This meeting is not subject to
Brown Act noticing requirements.
The agenda is subject to change.

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

**Water Demand Committee Members:**
*Alvin Edwards, Chair*
*Gary Hoffmann*
*George Riley*

**Alternate:**
*Molly Evans*

**Staff Contact**
*Stephanie Locke*
*Arlene Tavani*

*After staff reports have been distributed, if additional documents are produced by the District and provided to the Committee regarding any item on the agenda they will be made available on the District's website prior to the meeting. Documents distributed at the meeting will be made available upon request and posted to the District's website within five days following the meeting.*

**AGENDA**
**Water Demand Committee**
**Of the Monterey Peninsula Water Management District**
*********
Thursday, May 7, 2020, 3:00 pm, Teleconference

Pursuant to Governor Newsom's Executive Orders N-29-20 and N-33-20, and to do all we can to help slow the spread of COVID-19 (coronavirus), meetings of the Monterey Peninsula Water Management District Board of Directors and committees will be conducted with virtual (electronic) participation only using WebEx.

Join the meeting at mpwmd.webex.com.
Meeting number: 291 228 610
Meeting password: TXxJFHeU253
Participate by phone: 877-668-4493

**For detailed instructions on connecting to the WebEx meeting see page 3 of this agenda.**

**Call to Order/Roll Call**

**Comments from Public -** *The public may comment on any item within the District's jurisdiction. Please limit your comments to three minutes in length.*

**Action Items** -- *Public comment will be received.*

1. Consider Adoption of April 2, 2020 Committee Meeting Minutes
2. Consider Denial of Request from City of Monterey re Allocation for 2000 and 2600 Garden Road, Monterey
3. Consider Recommendation to the Board re Disposition of District Reserve Allocation
4. Consider Recommendation to the Board to Adopt Final Report *"Supply and Demand for Water on the Monterey Peninsula"*

**Discussion Items** – *Public comment will be received.*

5. Update on Water for Regional Housing Needs per District TAC (Technical Advisory Committee) Request to Jurisdictions
6. Discuss Methods for Implementation of Enhanced Water Conservation Measures for Non California American Water Pumpers in the Carmel Valley Alluvial Aquifer
7. Suggest Items to be Placed on Future Agendas

**Adjournment**

Upon request, MPWMD will make a reasonable effort to provide written agenda materials in appropriate alternative formats, or disability-related modification or accommodation, including auxiliary aids or services, to enable individuals with disabilities to participate in public meetings. MPWMD will also make a reasonable effort to provide translation services upon request. Submit requests by noon on Tuesday, May 5, 2020, to the Board Secretary at arlene@mpwmd.net or call 831-658-5652.

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**See next page of agenda for instructions on connecting to the WebEx meeting.**

## Instructions for Connecting to the WebEx Meeting

Note: If you have not used WebEx previously, when you begin connecting to the meeting you may be asked to download the app or join via the web. You can do either option. If you log on via your computer AND use your phone for the audio, please disable your computer speakers using your Settings menu on your computer to avoid echoes that occur when using the computer web link AND the phone number to join. If you do not have a computer, you can participate by phone only.

**Begin:** Within 5 minutes of the meeting start time from your computer go to: mpwmd.webex.com. Under "Join a Meeting" enter the meeting number **291 228 610**, hit the enter key and when prompted enter the meeting password **TXxJFHeU253**, click "Join Meeting" and participate in one of the methods listed below.

**1) Audio and video connection from computer with WebEx app – view participants/materials on your screen**
Once in the meeting, mute your microphone.
Turn your microphone on when it is your turn to speak.

**2) View material on your computer screen and listen to audio on your phone**
Once in the meeting, at the bottom of the meeting box, choose "Call In." Do not choose "Use Video System"
Click on "Start Meeting" / You will see a toll-free telephone number, access code, and attendee ID # -- enter these numbers on your phone.
Mute the microphone on your computer.
Disable computer speakers using the Settings menu.

**3) Join by phone only** (no computer) dial 877-668-4493 and use the meeting number above.

## Protocol for Meetings Conducted by Teleconference

1) The Chair will call the meeting to order.
2) Receipt of Public Comment – the Chair will ask for comments from the public.
   (a) Audio and video connection through WebEx – use the "raise hand" icon to indicate you would like to speak. When called upon, please state your name.
   (b) Audio on your phone – when the Chair asks for comments from persons participating by phone, your microphone will be unmuted, please state your name and present your comment.
   (c) Limit your comments to 3 minutes in length.

## Submit Written Comments

If you are unable to participate via telephone or computer to present oral comments, you may also submit your comments by e-mailing them to comments@mpwmd.net with the subject line "PUBLIC COMMENT ITEM __" and add the item number. Comments must be received by noon on Thursday, May 7, 2020. All submitted comments will be provided to the Board of Directors and may be read into the record and will be compiled as part of the record.

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

**WATER DEMAND COMMITTEE**

**ITEM: ACTION ITEM**

**1. CONSIDER ADOPTION OF APRIL 2, 2020 COMMITTEE MEETING MINUTES**

| | | | |
|---|---|---|---|
| **Meeting Date:** | **May 7, 2020** | **Budgeted:** | **N/A** |
| **From:** | **David J. Stoldt, General Manager** | **Program/ Line Item No.:** | **N/A** |
| **Prepared By:** | **Arlene Tavani** | **Cost Estimate:** | **N/A** |

**General Counsel Review: N/A**
**Committee Recommendation: N/A**
**CEQA Compliance: This action does not constitute a project as defined by the California Environmental Quality Act Guidelines section 15301**

**SUMMARY:** Attached as **Exhibit 1-A**, are draft minutes of the April 2, 2020, committee meeting minutes.

**RECOMMENDATION:** The Water Demand Committee should review the minutes and approve them by motion.

**EXHIBIT**
**1-A** Draft minutes of April 2, 2020 committee meeting

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

# EXHIBIT 1-A

**DRAFT MINUTES**
**Water Demand Committee of the**
**Monterey Peninsula Water Management District**
**April 2, 2020**

**Call to Order**
The meeting was called to order at 3:05 pm.

| | |
|---|---|
| **Committee members present:** | Alvin Edwards, Chair<br>Gary Hoffmann<br>George Riley (joined at 3:40 pm) |
| **Committee members absent:** | None |
| **Staff members present:** | David Stoldt, General Manager<br>Stephanie Locke, Water Demand Division Manager<br>Arlene Tavani, Executive Assistant |
| **Comments from the Public:** | No comments. |

**Action Items**

1. **Consider Adoption of March 5, 2020 Committee Meeting Minutes**
   On a motion by Hoffmann and second by Edwards, minutes of the March 5, 2020 committee meeting were adopted on a vote of 2 – 0 by Hoffmann and Edwards. Riley was absent.

2. **Discuss Request from City of Monterey re Allocation for 2000 and 2600 Garden Road, Monterey**
   Hoffmann offered a motion to defer action until such time as staff and the SWRCB could meet and reach some accommodation regarding the District's use of the reserve. There was no second to the motion, however there was discussion about the possible timing for reaching a resolution to this issue.

   Edwards offered a motion to bring this issue back to the committee on May 7, 2020. Hoffmann seconded the motion and it was approved on a vote of 2 – 0 by Edwards and Hoffmann. Riley was absent.

   Director Riley joined the meeting at 3:40 pm.

3. **Consider Recommendation to the Board on First Reading of Ordinance No. 136 – Amending District Rule 24 to Allow Special Fixture Unit Accounting for Second Bathrooms in Existing Dwelling Units and to Permanently Adopt Sub-Metering Requirements and Exemptions for Accessory Dwelling Units**
   Edwards offered a motion to recommend that the Board of Directors adopt the first reading of Ordinance No. 136. The motion was seconded by Riley and approved on a vote of 3 – 0 by Edwards, Riley and Hoffmann.

**4. Consider Recommendation to the Board to Adopt Final Report *"Supply and Demand for Water on the Monterey Peninsula."***

The committee discussed this issue and agreed that it should be brought back for further consideration at the May 7, 2020 committee meeting.

**Discussion Items**

**5. Suggest Items to be Placed on Future Agendas**

It was requested that items requested at the March 5, 2020 meeting be brought forward. Those items were: (a) Discuss how water would be allocated when it becomes available. (b) Discuss methods for implementation of enhanced water conservation measures for non-Cal-Am water users along the Carmel River.

**Adjournment:** The meeting was adjourned at 4:35 pm.

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**WATER DEMAND COMMITTEE**

**ACTION ITEM**

## 2. CONSIDER DENIAL OF REQUEST FROM CITY OF MONTEREY RE ALLOCATION FOR 2000 AND 2600 GARDEN ROAD, MONTEREY

| | | | |
|---|---|---|---|
| **Meeting Date:** | **May 7, 2020** | **Budgeted:** | **N/A** |
| **From:** | **David J. Stoldt<br>General Manager** | **Program/<br>Line Item No.:** | **N/A** |
| **Prepared By:** | **David J. Stoldt** | **Cost Estimate:** | **N/A** |

**General Counsel Approval: N/A**
**Committee Recommendation: N/A**
**CEQA Compliance: Action does not constitute a project as defined by the California Environmental Quality Act Guidelines section 15378.**

**SUMMARY:** At its March 5, 2020 Water Demand Committee meeting, the Committee discussed a letter dated February 18, 2020 from the City of Monterey requesting a water allocation for affordable housing projects on Garden Road. The allocation would come from the District Reserve initially, but shifted to a future District allocation for jurisdictional use based on housing needs.

The allocation would allow 31 additional 100% affordable units at 2000 Garden Road and 35 additional 100% affordable units at 2600 Garden Road.

The day prior to the March Committee meeting, the State Water Resources Control Board (SWRCB) submitted an email expressing its concerns with such an approach. The email simply clouded any decision to release water at this time, prior to having discussion with SWRCB staff once total Peninsula needs are identified. At its April 2, 2020 meeting the Water Demand Committee took up this matter with Director Hoffmann initially making a motion for the committee to defer action until after staff and the SWRCB meet and come to some accommodation regarding use of the District Reserve. However, Director Edwards then suggested staff bring the item back in May and Director Hoffmann agreed. Director Edwards then turned that suggestion into a motion and it passed 3-0.

At this time, staff is recommending denial of the request because of the SWRCB email still being unresolved, as well as the policy for the use of the District Reserve is under separate discussion (see agenda Item 3.)

District staff is still planning to visit SWRCB staff about water for housing needs under the Cease and Desist Order (CDO) once the various jurisdictional needs are known, as an outcome of the Technical Advisory Committee (TAC) process (see agenda Item 5.) The General Manager spoke with the SWRCB attorney assigned to the CDO on April 30, 2020 to begin the process of seeking accommodation for near-term housing needs under the existing CDO.

**RECOMMENDATION:** The Committee should recommend the Board deny the City's request at this time and direct staff to interact with SWRCB on Peninsula-wide housing needs and the CDO, pursuant the TAC process.

**EXHIBIT**
None

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**WATER DEMAND COMMITTEE**

**ACTION ITEM**

**3. CONSIDER RECOMMENDATION TO THE BOARD REGARDING DISPOSITION OF DISTRICT RESERVE ALLOCATION**

| | | | |
|---|---|---|---|
| **Meeting Date:** | **May 7, 2020** | **Budgeted:** | **N/A** |
| **From:** | **David J. Stoldt<br>General Manager** | **Program/<br>Line Item No.:** | **N/A** |
| **Prepared By:** | **David J. Stoldt** | **Cost Estimate:** | **N/A** |

**General Counsel Approval: N/A**
**Committee Recommendation: N/A**
**CEQA Compliance: Action does not constitute a project as defined by CEQA**

**SUMMARY:** At its April 2, 2020 meeting the Water Demand Committee deferred action on the City of Monterey's request for an allocation of water from the District Reserve Allocation. Conversation ensued among Committee members whether (a) the balance in the Reserve be allocated equally to the jurisdictions, or (b) it should be retained by the Board for use at its discretion.

The District Reserve was established by Ordinance 182 adopted by the Board at its May 20, 2019 meeting. That Ordinance added a new definition to Rule 11:

> "District Reserve Allocation" shall mean a quantity of water held/or use at the discretion of the District.

It also established Rule 33-B:

> The District Reserve Allocation shall refer to a quantity of water available/or use at the District's discretion. The District Reserve Allocation can be augmented by dedications of water from a Water Entitlement, Water Use Credit, Water Credit, or a new Source of Supply

Use of the word "discretion" was intentional and derived from direction provided to staff by the Water Supply Planning Committee at its February 21, 2018 meeting. At that meeting under the agenda item *"Discuss Reinstatement of District Reserve and Policy for Use*," The committee discussed establishment of a District reserve, and if it should be restricted to projects that provide a public benefit or if it could be allocated for jurisdictional use. During the discussion committee members opined that: (a) only for public benefit projects; (b) Board should determine if a project provides a public benefit; (c) each request should be determined on its merit by the Board – not according to a list of qualifying projects; and (d) project should not be growth inducing.

**RECOMMENDATION:** The Committee should recommend the Board whether (a) the balance

in the Reserve be allocated equally to the jurisdictions, or (b) it should be retained by the Board for use at its discretion. Staff recommendation is to maintain the status quo.

