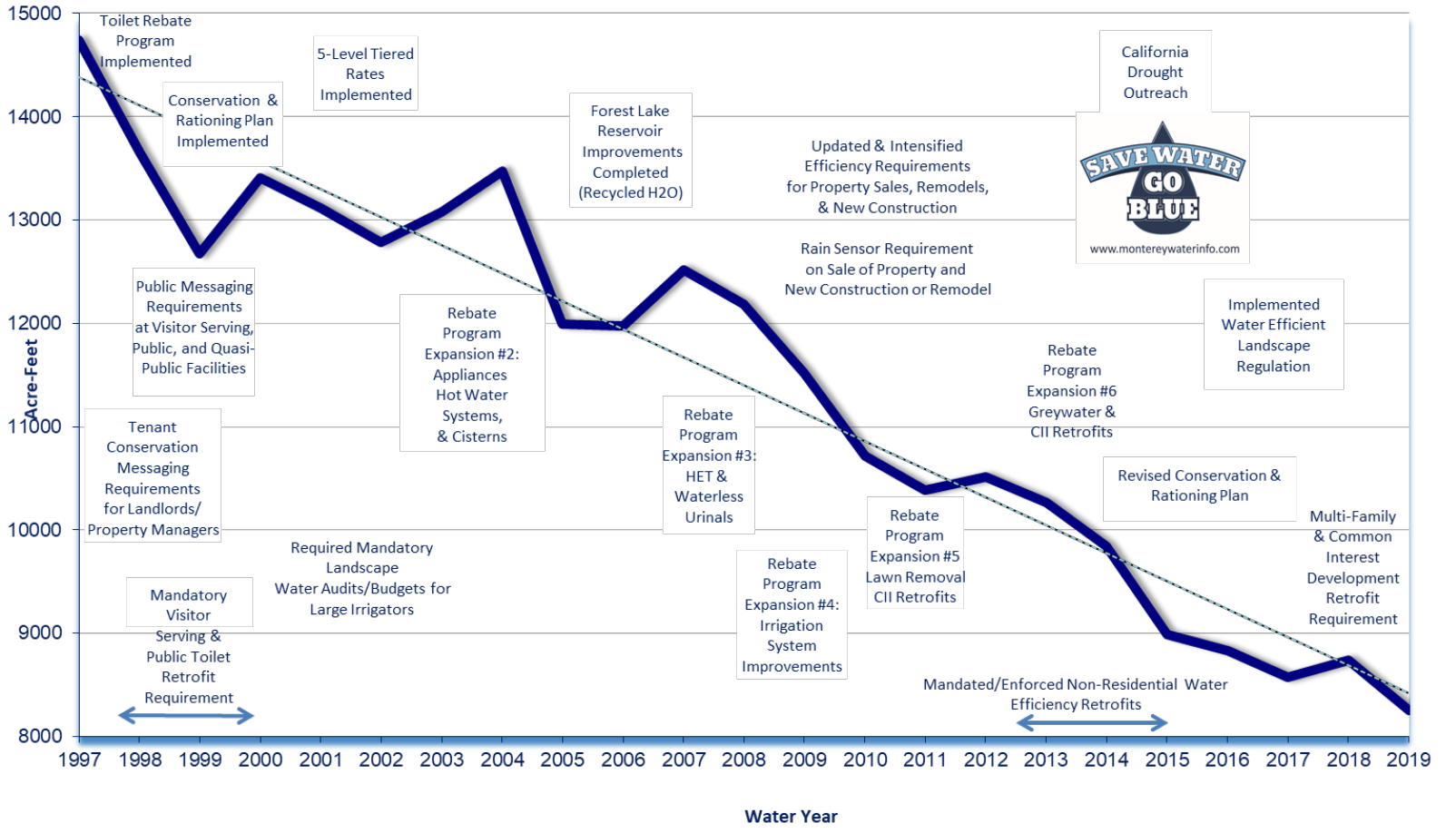
Figure 8-6
Impact of Conservation Programs on Customer Demand



Data Source: CAW Customers and Consumption by Political Jurisdiction

9. Production and Treatment Facilities

9.1. Production Facilities

Cal-Am Main System wells located in the Upper Carmel Valley, Lower Carmel Valley, and Seaside Basin, have the capability to pump 17.24 million gallons per day ("MGD") of groundwater within District boundaries, respectively, as summarized in Table 9-1. However, District data suggest that on a longer-term average many wells have higher capacities than reported by Cal-Am in 2019 below.[23]

Table 9-1: Seaside and Carmel Valley Active Well Summaries[26]

Region	Well Name / Number	Well Capacity (gpm)	Well Capacity (MGD)
Upper Carmel Valley	Los Laureles No. 5	280	0.40
	Los Laureles No. 6	347	0.50
	Garzas No. 3	272	0.39
	Garzas No. 4	307	0.44
	Panetta No. 1	313	0.45
	Panetta No. 2	243	0.35
	Total Capacity	**1,762**	**2.53**
Lower Carmel Valley	Rancho Canada No. 2	348	0.50
	Cypress No. 2	867	1.25
	Pearce No. 1	1,168	1.68
	Schulte No. 2	567	0.82
	Eastwood-Canada	27	0.04
	Begonia No. 2	643	0.93
	Berwick No. 8	586	0.84
	Berwick No. 9	177	0.25
	Total Capacity	**4,383**	**6.31**
Seaside	Plumas No. 4	197	0.28
	LaSalle No. 2	Monitoring	-
	Darwin No. 1	Monitoring	-
	Luzern No. 2	510	0.73
	Ord Grove No. 2	667	0.96
	Paralta No. 1	1,037	1.49
	Playa No. 3	229	0.33
	Santa Margarita No. 1[27]	1,700	2.45
	Seaside Middle School No. 3	1,500	2.16
	Total Capacity	**5,840**	**8.40**

[26] 2019 Annual Report filed w CPUC; However, MPWMD data suggest many wells have higher capacities than reported
[27] ASR well couplets; Only one well operated in production at a time; Santa Margarita site owned by MPWMD

There are also several satellite wells owned by Cal-Am, considered to be part of the "Main" system, as shown in Tables 9-2 through 9-4.

Table 9-2: Ryan Ranch Service Area Well Summary[28]

Well Name / Number	Well Capacity (gpm)	Well Capacity (MGD)
Ryan Ranch No. 7	70	0.10
Firm Capacity[29]	**0**	**0**

In 2020, the Ryan Ranch system was connected via a new intertie to the Main System, enabling Cal-Am to place the Ryan Ranch No. 7 well on inactive status.

Table 9-3: Bishop Service Area Well Summary[30]

Well Name / Number	Well Capacity (gpm)	Well Capacity (MGD)
Bishop Well No. 1	340	0.49
Bishop Well No. 3	308	0.44
Total Capacity	**648**	**0.93**
Firm Capacity	**0**	**0**

Table 9-4: Hidden Hills Service Area Well Summary[31]

Well Name / Number	Well Capacity (gpm)	Well Capacity (MGD)
Bay Ridge Well	279	0.40
Standex Well	Inactive	-
Firm Capacity	**0**	**0**

Additional wells are in the water system areas outside of the MPWMD boundaries serving the Ambler, Ralph Lane, Toro, Garrapata, and Chualar water system areas and are not under consideration for acquisition.

9.2. Water Treatment Facilities

As of 2019, the Monterey Water System was comprised of six water treatment facilities of various types and sizes, as summarized in Table 9-5, required to remove contaminants and

[28] 2008 Comprehensive Planning Study pg. 199, updated by MPWMD
[29] For single well satellite systems, redundancy is achieved through emergency interties.
[30] 2019 Annual Report filed w CPUC
[31] Ibid

meet state and federal water quality regulations. The Upper Carmel Valley wells only require disinfection and corrosion control chemical treatment. The Lower Carmel Valley wells require the removal of iron and manganese at the Begonia Iron Removal Plant (BIRP).

The Luzern, Ord Grove, and Paralta Seaside Coastal wells require the removal of hydrogen sulfide, and all of the satellite wells require iron removal, with the Ryan Ranch well requiring additional manganese and arsenic removal.

Table 9.5: Summary of Water Treatment Facilities[32]

Facility Name	Type	Age	Capacity (MGD)
Begonia Iron Removal Plant	Iron & Manganese Filtration	Originally built in 1975, upgraded in 2001.	16.9
Ord Grove Treatment Plant	Chemical Disinfection	N/A	4.0
Luzern GAC Filtration System	Granular Activated Carbon Filtration, Hydrogen Sulfide Removal	N/A	1.0
Ryan Ranch Water Treatment Plant	Greensand Pressure Filtration Plant for Iron, Manganese, and Arsenic Removal	Originally built in 1981 with upgrades made in 2007. Taken off-line in 2020.	0.22
Bishop Water Treatment Plant	Chemical Disinfection	N/A	1.2
Hidden Hills Water Treatment Plan	Chemical Disinfection	Built in 2001.	1.0

Wells utilizing chemical disinfection at the wellhead include Plumas 4, Los Laureles 5 & 6, Panetta 1 & 2, Garzas 3 & 4, Playa 3, and ASR 1.

[32] 2008 Comprehensive Planning Study (pg 5-7 to 5-15), updated by MPWMD

10. Distribution & Storage Facilities

10.1. Water Distribution

The existing Cal-Am water system is divided into four district areas. Each area has different operational conditions and requirements.[33] The four areas are: (i) Upper Carmel Valley; (ii) Lower Carmel Valley and Monterey Peninsula; (iii) Seaside; (iv) Upper Lift Zones.

Upper Carmel Valley

Water from the Upper Carmel Valley ("UCV") aquifer is pumped direct to the system with wellhead treatment. Additionally, the Del Monte Booster Station is able to lift water from the Lower Carmel Valley district into the UCV. Many upper lift zones are in the UCV district.[34]

Lower Carmel Valley and Monterey Peninsula

Wells in the Lower Carmel Valley ("LCV") pump raw water to the Begonia Iron Removal Plant ("BIRP"). BIRP is a pressure filter plant. LCV has a 36-inch diameter transmission main that transports water from the BIRP to the west. At the intersection of Valley Greens Road and Carmel Valley Road, the 36-inch transmission main divides into a 30-inch pipe that goes to the Segunda Tank and pumping facility and another 30-inch main that continues to the Forest Lake Tanks in Pebble Beach. Water pumped to the Segunda Tank is then pumped to the Crest Reservoir, which has a capacity of 0.25 MG. The Crest Reservoir is a break tank that sends flow to Del Ray Oaks and Seaside through the Del Rey Regulator. From Seaside, the water moves to meet the demands in Monterey and Pacific Grove. Water pumped towards the Forest Lake Tanks is pumped via the Monterey Pipeline completed in 2018. The transmission mains at Valley Greens include 12-inch and 24-inch manually operated valves that can each partially control the flow split from BIRP.[35]

Seaside

Water is drawn from the Carmel Valley via the Segunda Booster Station and Crest Reservoir to serve the Seaside area. In the summer, water is extracted from the Seaside Basin to meet water demands. Water from Luzern well is filtered with Granular Activated Carbon ("GAC") filters. Water from Playa and Plumas wells is chlorinated on-site and is then distributed to the system. Water from the Ord Grove and Paralta wells is pumped to the Ord Grove Treatment Plant and then to the Ord Grove Tank via the Ord Grove Treatment Plant Booster Station. The Santa Margarita and Seaside Middle School Wells are treated at the Santa Margarita site then distributed to the system. The Hilby Tanks are also in Seaside; these tanks are only available when the Hilby Booster pumps are active to pump water into the distribution system as a result of their lower elevation. Pressures within the Seaside system are regulated by the Del Rey Regulating Station. Limited supplemental flow is provided by the Fairway Tanks for periods of high demand and fire flows, but a recirculation line has been added in the upper Seaside area

[33] 2008 Comprehensive Planning Study (pg. 250), updated by MPWMD
[34] Ibid, pg. 263.
[35] Ibid, pg. 263-264.

to ameliorate that issue. Flows there are regulated by the Hwy 68 Regulating Station.[36]

Upper Lift Zones

There are 68 upper lift zones in the Monterey system. Booster stations within the lift zones are utilized to pump the water to higher gradients. Flow can travel through up to four lifts to service customers at the outer boundaries of the system. Forty-two of the upper lift zones have gravity storage, 14 are supplied from PRVs, eight have hydropneumatic (closed loop) systems, and the remaining are simply pumped. Upper lift zones account for around 34% of the average day demand in the Monterey system.[37] The main upper valley lift zones are served from the Segunda Tanks.

10.2. Water Distribution Piping

The water distribution system of the Central Division includes a distribution piping network consisting of approximately 614 miles of pipe, primarily cast iron, steel, cement asbestos, PVC, and ductile iron pipe with diameters of 1-inch to 36-inch.[38] A summary of the size and type of pipe that comprise the distribution pipe network is summarized in Table 10-1. The average age of the distribution pipe network within the Monterey District is 48.5 years.[39]

Table 10-1: Distribution Pipe Network – Length (Ft) by Diameter

Material	1”	1 ½”	2”	2 ½”	3”	4”	5”	6”	8”
Cast Iron	187		14,739	176	6,534	132,511		98,293	56,538
Cast Iron (Cement Lined)	178		25,829		103	153,776		242,584	86,867
Concrete									
Copper	284		216						
Riveted Steel	267	102	1,217		143	9,911		19,808	39,191
Standard Screw									
Screw or Welded Casing									
Cement-Asbestos	173		1,988		1,086	125,820	2,137	382,710	126,411
Welded Steel									
Wood									
Other-Galvanized	517	970	27,057	1,666					3
Other-PVC	2,692	3,229	25,042	5,195	3,366	30,633		210,091	549,951
Other-Ductile Iron	124		1,841			1,598		9,960	7,913
Other-Brass	1		203	9				15	
Other-PE			1,144						
Other-Unknown	2,266	3,414	21,017		1,370	41,914		61,718	36,945

[36] Ibid, pg. 264-265

[37] Ibid, pg. 265.

[38] Ibid, pg. 15.

[39] CAL-AM 2019 General Rate Case, MDR II.E.10.

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Material	1"	1 ½"	2"	2 ½"	3"	4"	5"	6"	8"
Total	6,689	7,715	120,293	7,046	12,602	496,163	2,137	1,025,180	903,819

Material	10"	12"	14"	16"	17-18"	20-22"	24"	30-36"	Total All
Cast Iron		42,359		9,657		993			361,987
Cast Iron (Cement Lined)		38,282		2,068	139		1,205		551,032
Concrete									-
Copper									500
Riveted Steel	20,421	17,468	1,356	2,627	7,815	16,310	3,702	53,975	194,314
Standard Screw									-
Screw or Welded Casing									-
Cement-Asbestos	4,109	70,202	5,483	5,686			505		726,311
Welded Steel									-
Wood									-
Other-Galvanized									30,213
Other-PVC	8,002	93,757	8	12,489		3,427	3,853		951,735
Other-Ductile Iron	160	9,551	281	46,588	2,932	33,430	44,717	82,825	241,919
Other-Brass									228
Other-PE									1,144
Other-Unknown	338	6,333	57	3,528	119	359	2,708	29	182,114
Total	33,030	277,953	7,184	82,644	11,004	54,519	56,690	136,829	3,241,498

Source: 2018 Annual Report to CPUC.

The distribution system must have the capacity to maintain water pressures between 40 – 90 psig at all customer meters during maximum day conditions. The capacity and reliability of the mains and service lines is essential to maintain water service throughout the service area.

10.3. Service Lines

The water system has approximately 40,000 service lines ranging in size from ¾ inch to 12-inch diameter. Cal-Am owns and is responsible for the service lines from the main up to the meter box, typically the property line. On average service lines range from 50-100 feet and are of various materials. The majority of service lines in the water system are High-Density Polyethylene (HDPE or PE) and Copper, however Galvanized Steel, and Polybutylene lines still exist. PVC, cast iron, or DIP piping typically are used for larger diameter service lines.

10.4. Pressure Zones and Storage Capacity

The Monterey water system covers a large geographic area of approximately 55 square miles that ranges in elevation from sea level to over 1,300 feet through 74 different pressure zones, of which 14 are supplied by pressure reducing stations (PRVs). The numerous pressure gradients are supplied by pump stations that pump to 88 water storage facilities located in

most of the pressure zones. The system has approximately 35 MG of usable water storage, excluding the earthen Los Padres Dam. Service sub-areas are pressures that do not have separate source of supplies and are served off of the Main Zone.