**EXHIBIT**
None

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**WATER DEMAND COMMITTEE**

**ACTION ITEM**

**4. CONSIDER RECOMMENDATION TO THE BOARD TO ADOPT FINAL REPORT *"SUPPLY AND DEMAND FOR WATER ON THE MONTEREY PENINSULA"***

| | | | |
|---|---|---|---|
| **Meeting Date:** | **May 7, 2020** | **Budgeted:** | **N/A** |
| **From:** | **David J. Stoldt<br>General Manager** | **Program/<br>Line Item No.:** | **N/A** |
| **Prepared By:** | **David J. Stoldt** | **Cost Estimate:** | **N/A** |

**General Counsel Approval: N/A**
**Committee Recommendation: N/A**
**CEQA Compliance: Action does not constitute a project as defined by the California Environmental Quality Act Guidelines section 15378.**

**SUMMARY:** At its September 16, 2019 meeting, the District Board accepted a report titled *"Supply and Demand for Water on the Monterey Peninsula"*, which was Exhibit 9-A of that Board packet. The report looked at the changing nature of demand on the Monterey Peninsula, the underlying assumptions in the sizing of the water supply portfolio, and indicators of the market's ability to absorb new demand. The report was reviewed by members of the public, local organizations, and state agencies. Many comment letters argued that the findings in the report contradict those of the California Public Utilities Commission, but the letters did not provide any substantive alternate assumptions or facts.

Subsequent to the release of the initial report the 2019 water year was completed, providing an additional data point on current customer demand. The report was revised December 3, 2019 to address three items: (i) What is average current demand with the additional water year in the data? (ii) What water will be required to meet future housing needs? and (iii) What might be the market absorption of water based on an objective third-party growth forecast – the Association of Monterey Bay Area Governments (AMBAG) 2018 Growth Forecast? The revisions were presented to the District's Water Demand Committee December 17, 2019 and a revised report was distributed to the Peninsula's six city managers in January.

On January 22, 2020 Hazen & Sawyer, a consultant to Cal-Am, issued an analysis of the District's report, to which the District responded on March 6, 2020. This FINAL version of the supply and demand report responds to comments made by the public, the city managers, Hazen & Sawyer, and incorporates an additional growth forecast. It is attached as **Exhibit 4-A**.

On April 21, 2020, Marina Coast Water District released its third-party "Expert Report and Recommendations of Peter Mayer, PE Regarding Water Supply and Demand in the California American Water Company's Monterey Main System" (attached as **Exhibit 4-B**). Using slightly different data and methodology than the District, Mr. Mayer reaches many of the same conclusions

as the District's Final Report.

**RECOMMENDATION:** The Committee should recommend the Board adopt the final report at its next meeting.

**EXHIBITS**

**4-A** Supply and Demand for Water on the Monterey Peninsula – Final

**4-B** Expert Report and Recommendations of Peter Mayer, PE Regarding Water Supply and Demand in the California American Water Company's Monterey Main System

**EXHIBIT 4-A**

# Supply and Demand for Water on the Monterey Peninsula

Prepared by David J. Stoldt, General Manager
Monterey Peninsula Water Management District
FINAL
March 13, 2020

## Introduction

With the approval of the Monterey Peninsula Water Supply Project (MPWSP) in September 2018 and the continued environmental work on Pure Water Monterey (PWM) expansion as a back-up option, it is an opportune time to examine available supplies and their ability to meet current and long-term demand. This memorandum will also look at the changing nature of demand on the Monterey Peninsula, the underlying assumptions in the sizing of the water supply portfolio, and indicators of the market's ability to absorb new demand.

At its September 16, 2019 meeting, the District Board accepted a report titled *"Supply and Demand for Water on the Monterey Peninsula"*, which was Exhibit 9-A of the Board packet. The report was reviewed by members of the public, local organizations, and state agencies. While publicly vetted, only three sets of comments were received: (a) California American Water provided a comment letter October 15, 2019, and (b) The Coalition of Peninsula Businesses provided letters September 15, 2019 and September 24, 2019. All three comment letters argued that the findings in the report contradict those of the California Public Utilities Commission, but the letters did not provide any substantive alternate assumptions or facts. The District's General Manager has encouraged the parties to provide their own forecast of growth and/or market absorption of water demand, but they have failed to do so.

At the November 14, 2019 Coastal Commission hearing former Pacific Grove mayor Bill Kampe did raise two substantive issues regarding the report: (a) pre-Cease and Desist Order (CDO) market absorption of water demand may have been constrained in some jurisdictions due to a lack of water allocation, and (b) new statewide focus on housing will require water.

Additionally, subsequent to the release of the initial report the 2019 water year was completed, providing an additional data point on current customer demand. The report was revised December 3, 2019 to address three items: (i) What is average current demand with the additional water year in the data? (ii) What water will be required to meet future housing needs? And (iii) What might be the market absorption of water based on an objective third-party growth forecast – the Association of Monterey Bay Area Governments (AMBAG) 2018 Growth Forecast? The revisions were presented to the District's Water Demand Committee December 17, 2019 and a revised report was distributed to the Peninsula's six city managers in January.

On January 22, 2020 Hazen & Sawyer, a consultant to Cal-Am, issued an analysis of the District's report, to which the District responded on March 6, 2020.

This FINAL version of the supply and demand report responds to comments made by the public, the city managers, Hazen & Sawyer, and incorporates an additional growth forecast.

**Supply**

Available sources of supply are shown in Table 1 below and are described in the discussion that follows. Despite the California Supreme Court's decision to not hear the two petitions for writ of review, there remains the risk of additional legal challenges and not all permits have been issued for California American Water's (Cal-Am) MPWSP desalination plant. For these reasons, supply has been shown with both desalination and with PWM expansion as a back-up.

Table 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** |

There also exists approximately 406 additional acre-feet of other available supplies as discussed below.

*Desalination:* The 6.4 million gallon per day (MGD) MPWSP desalination plant is expected to deliver 6,252 acre-feet annually (AFA).[1] It is likely to begin deliveries in late-2023, considering final permits in mid-2020, a 21-month construction period, and 6-month commissioning and start-up window.[2]

[1] CPUC Decision 18-09-017, September 13, 2018, page 70; Amended Application of California-American Water Company (U210W), Attachment H, March 14, 2016
[2] www.watersupplyproject.org/schedule

*Pure Water Monterey:* Monterey One Water's (M1W) project came online in February 2020 and should begin deliveries for customer service of 3,500 AFA to Cal-Am in mid-2020.

*Pure Water Monterey Expansion:* The expansion of Pure Water Monterey is expected to yield 2,250 AFA.[3] The source waters for the expansion are secure: In multiple presentations by the staff of Monterey One Water (M1W)[4] 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.

*Carmel River:* 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.

*Seaside Basin:* 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 & Recovery:* There are two water rights that support ASR. Permit 20808A allows maximum diversion of 2,426 AFA and Permit 20808C allows up to 2,900 AFA for a total of 5,326 AFA. However, these are maximums that may only be close to being achieved in the wettest of years. Based on long-term historical precipitation and streamflow data, ASR is designed to produce 1,920 AFA on average. The MPWSP assumes a lesser amount of 1,300 AFA to be conservative.

*Sand City Desalination Plant:* The Sand City plant was designed to produce a nominal 300 AFA, but 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 past four years including water year 2019. The intakes will likely be augmented and production increased (see "*Other*

[3] Notice of Preparation of a Supplemental Environmental Impact Report and Public Scoping Meeting Notice, page 4, May 15, 2019

[4] 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

*Available Supplies*", below.) Here only the 94 AFA of long-term production legally committed to offset Carmel River pumping is included.

*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.

**Historical Water Demand for which MPWSP Desalination Plant is Sized**

The MPWSP was initially sized solely as a replacement supply[5] 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.[6] Table 2 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 2
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** |

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

*Average Current Customer Demand:* The Application of Cal-Am to the CPUC in April 2012 utilized 13,290 AFA which was the 5-year average demand for 2007-2011.[7] As stated earlier, this was to be replacement supply and the Application stated *"At this point future demands of the Monterey System have not been included in the sizing of the plant."*[8] At that time, the 5-year average maximum month was 1,388 AF and the highest month was 1,532 AF.[9]

In a January 2013 CPUC filing, average demand was reiterated by Cal-Am to be 13,290 AFA but Cal-Am added that the plant would need to be increased larger by approximately 700 acre-feet per year for the in-lieu recharge of the Seaside Basin.[6] However, as can be seen in comparing Tables 1 and 2 above, supply equals demand at 15,296 AFA without changing the size of the plant from the initial Application.

In a 2016 update to the CPUC, Cal-Am recognized that average demand had declined in the intervening three years.[10] The 5-year average had declined to 10,966 AFA and the maximum month declined to 1,250 AF. At the time of the 2016 update, Cal-Am suggested that it should size the plant based on the backward-looking 10-year average demand and maximum month, instead of the 5-year average in the original Application, as well as several alternate assumptions about return of water to the Salinas Valley. They concluded *"we do not believe the size of the plants should be changed."*[11]

In a September 2017 filing to the CPUC, Cal-Am acknowledged continuing declines in demand, but indicated that the plant sizing remained appropriate saying *"We anticipate demand to rebound over time after these new water supplies are available, the drought conditions continue to subside, the moratorium on new service connections is lifted, and strict conservation and water use restrictions are eased."*[12] The company also for the first time introduced the use of future population and demand as a way to "normalize" the average demand used in sizing, a departure from the "replacement supply" basis under the initial Application in 2012.[13] This resulted in their estimate of average "current" system demand of 12,350 AFA. This amount, combined with the same lots of record, tourism bounce-back, and Pebble Beach buildout results in demand of 14,355 AFA – a reduction from the initial Application – but the company asserted that the plant need not be resized because this would allow it to run at 86% capacity, a more reasonable operating rate compared to the 95% posed in the original Application.

[7] Direct Testimony of Richard C. Svindland, April 23, 2012, page 21
[8] Direct Testimony of Richard C. Svindland, April 23, 2012, page 36
[9] Direct Testimony of Richard C. Svindland, April 23, 2012, page 22
[10] Supplemental Testimony of Richard C. Svindland, April 14, 2016 (Errata), pages 7-11
[11] Supplemental Testimony of Richard C. Svindland, April 14, 2016 (Errata), page 9
[12] Direct Testimony of Ian Crooks Errata Version, September 27, 2017, page 10
[13] Direct Testimony of Ian Crooks Errata Version, September 27, 2017, pages 11-13

The CPUC, in its September 2018 Decision, agreed that "current" demand was 12,350 AFA, therefore the 6.4 MGD desalination plant is warranted. In its Decision D.18-09-017 the CPUC stated *"we are convinced that 12,350 afy represents an appropriate estimate of annual demand to use in assessing the adequacy of Cal-Am's water supply…"*[14] It is important to understand that the CPUC did no original analysis, modeling, or projection of its own. It surveyed testimony provided by others and chose one to support its findings and recommendations. It should not be represented that that the CPUC developed demand numbers on its own.

*Legal Lots of Record:* The 2012 Application to the CPUC also included 1,181 AFA for Legal Lots of Record.[15, 6] Legal lots of record are defined as lots resulting from a subdivision of property in which the final map has been recorded in cities and towns, or in which the parcel map has been recorded in Parcels and Maps or Record of Surveys. Lots of record may include vacant lots on vacant parcels, vacant lots on improved parcels, and also included remodels on existing improved, non-vacant parcels. Ultimately, not all legal lots are buildable. While the District is the source of the 1,181 AFA estimated demands for the lots of record, the number was lifted from the 2009 Coastal Water Project environmental impact report.

*Tourism Bounce-Back:* The 500 AFA for economic recovery was originally proffered by the hospitality industry to handle a recovery of occupancy rates in the tourist industry in a post-World Trade Center tragedy setting. [16, 6] The industry felt that their most successful occupancy rates were in the three years prior to September 11, 2001 and felt 500 AFA would provide a buffer for a return to that level.

*Pebble Beach Buildout:* Ever since the State Water Board issued Order 95-10 and the Cease and Desist Order (CDO) it has recognized the Pebble Beach Company's investment in the Reclamation Project and the Company's right to serve its entitlements from the Carmel River. However, the State Water Board has stated a desire to have the Pebble Beach entitlements shifted away from the river and be satisfied by a new supply. At the time of the 2012 Application, the Pebble Beach company had approximately 325 AF of entitlements still available.

**Water Demand Assumptions in 2020**

The original MPWSP desalination project plant sizing was done eight years ago in 2012. With the passage of time and the opportunity to perform deeper research, it is possible to revisit the assumptions about consumer demand for water in the current context.

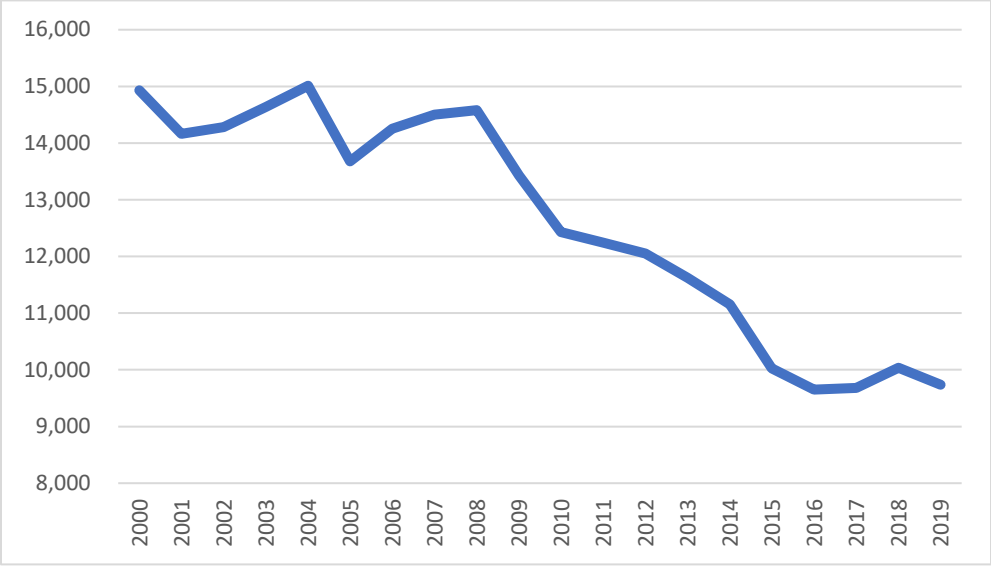
[14] CPUC D.18-09-017, page 49, lines 1-2.
[15] Direct Testimony of Richard C. Svindland, April 23, 2012, pages 22, 37.
[16] Direct Testimony of Richard C. Svindland, April 23, 2012, page 37

It states in Decision 18-09-017 *"The Commission similarly evaluated all of the evidence presented along with arguments of the parties and determines that Cal-Am's future water demand will be approximately 14,000 afy"*[17] However, no evidence was presented to determine if tourism "bounce-back" had already occurred, whether water efficiency gains would reduce the water demand of legal lots of record, or if the Pebble Beach Company could realistically build out its whole entitlement in a reasonable timeframe. Neither the CPUC, Cal-Am, nor Hazen & Sawyer evaluated the market absorption for new demand, which would answer the question: How soon will we get there? This MPWMD report simply takes a deeper look at the data behind these questions: How much will we need in the future? And How soon will we get there?