Table 10-2: Summary of Pressure Zone Facilities

Service Area	Sub-Area	# of Pressure Zones	Zones Supplied by PRV or Pneumatic
Main		**1**	**0**
Upper Carmel Valley	Los Tulares	4	2
	Robles	4	1
	Airway	2	0
	Middle Canyon	4	0
	Ranchitos	2	1
	Rancho Fiesta	3	1
	Vista Hermosa/ Carmel Valley Ranch	2	0
	Total	**21**	**5**
Lower Carmel Valley	Tierra Grande	5	1
	Mercurio	1	0
	Crest	1	0
	Quail Meadows	1	0
	Del Mesa	1	0
	Rio Vista/ Carmel Views	5	3
	Lower Carmel Valley Reduced	1	2
	Total	**15**	**6**
Peninsula	Cypress/ Mt. Devon	2	0
	Lower Walden/ Crest Canyon	2	0
	Carmel Woods	5	2
	Old Pebble Beach	6	4
	Pacific Grove	9	2
	Total	**24**	**8**
Seaside	Fairways	1	0
	Darwin	1	0
	Del Rey Oaks Reduced	1	1
	Hilby Pneumatic	1	1
	Total	**4**	**2**
Ryan Ranch		**1**	**0**
Bishop		**5**	**1**
Hidden Hills		**3**	**1**
Monterey Water System	**8 Service Areas 24 Sub-Areas**	**74**	**24**

10.5. Booster Pump Stations

As of 2008, the Monterey Water System was comprised of 65 booster pump stations (excluding production wells) in the main Monterey system, and 9 pumping stations in the satellite systems.[40] The Hilby Pump Station was added in support of the Monterey Pipeline in 2018 and a future Carmel Valley Pump Station will begin construction in 2020 or early 2021.

10.6. Water Storage Facilities

There are 105 finished water storage facilities within the Monterey District with a total combined capacity of 579 million gallons, which includes an earthen collecting reservoir.[41] A summary of the distribution storage tanks by system and type is provided in Table 10-3.

Table 10-3: Water Storage Facility Summary

System	Type	Quantity	Combined Capacity (MG)
Monterey Main System	Steel	77	31.719
	Concrete	11	2.165
	Earthen	1	543.780
Hidden Hills	Steel	6	0.440
Bishop	Steel	7	0.750
Ryan Ranch	Steel	1	0.500
	Plastic	2	0.026

10.7. Other Distribution Appurtenances

The water distribution system also contains 3,496 fire hydrants and an estimated 12,000 distribution valves.

A summary of the water meters and active service connections by size is provided in Table 10-8, but excludes four 18-inch meters at the ASR sites.

Table 1-8: Water Meters and Services[42]

Meter Size (inches)	No. of Meters	Service Line Diameter (inches)	Active Service Connections
5/8 x 3/4	32,922	Less than 3/4	0
3/4	223	3/4	1,254
1	6,182	1	35,335

[40] 2008 Comprehensive Planning Study, p.6-11.

[41] 2019 Annual Report of District Water System Operations for the Monterey County District, prepared by Cal-Am for the CPUC, p.14.

[42] 2018 Annual Report of District Water System Operations for the Monterey County District, prepared by Cal-Am for the CPUC, p.16.

1 1/2	1,064	1 1/2	380
2	747	2	3,414
3	89	3	56
4	36	4	452
6	21	6	100
8	18	8	47
12	-	12	3
Other (unknown)	-	Other (unknown)	8
Total	**41,302**		**41,049**

10.8. Monterey Pipeline and Pump Station

The Monterey Pipeline was completed in 2018 and provides conveyance infrastructure for CAL-AM to move water north-to-south to Pacific Grove, Carmel, and Carmel Valley. It is comprised of approximately 6.5 miles of 36-inch pipe that conveys water from an existing pipeline at the intersection of Yosemite Street and Hilby Avenue (its eastern terminus) in Seaside, through Seaside and Monterey to the Eardley pump station within the City of Pacific Grove (the western terminus). The pipeline route improves the hydraulics of the existing system, will allow for delivery of desalination water from the new Monterey Peninsula Water Supply Project desalination plant, will allow for deliveries of Pure Water Monterey advance purified water, and will allow for maximum use of ASR and Carmel River excess diversion rights. The Monterey Pipeline connects two pressure zones in the Cal-Am system (one in the area of the City of Pacific Grove and one in the area of the City of Seaside), by-passing the distribution system in Old and New Monterey. With implementation of this pipeline, water stored in Forest Lake Tanks in Pebble Beach could flow via gravity to the LCV or be pumped to the UCV, with construction of a new pump station.

The existing Cal-Am distribution system currently conveys Carmel River water through the Segunda-Crest pipeline network to the existing ASR facilities; however, the capacity of this pipeline can constrain the volume of water that can be delivered to the injection wells. The capacity of the Carmel Valley wells can also constrain amounts available for ASR injection. The Monterey Pipeline, completed in 2018, is expected to improve the capacity of Cal-Am's existing system to convey additional excess Carmel River winter flows to specially-constructed injection/recovery wells in the Seaside Groundwater Basin. The pipeline is expected to better achieve the full yield authorized by previously approved water rights for later extraction and use by Cal-Am during dry periods. This "conjunctive use" more efficiently utilizes local water resources to improve the reliability of the community's water supply while reducing the environmental impacts to the Carmel River and Seaside Groundwater Basins.

The Monterey Pipeline will also enable Cal-Am to deliver Pure Water Monterey water to its customers and could be used for both the ASR Project and the Pure Water Monterey Project.

11. Environmental Resources & Protection

11.1. The Legal Mandate for the Mitigation Program

The District established its Water Allocation Program in 1981 to manage the limited water supplies available to Monterey Peninsula water users. Under the Water Allocation Program, the District regulates the amount of water that can be produced and delivered by public and private water distribution systems within the District. The District established procedures for annually setting a limit on the total amount of water available to Cal-Am and a limit on how much water each local municipality could release for new construction in subsequent years. Presently, all water delivered within the District is produced from sources within the District. These sources include surface water from the Carmel Valley Alluvial Aquifer and Seaside Groundwater Basin. Collectively, these sources are referred to as the Monterey Peninsula Water Resource System (MPWRS). In 1981, the annual production limit from the MPWRS for Cal-Am's main distribution system was set at 20,000 acre-feet per year (afy) and a formula for distributing water among the jurisdictions within Cal-Am's service area was specified.

Between 1981 and 1983, scientists retained by the District concluded that Cal-Am's diversions along the Carmel River had contributed to a large drop in the number of returning adult steelhead, substantial loss of streamside vegetation, and widespread channel instability during the late 1970s and early 1980s. In October 1984, the District began implementing the Carmel River Management Plan, which focused on restoring streamside vegetation and improving steelhead and wildlife habitat along the main stem of the river.

The District's steelhead rescue and rearing program and irrigation of riparian vegetation to offset impacts from Cal-Am's water extraction efforts were begun as part of the "1988 Interim Relief Plan" (IRP), which was developed cooperatively by representatives from Cal-Am, MPWMD, the California Department of Fish and Game (now "and Wildlife") (CDFW), State Water Resources Control Board (SWRCB), Carmel River Steelhead Association (CRSA), and the Carmel Valley Property Owners Association (CVPOA). It was created to respond to the community's environmental concerns under the authority granted to the District by the State Legislature, prior to the development of a permanent replacement water supply for the existing levels of Carmel River diversions. The IRP was also developed at the request of the SWRCB as part of a settlement for two water rights complaints filed by CRSA in 1987. The IRP initially included three general program elements directly related to steelhead and riparian vegetation as part of its initial Emergency Relief Plan: (1) Fish Rescues and Rearing, (2) Irrigation of Riparian Vegetation, and (3) Flow Releases from San Clemente Dam (SCD). The intent of the flow releases was to provide steelhead habitat that could be sustained throughout the Low Flow Season with existing water supplies. This was to be achieved through two processes: a) the negotiation of an Annual Low Flow MOA between Cal-Am, CDFW, and MPWMD regarding the release of water from SCD; and b) the Quarterly Water Supply Budget process mandated by District Ordinance No. 19. At the time the IRP was adopted, Fish Rearing and Rescues were focused on moving fish upstream into year-round flowing waters with some short-term rearing in off-stream ponds, and capturing and moving smolts downstream to the ocean in drier years,

when they otherwise would not have been able to reach the ocean. The IRP was subsequently replaced by the Mitigation Program resulting from the 1990 EIR, described below.

In 1990, the District revised the Water Allocation Program to reflect dry rainfall year conditions instead of average rainfall year conditions. As required by the California Environmental Quality Act ("CEQA"), the District prepared an Environmental Impact Report ("EIR") to consider the environmental effects of the Water Allocation Program. This EIR evaluated the environmental effects assuming five different production volumes from the various sources of supply on the Monterey peninsula. Based on the revised analysis that was conducted, the annual production limit from the MPWRS for CAW's main distribution system was reduced to 16,744 AFY and a moratorium on new or expanded water uses was imposed.

In implementing the Water Allocation Program, the District was required under CEQA to mitigate, to the extent feasible, the significant impacts of the Water Allocation Program. On November 5, 1990, the District Board certified the Final EIR for the Water Allocation Program and adopted findings that included a Five-Year Mitigation Program for the selected production limits.

Five water supply options were analyzed in the EIR, along with associated impacts, and possible mitigations. Impacts to riparian vegetation, riparian wildlife, special-status wildlife, fisheries, and aesthetics without full mitigation measures were projected to be "significant adverse impacts" that could be reduced to "potentially significant" or "less than significant" adverse impacts with mitigation. To accomplish this, several programs enacted by the District in the 1980s to offset the impacts of Cal-Am pumping along the river were combined into a single, comprehensive program. The District's Board adopted a Mitigation Program and authorized staff to carry out that program for five years, until June 30, 1996, and to report the results of the Mitigation Program to the Board. Following public hearings in May 1996, the District Board authorized continuation of the Five-Year Mitigation Program through 2001. Since 2001, the District Board has voted to continue the Comprehensive Mitigation Program as part of the District's annual budget approval process.

In Order 95-10, the State Water Resources Control Board found that the Mitigation Program was alleviating the effects of Cal-Am's diversions on the Carmel River. At the time the SWRCB was considering Order 95-10, the District's Mitigation Program was initially intended to be reviewed in June 1996. To ensure that those mitigation measures continued to be implemented pending a long-term water supply solution, the SWRCB ordered Cal-Am to implement those mitigation programs if the District ceased those activities after June 30, 1996, making the Mitigation Program a contingent obligation of Cal-Am. However, the District continued to implement the Mitigation Program, which was funded in part by the User Fee until 2009, when the CPUC ordered Cal-Am to cease collecting and remitting the User Fee, which occurred in May 2011. Since 2011, Cal-Am and the District have worked cooperatively to ensure the Mitigation Program has continued uninterrupted. In 2017, the User Fee was restored and the District still pays all of the mitigation program costs.

The CPUC has also concluded that the Mitigation Program is a contingent obligation of Cal-Am. Because the District has been implementing this program, ostensibly to the satisfaction of the

State Water Resources Control Board, and the personnel and processes are in place, continued implementation by the Monterey Peninsula Water Management District is the most efficient and effective manner of meeting this responsibility. Further, most interested outside agencies such as the Sierra Club, the CRSA, and others have expressed a specific interest in the District maintaining responsibility for execution of mitigation activities.

11.2. Mitigation Required by the 2006 EIR for ASR Phase 1 Activities

The 2006 EIR for Aquifer Storage and Recovery (ASR) Phase 1 required two mitigation measures related to Fisheries: AR-1 requires MPWMD to conduct an annual survey of the riffles below River Mile 5.5, and if feasible, modify any deemed impassible, then monitor the worst five during the diversion season to assure they remain passable, or cease diversions for ASR; AR-2 requires MPWMD to cooperate with Cal-Am to develop a program to maintain, recover, or increase storage at LPR, and continue the fish rescue program as needed.

The SWRCB issued Permit 20808A for ASR Phase 1 which added more requirements: Conditions #19 and #20 related to gages and monitoring, Condition #24 to continue the Annual Low Flow MOA process in an attempt to insure 5+ cubic-feet per second (CFS) of flow at the Sleepy Hollow Weir insofar as possible with existing LPR storage, Condition #25 to continue the fish rescues required by the 1990 Water Allocation EIR's Fisheries Mitigation #3, Condition #26 to conduct studies to determine the efficiency of annual fish rescues, Condition #27 to implement all aspects of the Carmel River Lagoon Mitigation Measures specified in the 1990 Water Allocation EIR, and Condition #29 related to riparian requirements of the Mitigation Program. These conditions are also currently included in the SWRCB's Permit 20808C for ASR Phase 2.

11.3. Other Mandates from State or Federal Permits

The CDFW, National Marine Fisheries Service (NMFS), and USFWS require that all programs that affect or handle listed species, such as steelhead and red-legged frog, maintain trained and certified staff qualified for such work. Cal-Am has to contract for field biologists with such scientific qualifications, whereas MPWMD has them on staff at less than one-half the hourly rate of their consultants. All District Fisheries staff are certified in electrofishing by the USFWS, NMFS, and CDFW, and to handle red-legged frogs by the USFWS. In order to conduct our Monitoring Program, which is required by NMFS and CDFW to track and evaluate the effectiveness of the Mitigation Program, Fisheries staff must acquire and submit reporting for bi-annual State Scientific Collecting Permits through CDFW, which are in turn linked to separate annual Federal ESA Section 10 Permits from NMFS. The NMFS requires 5-Year Section 10 Permits to operate the Sleepy Hollow Steelhead Rearing Facility (SHSRF), and CDFW requires a congruent matching MOA. These agreements in turn require the District's Fisheries staff to be formally trained in aquaculture to run the SHSRF. The Section 10 Permit process requires the District to develop and have approved a Rescue and Rearing Management Plan (RRMP). The RRMP currently requires (a) steelhead rescue efficiency studies, (b) adult and juvenile steelhead population surveys, (c) SHSRF operations improvement experiments to attempt to increase survival, and d) downstream migration survival study of reared versus wild juvenile steelhead with marked and recaptured fish. Sustaining the continuing education, re-certification, and re-permitting of the Fisheries staff and their program consumes a significant amount of time each

year, and must be funded as part of any modern mitigation program conducted by Cal-Am or District.

11.4. Mitigation Program is Related to the Provision of Water

The legal mandates discussed above show a clear nexus between the requirements of the Mitigation Program and the provision of water supply from the Carmel River, as well as the provision of water supply from ASR. Mitigation is a component of the basic operating and maintenance (O&M) expense related to providing water from the Carmel River under existing conditions. Until such time as the need for the mitigation activities can be documented as no longer necessary and a supplemental EIR or other filing modifies or reverses the requirements of the 1990 Allocation EIR and the 2006 ASR EIR, the mitigation activities remain a required cost of operations related to provision of water. Cal-Am has provided very limited funding for these activities, yet until all environmental effects of a new permanent replacement water supply are assessible, the costs of mitigation will remain a District funding priority.

11.5. Description of the Mitigation Program

Key components of the Water Management District's Mitigation Program include general mitigations relating to water supply and demand management and specific measures relating to select environmental resources such as steelhead and riparian vegetation. General mitigation measures include hydrologic monitoring (precipitation, streamflow, groundwater levels, and water quality), water production management (operations agreements, quarterly water supply budgets, and well registration and reporting), water demand management (conservation, permitting, and monitoring), and water supply planning. Specific mitigation measures include steelhead protection (spring smolt rescues, fall/winter juvenile rescues, summer juvenile rescues and rearing, and adult and juvenile population monitoring), riparian habitat protection (vegetation monitoring, plantings and irrigation, erosion control, and channel clearing) and lagoon habitat protection (vegetation surveys, topographic measurements, and wildlife monitoring). Each of the components is described in the Annual Mitigation Program Reports that are required by CEQA. The 2021 Annual Report will be the thirtieth report prepared by the District since the program began.

Fisheries Program

In summary, the Fisheries Program, among other things: (i) records data on the steelhead population in the Carmel River; (ii) rescues young steelhead from drying reaches of the Carmel River; (iii) operates the Sleepy Hollow Steelhead Rearing Facility, including steelhead stocking, physical plant maintenance and capital improvements, and preparation of the facility's Rescue and Rearing Management Plan in consultation with state and federal experts; (iv) conducts a California Stream Bio-assessment Procedure (benthic invertebrate sampling at 6 stations); (v) coordinates with California American Water regarding operations to maximize fish habitat, including monitoring the Carmel River Lagoon water levels and water quality to improve the lagoon as habitat for fish. Also included within this budget are activities to mitigate potentially significant impacts associated with the operation of the Aquifer Storage and Recovery project.