*Average Current Customer Demand:* The Cal-Am testimony submitted in support of the 12,350 AFA value used data that ended in 2016 and the company discounted the value of 2016 by incorrectly stating it was a drought year, which it was not on the Monterey Peninsula.[18] Hence, there are now three additional years of data (four if you do not discount 2016) since that used to develop the 12,350 AFA value.

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

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




[17] CPUC Decision 18-09-017, page 68, line 1
[18] Direct Testimony of Ian Crooks, Errata Version, in A.12-04-019, September 27, 2107, page 10, at line 22.

Table 3 shows how the 10-, 5-, and 3-year average demand compares to the CPUC and Cal-Am's most recent 12,350 AFA assumption.

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

| Period | Amount | Difference to CPUC/Cal-Am # |
|---|---|---|
| CPUC/Cal-Am Assumption | 12,350 | |
| 10-Year Average - Actual | 10,863 | 1,487 |
| 5-Year Average - Actual | 9,825 | 2,525 |
| 3-Year Average - Actual | 9,817 | 2,533 |

Hence, the case could be made that the average 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. Pure Water Monterey expansion adds 4 new extraction wells, two for production and two for redundancy. Preliminary analysis (see Appendix C) shows that peak month/peak day can also be met with Pure Water Monterey expansion.

Cal-Am itself has moved away from the 12,350 AFA number as a measure of current water demand in its current General Rate Case (GRC) application. As shown in the table below, Cal-Am now asserts in the GRC that its total water production for 2021 and 2022 from the Central Division will be 9,789 AFA,[19] which includes the Cal-Am Main System plus its satellites (generally thought to be 4-5% greater in total demand than the Cal-Am Main system.) This validates MPWMD's estimate of current demand. The Cal-Am GRC filing can be seen in Appendix D attached.

In CPUC Decision 16-12-026, the Commission required Class A and B water utilities to propose improved forecast methodologies in their next general rate cases.[20] In the current GRC, Jeffrey Linam, Cal-Am's Vice President of Rates and Regulatory, states in his testimony that Cal-Am *"believes that the testimony demonstrates improved forecasting methodologies that consider*

[19] California-American Water Company's (U-210-W) Update to General Rate Case Application, A.19-07-004, October 14, 2019, Table 3.14 of Results of Operations Model
[20] Direct Testimony of Jeffrey T. Linam (Final Application), in A.19-07-004, July 1, 2019, page 108, at line 14

*the consumption trends during and following the drought that began in 2013*".[21] Cal-Am *"hired David Mitchell of consulting firm MCubed to provide its sales forecast based on econometric models. The Company believes this is a significant improvement over the prior methods and use of historical averages…"*[22] This augments the testimony of Cal-Am expert witness Bahman Pourtaherian in the GRC who says David Mitchell's company M-Cubed *"has expertise addressing sales forecasting and rate design issues for energy, municipal and investor owned water utilities across the State."*[23]

Mr. Mitchell developed a highly complex econometric model for Cal-Am that in this GRC estimated the following (see Table 4) current demand (2021-2023) for the Cal-Am Main System (which is the system analyzed by MPWMD's supply and demand analysis). His results, presented in the table below, also support MPWMD's estimate of current demand.[24]

Table 4
Cal-Am Estimates of Current Demand
From Current 2019 GRC
(AFA)

| | 2021 | 2022 | 2023 |
|---|---|---|---|
| Central Division Forecast Sales<br>Results of Operations Model in A.19-07-004<br>Table 3.14 (See also Exhibit 2)[19] | 9,789 | 9,789 | n/a |
| Expert Testimony of Cal-Am Witness David Mitchell<br>Cal-Am Main System[24] | 9,338 | 9,478 | 9,610 |

The forecasts were created when it was assumed the desalination plant would be online at the end of 2021.

*Legal Lots of Record:* The 1,181 number is derived from the October 2009 Coastal Water Project Final Environmental Impact Report and references a 2001 District analysis as the source. It was actually sourced from a Land Systems Group Phase II February 2002 interim draft report that used the number 1,181.438 AF. At that time, a calculation error was corrected and the report was subsequently updated in June 2002 and the number was revised to 1,210.964. However, the earlier number seems to have been used going forward. Both versions did not include vacant lots on improved parcels in the unincorporated County. Table 5 shows how the corrected number was calculated.

[21] Direct Testimony of Jeffrey T. Linam (Final Application), in A.19-07-004, July 1, 2019, page 102, at line 25
[22] Direct Testimony of Jeffrey T. Linam (Final Application), in A.19-07-004, July 1, 2019, page 105, at line 6
[23] Direct Testimony of Bahman Pourtaherian (Final Application), in A.19-07-004, July 1, 2019, page 9, at line 21
[24] Direct Testimony of David Mitchell (Final Application), in A.19-07-004, July 1, 2019, Attachment 2, page 32, final line converted to acre-feet from CCF

Table 5
Legal Lots of Record Estimates (2002)
Unincorporated County Not Included
(Acre-Feet)

| Type of Parcel | Amount |
|---|---|
| Vacant Lots on Vacant Parcels | 729.9 |
| Vacant Lots on Improved Parcels | 288.2 |
| Anticipated Remodels (10 years) | 192.8 |
| **Total** | **1,210.9** |

Table 6
Assumptions Driving the Legal Lots of Record Conclusions

| Category | Units on Vacant Parcels | Units on Improved Parcels | Estimated Number of Remodels | Water Use Factor | Total Water Usage |
|---|---|---|---|---|---|
| Single Family Dwellings | 688 | 152 | | 0.286 AF | 240.2 |
| Multi-Family Dwellings | 846 | 204 | | 0.134 AF | 140.7 |
| Commercial/Industrial | 556 | 288 | | 0.755 AF | 637.2 |
| Residential Remodels | | | 3765 | 0.029 AF | 109.2 |
| Commercial Remodels | | | 513 | 0.163 AF | 83.6 |
| | **2,091** | **789** | **4,278** | | **1,210.9** |

However, since the study was done, the District's conservation programs have resulted in reductions in the average water use factors which reduces the water needed for the same lots of record. For example, with single-family water use at 0.2 AFA, multifamily use at 0.12 AFA, and commercial customer connections averaging 0.66 AFA (2016 data), these changes alone would reduce the total above by 167.1 AF. Further, some of these lots may have been built upon, others determined unbuildable. Many of the remodels have likely occurred. General plans have been rewritten and housing elements recalculated. These factors taken together could result in another 150 AF reduction in the assumption.

Compared to the 1,890 units from the 2002 Land Systems Group study shown above, going forward, AMBAG's Regional Housing Needs Allocation (RHNA) Plan: 2014-2023 showed 1,271 additional housing units expected in the 6 cities for a ten-year period. This is shown in Appendix B of this report. Assuming single-family water use at 0.2 AFA and multifamily use at 1.2 AFA, this equates to approximately 395-405 AFA over a 20-year period[25]. Most of AMBAG's

[25] Appendix B of this report

projected growth occurs in Seaside and Monterey, which if slated for the former Fort Ord would not be served by Cal-Am. Unfortunately, it is not possible to accurately distinguish the Cal-Am served housing growth from the non-Cal-Am housing growth, but the 405 AFA likely overstates the Cal-Am growth. The AMBAG assumptions appear consistent with the Land Systems Group estimates. The RHNA is expected to be updated soon and the allocation could change. Instead of focus on a RHNA number, however, the water for housing can be thought of as captured within the population growth component of the third-party growth forecast discussed later in this report and in Appendix A, because houses don't use water – people do.

The case could be made that the legal lots of record demand assumption in the sizing of the MPWSP should be 864 to 1,014 AFA.

*Tourism Bounce-Back:* As stated earlier, the 500 AFA for economic recovery was originally suggested by the local hospitality industry to account for a recovery of occupancy rates in the tourist industry in a post-World Trade Center tragedy setting.[6, 16] Representatives of the Coalition of Peninsula Businesses indicated in 2017 testimony that the hospitality industry was hurt by the recent recession and that occupancy rates need to increase by 12 to 15 percent to re-attain the levels of decades ago.[26] It is true that the Salinas-Monterey market was one of five California markets, out of 22, to experience significant declines after the events of 2001, from 71.8% in 2000 to 63.0% in 2001.[27] It is also true that the decline persisted and was still down when the MPWSP desalination plant was sized, with occupancy rates of 62.8% in 2011-12 and 64.1% in 2012-13.[28] However, occupancy rates have since recovered with no notable increase in water demand. Hotel occupancy locally is back at approximately 72% and is estimated by Smith Travel Research to be higher for better quality properties on the Monterey Peninsula.[29, 30] The commercial sector water demand is shown below in Table 7 for the year prior to the World Trade Center tragedy, the year of the MPWSP plant sizing, and the most recent year. As can be seen, commercial demand, which is heavily influenced by the hospitality industry remains in decline, despite the already absorbed "bounce-back" in occupancy rates.

Table 7
Commercial Sector Water Demand - Selected Years
(Acre-Feet)

| Year | Demand |
|---|---|
| 2001 | 3,387 |
| 2012 | 2,770 |
| 2018 | 2,442 |

[26] Testimony of John Narigi (to CPUC), September 29, 2017, page 5
[27] HVS San Francisco, August 19, 2003
[28] Monterey County Convention and Visitors Bureau Annual Report 2012-13, page ii
[29] Fiscal Analysis of the Proposed Hotel Bella Project, Applied Development Economics, April 6, 2016
[30] Cannery Row Company, January 9, 2019

There is a secular change in commercial demand that is due to permanent demand reductions resulting from targeted rebate programs, conservation standards for the visitor-serving sector since 2002, mandatory conservation standards for other commercial businesses instituted in 2013, and commercial inspection/enforcement by the District. A "bounce-back" of 500 AFY would represent an increase in water use demand of 20% in the entire commercial sector, not just the hospitality industry. The District does not view this as likely in the near-term, nor due to a return to higher occupancy rates.

Hence, the case could be made that the tourism bounce-back demand assumption in the sizing of the MPWSP should be 100 to 250 AFA.

*Pebble Beach Buildout:* As cited earlier, at the time of the 2012 Application, the Pebble Beach company had approximately 325 AF of entitlements still available and that number was added to the MPWSP sizing needs. However, the final environmental impact report certified in 2012 envisioned 145 AFA for the buildout projects and 154 AFA in "other entitlement demand."[31]

However, the "other entitlement demand" is very likely to go away when a new water supply comes online because homeowners will have no reason to pay $250,000 per AF for an entitlement when connecting directly to Cal-Am is possible when the moratorium on new service connections is lifted. In the ten years since the CDO was imposed, Pebble Beach entitlement water demand has averaged 4.9 AF added each year. It is reasonable to assume only another 15 AFA during the next three years before a permanent water supply is online.

The project buildout from the EIR is 145 AFA, not 325 AFA used in MPWSP sizing. Further, the buildout number includes estimated water use that may not materialize in decades, if ever. Table 8 shows the elements that comprise the Pebble Beach buildout.

Table 8
Components of Pebble Beach Buildout in AFA

| Project | Demand |
|---|---|
| Lodge | 13.11 |
| Inn at Spanish Bay | 12.85 |
| Spyglass Hotel | 30.59 |
| Area M Residential | 10.00 |
| Other Residential | 77.00 |
| Driving Range | 0.33 |
| Roundabout | 0.70 |
| Total | 144.58 |

[31] Pebble Beach Final Environmental Impact report (FEIR), April 2012, Appendix H "Water Supply and Demand Information for Analysis"

Two elements of the project warrant greater discussion: "Other Residential" includes 66 single family residences at 1.0 AF each and 24 residences at 0.50 AF each (and a decrement of 1 AF in the total calculation for other reasons.) District research in 2006 determined the average large lot Pebble Beach home utilized 0.42 AFA. Building conservation standards have increased since then. Many of the proposed homes are not utilized year-round. Hence, the estimate could be overstated by one-third or more. Spyglass Hotel is not currently being pursued and there are no plans to do so in the near-term. The project could be a decade or two away, if ever.

Hence, the case could be made that the Pebble Beach buildout demand assumption in the sizing of the MPWSP should be 103 to 160 AFA.

**Summary of Demand v. Supply**

Table 9 shows the range of demand estimates that have been established in the foregoing analysis. These long-term demand estimates can be compared to existing current demand to determine how much water supply is needed.