Riparian Program

The Riparian Habitat Program, among other things: (i) irrigates riparian vegetation that is impacted by groundwater extraction; (ii) restores streambanks and floodplains with native vegetation that has been degraded because of water extraction, and engages in other vegetation management activities, including obtaining required State and federal permits for these activities; (iii) manages data collection regarding the channel profile and also cross section data from the Carmel River for use in maintaining a long-term record and comparing to the past and future data; (iv) monitors the physical and biological processes along the river to evaluate the District's river management activities; (v) inspects the Carmel River from the upstream end of the lagoon to Camp Steffani for violations and debris dams; (vi) maintains and updates records regarding erosion damage, conditions that could cause erosion, and the overall condition of the riparian corridor; (vii) enforces the District riparian ordinances; and, (viii) prepares Integrated Regional Water Management Plans.

Lagoon Program

In summary, the Lagoon Habitat Program performs the following activities: (i) vegetation habitat monitoring; surveying and analyzing bathymetric transects; conducting topographic, hydrology and wildlife surveys; and (ii) providing technical expertise regarding management and improvement of the lagoon.

Hydrologic Monitoring Program

The Hydrologic Monitoring Program: (i) regularly tracks precipitation, streamflow, surface and groundwater levels and quality, and lagoon characteristics between Los Padres Dam and the Carmel River Lagoon, using real-time and computer monitoring methods at numerous data collection stations; (ii) maintains an extensive monitoring network, and continuous streamflow recorders along the Carmel River; (iii) implements a multi-agency Memorandum of Agreement and develops quarterly water supply strategies based on hydrologic conditions; (iv) works cooperatively with resource agencies implementing the federal Endangered Species Act; and, (v) implements ordinances that regulate wells and water distribution systems.

11.6. Mitigation Program is Distinct from Cal-Am's Other Mitigation Requirements

The District's Mitigation Program activities are more comprehensive and quite distinct from other mitigation activities undertaken by Cal-Am. The focus of Cal-Am's water withdrawal mitigation activities center on meeting the terms of agreements with the National Oceanic and Atmospheric Administration (NOAA) regarding impacts to the South Central California Coast (SCCC) Steelhead, and with the United States Fish and Wildlife Service (USFWS) regarding impacts to the California Red-Legged Frog.

Regarding the SCCC Steelhead, the funds paid by Cal-Am to the California Department of Fish and Wildlife are funding mitigation projects under the Department's Fisheries Restoration Grant Program. The activities selected by the Department to fund include Carmel River habitat improvements such as the removal of the Sleepy Hollow Ford, the removal of the Old Carmel River Dam, and studying the feasibility of a Carmel River Lagoon Barrier. These activities do not

fall within the scope of activities undertaken by the District under the auspices of the Mitigation Program.

Regarding the California Red-Legged Frog, Cal-Am consultants monitor, rescue, and relocate California Red-Legged Frog tadpoles in the vicinity of large production wells when necessary, as well as part of certain mitigation measures associated with drawdown of San Clemente Dam. The District does not perform any rescue or relocation operations with respect to California Red-Legged Frog and only records incidental sightings when out in the field, but does work in conjunction with Cal-Am's consultants during rescue activities.

Both the District's and Cal-Am's environmental resource protection programs will be maintained under an acquisition and integration of operations.

12. Operations & Maintenance Plan

The water infrastructure and assets in the United States have aged, in many water systems reaching or exceeding the useful service life of a significant portion of facilities, equipment, and assets. Equipment, pipelines, and assets have failed in an increasing rate in many systems. In response the industry has focused on extending the useful life of assets through inspection, condition assessment, program and preventive maintenance, and timely asset renewal and replacement programs.

The Monterey Water System has a significant portion of the facilities, pipelines, equipment, and other assets that have reached or are nearing the end of their useful life. The disruption to service, impact to customers, cost, and rate impact of immediately replacing a large portion of the water system is not practical or efficient. Both the current system owner, Cal-Am, and the acquiror will have to address these issues. To address the issue of the aging water infrastructure the District is adopting the industry approach of implementing aggressive and robust program/preventive maintenance focused on the extension of the asset useful life, especially critical facilities, pipelines, and equipment.

The District intends to adopt and develop its maintenance programs founded on the **AWWA Standards G200 and G410**, with guidance from the **AWWA Maintenance Management for Water Utilities Handbook.** As discussed in Chapter 5, the District has adopted two Strategic Goals, No. 5 and 6, that strive to maintain or improve the existing condition and level of service of the water system while providing rate stabilization that is directly supported by robust maintenance programs.

In preparing a zero-based operating budget, the District has initially developed a number of preventive maintenance programs it plans to implement, in a phased approach, over the initial years of operational responsibility. The following programs were developed using AWWA standards as guidance and a roadmap to maintain or improve the life expectancy of assets and improve water service. A brief description of the maintenance programs is described below.

12.1. Standard Operations Policies and Procedures

AWWA Standards state that to meet the specific standard the utility must demonstrate that it has in place written procedures, policies, and performance standards. As outlined in Section 2.5 earlier, the District will maintain the current Cal-Am policies, procedures, and practices to operate the water system during the first year of the District's operation. During that 12-month period the District will assess the operational procedures, business processes, and performance to readjust the Strategic Goals, Level of Service Standards (LOS), and refine and document the Standard Operating Procedures (SOPs) that include performance metrics.

12.2. Operations Performance Metrics

Section 12.3 below provides a brief description Routine Operations Workplan and Section 12.4 provides a brief description of the initial preventive maintenance programs. The Operational work tasks and maintenance programs will include an initial list of performance metrics.

The performance metrics are based on the **AWWA Utility Benchmarking Survey – Performance Management for Water and Wastewater**, industry data, and operational experience. Performance metrics shall be specific and clearly defined, measurable, and support a culture of continuous improvement.

12.3. Routine Operational Workplan

The routine operational workplan defines the daily, weekly, monthly, quarterly, and the annual operations staff activities. An Operational Workplan outlining the work tasks, level of effort, frequency, and manpower required will be developed as part of the transition planning. The following is a brief description of the key operations work tasks.

Water Quality Monitoring

The monitoring of water quality from production and treatment facilities and within the distribution system is a key work task and responsibility of the operations staff. Water quality sampling and testing is performed on a daily, weekly, monthly, quarterly, and annual frequency for different water quality parameters and contaminants. The following are the various water quality categories that the District shall monitor:

Water Quality Parameters:

- Water Chemistry
  - pH
  - Alkalinity
  - Nitrogen (Ammonia & Nitrates)
  - Chloride
  - Dissolved Oxygen
  - Phosphorus
- Organics
  - Volatile Organic Compounds (VOCs)
  - Synthetic Organic Chemicals (SOCs)
  - Pesticides
- Inorganic Chemicals
  - Heavy Metals
  - Lead & copper
  - Arsenic
  - Mercury
  - Solenium
- Radionuclides

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- Microbials and Turbidity
  - Total Coliform
  - Viruses
  - Pathogens
  - Biofilm Bacteria
  - Chlorine Residual
  - Heterorropichic Plate Counts (HPC)
- Disinfection By-Products
  - Trihalomethanes (THMs)
  - Haloacetic Acids (HAAs)
- Secondary Standards
  - Iron
  - Manganese
  - Total Dissolved Solids (TDS)
  - Taste and Odor
  - Sulfate
  - Aluminum
  - Fluoride

Water Quality Sampling Plan: The location and frequency of collecting water quality samples shall be routinely performed in accordance with the state approved sampling plan estimated at approximately 100 sample sites for the water quality parameters regulated by the SWRCB.

The District will implement a non-regulated sampling plan and testing program to collect and test samples from additional locations and frequency for various water quality parameters including parameters that EPA is considering new regulations or lower MCLs in the future. These water quality results, along with the regulated water quality tests, will be the basis for maintaining or improving water quality beyond the state and federal standards (Section 5.2 – Strategic Goal No. 1). This could include, but not limited to, additional testing of:

- Dead-End Mains
- Distribution System Storage Tanks at multiple sample locations/depths in the tank, tank locations without chlorine residual analyzers, and steel tanks that have coal-tar epoxy interior coatings or interior coatings older than 25 years.
- Increased testing at well locations
- Increased testing at each treatment facility
- Unlined cast-iron, steel, or other metallic pipe locations within the distribution system, especially in areas of periodic taste and odor or color/dirty water detections.
- Galvanized, cast-iron, brass, or other metallic service lines, and service lines older than 40 years.
- Mains and tanks that have an average age of water, especially during low demand periods, of more than 7 days.

- Areas of the distribution system with a potential of nitrification due to the presence of naturally occurring ammonia and similar nitrogen compounds in mains and tanks with longer age of water durations occur especially during hot low demand periods.
- Well pump-to-waste discharge locations, including discharge percolation pits

Water Quality Testing & Laboratory Operation

The District will own, via the acquisition, and operate a state-certified laboratory for the testing of water quality parameters:

- Organics
- Water Chemistry
- Inorganics
- Microbials and Turbidity
- Disinfection By-Products
- Secondary Standards

The District's lab will be responsible for processing water quality testing and for sending out water quality samples to outside state-certified labs for parameters that the District lab is not certified for. The lab shall be responsible for preparing and submitting monthly water quality reports to the state.

Field Customer Service

The field customer service activities are routine work tasks that directly interact with customers or with their individual water service/account. Work tasks are identified and scheduled through the issuance of a work order/ticket with the exception of routine monthly meter reading. The following is a brief summary and description of the primary routine work tasks:

Customer Turn-On/Turn-Off: When a new customer account is setup at a location with an existing service/meter, a field customer service representative is assigned to turn-on the water service and take an initial meter reading. Water service is also turned-off under certain circumstances for non-payment of the water bill and turned-on when the bill is paid. Water service is turned off when an account is closed and a final meter reading is taken.

Customer Notices: Field Customer Service Representatives install notices ("Door-Hangers") at customer properties to inform them of various activities that could affect their water service. This could include notices for:

- Scheduled water service shutdown/interruption;
- Turning-off their service for non-payment;
- Meter Replacement/Testing;
- Construction or maintenance activity that could impact their water service or located near their property;

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Billing/Water Usage Customer Complaints: When a customer calls and issues a question or complaint regarding their bill related to the quantity of water used, a field customer service representative/meter reader is assigned to re-read the meter for comparison to the recorded usage. Based on the date of the meter re-read an average daily usage is calculated and compared to the customer's average daily and monthly usage for the past 12 months. If it appears there was an error in the monthly meter usage recorded a billing adjustment will be implemented.

If the meter reading appears to be correct the customer can request an inspection of the customer's service and any outside irrigation system. This is performed by a field customer service representative or outside contractor. The customer can also request that the meter be tested. If the result is a problem with the meter, then a bill adjustment will be made. If the meter is operating properly or if a leak is detected in the customer service line or outside irrigation system, then the customer will be billed for the cost of the inspection and/or meter test.

Monthly Meter Reading: Similar to pre-acquisition, the District will bill customers monthly for water service. Customer water usage is normally collected monthly over a ten-day period by recording meter totalization and then the data is downloaded at the end of each day into the meter reading software program. This data is then uploaded into the billing system.

Meter reading is scheduled by meter route and on average approximately 4,000 meters are read per day over the 10-day period. Each meter route is different based on the location and topography of the route, however approximately an average of 500 meters are recorded per day for each meter reader. Meter usage is recorded utilizing Automated Meter Reading (AMR) meters/transmitters by mobile ("drive-by") receivers installed in the vehicle. As Advanced Metering Infrastructure (smart meters) becomes more prevalent, more meters will be able to be read more quickly, by fewer meter readers.

Meter Testing and Aging/Replacement: The accuracy of meters is essential to billing, water supply planning, and conservation on the Peninsula. To maintain accurate customer usage, meter testing is core function for the field customer service staff. The following is a brief summary and description of meter testing requirements/performance metrics for the District.

- Meter Test Group – the accuracy of water meters over time from different manufacturers varies, sometimes significantly, and the replacement schedule may be different for different manufacturers. To monitor the accuracy of meters, the District will select 50 new meters every year to pull and test annually to measure the accuracy to assess the deterioration rate over time. The scheduled replacement of 5/8 x 3/4 and 3/4 meters is 15 years resulting in testing 750 meters per year over 15 years. The 50-meter test group could be a combination of such small meters and 1" meters.
- Meter Testing – Meters often slow down over time and under-record water usage. This varies by meter size and type. Routine meter testing is performed monthly throughout the year at a frequency specified by meter size (other than the 5/8 x 3/4 or 3/4) below.

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Table 12-1: Meter Testing Plan Goal

Meter Size	Number of Meters (est.)[43]	Testing Frequency	Estimated Number Tested Annually
1-in	6,182	Every 3 years	2,061
1.5-in	1,064	Every 2 Years	532
2-in	747	Annually	747
3-in	89	Annually	89
4-in	36	Every 6 months	72
6-in	21	Every 6 months	42
8-in	18	Every 6 months	36
12-in	0	Every 6 months	0

- 5/8 x 3/4 inch and 3/4 in meters are not tested with exception to the annual test group meters
- 1-in, 1.5-inch, and 2-inch meters are pulled and bench tested
- 3 to 12-inch meters are tested in place
- This does not include testing of stuck meters or meters requesting testing due to billing questions.

- Meter Aging and Replacement – As water meters age, the accuracy can be reduced, typically by under-recording water usage, and are replaced at normalized annual rate. The following is a representative meter replacement schedule:

Table 12-2: Meter Replacement Plan Goal

Meter Size	Replacement Frequency	Average Number of Meters Replaced Annually
5/8 x 3/4-in	15 Years	2,200
3/4-in	15 Years	15
1-in	10 Years	620
1.5-in	10 Years	100
2-in	10 Years	75
3-in	10 Years	9
4-in	10 Years	4
6-in	10 Years	2
8-in	10 Years	2
12-in	10 Years	0

Note: Does not include stuck or inoperable meters replaced annually

Customer Water Service Complaint Response: Periodically customers call to notify the District of a water service concern, that may include questions about water quality (e.g. dirty water), low or high-water pressures, service line leaks, main leaks/breaks, or some other

[43] 2018 Annual Report of District Water System Operations for the Monterey County District, prepared by Cal-Am for the CPUC, p.16

operational/technical issue. Pre-acquisition the call center is nationally (Illinois or Florida), but post-acquisition there will be a locally staffed customer call center.

Field Customer Service representatives are assigned to respond to the customer concern, field inspect the potential issue, and reply to the customer either in person or by phone. If the customer can't be reached a door-hanger is placed at the property. A customer complaint response report is prepared documenting the water service issue, inspection observations/findings, and actions taken to resolve the issue.

Routine Facility Operations

The daily operation of the water system is performed by the Field Services and Operations divisions that includes certified Treatment Plant Operators, Pump Operators, Utility Workers, Foremen, and Field Service Reps. Water Quality Specialists and Lab Techs also have daily duties. The following is a summary and brief description of the daily, weekly, and monthly water operation activities.

Water Facility Operational Monitoring: The water system facilities are remotely monitored by a Supervisory Control and Data Acquisition (SCADA) computerized system. The SCADA system is centrally controlled and monitored, using *Wonderware* SCADA operating system which the District is likely to continue from the District's operations center where certified operators will monitor the water system conditions and can implement changes in control functions, turn-on/turn-off pumps and other equipment, and respond to alarms.

Operators will rotate during the day to ensure the SCADA system is monitored from the control room during the eight-hour working day. After hours and during weekends and holidays, the SCADA system is monitored remotely by senior operators remotely connected through the Remote Access Server (RAS) and use of a dedicated laptop computer. This SCADA system is protected by a firewall and the laptops, with their specific TCIP address, can access the system.

Data collected from the remote distributed facilities is stored in SCADA computer for 24 hours and then downloaded daily into the SCADA Historical Database Server (HDS) to provide historical data and trends for analysis and records. The SCADA system is not connected to the District's internal intranet, to the internet, or other external on-line systems.

A Programmable Logic Controller (PLC), located at each facility collects data from field devices through transmitters connected to the PLC. The data is then communicated back to the central SCADA control system for control and monitoring. Communication between facilities and the District's operations center will be performed through a variety of methods; Digital leased lines, spread-spectrum radios, dedicated 900 MHz fixed frequency (FCC license), and frame relay communication.

The PLC is housed in a cabinet equipped with a power supply, back-up battery, radio or communication equipment, computer access port for local access, and panel access security.

Typical input/outputs include pump status/control, well level tank level, flow, pressure, chlorine residual, generator status/control, chemical feed systems, filter flow-control, turbidity, security, and other treatment controls and monitoring.

Water Operation Facility Inspections: To ensure water service is not interrupted, water quality meets or exceeds regulated MCLs, and equipment is routinely inspected, water treatment and production operators visit each facility at a frequency to properly monitor the water production and delivery to the customer. The table below shows the District's best estimate of current facilities within the system.

Table 12-3: Facility Inspection Goal

Facility	Inspection Frequency	Number of Facilities
Water Treatment Plants	Daily	6
Wells	2 times per week	27
Pump Stations	2 times per week	73
Storage Tanks & Reservoirs	Weekly	97
Pressure Reducing Stations	Every 6 Months	19
Chemical Feed System Inspections	Monthly	94
Generator Inspection & Exercising	Monthly	20
Facility SCADA/PLC & Instrumentation Inspection	Quarterly	265

- Wells include 4 ASR wells, only 2 of which may be used for water production at any one time.
- Daily inspection of the six water treatment plants (WTPs) routinely include observation and assessment of mechanical equipment, chemical feed and monitoring (e.g. chlorine residual analyzers) equipment, water quality sampling, data recording, filter inspection, security, and other treatment processes.
- Wells and pump stations would typically be inspected twice a week, or more frequently based on production criticality and risk. Inspection routinely observe and assess mechanical equipment, chemical feed equipment, SCADA & instrumentation, chlorine residual and well level data recording, security, other equipment including taking water quality samples.
- Distribution storage tanks will likely be inspected weekly to observe and assess the tank condition, any evidence of leakage, SCADA & level transmitters, chlorine residual analyzers (if present), and site security. Water quality samples are routinely taken to check chlorine residual and presence of other microbial contaminants. Critical storage facilities may be inspected more frequently.
- Pressure Reducing Valve (PRV) stations are inspected every six months to assess the condition of the valve, piping, vault, and check/adjust pressure set-points. PRV pressure set-points may require adjustments for seasonal demand and pressure conditions.

- Chemical feed systems are inspected and tested monthly to confirm feed settings, leaks, injectors, and condition of the various components of the feed system equipment. The chemical feed pump will be calibrated using a calibration tube every 6 months.
- Generator sets shall be inspected and exercised monthly for at least 15-20 minutes. Transfer switches, fuel levels, and batteries will be checked as part of the monthly inspection.
- Facility SCADA system, including the PLC, power supply, back-up battery, instrument field devices & transmitters, and radio communication equipment shall be inspected and tested quarterly.

Cross Connection Program

The District will maintain or improve Cal-Am's robust cross connection program in compliance with Title 17 to protect the water system from private/public facility contamination through the implementation of backflow preventers and other approved backflow devices. The District will ensure that it retains or hires certified cross connection staff that manages the program, recordkeeping, and provide annual inspection of backflow devices connected to the water system. Backflow preventer devices are typically required for industrial, commercial, or private/public facilities, connected to the water system, that have the following conditions:

- Auxiliary Water Supplies
- Sewage
- On-site storm water treatment
- Recycled Water Supplies
- Fire Protection Systems
- Hazardous Chemicals and Substance Processes
- Biological Processes
- Private/Public Facilities that have internal cross connection exposure

Operations Staff Training

The District has embraced the AWWA Effective Utility Management (EUM) and Standards as the foundation of the Operations Plan. A Continuous Improvement operation and management culture and Employee Training and Certification Program are key attributes of the District's Strategic Goal #3 summarized in Chapter 5 above. Three key goals are:

- Goal 3B – Continuous Improvement Policy
- Goal 3E – Employee Certification and Training Program
- Goal 3F – Employee Internal Education Program

The AWWA utility operation and management standards, G200 & G400-440, all require written routine training programs that are essential for the various department and management staff including operations personnel.

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Training program requirements will be included in the specific job descriptions for all employees and must be achieved before advancement or transfer to a new position. All training programs will be written and integrated with the District's strategic goals, level of service metrics, and performance standards. Each training program shall include initial and refresher training modules along with refresher training schedules. Documentation of all certification and training programs per individual staff personnel shall be maintained and available to the public and other stakeholders for transparency.

Weekly, monthly, quarterly, and annual training shall be conducted for the operations staff and include, but not limited to the following programs:

- Operations Department Training Program & Matrix
- New Hire Orientation and Training Program
- Operation Standard Procedures Training
- Operations Certification Education & Training Program
- Regulatory and Permit Compliance Training
- Water Quality Monitoring, Testing, and Protection Training
- Environmental Impact Prevention Training
- Continuous Improvement Program Training
- Emergency Preparedness and Response Training
- Operations Risk Management and Mitigation Training
- Safety Program Training
- OSHA Regulations Training
- Confined Space Training
- Lock-Out/Tag-Out Training
- Hazardous Material Handling & Spill Containment Training
- Vehicle Driving Training
- Trip and Fall Prevention Training
- Electrical Safety Training
- Security Practices Training
- IT System, Computer Program, and Technology Training
- SCADA System Operations Training
- Cross Connection Program Training
- Asset Management and Condition Assessment Training
- Computerized Maintenance Management System (CMMS) Program and Practices Training
- Construction Inspection Training
- Customer Engagement Training
- Operations Staff Media Interaction Training

The District will adopt an internal educational program for the operations staff, and for other departmental staff, on the water system operation, activities, and the various departmental responsibilities and business processes. The objective is to familiarize all District personnel with

the broad activities and practices of each department to provide an overall understanding the water system operation and how they are integrated with their own departmental and job responsibilities.

12.4. Preventive Maintenance Workplan

The District will adopt a culture to provide preventive maintenance programs to maintain or exceed the level of service standards and to extend the service/useful life of the water system facilities, equipment, and assets. As custodian of the water system, the District's goal is to minimize the premature deterioration and potential failure of equipment/assets that could interrupt water service to the Monterey community. By minimizing the risk of service interruptions and extending the life of assets, the District reduces emergency repairs and lowers capital and O&M costs that will continue to stabilize water rates for customers. The following is a summary and brief description of the preventive maintenance programs to be implemented by the District.

Computerized Maintenance Management System (CMMS)

The District intends to utilize a CMMS (e.g. Maximo, Cityworks, Oracle EAM, Hansen/Infor, SAP) to manage and record both preventive and non-scheduled maintenance activities as well as retain asset data (including condition assessments) for all equipment, by asset class, in the water system. A CMMS system is a combination of a work order system and database that is capable of scheduling routine maintenance activities and recording emergency repair activities.

Field staff will record their time/hours for the various maintenance/repairs activities by asset number to be used with condition assessment data to determine future/on-going maintenance requirements or replacement. The CMMS and recorded cost data are also used to provide input into the annual O&M budget.

The operations staff and the District's Administrative Services Division will jointly manage the CMMS and routinely populate the CMMS database with the addition of new and retired equipment/assets, operational performance data, condition assessment data, and other supporting documents (e.g. inspection report, manufacturer data), uploaded into the system. Routine scheduling of maintenance work orders and the frequency of on-going/future maintenance activities by asset class or individual assets is performed by the Operations and Field Services staff.

Underground Service Alert (USA)

The District will become responsible for locating underground water pipelines when notified by city public works departments, other utilities, and contractors and marking them prior to the start of any construction. District operations staff will follow up with the contractor or public works department to confirm the location of mains, valves, and services. Any location dimensions that deviate from the GIS database, need to be corrected within 30 days of detection.

The District will repair or pay for damage to the mains and other assets that result from the mains/assets not in the location marked in the field. Damage to the water mains and other buried assets by other contractors, utilities, city public works, or private party shall be borne by that entity.

Pressure Zone Monitoring Program

The SCADA system monitors the water system operating pressures at wells, pump stations, treatment facilities, and tanks (tank level). However, water pressures at the customer meters are not monitored and will be assessed by the use of a hydraulic model simulation as part of the District's routine planning efforts. To monitor locations in the distribution system that may have low or high pressures, the assigned Utility Workers shall measure the water pressures monthly at customer meter locations identified by the engineering/resources division in all pressure zones twice a year. Each identified location shall be measured during peak (summer) and low (winter) demand periods. To facilitate pressure measurements taps for connecting a portable electronic pressure gauge may be installed in the customer's meter box. At a minimum, a hose-bib reading may suffice. Water pressure data will be used to update and refine the hydraulic model. The District recognizes that the current Cal-Am Monterey Water System has both longstanding high- and low- pressure zones that must be addressed.

General Facility Maintenance Program

This program is focused on above-ground structures, piping, HVAC, other non-mechanical equipment, and facility sites to provide routine maintenance such as painting, repairs to buildings, site improvements (e.g. site drainage/grading, fence repairs, surrey seal pavements, landscaping), and other minor repairs in the facility.

Right of Way (ROW) & Easement Maintenance Program

The District will acquire various facilities, underground mains, service lines, hydrants, air vacuum and release valves, and other equipment that are located within non-roadway ROW and dedicated easements. Routine landscaping, drainage, and other minor maintenance is performed quarterly to maintain these areas located within the cities, other jurisdictions, and private property the District serves.

Water Treatment Equipment Inspection, Testing, and Maintenance Program

The District will acquire 6 facilities that provide water treatment from groundwater (including surface water flowing in a known and definite channel underground) sources that are distributed around the Monterey Peninsula supplying water to customers. Most of these facilities are using chemical disinfection, granular activated carbon (GAC), greensand, or mixed media pressure filters to remove iron, manganese, hydrogen sulfide, and arsenic contaminants.

EXHIBIT 3-A

Routine inspection of pressure filters includes monitoring the pressure drop across each filter and removal efficiencies to assess the filter media condition; maintenance of filter influent flow control valves; and backwash facilities. Backwash lagoons require periodic cleaning and maintenance as well as backwash storage tanks and sludge tanks need to be taken out of service annually for cleaning and inspection.

Finished water, backwash, and sludge pumps shall be inspected and maintained as part of the Pump Inspection, Testing, Repair, and Replacement program. The chemical feed systems shall be maintained through the Chemical Feed Pump and Equipment, Testing, Calibration, and Maintenance Program. Electrical equipment shall be maintained under the Electrical Equipment Inspection, Testing, and Maintenance Program.

Begonia Iron Removal Plant (BIRP): The BIRP treats groundwater from the Lower Carmel Valley wells for the removal of iron and manganese. Influent well water treated with sodium hypochlorite for disinfection and to oxidize the iron and manganese and potassium permanganate for oxidation and to regenerate the downstream sixteen greensand filters. Stainless steel flow control valves located on the filter influent are used to balance flow through the plant. Post-filtration chemical feeds include caustic soda for pH control and zinc orthophosphate for corrosion control. The filters have surface wash capabilities and are backwashed off the distribution system and the Sequnda storage tank. Effluent backwash water is diverted to two open backwash lagoons. Sludge is trucked off-site. A 150,000 gallon septic tank is located on-site, as there is no sewer service in the area and requires to be pumped out periodically.

Ord Grove Ozone Treatment Facility: The Paralta and Ord Grove wells are treated at the Ord Grove chemical disinfection.

Ryan Ranch Water Treatment Plant: The remaining Ryan Ranch production well is treated at the plant for the removal of iron, manganese, and arsenic. Pretreatment of influent raw water includes dosing of sodium hypochlorite for disinfection and to oxide the iron, manganese, and arsenic and ferric chloride to coagulate the oxidized arsenic. The oxidized contaminants are filtered through two Pureflow catalytic media pressure filters that absorb any remaining unoxidized arsenic. Post filtration treatment includes caustic soda for pH control. The pressure filters are backwashed off of the distribution system with backwash water waste diverted to two sludge/reclaim tanks. Sludge settles in the tanks and supernatant is recycled to the plant influent and limited to ten percent of influent flow. Effluent sludge is trucked to the regional wastewater plant. This well and plant have recently been taken off-line due to the alternative supply line of an interconnection to the Cal-Am Main System.

Bishop Water Treatment Plant: Two Bishop wells are treated at the WTP that includes on-site generation of sodium hypochlorite for disinfection, caustic soda for pH control, zinc orthophosphate for corrosion control and an iron sequestering agent. Two finished water booster pumps are used to pump water to an upper pressure zone within the Bishop system.

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Hidden Hills Water Treatment Plant: The Bay Ridge well is treated at its own WTP that is similar to the Bishop WTP. An on-site sodium hypochlorite generator, sequestering agent for iron and manganese control, caustic soda, and zinc orthophosphate chemical feed systems provide finished water to a 16,000-gallon clearwell. Two booster pumps deliver water to the distribution system.

Luzern GAC Filtration Plant: The Luzern Well is treated for the removal of hydrogen sulfide using a GAC pressure filter with sodium hypochlorite for disinfection, caustic soda for pH control, and zinc orthophosphate for corrosion control. A detention tank/sand separator is located upstream of the GAC filter.

Monterey Main Zone Wells: The ten remaining Upper Carmel Valley and Seaside basin wells (including ASR wells) pump directly into the distribution system and are dosed with on-site sodium hypochlorite generators for disinfection with adequate CT time to meet Title 22, requiring a 4-log inactivation of viruses. Most of the Seaside wells have pump-to-waste facilities where discharge water is diverted to in-site percolation pits. Water withdrawn from the ASR wells will have a new chemical disinfection WTP online in late 2020.

Well Inspection, Testing, Maintenance & Rehabilitation Program:

The system has 23 active wells that supply the main zone, and 4 active wells that supply the other satellite service areas. See Tables 9.1 through 9-4 for a list of the active wells.

In general, all of the wells need the well pumps pulled, the casing/screens cleaned, the well inspected by CCTV, and redeveloped as necessary every 5 -10 years, with exception of the Lower Carmel Valley wells (see below), unless dictated by an increased loss of capacity.

The 6 Upper Carmel Valley Wells, located above the Narrows divide in the Carmel River, are relatively shallow (45-88 ft.) mostly in rock formations and of good quality. The Upper Valley wells cannot be operated during drier summer months in order to maintain a 20 cfs river flow.

The 8 Lower Carmel Valley Wells, located downstream of the Narrows along the Carmel River, are of medium depth (100-160 ft.) in alluvial gravels and have the presence of iron and manganese. The lower downstream along the Carmel River wells are located the higher iron and manganese levels. The SWRCB Orders mandate that the lowest wells in the Carmel Valley be pumped first to maintain stream flow as far down the river as possible during normal operations.

The lower CV wells also have iron bacteria growth risk in the well casing and screens that reduce capacity. The lower CV wells must regularly pull the pumps, wire brush the casing and screens, acid wash, CCTV the well, and perform a pump test every 2 to 3 years, even if the well is infrequently operated. If the iron bacteria growth is permitted to continue without regular maintenance, then the well screen will plug and prematurely deteriorate to the point the well will be no longer operational. The District recognizes this regular maintenance requirement.

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Seaside "Coastal" sub-basin Wells, located in the Seaside groundwater basin west of the Monterey Airport and north of the Route 68 corridor are medium to deep wells ranging from 225 ft. to 820 ft. in depth, in alluvial gravels with the presence of primarily hydrogen sulfide that creates taste and odor problems. Most of these wells have pumps to waste discharges to a percolation pit upon start-up and shut-down. The majority of the Seaside "Coastal" wells were constructed in the 1960s with the exception of the Ord Grove (1987) and Paralta (1991) wells that are located more to the east and are deeper resulting in higher hydrogen sulfide levels.

Seaside "Laguna Seca" Sub-basin Wells, located along the Route 68 corridor east of the Monterey Airport supply the Bishop, Hidden Hills, and Ryan Ranch satellite service areas are of medium to deep wells and in alluvial gravels with increased over-burden. Bishop wells are estimated to be constructed in the 1960s-1970s and in the estimated range of 400-500 ft in depth. The Ryan Ranch well and its unused potential back-up range in depth of 450-480 ft. The Hidden Hills well, constructed in 1994/1995, is in the 800-850 ft. in depth range.