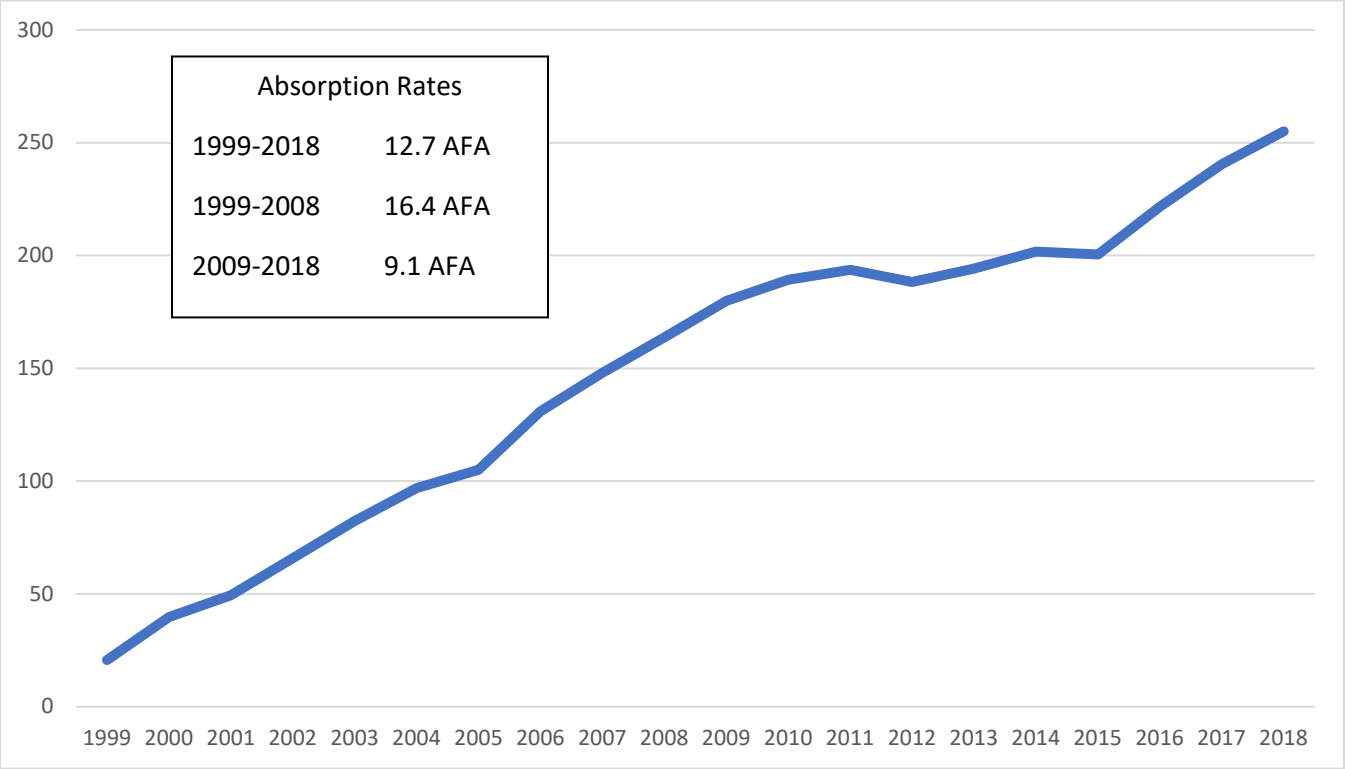
Table 9
Range of Potential Demand Scenarios in MPWSP Sizing
(Acre-Feet)

| Demand Component | Current Project | Revised High | Revised Low |
|---|---|---|---|
| Average Current Customer Demand | 13,290 | 10,863 | 9,817 |
| Legal Lots of Record | 1,181 | 1,014 | 864 |
| Tourism Bounce-Back | 500 | 250 | 100 |
| Pebble Beach Buildout | 325 | 160 | 103 |
| **Total Water Demand** | **15,296** | **12,287** | **10,884** |

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 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.

**EXHIBIT 4-A**

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

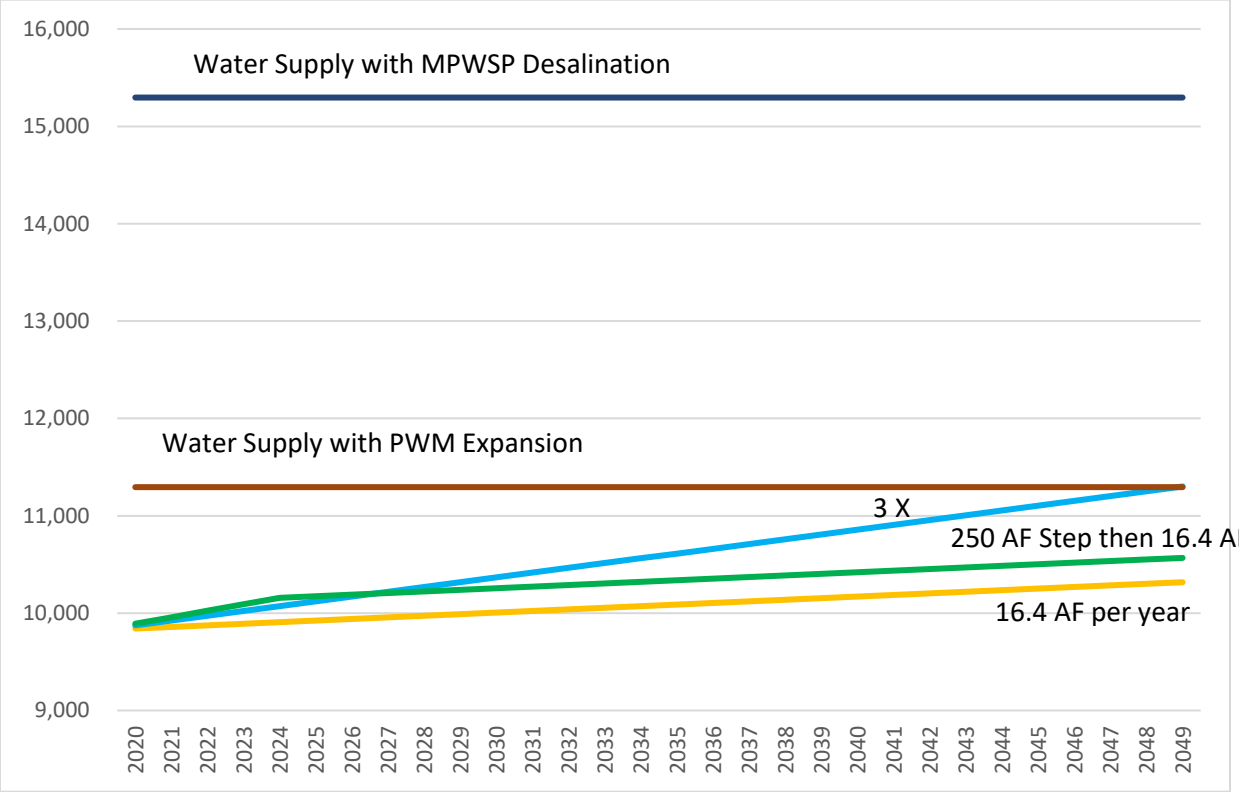



By adopting assumptions about current demand and market absorption rates, it can be determined the sufficiency of certain supply alternatives over time.

*Scenario 1: Supply v Demand Using Pre-CDO Absorption Rate Scenarios:* In Figure 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 1.

**EXHIBIT 4-A**

Figure 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.

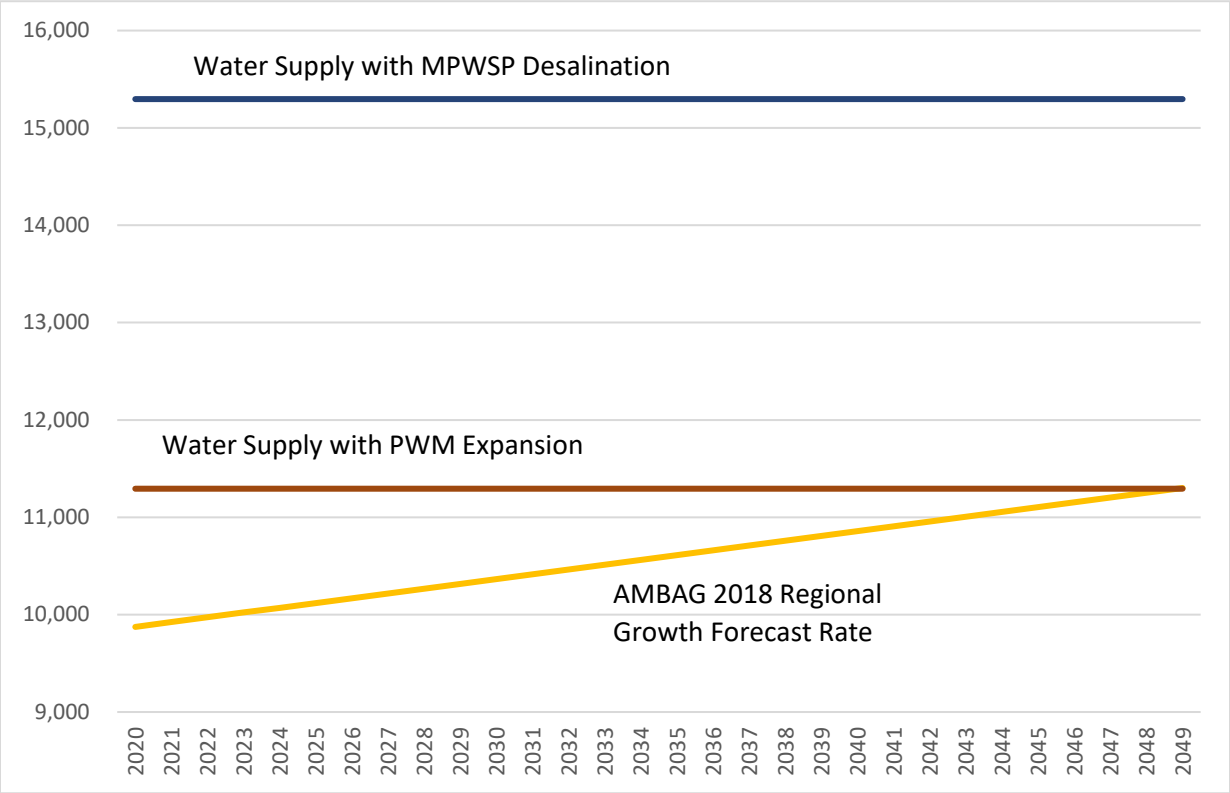
*Scenario 2: Supply v Demand Using 3rd-Party Growth Forecast Absorption Rate:* Rather than to rely on pre-CDO absorption of water demand or alternative theoretical future demand scenarios, as was done in the September report, it is instructive to instead look at a regional growth forecast by an objective third-party. Here, as shown in Appendix A, 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.[32]

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 4.

Figure 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.

[32] 2018 Regional Growth Forecast, Technical Documentation, Association of Monterey Bay Area Governments (AMBAG), June 2018, page 5

*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 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.

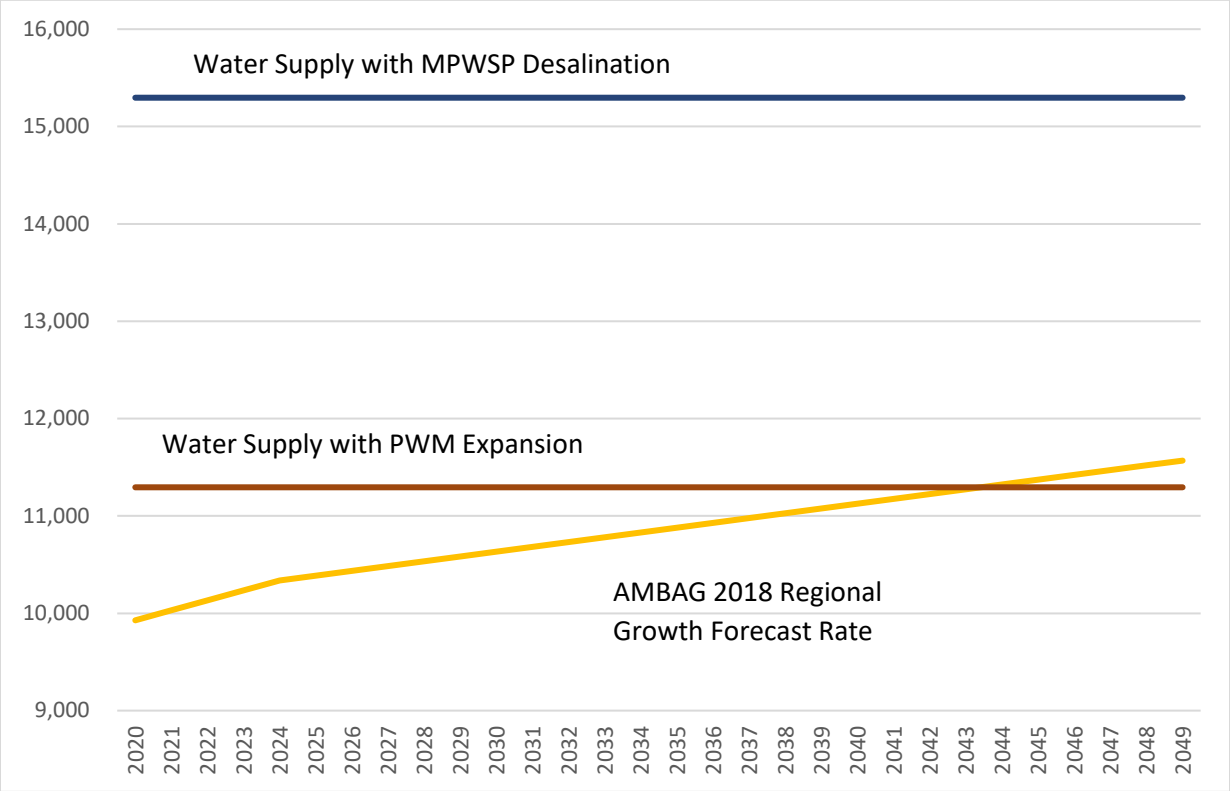
There is little likelihood that the market can absorb all of this quickly, but if it did there might be assumed to be something similar to the following pent-up near-term demand:

Table 10
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 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.