Pump Inspection, Testing, Repair, & Replacement Program

The District can only estimate the number of pump stations in the Cal-Am system due to the lack of information sharing, however the District believes the system has approximately 114 pumps and motors that supply and deliver water to the customers in the service area. The following is an estimated summary of the pumps and motors:

Table 12-4: Summary of System Pumps and Motors

Facility Type	Pump Type	Number of Pump/Motors
Wells	Vertical Turbine Greater than 100 HP	22
WTPs	Finished Water Centrifugal	9
WTPs	Process & Backwash Pumps - Centrifugal	10
Pump Stations	Booster Pumps Less 50 HP	58
Pump Stations	Booster Pumps Greater than 50 HP - Centrifugal	15

All pumps and motors are expected to be inspected weekly with flow, suction (well water level) and discharge pressure, volts, amps, power factor, and motor temperature (if available) data recorded. Records of weekly performance data shall be maintained for all pumps along with the trend log for analysis of deterioration/curve. Motor oil level shall be checked weekly.

EXHIBIT 3-A

An annual comprehensive pump performance test shall be performed on all pump/motors of 30 HP and greater. Critical Pump/motors or those 100 HP and greater should be performed every 6 months. Pump inspections and tests shall be performed on any pump/motor that has reduced capacity of 10 percent or more, or 5 percent loss of wire-to-water-efficiency within 3 months.

Performance testing shall include verifying capacity at a minimum of 4 points along the pump curve and include a dead-head (zero flow – closed valve) test for comparison to the design curve. Wire to water efficiencies recorded at each test point along with all electrical data. Vibration levels shall be recorded in all three directions at the top or end of the driver (motor), pump head, and discharge pipe.

Vibration measurements shall be taken after 30 minutes of runtime and the pump/motor shutdown, performed by a dead test by striking the motor with a sledge-hammer in both directions – this should be done with all other pumps off and in normal running mode. These vibration readings are to create a baseline to determine if there is any harmonic or resonance frequency of the pump/motor RPM with the building/foundation structure natural frequency with one or more pumps operating.

Using an infrared temperature measuring device to record the temperature of the driver (windings) after a minimum of 30 minutes of operation, an operator will record the temperature readings of the electrical leads connected to the motor. Those shall be confirmed with the manufacturer recommendations for motor temperature ratings at full power. As a rule of thumb, if the temperature reading of the external surface of the motor at the location of the windings is greater than 150 degrees F then further investigation and monitoring is warranted.

Pump Control Valve Inspection, Testing, Repair & Replacement Program

Pump control valves installed on well pumps, booster pumps, and filter flow-control valves regulate the water flow during start-up and shutdown operations. These valves minimize the pressure spikes that can occur creating water transient waves or water hammer pressures that can damage the pump, distribution piping, and even customer service lines and internal plumbing.

Well pumps typically have Cla-Val or similar hydraulic control valves installed on the pump-to-waste discharge line that opens slowly (typically in the range of 30-60 seconds) upon start-up that diverts water that is contained in the pump column to a percolation pit or other discharge location. The pump-to-waste operation routinely runs for 2-3 minutes and then closes slowly diverting flow, opening the swing or silent check valve, into the distribution system. The control valve operation is set to close upon power outages/interruptions that creates the solenoid valve to close the valve as it is de-energized.

The operation is the same for the pump shutdown, but typically only remains open for approximately 60 seconds to allow the check valve to close slowly. The pump-to-waste

operation also benefits water quality as aged water in the pump column can be dirty or have taste, odor, or color issues that are disposed of upon start-up.

Routine maintenance of the control valves is required for proper operation of the valves and shall be done at least once a year. Critical pumps, or older valves should have maintenance performed every six months. The valve components that routinely need to be replaced are the solenoid valve, pilot valves, and diaphragm.

Booster pumps typically also have a Cla-Val pump control valve, followed by a swing or silent check valve, installed on the discharge pipeline. The start-up and shutdown operation is similar to the well pumps, opening and closing in approximately 30-60 seconds to prevent the check valve from slamming open or shut creating a water hammer condition. Smaller booster pumps may only have a check valve on the discharge line due to the low risk of creating damaging surge pressures. The swing or silent check valves shall be inspected annually and typically require maintenance every 3-5 years.

Filter flow control valves are similar to pump control valves as they are hydraulically controlled to maintain a set flow through the filters and can include pressure sustaining capability to protect the filter. The flow control valves have similar components to pump control valves that need to be routinely maintained and close upon power outages.

The District understands the required maintenance for pump control valves.

Distribution Main and Hydrant Flushing

It is the District's understanding that the Monterey Peninsula water system has a significant quantity of unlined cast-iron and other metallic mains that can contribute to the collection of sediment that creates dirty water and an environment for bio-film bacteria to grow, along with the premature loss of chlorine residual that could result in a coliform detection. The presence of iron bacteria growth in the wells and soluble iron and manganese that could precipitate in the piping system can exacerbate the issue.

To prevent distribution system water quality issues, the entire distribution system should be flushed every five years. Pipelines that have a higher frequency of dirty water or loss of chlorine residual are considered "Hot Spots" and are flushed more frequently. Dead-End mains shall be flushed every 2-3 years, preferably more often. Provisions for dechlorination of discharged water shall be maintained to protect the environment. Where possible, hydrant discharges will be collected in a portable tanker truck and disposed of at the regional wastewater plant for recycling.

Although flushing is an essential preventive maintenance provision to maintain water quality, adequate water supplies must remain available and the District will determine if flushing can be deferred due to drought or other supply or regulatory restrictions.

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Fire hydrant flow testing shall be conducted during main flushing activities as outlined in the next section.

Hydrant & Blow-Off Valve inspection, Maintenance, and Replacement Program

The safety and fire protection of the Peninsula residents is dependent on functional operation of fire hydrants located throughout the distribution system. Hydrants and blow-off valves will be exercised, inspected and tested as part of the main flushing program. In the event main flushing is deferred due to drought, limited water supplies, or regulatory constraints, exercising and inspection of all hydrants shall be conducted on a five-year rotation. All inoperable hydrants discovered from inspection activities shall be repaired or replaced within 30 days and the local fire department or agency shall be notified within 24 hours.

Critical hydrants, those in close proximity to hospitals, first responder facilities, schools, hotels, multi-family/apartment building, and other higher density public facilities shall be exercised, inspected, and flow tested every two years.

Hydrant flow testing will be an essential activity for the District to provide adequate fire protection for the community. Fire flow requirements vary by city and jurisdiction, and by building capacity and construction. Flow tests are to confirm the hydrant flows at a minimum of 20 psig to ensure compliance with fire flow requirements. Fire flow requirements shall be listed/documented in the GIS system for every hydrant in the water system.

The District will coordinate with the various fire departments and agencies serving the Peninsula to assess the fire flow requirements throughout the distribution system. Local fire departments or agencies, in coordination with the District may conduct hydrant flow tests with results shared between the agencies. The District's long-term goal will be to meet or exceed the local fire department fire flow requirements and to comply with the California state fire code and Insurance Services Office (ISO) standards.

Valve Exercising and Replacement Program

The District believes that the Monterey water system has approximately 13,000 distribution piping isolation valves. These valves are used to isolate piping segments to minimize the service interruption to the fewest number of customers possible in order to repair, flush, or replace the main. To ensure isolation valves are operable when needed, annual valve exercising work tasks are performed to test the valves.

The District estimates there are approximately 3,500 hydrants in the water system, and typically each hydrant has 3 isolation valves, two on the main and one on the bury. The approximate 10,500 hydrant isolation valves shall be tested as part of the main flushing or hydrant flow testing programs.

The following is the valve exercising schedule:

EXHIBIT 3-A

Table 12-5: Valve Exercising Schedule

Valve Size	Frequency
5” & Less	Every 7 Years
6”-12”	Every 5 Years
14”-18”	Every 3 Years
20”-24”	Every 2 Years
Larger than 24”	Annually
Hydrants	Every 5 Years

Isolation valves on transmission mains, mains that supply more than 1,000 customers, and critical mains that supply essential facilities (hospitals, first responder facilities, schools, etc.) shall be exercised every six months. All inoperable valves or broken valve stems shall be repaired or replaced within 90-days of discovery. All valve cans that are buried or paved over shall be raised within 90-days.

The Valve Crew will confirm the valve location with the GIS data and document the number of turns to open and close the valve including the direction (right or left-hand turning) of operation. That data will be populated in the GIS and CMMS.

Tank Cleaning and Inspection Program

The Monterey system has an estimated 104 distribution water storage, WTP backwash, and process tanks that are located through-out the service area. Most of the tanks are steel ground storage tanks that have interior and exterior painted coatings. Interior coatings have an expected service life of 20-25 years and exterior coatings have an expected service life of 25-30 years.

Sediment that collects in storage tanks can reduce the useful life of the interior coating and lead to the loss of chlorine residual and other water quality issues. Annual or periodic cleaning of storage tanks is essential to maximize the service life of the coatings and the tank itself by protecting it from internal corrosion. In general storage tanks will be inspected and cleaned every five years.

Dry inspections are required to be performed approximately every 5-10 years depending on the age, interior coating age, and capacity/criticality of the tank. Exterior coating inspections/testing shall be performed every 5-10 years, unless due to the age or condition of the coating every 1-3 years.

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Table 12-6: Tank Rehab Inspection Schedule

Tank/Coating Age, Condition, Capacity, and Criticality	Wet Inspection and Cleaning	Dry Inspection
New Tank	Every 5 years after first year dry inspection	First year after construction, then every 10 years or at interior recoating
Tank 20-30 Years Old	Every 5 years	Every 10 Years
Tank 30-50 Years Old	Every 3 years	Every 7 Years
Tank 50+ Years Old	Annually	Every 5 Years
Initial Exterior Coating ~30 Year Service Life	N/A	Every 10 Years
Second Exterior Coating, ~25 Year Service Life	N/A	Every 7 Years
Third Plus Exterior Coating, ~20 Year Service Life	N/A	Every 3- 5 Years
Initial Interior Coating ~ 25 Service Life	Every 5 Years	Every 10 Years
Second Interior Coating ~20 Year Service Life	Every 3 Years	Every 7 years
Third Plus Interior Coating ~ 15 Years	Annually	Every 5 Years
250,000 Gallon or Less Capacity	Every 5 Years	Every 10 Years
250,000-500,000 Gallon Capacity	Every 3 Years	Every 7 Years
500,000- 1 Million Gallon Capacity	Every 2 Years	Every 5 Years
1 MG and greater Capacity	Annually	Every 3 Years
Tanks without Redundancy	Annually	Every 5 Years

Chemical Feed System Testing, Calibration, and Maintenance Program

Chemical feed systems are installed at well and water treatment facilities required for disinfection, pH adjustment, corrosion protection and the removal or sequestering of iron, manganese, hydrogen sulfide, arsenic, and other contaminants. Most treatment chemicals are liquids and are stored in bulk tanks, transferred to day tanks and then injected, using chemical metering pumps (typically LMI pumps) into the process or effluent pipeline.
Potassium Permanganate is fed, using a dry-feeder, in to a mixing tank that the metering pumps take direct suction from and pump to the pipeline injectors. At the majority of the wells not treated at a WTP facility, on-site sodium hypochlorite generators produce the sodium

hypochlorite that are stored and fed from a day tank that supplies the metering pumps to the injectors. Salt storage on pallets is provided in the well or chemical buildings.

Generator Exercising, Inspection, and Maintenance Program

The District estimates 17 facility installed standby diesel generators and 2 trailer mounted diesel generators that provide emergency power to operate treatment plants, wells, and pump stations during a power outage or other emergency that interrupts electrical power to a facility. Two other portable generators were recently reclassified by the local air district and can only be used at specific sites. The generators must be operated for at least 15-20 minutes monthly to maintain the generators in good working condition.

- Monthly Generator Maintenance
  - oil levels are correct
  - radiator core for fouling
  - radiator hose condition
  - block heater working
  - fuel level – gallons used/added
  - fuel solenoid linkage for security
  - governor operation
  - voltage regular adjustment
  - start battery electrolyte level
  - control battery electrolyte level
  - charging voltage
  - housekeeping clean-up
  - record hours run time on start
  - record kwh meter reading
  - check fuel oil water and exhaust for leakage

- Quarterly Generator Maintenance
  - In addition to monthly maintenance work tasks the following items shall be checked:
  - fan belt tension
  - fan belt wear
  - check battery terminals
  - conduct a thorough clean on the battery terminals

- Annual Generator Maintenance
  - change engine sump oil
  - change full flow oil filter
  - empty, flush and refill radiator
  - change bypass oil filter
  - flush daily service fuel tank
  - change fuel filter
  - change air filter

- check and clear crankcase breathers
- check all nuts, bolts and clamps
- check starter motor solenoid
- check all electrical connections
- clean engine
- remove and clean air grilles
- inspect/check all alternator output connections
- clean alternator
- inspect all components and cubicle
- inspect all wiring and terminals
- clean switchboard
- test with load.

Pressure Reducing Valve/Air Release & Vacuum Valve Inspection, Testing, and Maintenance Program

The Monterey water system has approximately 74 pressure zones with storage facilities and 14 Pressure Reducing Valve (PRV) supplied pressure zones (no storage). PRV stations are located throughout the water system, and pressure settings vary due to seasonal demand conditions in a number of the pressure zones. Inspection and any pressure setting adjustments should be conducted every six months. Annual maintenance of pressure reducing valves to replace diaphragms, gaskets, pilot valves, and pressure control device as necessary. Inspection and maintenance of the vault, isolation valves, air vents, sump pump, and other ancillary equipment is performed annually.

Combination pressure relief and vacuum valves are typically installed on the well, booster, and finished water pump discharge lines to relieve surge pressures that can occur in the system and to allow air, as a vacuum break, to enter and then expel air from well columns during start-up and shut-down.

Air vacuum and relief valves are located through-out the distribution system to provide vacuum breaks due to water column separation in the distribution piping caused by water hammer conditions as well as relieve any entrained air collected in the piping system. Air relief/vacuum valves installed on pump discharge lines are inspected and maintained annually and the combination valves located in the distribution system are inspected and maintained every 3 years.

Table 12-7: Pressure Zone & PRV Summary

Service Area	Pressure Zones	Pressure Zones Supplied by PRV
Monterey Main System	65 Pressure Zones	14 Pressure Zones
Bishop	5 Pressure Zones	None
Hidden Hills	3 Pressure Zones	None
Ryan Ranch	1 Pressure Zone	None

EXHIBIT 3-A

Electrical Equipment Inspection, Testing, and Maintenance Program

The District believes all of the water treatment, well, and pump station facilities have incoming electrical power, 3-phase 480-volt service, (transformer, main disconnect, meter, etc.) that is inspected annually by PG&E. Pumps and other mechanical equipment are powered from the Motor Control Center (MCC) or individual motor starter/switchgear with some that include Variable Frequency Drives (VFDs). Step-down transformers are provided to reduce the voltage to 120-volt service for lighting and other facility power needs.

Incoming power equipment is typically one of the highest critical assets within the facilities, as if any component fails the entire facility is out of service. Each pump/motor is powered by individual switchgear and most facilities have redundant pumps/starters. Long lead times to procure replacement electrical equipment - motor starters, VFDs, generator transfer switches, step-down transformers, and internal electrical repair parts (electrical leads, coils, capacitors, etc.) are routine in the industry. To minimize potential unscheduled failure of electrical equipment, an infrared inspection of all electrical equipment in each facility should be tested every 3 years to detect “hot” or weak internal components that can be replaced before they fail. Annual electrical/motor efficiency performance tests shall be performed to establish a baseline and degradation curve to forecast rehabilitation or replacement.

Instrumentation Equipment Inspection, Calibration and Maintenance Program

The water system is controlled and monitored by a SCADA system that relies on digital field transmitters/devices to send data that is collected by the PLC located in each facility and that data is communicated back to the central operations center. The reliability of the facility is dependent on the accuracy and reliable operation of the individual instrumentation and control (I&C) digital monitoring devices.

Typical I&C transmitters/devices include flow meters, level transmitters (well level, tank, clearwell, chemical tank, etc.), chlorine residual monitoring, pressure transmitters, electrical monitoring (volts, amps, run-time, power factor), security devices, and other instrumentation. These digital devices transmit an analog 4-20 milliamp output signal to the PLC that needs to be calibrated twice a year to accurately measure the attribute it monitors. Critical facilities and I&C devices shall be inspected and calibrated quarterly. The service life expectancy of field I&C devices is approximately 5-7 years.

The PLC, radio/communication equipment, and other components in the PLC cabinets shall be inspected and tested annually. The service life of the PLC, radio, and cabinet equipment is approximately 10 years.

EXHIBIT 3-A

Leak Detection Program

Approximately 44 percent (270 miles) of the 614 miles of distribution mains are metallic including a considerable percentage of unlined cast-iron and steel piping. The water system has approximately 40,000 service lines many of them are galvanized steel, polybutylene, cast-iron, and other non-PVC/copper materials that experience a high rate of leaks/breaks.

The District's long-term goal is to achieve the AWWA recommended water main leak/break rate of 15 per 100 miles of main per year. For the Monterey system that is approximately 92 main leaks/breaks per year. The long-term goal for service line leaks/breaks is 0.5 percent of total services lines or approximately 200 per year. An annual leak detection plan is prepared based on the annual update of the pipeline renewal forecast analysis completed by the engineering department.

To detect and repair main and service line leaks in the system to reduce water loss, the District will implement an aggressive leak detection program to survey approximately 60-65 miles of pipe and 2.5 percent of services annually.

Asset Management Operational Support

The Operations staff will support the District's Asset Management Program that is developed and maintained by the Water Resources Division through the collection of field data and performing condition assessments of facility assets. The long-term objective is to prolong the service life of assets by at least 20 percent beyond the original asset useful of assets as documented by manufacturer and industry average data and to limit any service interruptions to one per year as a result of a facility asset failure.

Asset Inventory and Facility Data Collection: During the first five years of operation after the 12-month transition operational assessment period, the Operations staff, (Production and Distribution) will collect and document 20 percent of facility asset data requested by the Water Resources Division for each asset class and type each year. Collected data will be populated in the CMMS by asset number and linked to the Asset Registry database that is maintained by the Water Resources Division and the Administrative Services Division.

Asset Condition Assessment Program: Operations and Engineering staff will collaborate in performing asset inspections, testing, and condition assessments as part of the Preventive Maintenance Programs. Upon completion of the annual facility asset inventory data collection effort, the condition assessment inspections will be initiated and performed by asset class for the facilities with completed inventories.

Condition assessment inspection and rating criteria by asset class developed by Engineering shall be used and completed asset condition ratings, by asset number and will be populated in the CMMS and linked to the Asset Registry database. Asset condition inspections are to be performed with the updated rating every five years, or more frequently for critical assets.

12.5. Emergency Repair and Maintenance

Emergency or non-scheduled maintenance activities and work tasks unexpectantly occur in every water system. Prior to acquisition, the District will have prepared documented procedures and guidelines to respond to unscheduled repairs and maintenance work tasks. The goal is to respond and be on-site within one hour for all emergency/non-scheduled events which includes responding to facility alarms requiring action to be taken in the field. Typical procedures include:

- Power outage response procedures
- SCADA system communication failure response procedures
- Employee safety and injury response procedures
- Storage tank failure response procedures by pressure zone
- Chemical spill containment and clean-up procedures
- Main leak/break repair procedures
- Service line leak/break repair procedures
- Repair disinfection requirements and procedures
- Water quality contaminant detection response procedures
  - Coliform detection
  - Loss of chlorine residual
  - Disinfection By-Products (THMs) detection above MCL
  - Lead and Copper detection above MCL440
  - Dirty water detection
  - Iron and manganese filter effluent detection
  - Taste and Odor detection
- Facility equipment failure response and repair procedures
- Water treatment process failure procedures for each WTP

Major Emergency Event Resiliency Response

Major emergency events- earthquake, severe storm, extended power outage, flood in the Carmel River, wild fire, major urban or commercial fire, terrorist act, and other events that significantly impact water service and operations occur and operations staff are prepared and trained to maintain water service.

The District will adopt Cal-Am's Emergency Response Plan (ERP) that address the procedures, assigned responsibilities, and communication protocols for each type of emergency event. The ERP is prepared in compliance with the **AWWA Standard G440 – Emergency Preparedness Practices** that includes the activation of an Incident Command Center to coordinate all water system response activities with local, regional, and state agencies and first responder departments and agencies.

12.6. Employee Health and Safety Program

The health and safety of the employees is of utmost priority and focus by the District and is included in the organization's Strategic Goal No.3 (see Section 5.2). Safety protocols will be

included in all the District's Standard Operations Procedures (SOPs) and comply with Cal OSHA regulations and industry practices. The District will have a comprehensive Safety Manual that covers safety procedures for all employee work tasks and includes injury response protocols and procedures. Employees are required to report all injuries to their supervisor regardless of how minor they may seem.

Weekly safety meetings will be conducted with field crews that cover safety procedures and methods to maintain their health and protection from potential injuries. Formal employee safety training includes 16 hours of training quarterly for each employee by department. Annual one day formal OSHA regulation training will be conducted for all field personnel.

Safety procedure violations are documented for each employee, requiring training refresher activities to be completed for each event and included in their annual performance review. The goal is to have zero injuries, lost time accidents, vehicle accidents, or reportable safety violations each year. Safety awards will be given to employees and field crews that achieve the zero safety incident goals.

12.7. Asset Management Program

One of the key Strategic goals (Strategic Goal No. 6) is to maintain or improve the water service level of service through the implementation of an Asset Management Program. The objectives of the asset management program are to:

- Prepare an Asset Management Plan, GAP analysis, and Roadmap;
- Extend the service life of assets by at least 20 percent beyond recommended or industry average useful life for each asset class;
- Replace assets in a timely manner prior to failure;
- Limit water service interruptions to customers to one incident per year caused by a facility asset failure;
- Implement an Asset Renewal Forecast Program for each asset class;
- Integrate the asset registry database with the GIS, CMMS, and financial systems;
- Conduct an asset criticality analysis and rating system;
- Establish asset condition assessment inspection and rating criteria by asset class and type;
- Adopt a risk-based project/asset renewal priority analysis.

Asset Management Plan

The development and implementation of a successful asset management plan is founded on a collaborative team with input and consensus from operations, engineering, finance, and IT that is supported by management. An asset management policy and culture will be adopted by the District and will be integrated into the various department workflow processes and decision making going forward. Asset management is a continuous improvement process that is adopted by operations and management staff.

Frequent internal communication with employees regarding the asset management program, implementation process and status, objectives, and explanation of the benefits to customers, staff, and the District are key to implementing the various phases of the program. An implementation roadmap will be prepared to gradually phase in the multiple steps of the program to achieve the successful implementation of each phase before the next step in the process.

Operations and field personnel adopting the new workflow and accurate and timely collection of asset data that includes assigning hours spent for various O&M work tasks to specific asset numbers is an essential step in the process. Accurate time charged and documented on work orders by individual asset are necessary to perform analysis of maintenance requirements, renewal forecasts, and financial analyses and reporting.

The District will implement a central asset database or data warehouse by IT that is integrated with computer systems used by operations, engineering, and finance to maintain a single consistent data record for each utility plant asset.

Facility and Asset Data Collection

As indicated in Section 12.4 above, the collection of facility and asset data by operations staff to compile an asset inventory by asset number will completed within the first five years after the 12-month transitional operation assessment period. To perform the data collection, the District will determine the smallest asset, by class, it will want to make business decisions for. The definition and criteria of “failure” or replacement is determined for each asset type. This “failure” definition establishes the condition when an asset will be replaced, the condition assessment methodology and criteria, and the asset data that is needed to be collected and monitored.

Condition Assessment Methodology and Criteria

Consistent condition assessment inspections and ratings will be achieved through the implementation of standard inspection /testing practices, by asset class, and standardization of inspection findings criteria for assigning a condition rating for each asset.

Asset Criticality Analysis and Ranking

A criticality analysis is a process to assess the consequence of asset failure and likelihood or risk assessment of failure for each facility and the assets within each facility, by asset type. Criticality criteria will be established for the different facility types, asset classes, and asset types specifying the rating for the various criteria attributes. A criticality ranking by facility type will list the highest to the lowest rated critical pump station, tank, well, or treatment facility in the water system.

A criticality rating of the individual assets within each facility will be assessed and the asset will be ranked by the highest criticality rating. The facility and asset criticality ratings are multiplied together to overall rank each asset. The goal is to multiply the criticality rating with the condition assessment rating to rank all the utility assets, so maintenance, repair, and replacement priorities and funding are focused on the most critical assets in the worst condition.

12.8. Construction Management and Inspection

Construction projects are routinely performed annually for all water systems to maintain the level of service expected by customers. Construction projects and activities can vary depending on the improvement installed and by which entity. Construction projects can include new facilities or pipelines, replacement of assets or facility upgrades, developer projects for expansion of increased capacity for new customers, or repair and rehabilitation of existing assets.

Construction projects or activities can be performed by District field staff, outside contractors, developer contractors, other utilities, or private contractors. The District's construction managers/inspectors will be responsible for managing contractors hired by the District to perform the capital improvement, repair, or maintenance work authorized.

The construction inspectors are also responsible for the inspection and acceptance of work performed by developers and their contractors, other utilities, and private contractors (e.g. new service for a commercial customer). The District has design standards that are required to be followed both by internal crews and outside contractors. Compliance with the design standards, regulatory requirements, and best construction practices is the basis for the inspectors to accept the installation of the new or replacement asset or facility. The District has standard procedures for construction management and inspection practices.

13. Capital Improvement Plan

The reliability of water infrastructure in the United States has declined over the past several decades due to the lack of investment to replace aging facilities, equipment, and assets. To improve the reliability and sustainability of the Monterey water system, the District will maintain, repair, rehabilitate, and replace assets in a timely manner to minimize service interruptions to customers.

The District's approach will be thorough comprehensive planning, as discussed in Chapter 6, prioritized preventive maintenance programs, as discussed in Chapter 12, and with the implementation of an asset management program, asset renewal forecasting, risk-based project prioritization process, and sufficient funding to maintain or improve the level of service of the water system.

13.1. Capital Improvement Budgeting

The District will prepare annual and 5-year capital improvement budgets each year including the annual asset replacement programs and capital improvements using the recommendations summarized in the Water Master Plan and the annual master plan reviews and updates. Input from the water operations personnel as to assets requiring rehabilitation, replacement, or increased preventive maintenance activities shall integrated into the capital budgeting process.

Updates to the asset management program including additional equipment and facility condition assessments including the annual update of the water main renewal forecast providing recommendations for funding levels of the annual replacement programs. Recommendations from the annual update to the Risk Management Plan will be incorporated into the capital budget prioritization process.

Customer service complaints, service interruptions, public relations and stakeholder issues, social economic impacts, and environmental impacts issues will be considered as part of the capital improvement budgeting process. The water system level-of-service metrics are to complete 90 percent of the budgeted capital improvements, reduce main and service line breaks/leaks, reduce customer complaints and service interruptions.

Capital budget funding will be established based on the maintaining or achieving the Strategic Goals and LOS Standards adopted by the District, the assessment and acceptance of risk exposure, and evaluation of customer affordability and rate stabilization. Initially, the District expects it will use the industry average of 1.5 times the annual depreciation value until the completion of the Water Master Plan, Risk Assessment, and Finance Evaluations.

13.2. Annual Asset Replacement Programs

Routine equipment purchases necessary to operate the water system are typical for all water systems within the industry. These purchases are for management, administrative, operations

and maintenance, and other departments that support the water system operations. The capital purchases can include, but not limited to:

- Office Furniture & Equipment
- Tools and Power Equipment Replacements
- New & Replacement Vehicles
- Computer/IT Equipment/GIS/Software Purchases

The annual renewal and replacement of mains, services, hydrants, pumps, and other essential assets is necessary to maintain the LOS and reduce service interruptions. These programs are based on the asset management and condition assessment programs to determine the level of funding and the prioritization of assets to be replaced. The annual replacement programs typically include:

- Annual Small Main (2”- 10”) Replacement Program
- Annual Main (12” – 20”) Replacement Program
- Mains 22” – 36” shall be individual capital improvement projects
- Annual New Service Installations
- Annual Service Line Replacement Program
- Annual Meter Replacement Program
- Annual Valve, Hydrant, and Blow-Off Replacement Program
- Annual Pump/Motor Replacement Program
- Annual Pump Control Valve Replacement Program
- Annual Pressure Reducing Valve (PRV) Replacement Program
- Annual SCADA/I&C/Security/Communication System Upgrades and Replacement Program
- Electrical Equipment Upgrade and Replacement Program
- Chemical Feed System Replacement Program

The annual capital purchases and replacement programs typically comprise approximately 60% -75% of the annual budget in normal years. However, in the event a major capital improvement project is required this percentage may be reduced.

13.3. Capital Improvement Plan

Annual or multi-year capital improvement plan (CIP) includes projects that are larger and more complex individual facility/main/asset replacement projects requiring advanced engineering, planning, and construction management activities. The CIP projects are identified through the master planning process and specific planning projects to resolve discovered regulatory, reliability, environmental impact, and operational deficiencies.

The CIP projects typically address key operational issues and can include:

- Source of Supply Projects

- Fire Protection Improvement Projects
- Transmission Main or Large Main Capacity Projects
- Well Rehabilitation/Replacement Projects
- Tank Safety/Painting/Seismic/Replacement Improvement Projects
- Pressure Reducing Station Improvement/Replacement Projects
- Water Treatment Plant Process Improvements, Upgrades, and Equipment Replacement Projects
- Emergency Generator Improvements/Replacement Projects

Individual CIP projects are outlined in Capital Project Budget (CPB) Memoranda that summarize the identified deficiency, the alternative solutions evaluated, a description of the recommended project, O&M budget impacts, detailed cost estimate, and project schedule. The CPB memoranda will be presented along with the annual budget to the Board for approval. Engineering and construction contracts to perform the project shall be presented to the Board for approval supported by an update to the CPB memorandum.

13.4. Engineering, Planning, Construction, and Operation Capital Labor Expenditures

Engineering, planning, construction, operations, and other District staff that work on the planning, design, construction, or operational start-up/support to complete the CIP project will charge their labor to the capital work order and separate retirement work order if applicable. Inclusion of the labor costs in the work orders captures the total cost of implementing the improvement project.

No management, administration, or other District department allocations or overheads shall be charged to the capital work orders.

13.5. Asset Management Program

The District will adopt and implement an asset management program after the completion of the 12-month Water System Management and Operational Assessment as described in Chapter 2. The following is a summary of the Asset Management Program.

Asset Management Program Objectives and Strategy

The Asset Management Program (AMP) aligns with the overall goals and objectives of the District's Mission and Vision, which establishes the focus and priorities for operating the Monterey water system to serve and support the communities and its customers. The AMP objectives are intended to aid in the achievement of specific, measurable results and align with organizational priorities.

The District's four AMP objectives and related strategic elements include:

Objective 1 - Holistic Inventory: Create and maintain an inventory of reliable, integrated information on all assets throughout their lifecycle.

- Build and Maintain a Centralized Asset Inventory
- Standardize AM Procedures
- Manage Data as an Asset
- Conduct Regular Condition Assessments and Inspections
- Establish and Implement Condition Assessment and Inspection Guidelines

Objective 2 - Resilient Service: Provide resilient service by preserving safety and value of assets through sustainable, cost-effective maintenance practices.

- Establish LOS for Assets
- Conduct Condition-based Lifecycle Planning for Assets
- Incorporate Planning for Future Assets into the CMMS and Asset Database
- Integrate Facilities and Asset data and maintenance with engineering and financial IT systems

Objective 3 - Transparent + Translatable Prioritization: Prioritize capital investment in a manner that is transparent and translatable across operational, maintenance, environmental, social economics, and financial objectives.