Figure 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)




**Additional Factors Affecting Future Demand**

*Cost:* The future water supply will significantly impact rates. It is expected that the combined cost of new water supply and regular annual rate increases will almost double a residential ratepayer's water bill by 2023. Rules of price elasticity suggest the cost of water might dampen demand. The cost of each major component of supply is shown below:

| | |
|---|---|
| Desalination Plant | $6,094 per acre-foot[33] |
| Carmel River: | $271 per acre-foot[34] |

[33] Attachment C-3 California American Water Company Advice Letter 1220 "Total Yr 1 Cost to Customer" $38.1 million, divided by 6,252 acre-feet per year
[34] MPWSP Model- V 2.1 submitted to CPUC; February 2018 and October 2017 versions, 6.4 MGD scenario, "Avoided Costs" worksheet

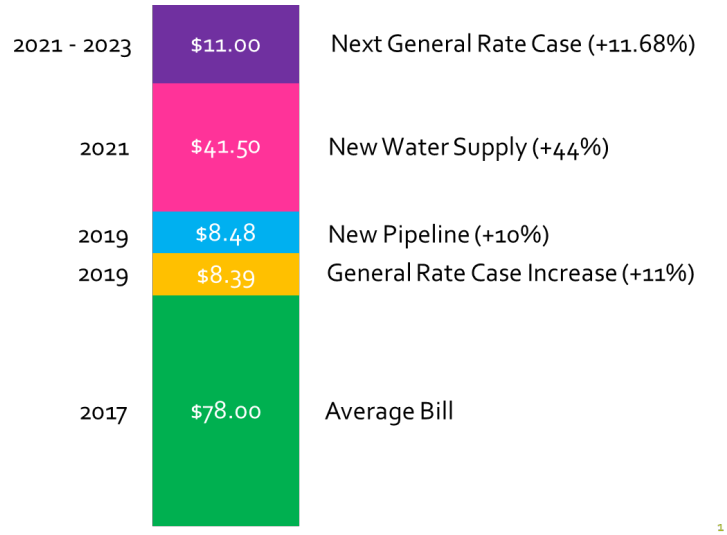
| | |
|---|---|
| Seaside Basin: | $130 per acre-foot[35] |
| Pure Water Monterey: | $2,398 per acre-foot[36] |
| PWM with Expansion: | $2,339 per acre-foot[37] |

Further, if the desalination plant capacity is not fully utilized, the cost per acre-foot rises due to the fixed costs, as shown below.

| Production by Desal Plant – AF | 6,252 | 5,000 | 4,300 |
|---|---|---|---|
| Variable Cost ($ Million) | 7.8 | 6.2 | 5.4 |
| Fixed Cost ($ Million) | 30.3 | 30.3 | 30.3 |
| Total Annual Cost to Customer | 38.1 | 36.5 | 35.7 |
| Cost per Acre-Foot | $6,094 | $7,308 | $8,294 |

The rate impact can be seen in Figure 5 below, which is calculated based on full utilization of the desalination plant.

Figure 5
Ratepayer Impacts of New Water Supply[38]




*Legislation:* 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

[35] MPWSP Model- V 2.1 submitted to CPUC; February 2018 and October 2017 versions, 6.4 MGD scenario, "Avoided Costs" worksheet
[36] Recent estimate for 2020-21 fiscal year
[37] Estimate
[38] "Your Rates Are Changing" California American Water mailer, April 2019 and "Notice of General Rate Case Application filed" July 2019

(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.

**Principal Conclusions**

- 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

**EXHIBIT 4-A**

# Appendix A

## Water Required to Meet AMBAG 2018 Regional Growth Forecast

Water Required for Population Growth[39]

| | Monterey | Pacific Grove | Carmel-by-the-Sea | Sand City | Seaside | Del Rey Oaks | County[40] | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Population in 2020 | 28,726 | 15,349 | 3,833 | 544 | 34,301 | 1,949 | 7,182 | **91,884** |
| Population in 2040 | 30,976 | 16,138 | 3,876 | 1,494 | 37,802 | 2,987 | 7,541 | **100,814** |
| Increase | 2,250 | 789 | 43 | 950 | 3,501 | 1,038 | 359 | **8,930** |
| GPCD[41] | 56.8 | 56.8 | 56.8 | 56.8 | 56.8 | 56.8 | 56.8 | **56.8** |
| Acre-Feet per Year | 143 AF | 50 AF | 3 AF | 60 AF | 223 AF | 66 AF | 23 AF | **568 AF** |

*: Likely overstates population growth in Cal-Am service area due to some growth attributable to the Fort Ord build-out.

Water Required for Employment Growth[42]

| | Monterey | Pacific Grove | Carmel-by-the-Sea | Sand City | Seaside | Del Rey Oaks | County[43] | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Jobs in 2020 | 34,434 | 5,093 | 2,998 | 1,569 | 10,161 | 371 | 4,300 | **58,926** |
| Jobs in 2040 | 40,173 | 5,808 | 3,378 | 1,810 | 11,299 | 432 | 4,845 | **67,745** |
| Increase | 16.7% | 14.0% | 12.7% | 15.4% | 11.2% | 16.4% | 12.7% | |
| Commercial Consumption In 2019[44] | 1,371 AF | 248 AF | 203 AF | 54 AF | 282 AF | 21 AF | 651 AF | **2,830 AF** |
| Commercial Consumption In 2040[45] | 1,600 AF | 283 AF | 229 AF | 62 AF | 314 AF | 24 AF | 734 AF | **3,246 AF** |
| Increase | 229 AF | 35 AF | 26 AF | 8 AF | 32 AF | 3 AF | 83 AF | **416 AF** |

Using this methodology, total water demand increase in 20 year period is 984 AF or 49.2 AFY.

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[39] Association of Monterey Bay Area Governments. 2018. "2018 Regional Growth Forecast." Table 8, page 32

[40] Uses Cal-Am service area population reported in SWRCB June 2014 – September 2019 Urban Water Supplier Monthly Reports (Raw Dataset), minus urban areas, escalated at 5%.

[41] SWRCB June 2014 – September 2019 Urban Water Supplier Monthly Reports (Raw Dataset); Average gallons per capita per day for August 2018 – July 2019; www.waterboard.ca.gov

[42] Association of Monterey Bay Area Governments. 2018. "2018 Regional Growth Forecast." Table 7, page 30

[43] California Employment Development Department, Monthly Labor Force Data for Cities and Census Designated Places. November 15, 2019. Sum of Carmel Valley Village CDP and Del Monte Forest CDP. Escalated at same rate as Carmel-by-the-Sea.

[44] Cal-Am. 2019. "Customers and Consumption by Political Jurisdiction"

[45] Assumes escalation at same rate as job growth 2020 to 2040

**EXHIBIT 4-A**

# Appendix B
## Water Required to Meet
## Regional Housing Needs Allocation Plan: 2014-2023

2014-2023 RHNA Goals by Local Jurisdiction[46]

| | Monterey | Pacific Grove | Carmel-by-the-Sea | Sand City | Seaside | Del Rey Oaks | TOTAL |
|---|---|---|---|---|---|---|---|
| Total Allocation | **650** | **115** | **31** | **55** | **393** | **27** | **1,271** |
| Very Low (24.1%) | 157 | 28 | 7 | 13 | 95 | 7 | **307** |
| Low (15.7%) | 102 | 18 | 5 | 9 | 62 | 4 | **200** |
| Moderate (18.2%) | 119 | 21 | 6 | 10 | 72 | 5 | **233** |
| Above Moderate (42%) | 272 | 48 | 13 | 23 | 164 | 11 | **531** |

*: Does not include unincorporated Monterey County, which might be 15-25 additional AFY to full build-out

Estimated Water Required to Meet RHNA Goals on the Monterey Peninsula

| | TOTAL RHNA GOAL | Water Required (AFY)[47] | Factor Used |
|---|---|---|---|
| Very Low (24.1%) | 307 | 37 | 0.12 AFA (multi-family) |
| Low (15.7%) | 200 | 24 | 0.12 AFA (multi-family) |
| Moderate (18.2%) | 233 | 37 | 0.16 (half single family/half multi-family) |
| Above Moderate (42%) | 531 | 92 | 0.173 (2/3 single family/1/3 multi-family) |
| **Total Allocation/Water Required** | **1,271** | **190** | |

Over two similar 10-year periods, total water required for housing calculated with this methodology is 380 AF over twenty years, or 395 – 405 AF including estimate for unincorporated County (footnote above.)

[46] Association of Monterey Bay Area Governments. ND. "Regional Housing Needs Allocation Plan: 2014-2023." Available at: https://ambag.org/sites/default/files/documents/RHNP%202014-2023_Final_revised.pdf.

[47] Calculated based on the RHNA goals for the six cities in the Monterey Peninsula and MPWMD's water use factors for single family units (0.2 AFA) and multi-family units (0.12 AFA).

# Appendix C

## Pure Water Monterey Expansion
## Consistency With Planning Criteria

MPWMD has consistently followed state and federal codes, as well as industry standards, in its analysis of the two supply options in the report. Specifically, any MPWMD conclusions in the report are consistent with the following:

- California Code of Regulations (CCR) section 64554
- California Health and Safety Code (CHSC) section 116555
- California Water Code (CWC) sections 10635 and 10631
- CPUC General Order 103A and other rules; and
- American Water Works Association "Water Resource Planning" guidance M50

*CCR section 64554:* MPWMD meets the requirements of CCR Title 22 section 64554. This was shown in a document produced and available from MPWMD in September 2019 and later publicly filed by the California Coastal Commission demonstrating MPWMD compliance.[48] With the passage of time, that analysis has been updated and is included in this Appendix C, now assuming a new water supply comes online in the year 2023. It shows that Pure Water Monterey expansion can meet the Maximum Day Demand (MDD) and Peak Hourly Demand (PHD) required under this section of the CCR.

There is no standard in 64554 to look back 10 years to ascertain current or projected future average annual demand. Section (k) which says *"The source capacity of a surface water supply or a spring shall be the lowest anticipated daily yield based on adequately supported and documented data"* by citing "daily yield", still goes to MDD and PHD, not long-term average annual demand. This bears repeating: CCR section 64554 has nothing to with estimating current existing consumer demand or future average annual consumer demand for water.

*CHSC section 116555:* All that is required under this section of the Code is that a water supplier "provides a reliable and adequate supply of pure, wholesome, healthful, and potable water." Nothing more, nothing less. To assert that either Pure Water Monterey expansion or the proposed desalination plant do not do so would be disingenuous.

*CWC sections 10635 and 10631:* Section 10635 of the CWC requires that *"every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years.*

[48] See California Coastal Commission agenda, November 14, 2019, Application 9-19-0918 / Appeal A-3-MRA-19-0034 (California American Water Co.) Exhibit 9 staff note attachment

*This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years."* MPWMD has done so with respect to both proposed water supply sources and have concluded that they can each meet the challenges of a normal water year, a single dry water year, and a 5-year drought. Drought resilience of Pure Water Monterey and ASR is discussed in more detail below.

We also recognize section 10631 reiterates the above-said requirement in the plan. Section 10631 also requires analysis by the utility of (i) Water waste prevention ordinances; (ii) Metering; (iii) Conservation pricing; (iv) Public education and outreach; (v) Programs to assess and manage distribution system real loss; (vi) Water conservation program coordination and staffing support; and (vii) Other demand management measures. These programs, many of which have been sponsored by MPWMD, have led to the decline in water demand that sets the baseline for future water supply planning.

*CPUC General Order 103A and other rules:* MPWMD's analysis has met the requirements of CPUC General Order 103A which states all water supplied shall be *"obtained from a source or sources reasonably adequate to provide a reliable supply of water" and "shall have the capacity to meet the source capacity requirements as defined in CCR Title 22, Section 64554".* This has been addressed above.

The CPUC's "Rate Case Plan and Minimum Data Requirements for Class A Water Utilities General Rate Case (GRC) Applications" states utilities should *"forecast customers using a five-year average of the change in number of customers by customer class"* subject to unusual events (such as a meter moratorium here in Monterey). MPWMD has also recognized this regulatory guidance.

*American Water Works Association (AWWA) "Water Resource Planning" guidance M50:* AWWA recognizes there are 6 traditional forecasting methods.[49] MPWMD's report has incorporated at least three of the accepted methods: "per capita models", "extrapolation models", "disaggregate water use models", and have checked certain estimates using "land-use models" each recognized by AWWA. Further, to the extent MPWMD has analyzed the AMBAG growth forecast and assigned water usage to the population and job forecasts, "multivariate" modeling has been included, also recognized by AWWA. "Several methods of demand forecasting are often combined, even within a single utility."[50]

[49] AWWA, "Water Resources Planning: Manual of Water Supply Practices M50", 3rd Edition, pages 81-84.
[50] AWWA, "Water Resources Planning: Manual of Water Supply Practices M50", 3rd Edition, page 81, paragraph 2.

The out-of-date second edition of AWWA M50 does cite a period of 10 years of historical data be used to develop future forecasts of demand, but the same section also states *"If a simple per capita approach to forecasting is selected, the data requirements could be as easy as securing historical annual water production or sales for 5 to 10 years"* Hence, MPWMD's use of a 5-year period would have been acceptable.[51] However, that edition of M50 was superseded by the third edition published in 2017. The current M50 edition from AWWA does not reference a specific preferred time period for historical data to be used for a future demand forecast. The MPWMD analysis is consistent with the current section of M50. There is nothing wrong, or outside industry standards, with looking at a 5-year average or some other measure to determine "How much water do we use today?"

[51] AWWA, "Water Resources Planning: Manual of Water Supply Practices M50", 2nd Edition, pages 47-48

**EXHIBIT 4-A**

# Drought Resilience of ASR and Pure Water Monterey

*ASR:* Based on the Benito/Williams technical memorandum modeling assumptions contained in the Pure Water Monterey SEIR appendices, MPWMD concludes that build-up of ASR storage would be sufficient to meet a 5-year drought. The build-up occurs based on historical data including wet, normal, and dry years. If the data is randomized, the same results will occur – ASR acts like a lake behind a dam, building up supplies for use later during a drought. To remove ASR from the resource planning mix is inappropriate and would be inconsistent with industry practice for estimating water supply availability. Even AWWA recognizes ASR in its reliability assessment: *"ASR wells can improve water basin management by storing water underground from periods of excess supply…, and later allowing a portion of the stored water to be extracted during periods of demand or short supply"*[52]

If the Monterey Peninsula were to experience drought during the "buildup period" following the completion of new water supply and the lifting of the CDO, ASR would arguably be delayed in building up a drought reserve, it should not be overlooked that a Pure Water Monterey expansion is new capacity without an immediate offsetting demand. That is, 2,250 AFA from Pure Water Monterey expansion would provide the necessary approximately 800 AFA to offset unlawful Carmel River diversions and lift the CDO and provide a remaining 1,450 AFA for which there is no immediate present-day demand and can instead be delivered for customer service in the early years if ASR's drought reserve has not yet built-up. Just a few years of Pure Water Monterey expansion water could also provide drought-resilience to the Monterey Peninsula.

The District believes the Benito/Williams memo demonstrates ASR is drought-resilient and Pure Water Monterey expansion provides an additional factor of safety against drought impacts to ASR.

*Pure Water Monterey:* A memorandum dated November 1, 2019 which appears as Appendix I to the Pure Water Monterey Supplemental Environmental Impact Report titled "Source Water Availability, Yield and Use Technical Memorandum", indicates Pure Water Monterey is resilient to drought, in general. Page 1 of the memorandum states the purpose of the memorandum is to summarize the source water availability and yield estimates for proposed modifications to the approved Pure Water Monterey Groundwater Replenishment Project (as modified, the full project is referenced as the Expanded PWM/GWR Project), to explain the seasonal storage yield estimates, and to provide the proposed maximum and typical (or normal) water use estimates for the Proposed Modifications.

[52] AWWA, "Water Resources Planning: Manual of Water Supply Practices M50", 3rd Edition, page 148

# EXHIBIT 4-A

Page 10 of the memorandum says *"In the attached scenario tables (Tables 9 through 11), the use of the various sources is reduced to just meet the demands of the AWPF and offset the current CSIP groundwater use in the wet season (October-March). During the dry season (April-September), surface water diversions are shown meeting the monthly AWPF demands and providing extra flow for the CSIP, such that* ***the annual use of new sources exceeds the annual AWPF demands."*** *(emphasis added by MPWMD)*

"*The demand scenarios considered are:*

*Table 9: A normal water year while developing a drought reserve (AWPF producing 6,550 AFY)*
*Table 10: A normal water year with a full drought reserve (AWPF producing 6,350 AFY)*
***Table 11: A drought year starting with a full reserve (AWPF producing 5,550 AFY)*** *(emphasis added by MPWMD)*

*In the drought year scenario, the stormwater and wastewater availability were reduced. Urban runoff from Salinas was assumed to be one-third of the historic average. Rainfall on the SIWTF ponds used the 2013 rainfall record (critically dry year). The unused secondary treated effluent values from 2013 were used, also the historic low. The CSIP groundwater well use from OCT 2013 to SEP 2014 was used as the CSIP augmentation target. Under this scenario, surface water diversions were required from the Reclamation Ditch, Blanco Drain and Lake El Estero, and the diversions were needed from March through November*."

In MPWMD's opinion, this shows that the drought scenario shows all Advanced Water Purification Facility needs are met and there are still residual new supplies available to CSIP. In other words, Pure Water Monterey expansion is reliable in periods of reduced usage or drought years.

**EXHIBIT 4-A**

# MPWMD Analysis of Available Well Capacity for 10-Year Maximum Daily Demand (MDD) and Peak Hour Demand (PHD)

A) Find maximum month demand for 10-year period 2014-2023
August 2014 = 1,023 AF[53]

B) Convert to average daily demand
1,023 AF / 31 days = 33 AF/day

C) Convert to million gallons per day (MGD)
33 AF/day X 325,851 gal/AF divided by 1,000,000 = 10.753 MGD

D) Gross-up for peaking factor of 1.5
10.753 MGD X 1.5 =16.13 MGD = Maximum Daily Demand (MDD)

E) Average hourly flow during MDD is 10.753 MGD divided by 24 hours = 0.448 MGh

F) Gross-Up for peaking factor of 1.5
0.448 MGh X 1.5 = 0.672 million gallons per hour = Peak Hour Demand (PHD)

Hence, new water supply must support a MDD of 16.13 MGD. Table 1 on the next page shows existing and planned system supply capacities under authorized, desired, and firm capacity scenarios. As can be seen, the lowest available capacity is 19.41 MGD which significantly exceeds MDD.

This assumes additional production well capacity currently being analyzed in the Pure Water Monterey Expansion Supplemental EIR are developed and the Forest Lake Pump Station currently requested under the 2019 General Rate Case filing is built. These two projects markedly remove system capacity constraints.

We also recognize that the Plumas, Luzern, Ord Grove, Paralta, and Playa wells are presently unable to deliver to the Monterey Pipeline, serving only Seaside, Sand City, and Old Monterey. This could potentially reduce available capacity throughout the rest of the system on the order of 2 MGD. Even in this instance, operations are sufficient to meet MDD. This issue goes further away if one or more of the wells are also connected to the pipeline, as well as with the continued reduction in MDD in more recent years.

CONCLUSION: Pure Water Monterey expansion provides sufficient capacity to meet MDD and PHD for the Cal-Am Monterey Main System.

[53] Direct testimony of Ian Crooks, Errata version 9-27-17 in A.12.04.019 at California Public Utilities Commission, page 9, Table 3

# EXHIBIT 4-A

TABLE 1

| Cal-Am Monterey Main Well Capacity<br>Under Authorized and Desired Operations<br>With New Wells being Analyzed in Pure Water Monterey Expansion SEIR | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Authorized Operations** | | **Desired Operations** | | **Desired Operations Firm Capacity** | |
| **Upper Carmel Valley Wells** | **Capacity (gpm)** | **Capacity (MGD)** | **Capacity (gpm)** | **Capacity (MGD)** | **Capacity (gpm)** | **Capacity (MGD)** |
| Assume n/a in Summer | - | - | - | - | - | - |
| | | | | | | |
| **Lower Carmel Valley Wells** | | | | | | |
| Rancho Canada | 1,150 | 1.66 | 1,200 | 1.73 | 1,200 | 1.73 |
| Cypress | 1,500 | 2.16 | - | - | - | - |
| Pearce | 1,500 | 2.16 | - | - | - | - |
| Schulte | 1,250 | 1.80 | - | - | - | - |
| Manor | 125 | 0.18 | - | - | - | - |
| Berwick No 8. | 600 | 0.86 | - | - | - | - |
| Berwick No. 9 | 985 | 1.42 | - | - | - | - |
| Subtotal Lower CV | 7,110 | 10.24 | 1,200 | 1.73 | 1,200 | 1.73 |
| | | | | | | |
| **Seaside Wells** | | | | | | |
| Plumas | 192 | 0.28 | 192 | 0.28 | 192 | 0.28 |
| Luzern | 640 | 0.92 | 640 | 0.92 | 640 | 0.92 |
| Ord Grove | 1,000 | 1.44 | 1,000 | 1.44 | 1,000 | 1.44 |
| Paralta | 1,350 | 1.94 | 1,350 | 1.94 | 1,350 | 1.94 |
| Playa | 350 | 0.50 | 350 | 0.50 | 350 | 0.50 |
| Santa Margarita ASR 1 or 2 | 1,750 | 2.52 | 1,750 | 2.52 | 1,750 | 2.52 |
| Middle School ASR 1 or 2 | 1,750 | 2.52 | 1,750 | 2.52 | 1,750 | 2.52 |
| Subtotal Seaside | 7,032 | 10.13 | 7,032 | 10.13 | 7,032 | 10.13 |
| | | | | | | |
| **4 New Wells in Pure Water Expansion SEIR** | | | | | | |
| New 1 | 1,750 | 2.52 | 1,750 | 2.52 | 1,750 | 2.52 |
| New 2 | 1,750 | 2.52 | 1,750 | 2.52 | 1,750 | 2.52 |
| New 3 | 1,750 | 2.52 | 1,750 | 2.52 | 1,750 | 2.52 |
| New 4 | 1,750 | 2.52 | 1,750 | 2.52 | - | - |
| Subtotal New | 7,000 | 10.08 | 7,000 | 10.08 | 5,250 | 7.56 |
| | | | | | | |
| **Total Well Capacity** | **21,142** | **30.44** | **15,232** | **21.93** | **13,482** | **19.41** |
| | | | | | | |
| | | | | | | |
| **Notes:** | | | | | | |
| gpm = Gallons per Minute | | | | | | |
| MGD = Million Gallons per Day | | | | | | |
| AF = Acre-Feet | | | | | | |
| Firm Capacity = Without largest producing well | | | | | | |

**CALIFORNIA AMERICAN WATER**
**Central Division - 2019 GRC**
**WATER PRODUCTION (KCCF)**
**AUTHORIZED AND PROPOSED**

**Filing: 100-Day update**

| Line No. | Description | Last Authorized Test Year 2018 | Estimated 2019 | Estimated 2020 | Proposed Test Year 2021 | Escalation Year 2022 |
|---|---|---|---|---|---|---|
| 1. | Metered Sales | 4,172.6 | 3,989.7 | 3,989.7 | 3,989.7 | 3,989.7 |
| 2. | Other Consumption | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3. | Total Consumption | 4,172.6 | 3,989.7 | 3,989.7 | 3,989.7 | 3,989.7 |
| 4. | Non Revenue | 363.6 | 274.5 | 274.5 | 274.5 | 274.5 |
| 5. | Total Water Requirement | 4,536.2 | 4,264.3 | 4,264.3 | 4,264.3 | 4,264.3 |
| 6. | Non Revenue Water % | 8.0% | 6.4% | 6.4% | 6.4% | 6.4% |
| 7. | Equivalent Acre Feet | 10,413.6 | 9,789.4 | 9,789.4 | 9,789.4 | 9,789.4 |
| 8. | Total Water Requirement in CCF | 4,536,162 | 4,264,251 | 4,264,251 | 4,264,251 | 4,264,251 |

References:
Line 1 Metered sales per Table 3.11
Other Consumption per [insert text if applicable]
Line 3 is sum of lines 2 and 3.
Line 4 is based on projection. See REV Wkp [insert reference]
Line 5 is line 3 plus 4
Line 6 is line 4 divided by line 5.
Line 7 is line 5 divided by 435.6 and multiplied by 1,000 to convert to Acre Feet.
Line 8 is line 5 multiplied by 1,000 to convert ot CCF.

**EXHIBIT 4-B**

# Expert Report and Recommendations of

# Peter Mayer, P.E.

# Regarding Water Supply and Demand in the California American Water Company's Monterey Main System

## Prepared for:

## The Marina Coast Water District

April 21, 2020

WaterDM
DEMAND MANAGEMENT

**EXHIBIT 4-B**

WATER DEMAND MANAGEMENT
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Boulder, CO 80304
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## INTRODUCTION

My name is Peter Mayer. I am the Principal of Water Demand Management, LLC (WaterDM) based in Boulder, Colorado.

WaterDM is a water consulting firm providing expertise and services in the following areas:

- Municipal and industrial water use, research, and analysis
- Water conservation and demand management planning and implementation
- Integrated water resources planning
- Water loss control
- Analysis of municipal water rates and rate structures
- Drought preparedness and response
- Demand forecasting
- Evaluation of changes in demand
- Statistical analysis of water demand and modeling
- Meter technology implementation
- Meter and service line sizing

I have a Master of Science in Engineering (1995) from the University of Colorado, Boulder and a Bachelor of Arts (1986) from Oberlin College. I am a registered and licensed Professional Engineer in Colorado.

I am a civil engineer and the focus of my career for over 25 years has been on urban water systems and demand management including conservation planning and implementation, rate analysis, water demand research, demand forecasting, drought preparation, utility metering, and water loss control.

Since 1995, I have served as a consultant and researcher to urban water providers, US EPA, the Water Research Foundation, the Alliance for Water Efficiency, state governments, and municipal and industrial water users in the US and Canada.

Over my 25 -year engineering and consulting career, I have worked with and advised hundreds of water providers and organizations such as the California Department of Water Resources; Tucson Water; New York City Water Board; the Colorado Water Conservation Board; Hilton Head, SC; Denver, CO; Scottsdale, AZ; San Antonio, TX; Metropolitan Water District of Southern California; US EPA; the US Department of Justice; the Alliance for Water Efficiency and many others. I have served as the principal investigator and lead or co-author of numerous national and state-level water demand research studies including: Residential End Uses of Water (2016, 1999); Assessing Water Demand Patterns to Improve Sizing of Water Meters and Service Lines (2020); Peak Demand Management (2018); Colorado Water Plan and Update (2010, 2018); National Submetering and Allocation Billing Program Study (2004); Water Budgets and Rate Structures (2008); Commercial and Institutional End Uses of Water (2000); and many others.