- Implement a Risk-Based Project Prioritization Process
- Use the Asset Rating/Ranking Process in Capital Planning and Prioritization
- Establish Capital Project Guidelines
- Optimize Capital and Operations and Maintenance (O&M) Expenditures
- Confirm O&M Cost Impacts in Capital Plans

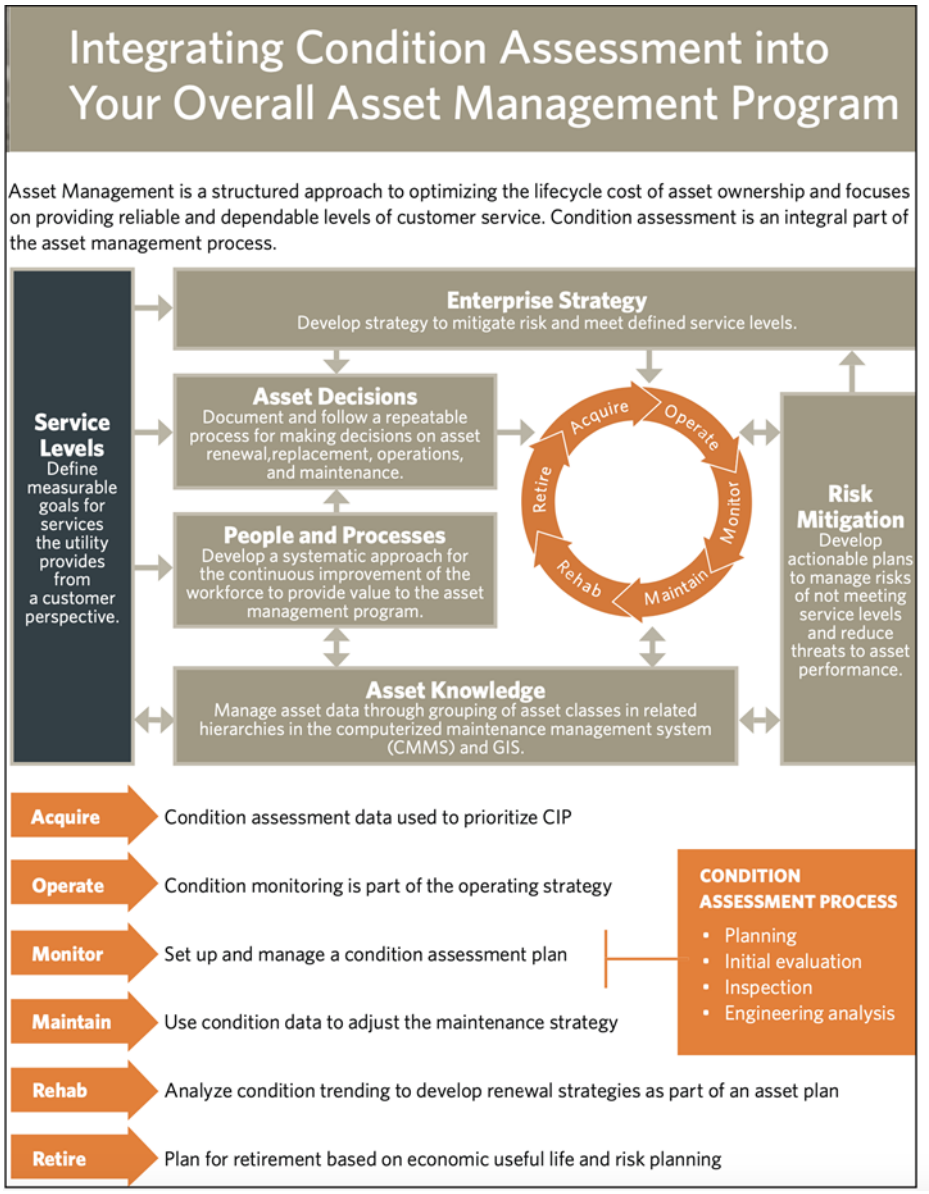
Objective 4 - Supported Investment: Enhance and sustain stakeholder support of investment through ongoing communication and education.

- Review Current Funding Structures at Regular Intervals
- Develop a Financing Strategy
- Assess Viability of Implementing a Capital Replacement Fund (CRF)
- Build Support through Public Outreach Initiatives
- Measure Satisfaction of Stakeholders

Framework for AMP Plans

AMP plans form the cornerstone of an effective AM System. *ISO 55000* notes that AMP plans provide the roadmap for achieving value from physical assets by optimizing cost, risk, and performance across the asset lifecycle. AMP plans identify what assets are in operation, their condition, and needed maintenance to keep the asset at a desired, pre- determined LOS as well as repair or replacement schedules and investment strategies. The District will develop the AMP plan based on the framework outlined in AWWA Standards, while supplementing with detail related to specific asset-based considerations.

EXHIBIT 3-A



Policy

With AMP objectives and related strategies identified, a policy is necessary to explicitly define the course of action to be collectively adopted by the District. The two District Policies under future ownership anticipated are:

- Prioritizing Capital Improvement Program (CIP) Projects - the policy is proposed to, (1) enable prioritization across municipalities, customer classes, and customer demographics; and (2) incorporate rankings specifically for capital needs, including how the AMP process can be used to support it.
- Asset Management Guidelines and Plan Steps - A new AMP policy which clearly states the District's vision and principles for Asset Management Program. Integrated with the

AMP objectives and strategy, business processes and AMP systems, the policy emphasize the District's, holistic approach to asset management, level of service, and financial stability.

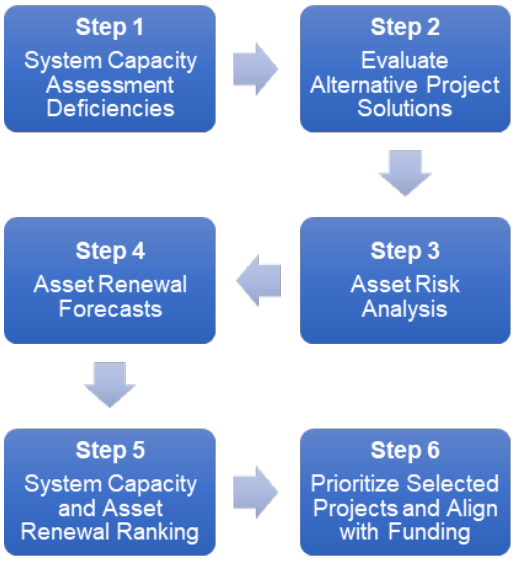
> *"Renewing and replacing the nation's public water infrastructure is an ongoing task. Asset management can help a utility maximize the value of its capital as well as its operations and maintenance dollars. Asset management provides utility managers and decision- makers with critical information on capital assets and timing of investments. Some key steps for asset management are making an inventory of critical assets, evaluating their condition and performance, and developing plans to maintain, repair, and replace assets and to fund these activities."*
> **– EPA**

13.6. Risk-Based Project Prioritization Process

A key attribute of the *AWWA Effective Utility Management Program* is the implementation of a Risk-Based Project Prioritization Process. The District supports a risk-based process to prioritize project and O&M needs that improves water service and minimizes impacts and interruptions to water delivery to customers. A risk-based project prioritization provides a transparent methodology for cities, regulatory agencies, stakeholders, and customers to understand and support projects that the District will undertake annually. An implementation process, that uses the concept of the EPA Integrated Planning Process, has been developed by the District and is summarizes as follows:

Risk-Based Project Development and Prioritization

The Monterey Peninsula Water System is experiencing a lack of water supply reliability, system capacity, fire flow deficiencies, and environmental protection that needs to be weighed against the renewal of aging infrastructure.



Traditional CIP plans typically consider growth or regulatory-related system improvements only. Not often are system repair and replacement needs addressed alongside the capacity drivers within a capital improvement plan.

Applying a risk-focused approach for both capacity development and renewal needs, priorities can be better understood and balanced providing a clear

path forward. Capital projects to improve water service and system reliability to support the community and economic growth while maintaining existing water asset dependability and performance can be prioritized to maximize the funding and value.

Information typically collected, but not always put to good use, such as water main or service line breaks, pump efficiencies, and other asset condition scoring combined with risk scoring can be leveraged into the prioritization process. Combining this condition-related data with non-renewal needs such as regulatory, hydraulic capacity, efficiency and quality improvements, a parallel method of fairly evaluating and prioritizing capital improvements and their associated drivers is viable.

Step 1 – System Capacity Assessment Deficiencies: Determine system capacity (non-renewal) deficiencies through demand projections and hydraulic modeling. Consider potential system development drivers include growth, new regulations, service quality, chemical/energy efficiency, climate change, vulnerability, safety/security, and innovation.

Step 2 –Evaluate Alternative Project Solutions: Develop and analyze project alternatives and O&M enhancement initiatives based on resolving capacity deficiencies.

Step 3 – Asset Risk Analysis:

- Develop desktop risk of failure on existing assets using available performance data
- Main Breaks
- Service Line Leaks
- Pump/Motor Runtimes, Efficiencies, Vibration Analyses, Operating Temperatures
- Daily and Seasonal Pressure Variations
- Water Hammer/ Surge Conditions/Events
- Electrical Equipment Operating Temperatures/Overheating
- SCADA Operating Data
- Other Performance Data from Preventive Maintenance Programs
- Perform Facility/Asset Criticality Analysis
- Develop Consequence and Likelihood of Asset Failure
- Determine Interruption of Water Service Likelihood
- Identify Environmental Impacts
- Assess Public Safety Exposure
- Assess Private Property Damage Exposure
- Estimate Economic Impacts
- Calculate risk and rank assets

Step 4 – Asset Renewal Forecasts:

- Identify level of renewal based on assets with unacceptable level of risk over time
- Determine reliability and redundancy goals
- Develop capital renewal forecasts and O&M impact assessments based on level of renewal and risk ranking

EXHIBIT 3-A

Step 5 – System Capacity and Asset Renewal Ranking:

- Rank Capacity Deficiency Projects and Asset Renewal Projections together through simplified Risk-Based Business Case Evaluation to establish project priorities – include coordination with other cities, municipalities, and agencies regarding other utility improvement projects, pavement replacement, construction impacts and fatigue, and other public factors.
- Calculate a Project score by combining the Condition and Risk Assessment (including capacity deficiency risks) rankings to rank and prioritize projects.
- Identify common needs – example, failing infrastructure needs upsizing to meet future hydraulic needs
- Assign life cycle cost to projects
- Align selected system capacity and renewal projects with the District's Strategic Goals, LOS Standards, and Performance Metrics or other industry benchmarks (AWWA Effective Utility Management, AWWA Utility Benchmarking Study, etc.)

Step 6 – Prioritize Selected Projects and Align with Funding:

- Prioritize selected system capacity and renewal projects based on total project score/ranking and efficiency gains (life cycle cost savings)
- Assign primary project triggers (capacity, condition, risk, regulatory, etc.) based on assessment scores and rankings
- Prepare recommended 1-year and 5-year Capital Budget with selected priority CIP projects
- Incorporate condition assessment rating /ranking, risk analyses ranking, costs, non-water system benefits, and implementation considerations in the Capital Project Budget (CPB) Memorandum.
- Align projected system capacity and renewal projects with financial and rate forecasts over the 20-year planning horizon.

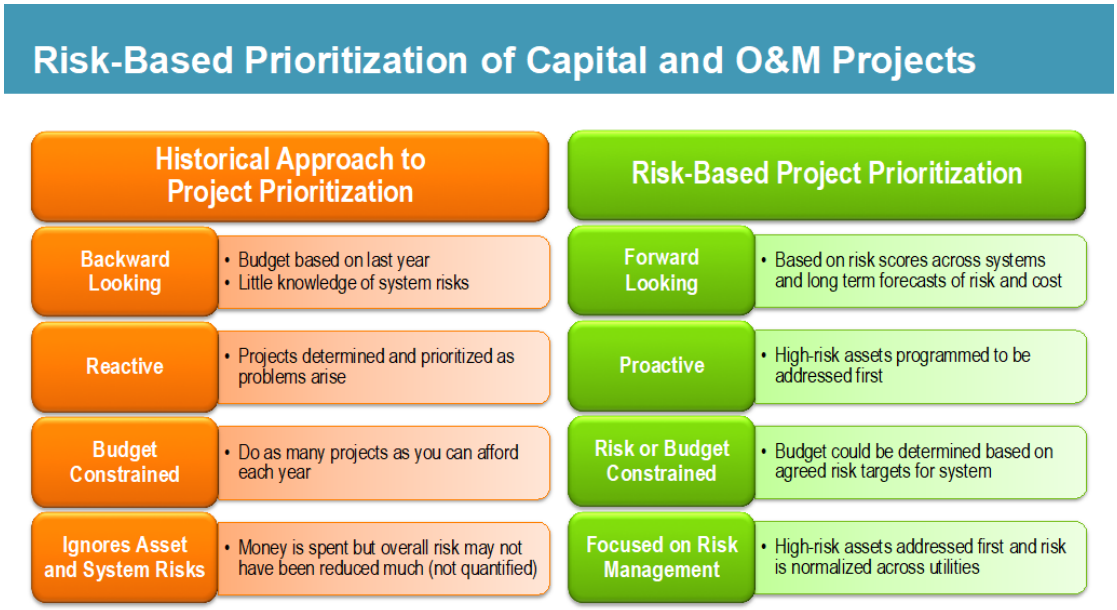
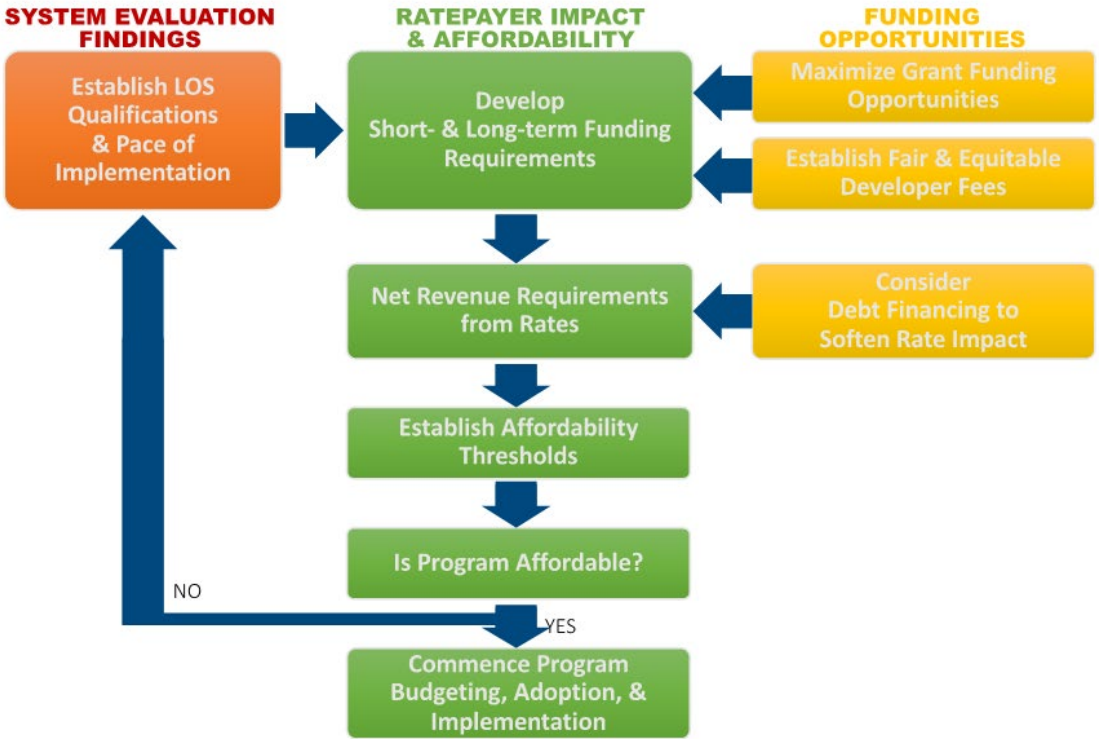


EXHIBIT 3-A


SYSTEM EVALUATION FINDINGS
RATEPAYER IMPACT & AFFORDABILITY
FUNDING OPPORTUNITIES
Establish LOS Qualifications & Pace of Implementation
Develop Short- & Long-term Funding Requirements
Maximize Grant Funding Opportunities
Establish Fair & Equitable Developer Fees
Net Revenue Requirements from Rates
Consider Debt Financing to Soften Rate Impact
Establish Affordability Thresholds
Is Program Affordable?
NO
YES
Commence Program Budgeting, Adoption, & Implementation

14. Organizational Structure & Staffing

As stated in Chapter 5, The District's Strategic Plan has been developed to initially adopt Cal-Am's current operating and management practices upon assuming ownership and operational responsibility of the Monterey Peninsula water system. As indicated in Section 2 – Transition Plan, the District will conduct a 12-month operational assessment to refine the strategic goals, management policies, operating procedures and practices, performance metrics (LOS), and establish a timeframe to work towards and achieve those goals.