I was Chair of the subcommittee and lead author of the American Water Works Association (AWWA) M22 Sizing Water Service Lines and Meters 3rd. ed. (2014). I am co-author of the AWWA G480 Water Conservation Standard and co-author of the Colorado Best Practices Guidebook for Municipal Water Conservation (2010). I served as Trustee of the AWWA Water Conservation Division from 2001-2007 during which time I worked with EPA to create the WaterSense™ program and helped establish the Alliance for Water Efficiency. I have been a Senior Technical Advisor to the Alliance for Water Efficiency since 2007. I am a member of the American Water Works Association, the Alliance for Water Efficiency, the American Water Resources Association, the American Society of Civil Engineers (ASCE) and the Colorado River Water Users Association.

In 2016, I testified as an expert witness on municipal and industrial water use at the US Supreme Court (FL v. GA, 142 Original) on behalf of the State of Georgia.

A copy of my curriculum vitae is attached to this report.

## SCOPE OF INVESTIGATION

I was retained by the Marina Coast Water District to review and respond to the recommendations in the staff report of the California Coastal Commission related to Application 9-19-0918 / Appeal A-3-MRA-19-0034 (California American Water Co.). Specifically, I was asked to investigate if the California-American Water Company ("Cal-Am") has a feasible, reasonable, and reliable alternative to its proposed Monterey Peninsula Water Supply Project ("MPWSP") desalination project that will allow it to reduce its water withdrawals from the Carmel River in accordance with provisions of a cease-and-desist order from the State Water Resources Control Board. I was also asked to respond to the analyses and opinions contained in reports prepared by the Monterey Peninsula Water Management District (MPWMD) and a peer review report prepared by Hazen and Sawyer as they relate to future water supply and water demand of the Cal-Am Monterey Main system.

My opinions are based on my understanding of the information available as of the date of this report and my experience evaluating municipal and industrial water supplies and demands and conservation measures. In forming my opinions, I also considered the documents, testimony, and other materials listed in Appendix A. Should additional information become available to me, I reserve the right to supplement this report based on any additional work that I may conduct based on my review of such materials.

## SUMMARY OF OPINIONS AND CONCLUSIONS

I have reviewed the following reports and documents:

- *Staff Report: Recommendation on Appeal Substantial Issue & De Novo Hearing and Consolidated Coastal Development Permit, California Coastal Commission, Application 9-19-0918 / Appeal A-3-MRA-19-0034 (California American Water Co.).* (Staff Report) (10-28-2020)

- *Supply and Demand for Water on the Monterey Peninsula prepared by David Stoldt, General Manager, MPWMD.* (MPWMD Report) (3-13-2020, 12-3-2019, and 9-16-2019)

- *California American Water Peer Review of Supply and Demand for Water on the Monterey Peninsula prepared by Kevin Alexander and Cindy Miller, Hazen and Sawyer* (Hazen Report) (1-22-2020)

- *MPWMD's March 6 response to the Hazen Report including supporting exhibits prepared by David Stoldt (*MPWMD Response) (3-6-2020)

As result of my review of these and other related and relevant documents and reports, my own independent analysis, and my expertise in municipal and industrial water use, water management, and engineering, I offer the following opinions and conclusions:

**a) California Coastal Commission staff have correctly concluded that the Pure Water Monterey Expansion project provides an available, feasible[1] water supply alternative for Cal-Am.**

The Staff Report concludes, *"the Commission finds that there is a feasible and less environmentally damaging alternative that would meet all or most of the proposed project's objectives in a timely manner*." I concur with this finding as it relates to the feasibility of the Pure Water Monterey Expansion project and the forecast adequacy of the future water supply provided by the combination of sources available to Cal-Am. I offer no opinion on the environmental components of the Staff Report.

I conducted an analysis of the historic demand trends in the Cal-Am service area and forecast growth in the service area. I developed an independent demand forecast based on the Associated Monterey Bay Area Governments (AMBAG) 2018 forecast of future population growth for the Cal-Am service area. My analysis supports the conclusions in the Staff Report projecting 2040 demands in the Cal-Am service area to be much lower than the California Public Utility Commissions (CPUC) certificating decision.

[1] Coastal Act Section 30108 states "'Feasible' means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.".

With the addition of the Pure Water Monterey Expansion project providing an additional 2,250 acre-feet per year of supply to Cal-Am, the combination of Cal-Am's available and reliable water resources provides sufficient supply potential to meet annual future demand in 2040 by more than 1,200 acre-feet (an 11.9% surplus).

The CPUC, in its September 2018 Decision accepted that Cal-Am's "current" demand was 12,350 acre-feet per year and the future demand in 2040 will be approximately 14,000 acre-feet per year.[2] This appears outdated and therefore unreasonably high based on my analysis, the MPWMD Report, and Cal Am's own most recent forecasts. Over the most recent five-year period, 2015 – 2019, water demand in the Monterey Main service area averaged 9,885 AF per year. Cal-Am, in its most recent General Rate Case Application, forecast demand for 2021 and 2022 at 9,789 acre-feet per year.[3] Thus Cal Am's own most recent forecast estimates 2022 demand to be 20% lower than "current" demand in the CPUC decision. Independent estimates of demand developed for the MPWMD Report and developed separately for this report, align closely with Cal Am's recent rate case forecast.

My analyses show that the staff of the California Coastal Commission correctly utilized more recent information on available future water supplies and likely future demands in its analysis. I agree with the staff findings that concluded there exists an available, feasible water supply alternative to Cal-Am's proposed desalination project.

**b) Cal-Am's per capita use is likely to decrease between now and 2040 due to ongoing conservation program implementation, conservation pricing, and statewide policy directives to reduce indoor and outdoor use and improve utility water loss control measures.**

The Monterey region has been regarded as a model for water conservation programs for many years. The Monterey Peninsula Water Management District implements an array of effective demand management policies and programs that are likely to extend water efficiency gains.[4] Cal-Am implements an active water conservation program including a steeply inclining block rate pricing structure and customer incentives for installing drought tolerant landscapes and high-efficiency fixtures and appliances. Cal-Am also implements a rigorous utility-scale water loss control program aimed at reducing real losses in its distribution system. Regional development regulations ensure that all new and remodeled buildings are equipped with high-efficiency fixtures.

Cal-Am acknowledged the level of effort, significance, and impact of this conservation program in recent testimony. "California American Water has expended significant effort and resources

[2] CPUC Decision 18-09-017, September 13, 2018

[3] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004.

[4] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004. Direct Testimony of Stephanie Locke. (pp.7-8)

to encourage conservation in the Monterey County District through a variety of methods. Most important has been the tiered rate design, which features steeply inclining block rates to encourage efficient water use." – Direct Testimony of Christopher Cook, July 1, 2019.[5]

Mr. Cook's testimony is backed up by testimony from Stephanie Locke, Water Demand Manager for the Monterey Peninsula Water Management District, and the significant financial resources Cal-Am continues to apply toward water conservation in the region. In its most recent General Rate Case, Cal-Am proposed a $1.845 million three-year budget ($615,132 per year) to fund water conservation programs in the Monterey service area.[6] Locke's testimony notes that many of the conservation programs budgeted in the General Rate Case and in the prior Cal-Am rate filings focus on reductions in outdoor water use, on reductions in demand areas that have not previously been extensively targeted, and on maintaining the current low water use fixtures that have been installed to date.[7]

Cal-Am's local efforts are in parallel to broader policy measures at the state level, designed to further increase efficiency. The State of California has implemented a series of laws and directives to ensure future water efficiency across the state including Assembly Bill 1668 and Senate Bill 60 which effectively mandate an ongoing reduction in per capita use. Cal-Am's continued compliance with these regulations and its active efforts to reduce customer water demand in the future are likely to gradually further decrease per capita water use across the service area.

I have prepared two demand forecasts for the Cal-Am Monterey Main service area with growth rates based on AMBAG's anticipated population increase in 2040 and the water usage of each sector – residential, commercial, public and re-sale and non-revenue water. In each forecast, demand in each of Cal-Am's sectors is increased each year proportionally to the increase in population. The "Current gpcd" forecast assumes the current rate of daily per person water usage (based on annual production which includes residential, commercial, water loss, irrigation, etc.) continues into the future, without any increases in efficiency or conservation reductions. The "Continued efficiency" forecast includes the impacts of ongoing efficiency improvements by applying an indoor reduction factor.

Under both forecasts, the "Current gpcd" and "Continued efficiency", Cal-Am will have sufficient and reliable water supplies to meet 2040 demand with the Pure Water Monterey Expansion. Even in the highly unlikely event that Cal-Am achieves no additional water efficiency reductions over the next 20 years, my analysis shows the portfolio of available reliable supplies will exceed demand.

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[5] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004. Direct Testimony of Christopher Cook. (p.10)

[6] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004. Direct Testimony of Stephanie Locke. (p.9)

[7] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004. Direct Testimony of Stephanie Locke. (p.10)

**c) Cal-Am's existing peak capacity is sufficient to meet anticipated future maximum daily demand (MDD) and peak hour demand (PHD) and Cal-Am has yet to avail itself of low/no-cost peak demand management measures that could reduce future peaks, if necessary.**

Peak capacity planning is typically based on metered measurements of peak day and peak hour production maintained by the water provider. To my knowledge, Cal-Am does not publicly report its actual peak day or peak hour demands for the Monterey system. Rather than producing actual measurements, Cal-Am relies on a calculated approach to estimate future peak day usage. This approach was described and carried out in both the MPWMD Report and the MPWMD response, using slightly different assumptions.

Analyses in the MPWMD Report and MPWMD Response show that Cal-Am has the ability to produce 19.41 million gallons per day and 0.81 million gallons per hour. Calculations of future Maximum Daily Demand (MDD) and Peak Hour Demand (PHD) show that Cal-Am must support an MDD of 19.01 MG/day and a PHD of 0.792 MG/hour (based on a July 2012 maximum month demand). Revised analysis in the MPWMD Response using slightly different demand data showed that Cal-Am must support an MDD of 16.13 MG/day and a PHD of 0.672 MG/hour (based on an August 2014 maximum month demand). Under either demand assumption, from an infrastructure standpoint alone, Cal-Am has sufficient capacity to meet future peak day and peak hour demands even under the highly conservative assumptions embedded in the calculated approach.

If managing the peak day or peak hour becomes an issue in the future, Cal-Am has several options it has yet to implement. From an infrastructure standpoint, Cal-Cam could increase pumping capacity and add finished water storage. Cal-Am could also choose to implement low-cost peak day and peak hour demand management measures such as prohibiting automatic irrigation at certain times or on certain days or by re-assigning irrigation days of the week to distribute the summertime peak. Sophisticated approaches using smart irrigation controllers could also be employed to ensure optimal irrigation scheduling (Mayer et. al. 2018).

**d) The Hazen Report contains numerous errors, mischaracterizations, and incorrect conclusions regarding Cal-Am's likely demand in 2040 and the availability and reliability of future water supply sources.**

The Hazen & Sawyer peer review report is rife with misleading statements leading to incorrect conclusions regarding California codes, Cal-Am's likely water demand in 2040, and the availability and reliability of future water supply sources. MPWMD's March 6 response to the Hazen Report identifies line by line these errors and misleading statements. In this report I focus on the following problems:

- The Hazen Report repeatedly confuses and conflates peak demand and annual demand planning requirements and offers numerous misleading statements about California codes and standards and AWWA water planning guidance.

- The Hazen Report makes incorrect statements about water conservation programs and planning without offering data or analysis and states that per capita water use will increase substantially, despite Cal-Am's demand management efforts and prevailing state policy and regulations.

- The Hazen Report asserts that "current" demand in the Cal-Am Main System must be assumed to be 12,350 acre-feet per year. This is far higher than actual current demand and contradicts Cal-Am's own most recent General Rate Case filing which forecasts 2022 demand to be 9,789 acre-feet per year.

- The Hazen Report mischaracterizes the likely future reliability of water supplies available to Cal-Am and in particular the beneficial impacts of the ASR system over time.

- The Hazen Report reaches erroneous conclusions regarding the reliability of future water supplies based on inflated hypothetical demands, misleading statements about planning requirements, and inaccurate characterization of future water supply reliability.

# Analysis and Recommendations

## Overview

California-American Water Company proposes to construct and operate the Monterey Peninsula Water Supply Project to provide potable water from desalinated water for customers in its service area in the Monterey Peninsula region. One of the main project purposes is to provide an alternative water supply for Cal-Am that will allow it to reduce its water withdrawals from the Carmel River system in accordance with provisions of a cease-and-desist order from the State Water Resources Control Board.[8]

The California Public Utilities Commission has regulatory authority over Cal-Am and its infrastructure. In 2018 the CPUC approved Cal-Am's application to construct and operate the desalination project. The CPUC approved a smaller overall project than Cal-Am had initially proposed, because of the availability of water from another project – the Pure Water Monterey recycling and aquifer storage and recovery project. The CPUC found the two projects together could produce more than enough water to meet Cal-Am's expected water demands.