14.1. Existing Cal-Am Operations

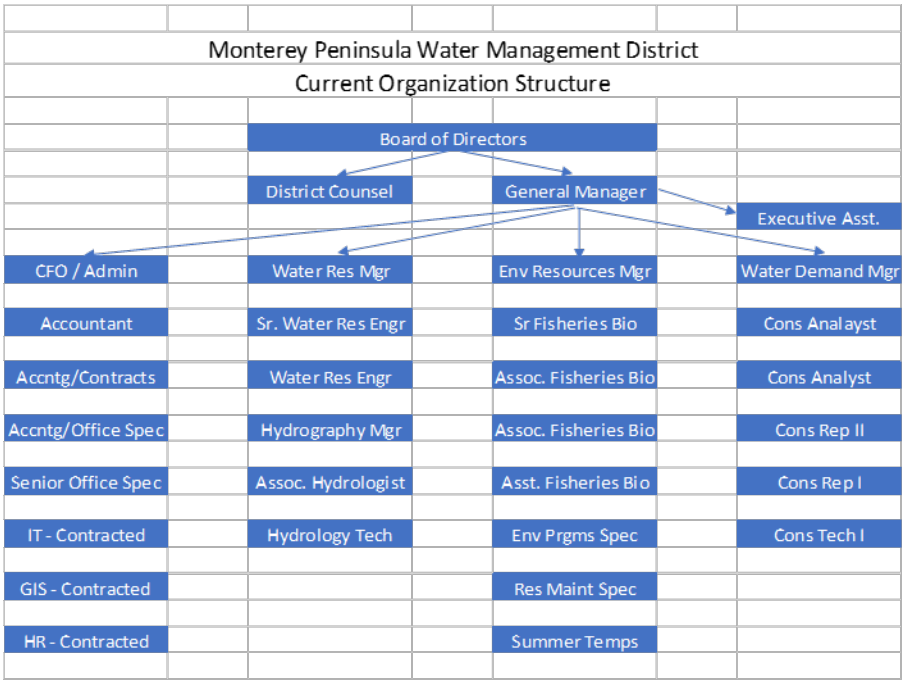
Figure 14.1 on the next page provides the District's approximate understanding of the local Cal-Am operations on the Monterey Peninsula. Actual positions are not known with certainty because Cal-Am has not made complete information available. However, the 73 positions shown is close to the 74 positions reported by Cal-Am for 2018 (actual) in the 2019 General Rate Case, MDR II.B.7.

EXHIBIT 3-A
Figure 14.1
Approximate Existing Organization

14.2. Existing District Operations

Figure 14.2 below shows existing authorized District positions.

Figure 14.2
Existing District Organization



The lost support of Cal-Am corporate employees (Service Corp in NJ and California General Office) will be made up by existing District positions and the requisite new hires. The District is already prepared to use its existing software, Tyler Incode 10 for billing. The District currently utilizes it for its customer billing and it will easily support 40,000 customer accounts. Accordingly, the District proposes to add a Billing Supervisor and three Customer Service Representatives. Bill collection will be through a third-party lock-box firm with remittance directly to District accounts. The District's IT and GIS will be augmented, but it is assumed the existing Cal-Am SCADA supervisor position will remain part of the operations. After-hours emergency service will be routed to employees that are "on call" through a contracted call center, but day-time calls will be received and routed by the Customer Service Representatives.

14.3. Combined Integrated Operations

The combined integrated organization is shown in Figure 14.3 on the next page. The net staffing increase is approximately 6 positions, as color-coded in yellow. The currently outsourced IT, GIS, and HR positions are likely to brought in-house, yet augmented by the District's third-party consultants, accounting for 2 of the net new positions. Asset management and risk management will be a function of the District's Administrative Services Division. Planning, regulatory compliance, and CEQA will be part of the Water Resources Division.

EXHIBIT 3-A
Fig. 14.3
Combined Integrated Operations

14.4. Bargaining Units & Labor

Cal-Am personnel currently are members of the Utility Workers Union of America (UWUA) Local 511 and others are members of the International Union of Operating Engineers (IUOE) Local 36. District general staff and division managers are represented by United Public Employees of California, Local 792/Laborers International Union of North America. Meeting with the bargaining units will be part of the District's transitional steps to communicate with the existing employees.

The goal will be to develop a framework to hire the Cal-Am staff and to present the approach to ensure employees don't lose any salaries or benefits in transitioning from a private company to a public agency. A key issue will be the valuation of a private company pension and 401k retirement plan to the CalPERS pension system. Attention must also be given to maintaining equity for current District employees. Early and frequent conversation with the bargaining units will be key to successful integration of both organizations.

14.5. Contract Operations

There is the extant possibility that Cal-Am will demonstrate before the Court that all or a majority of its employees will not be made available under an acquisition by the District. Whether or not integration of the Cal-Am employees is possible, the District has chosen to examine acquisition and subsequent operation of the utility by a third-party operator. The proposed operations plan under third-party operations is available as a separate document prepared by Jacobs Engineering Group.

EXHIBIT 3-A

15. Appendices

15.1. Appendix 15-1: Anticipated Policies and Procedures

EUM - AWWA EFFECTIVE UTILITY MANAGEMENT (EUM) 10 GUIDING PRINCIPLES					
	1. Product Quality	**2. Customer Satisfaction**	**3. Employee and Leadership Development**	**4. Operational Optimization**	**5. Financial Viability**
	A. Comply with regulatory and reliability requirements	*A. Minimize customer complaints*	*A. Recruit appropriate talent*	*A. Provide for ongoing operational improvements*	*A. Develop sound financial plan*
	B. Address customer needs	*B. Achieve target level of customer service delivery*	*B. Retain existing talent*	*B. Minimize resource use and losses from day-to-day operations*	*B. Provide financial integrity*
	C. Address public health and ecological needs	*C. Receive positive customer perceptions*	*C. Address succession planning needs*		*C. Achieve budget management effectiveness*
		D. Efficiently deliver customer service	*D. Strengthen core competencies*		
Utility Goals, Plans, Policies, Procedures, & Practices					
1. Utility Management & Administration	*Regulatory Agency Management Plan*	*Strategic Goals and Plan*	*Code of Ethics Policy*	*Operations Performance Goals & Monitoring Plan*	*Strategic Business Plan*
	Regulatory Compliance Policy	*Customer Response Plan*	*Succession Plan*	*Utility Operations Performance Measurement Plan*	*Strategic Financial Goals & Policies*
	Receiving Water Quality Protection Policy	*Management Performance Plan*	*Seniority Policy*		*Utility Budget Preparation & Approval Procedure*

EXHIBIT 3-A

	Water Quality Control Program	*Customer Education Program*	*Employee Retention Plan*		*Developer Contribution Policies*
	Customer Education & Involvement Program		*Organizational Structure*		*Budget Overrun Authority & Approval Procedure*
			Job Descriptions		*Litigation Policy*
			On-Call & Overtime Policy		
			Recruitment & New Hire Policy		
			Staffing Plan		
2. Operations	*Water Quality Sampling Plan*	*Water Service Interruption Practices*	*Training Program*	*Operational Policies*	*Deferred Maintenance Budget Procedure*
	Water Quality Sampling Procedure	*Operational Performance Metrics*	*Certification Program*	*Standard Operations Procedures (SOP)*	*Operations Budget Preparation & Monitoring Practices*
	Water Quality Testing Procedure	*Customer Interaction Practices & Training*	*Safety Plan & Training Program*	*Operational Benchmark Goals*	*O&M Cost per MG Metric Monitoring Practices*
	Production Report Practice	*Customer Compliant Resolution Practices*	*Knowledge Transfer & Retention Program*	*Pump Inspection, Testing, Repair, & Replacement Program*	
	Main & Service Line Repair Disinfection Procedure	*Notice Of Violation (NOV) Procedures*	*New Hire Orientation & Training Procedure*	*Pump Control Valve Inspection & Maintenance Program*	
	Coliform Detection and Notification Procedure		*On-Call Procedures*	*Service Line Replacement Program*	
	Well Discharge Permit Compliance & Reporting Procedure		*Computer Knowledge Training*	*Main Replacement Program*	
	Hazardous Material & Spill Containment Procedures		*Emergency Response Plan*	*Main & Service Line Repair Procedure*	
			Emergency Response Training	*Well Inspection, Testing, & Maintenance Program*	
			Lock-Out/Tag-Out Procedure & Training	*Main & Hydrant Flushing Program*	

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			Employee Advancement Guidelines	*Hydrant & Blow-Off Valve Inspection, Maintenance & Replacement Program*	
			Confined Space Training	*Valve Exercise & Replacement Program*	
				Tank Cleaning & Inspection Program	
				Meter Testing, Aging, & Replacement Program	
				Instrumentation Equipment Inspection, Testing, Calibration, and Replacement Program	
				Generator Exercising, Inspection, & Maintenance Program	
				Operations Report & Documentation Procedure	
				Construction Inspection Procedures	
				Disaster Recovery Procedures	
				Leak Detection Program	
3. Customer Service	*Customer Service Representative Water Quality Education and Training Program*	*Customer Service Performance Plan*	*Customer Service Representative Recognition Program*	*Customer Service O&M Education & Training Program*	*Customer Service Financial & Rate Basic Training*
	Customer Service Environmental Education & Training program	*Customer Service Policies*	*CS Representative Performance Program*		*CS metrics on cost of water service*
	Customer Service Regulatory Compliance Requirement	*Customer Billing Complaint Database*	*Customer Service Benchmark Goals & Metrics*		

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	Education & Training program				
	Water utility Strategic Goals, Level of Service, and performance metrics Training Program	*Customer water usage verification procedure*	*CS Emergency Response Training*		
		Customer Turn-On/Shut-off Policy and Procedure	*CS Employee Advancement Guidelines*		
		Customer Survey program	*CS New Hire Orientation & Training Procedure*		
4. Finance & Accounting	*Water Quality Cost Calculation Procedure*	*Customer Delinquent & Non-payment Policy and Procedure*	*Knowledge Transfer & Retention Program*	*Finance O&M Education & Training Program*	*Utility Valuation Policy & Procedure*
	Regulatory compliance Cost Calculation Procedure				*Depreciation Procedure*
					Invoicing Procedures
					O&M Cost Tracking Procedure
					Project Cost Recovery Plans
					Budget Cost Recovery Guidelines
					Project Capitalization Policy
					Asset Capitalization Procedure
					Reserve Account Policies
					Account Payable/Receivable Procedures

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5. Engineering & Planning	*Water Quality Improvement Plan*	*Capital Project Public Communication Program*	*Engineering Department Policies*	*Water Capacity Assurance Program*	*Capital Improvement Plan*
	Future MCL Compliance Plan	*Customer Compliant Resolution Capital Program*	*Cost Estimating Policies & Guidelines*	*QA-QC Policies & Procedures*	*O&M Cost Reduction Program*
	Environmental Protection Plan	*Level of Service Goals/Metrics Program*	*Construction Inspection Procedures*	*Fire Protection Policies & Plan*	*Developer Contributed Projects*
			Knowledge Transfer & Retention Program	*Emergency Power & Reliablity Plan*	*Capital Project Omissions & Contingencies Reduction Metrics & Procedure*
				Electrical Power Optimization Program	*Capital Project Approval Procedure*
6. Risk Management & Information Technology	*IT Water Quality Guidelines*	*Customer Service IT System Policies*	*HR Database Procedure*	*Computerized Maintenance Management System (CMMS) Procedures*	*Billing System IT Procedures*
		Customer Compliant Database Procedure	*Internet and Email Policy*	*O&M Database Procedures*	*Accounting IT Procedures*
		Customer Account Information Database Procedure	*Personal Mobile Devices & Texting Policy*	*O&M Reporting Procedures*	*Financial IT Database & Reporting Procedures*
		Utility Website Develoment & Maintenance Procedures	*Internal Website Development & Maintenance Policy & Procedures*		

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EUM - AWWA EFFECTIVE UTILITY MANAGEMENT (EUM) 10 GUIDING PRINCIPLES					
	6. Infrastructure Strategy and Performance	**7. Enterprise Resiliency**	**8. Community Sustainability**	**9. Water Resource Sustainability**	**10. Stakeholder Understanding and Support**
	A. Develop and implement an Asset Management Program	*A. Incorporate risk assessments into decision-making*	*A. Utility Organization*	*A. Achieve water supply adequacy*	*A. Stakeholder identification*
	B. Maintain knowledge of assets and costs	*B. Implement risk mitigation*	*B. Infrastructure project sustainability*	*B. Optimize reduction of non-revenue water*	*B. Stakeholder engagement plan*
	C. Incorporate risk-based analysis into decisions	*C. Sustain employee resiliency*	*C. Natural environment*	*C. Implement water conservation*	*C. Oversight body engagement strategy*
			D. Economic strength	*D. Achieve water supply reliability*	*D. Media interaction program*
			E. Social equity		*E. Stakeholder support performance measurement system*
Utility Goals, Plans, Policies, Procedures, & Practices					
1. Utility Management & Administration	*Capital Project Approval Policy*	*Risk Management Policy*	*Community Sustainability Involvement Plan*	*Non-Revenue Water Loss Goals*	*Stakeholder Management Plan*
			Demographic Diversity Policy	*Conservation & Demand Management Policies*	*Public Communications Plan*
					Media Relations Policy
					Community Involvement Program
2. Operations	*Asset Maintenance Prioritization Practice*	*Facility Security Procedures*	*Work in Low Income Areas Prioritization Practices*	*Leak Notification & Resolution Procedure*	*Operations Staff Media Interaction Training*

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	Facility Criticality Based Maintenance Practice	*Operational Risk Matrix & Risk Reduction Procedure*	*Operations Staff Resiliency Education Program*	*Water Loss Calculation Procedure*	*Operations Interaction with Stakeholder Groups Plan*
	Asset-Based Maintenance Work Order Procedure	*Electronic O&M Practices*	Green Infrastructure O&M Procedures		
	Asset Condition Assessment Procedures	*SCADA Cyber Security*			
	Asset Inventory Maintenance Procedures				
	GIS System Update Procedures				
3. Customer Service	*Customer Service on Water System Facilities & System Configuration Training*	*Customer Service Risk Management Training*	*Customer Service Resiliency & Sustainability Education Program*	*Customer Service Water Conservation Education Program*	*Customer Service Stakeholder Interaction Procedure*
	CS Annual Capital Project Communication Plan				*Customer Service Media Interaction Procedure*
	CS Asset Management Education Program				
4. Finance & Accounting	*Asset Registry Integration with Operations Procedures*	*Financial Risk Mitigation Plan*	*Financial Stability Policies*	*Water Conservation Rates Procedure*	*Financial & Investment Industry Communication Program*
	Asset Retirement Procedures	*Risk Matrix, Strategies & Reduction Plan*	*Water Rate Demographic Analysis Procedure*	*Water Loss Financial Impact Goals*	*Local Business Community Communication Program*
	Asset Renewal Forecast Financial Plan	*Financial Resiliency Plan*	*Low Income Customer Support Program*		*Developer Communication Program*

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5. Engineering & Planning	*Asset Management Plan*	*Risk Management Plan*	*Sustainability Master Plan*	*Water Supply Reliability Plan*	*Stakeholder Capital Project Prioritization Interaction Program*
	Water Master Plan	*Consultant Performance Requirement Procedure*	*Green Infrastructure Project Guidelines*	*Water Conservation & Demand Management Plan*	
	Condition Assessment Criteria & Procedures	*Quality Assurance Plan*		*Conservation Best Management Practices*	
	Criticality Criteria & Procedures	*Quality Assurance Audits*		*Drought Resiliency Plan*	
	Design Guidelines	*Remediation Plans*		*Water Loss Annual Water Audit Program*	
	Developer Design Guidelines	*Seismic Resiliency Plan*		*Groundwater Recharge/Stormwater Assessment Program*	
	Planning Study Procedure	*Earthquake Design Policy*		*Recycled Water Market Analysis*	
	Technical Report Procedure	*Tank Seismic Verification & Retrofit Program*			
	Tank Inspection & Recoating Program	*Risk Based Project Prioritization Procedure*			
	Developer Project Technical Review Procedure				
	Water System Planning Criteria Guidelines				
6. Risk Management & Information Technology	*Asset Database Policy & Procedures*	*IT Systems & Document Recovery Plan*	*Environmental Asset Database Procedure*	*Water Loss and Leak Detection Database*	*Public On-Line Communication Policy & Plan*
	Asset Purchasing Procedures	*Document Control Plan*			*Website Communication Procedures*
	Business Intelligence System Policy & Plan	*Document Retention Policy*			

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		Records Management Procedures			
		Cyber Security Policy & Procedures			
		Email Retention Policy			
		IT Emergency Response Plan			