The California Coastal Commission also must review and approve the proposed desalination project under the California Coastal Act because portions of the project are within the coastal zone with the potential to impact environmentally sensitive habitat and other resources. The desalination plant itself would be located outside the coastal zone at a site about two miles inland within the jurisdiction of Monterey County, but components extend through the coastal zone to the Pacific Ocean and the project cannot be constructed without a Coastal Commission approved coastal development permit.[9]

The November 2019 California Coastal Commission staff review considered new information about water supplies and demands that were not available at the time of the 2018 CPUC decision. The Coastal Commission staff found that there is less need for water from new sources than previously determined. Significantly, another project alternative – the expansion of the above-referenced Pure Water Monterey project – has progressed from being too "speculative" for the CPUC to consider as a viable alternative, to now being a feasible, well-developed alternative. This Pure Water Monterey Expansion would occur entirely outside of the coastal zone and would cause far fewer environmental impacts than Cal-Am's proposed project.

[8] The original order, issued in 1995, determined that Cal-Am was extracting over 14,000 acre-feet per year from the river when it had a legal right to 3,376 acre-feet. The Board determined that these excess withdrawals were adversely affecting the river's population of federally-threatened Central Coast steelhead. The Board ordered Cal-Am to develop or purchase alternative water supplies so it could end its excess withdrawals. Subsequent orders issued by the Board have included additional requirements, with Cal-Am currently required to end its excess withdrawals and be able to rely on a new source of water by December 2021.

[9] California Coastal Act, Sections 30108, 30260

The recently developed Pure Water Monterey Expansion along with revised water supply and demand information were considered and included in the Staff Report[10] of October 28, 2019. The Staff report recommended denying Cal-Am's permit request to construct elements of the desalination project in the coastal zone due to its inconsistency with the Local Coastal Program's habitat protection and hazards policies, its failure of the three tests of Coastal Act Section 30260, and its failure of the alternatives consideration of Section 30233.

The California Coastal Commission has yet to approve or deny Cal-Am's proposal.

## Coastal Commission 2019 Staff Report

Cal-Am's proposed desalination project is subject to the Coastal Act and the City of Marina Local Coastal Plan that require the California Coastal Commission to determine among other things, "whether there is a feasible and less environmentally damaging alternative to the proposed project".

The Staff Report provides the Coastal Commission staff's assessment of the proposed project's conformity to the City of Marina Local Coastal Plan (LCP) and Coastal Act's public access and recreation policies for purposes of the Commission's *de novo* review. The report also provides staff's assessment of the project's conformity to relevant Coastal Act provisions for those project components proposed within the Commission's consolidated permit jurisdiction.

### Inconsistent Project

The Staff Report recommended that the California Coastal Commission deny both the *de novo* and consolidated permit aspects of the proposed project because the proposed desalination project is inconsistent with the Coastal Act and/or Local Coastal Plan including the following.[11]

1. **Environmentally Sensitive Habitat Areas** (ESHA) - The proposed project could adversely affect up to about 35 acres of ESHA. The project is inconsistent with requirements of both the City LCP and the Coastal Act that allow uses in ESHA only if they are dependent on those habitat resources.
2. **Coastal hazards** - The proposed project's well field would be sited at a location where it could be adversely affected by coastal erosion and the associated inland movement of foredunes that could bury the well heads.
3. **Protection of coastal water quality** - The proposed project would involve placement of fill in coastal waters in the form of new or modified outfall diffusers and monitoring buoys. In this case there is a feasible and less damaging alternative to the proposed fill, so the project would not conform to the alternatives requirement of Section 30233.

[10] Staff Report: Recommendation on Appeal Substantial Issue & De Novo Hearing and Consolidated Coastal Development Permit, California Coastal Commission, Application 9-19-0918 / Appeal A-3-MRA-19-0034 (California American Water Co.). (p 7)

[11] Staff Report (pp. 4-5)

### Three-Part Test for an Inconsistent Project

Coastal Act Section 30260, which is incorporated into the Local Coastal Plan, provides that the Coastal Commission may approve a permit for a coastal-dependent facility that is otherwise inconsistent with other Coastal Act Chapter 3 policies if it meets a three-part test. The three test components that must be met are:

1) Alternative locations are infeasible or more environmentally damaging
2) Denial of the permit would not adversely affect the public welfare
3) The project's adverse effects are mitigated to the maximum extent feasible

The Staff Report addresses each of these three tests as outlined below.[12] The Staff Report concluded that the Cal-Am's proposed desalination project failed each test.

**Test 1: Are alternative locations infeasible or more environmentally damaging?**

The Staff Report states that, "another project, known as the Pure Water Monterey Expansion, would provide enough water to meet Cal-Am's needs for the next twenty years or more and would cause fewer adverse environmental impacts, including few, if any, on coastal resources, since it would be located outside the coastal zone."[13]

The Staff Report recommends the Commission find that Cal-Am's proposed project does not meet this first test of Section 30260, since there is a feasible, less environmentally damaging alternative to the proposed project that could be constructed in a different location.

**Test 2: Would denying the project adversely affect the public welfare?**

The Staff Report agrees there is a "clear need" for additional water supply to serve the Monterey Peninsula region and concludes that there is a "feasible and less environmentally damaging alternative that can supply sufficient water to allow Cal-Am to meet its legal obligations and to supply its customers for the coming decades."[14]

The Staff Report concluded that the costs of the proposed desalination project are substantially higher than other water sources, including the PWM Expansion, and would be borne by ratepayers and visitors to this coastal area.

From an environmental justice perspective the Staff Report notes, "Several communities of concern would be burdened by Cal-Am's project due to the higher costs for water it would impose or due to expected or potential impacts resulting from the construction and operation of some project components in areas of sensitive habitat or that provide public access to the shoreline."[15]

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[12] Staff Report (pp. 5-6)

[13] Staff Report (p.6)

[14] Staff Report (p.6)

[15] Staff Report (p.6)

The Staff report concluded that Cal-Am's proposed desalination project would "result in adverse effects to coastal resources – for example, sensitive habitat areas – that would diminish the public benefit from those coastal resources. The alternative project would entirely avoid those coastal resource impacts."[16]

**Test 3: Are the project impacts mitigated to the maximum extent feasible?**

Here the Staff Report concludes that "because the proposed project does not meet either of the first two tests of Section 30260, there is no need to determine whether it meets the third test. Nonetheless, Commission staff have determined that the proposed project's impacts are not mitigated to the maximum extent feasible. For example, the project could adversely affect up to several dozen acres of sensitive habitat, but the mitigation proposed thus far would result in a net loss of that sensitive habitat. Similarly, the proposed project would result in adverse effects to coastal water quality, but those effects, and the measures needed to avoid or minimize them, are not yet known."[17]

### Feasible Alternative that Meets All or Most Objectives

The November 2019 California Coastal Commission staff review considered new information about water supplies and demands that were not available for the 2018 CPUC decision. The Coastal Commission staff found that there is less need for water from new sources than previously determined. Significantly, another project alternative – the Pure Water Monterey project – has progressed from being too "speculative" for the CPUC to consider as a viable alternative, to now being a feasible, well-developed alternative. This Pure Water Monterey Expansion would occur entirely outside of the coastal zone and would cause far fewer environmental impacts than Cal-Am's proposed project.

The Pure Water Monterey Expansion along with revised water supply and demand information were considered and included in the Staff Report of October 28, 2019 which concluded based on data and analyses, "that there is a feasible and less environmentally damaging alternative that would meet all or most of the proposed project's objectives in a timely manner."[18]

This conclusion relies on three core components:

1) A feasible alternative exists.[19]
2) The alternative is less environmentally damaging.
3) The alternative would meet all or most of the proposed project's objectives in a timely manner.

[16] Staff Report (p.6)

[17] Staff Report (pp.6-7)

[18] Staff Report (p. 7)

[19] The Coastal Act Section 30108 states "'Feasible' means capable of being accomplished in a successful manner with a reasonable period of time, taking into account economic, environmental, social, and technological factors."

The Staff Report relied on analyses and opinions contained in reports and applications prepared by the Monterey Peninsula Water Management District (MPWMD) as they relate to future water supply and water demand of the Cal-Am on the Monterey Peninsula.

## Cal-Am Monterey System

The Cal-Am Monterey water system serves most of the population on the Monterey Peninsula, located along the coast of Central California. The Monterey Main system encompasses greater than 90-percent of the Monterey County District service area and is the area to be served with the proposed desalination plant. The Monterey Main system and includes the incorporated cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside as well as unincorporated communities of Pebble Beach, Carmel Valley East and West, Carmel Highlands, and the Presidio of Monterey.[20]

Cal-Am also serves a number of unincorporated satellite systems, including the communities of Hidden Hills, Ryan Ranch, Bishop, Ambler, Ralph Lane, Chualar, Garrapata, and Toro. These satellite systems encompassed an area greater than 7,000 acres and service a total population of 5,313 in 2010. Other than Garrapata, Ralph Lane and Chualar, the satellite systems border the Monterey Main system. By 2022, Hidden Hills, Ryan Ranch, and Bishop will be interconnected to the Monterey Main system.

A map delineating the service area of Cal-Am Monterey prepared by the MPWMD is shown in Figure 1.

[20]Cal-Am 2010 Urban Water Management Plan. 9/7/2012. Water Systems Consulting, Inc.

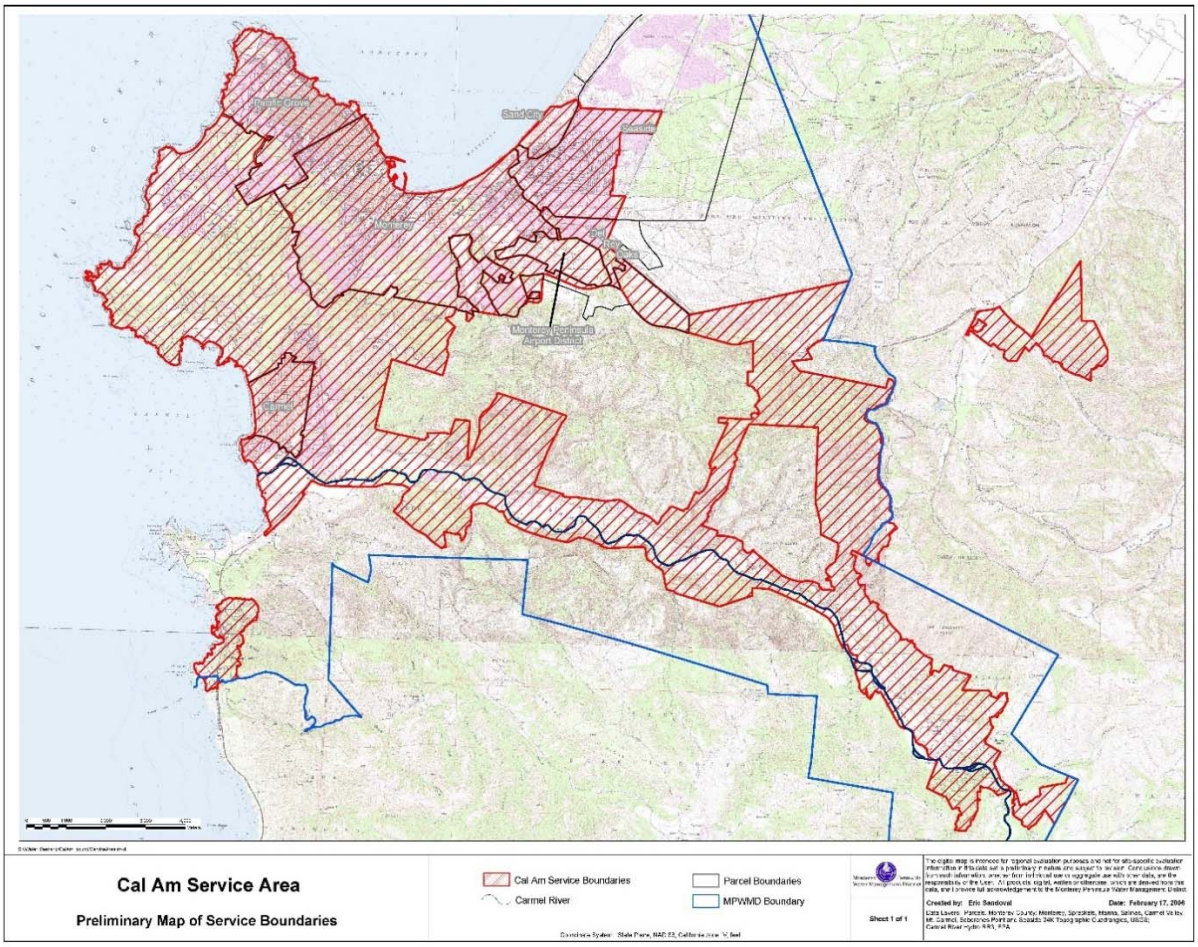


**Figure 1: Cal-Am Monterey service area boundaries[21]**

## Population Served

The Association of Monterey Bay Area Governments (AMBAG) prepares regional population and growth forecasts for the region. The most recently available forecast, the AMBAG 2018 Regional Growth Forecast, estimates the 2020 service area population of the Cal-Am Monterey Main service area to be 91,884.[22] This population is forecast to increase to 100,814 in 2040. These population estimates include Monterey, Pacific Grove, Carmel-by-the-Sea, Sand City, Seaside, Del Rey Oaks, and portions of the unincorporated County.[23] The MPWMD Report notes that the population estimates likely overstates growth to 2040 because portions of the cities of

[21] Monterey Peninsula Water Management District. Map created by Eric Sandoval. 2/17/2006

[22] Association of Monterey Bay Area Governments. 2018 Regional Growth Forecast. Table 8, page 32.

[23] Unincorporated county estimates based on Cal-Am service area population reported to the State Water Resources Control Board June 2014 – September 2019 Urban Water Supplier Monthly Reports (Raw Dataset), minus urban areas, escalated at 5%.

Monterey, Seaside, and Del Rey Oaks within the Fort Ord Buildout will be served water by the Marina Coast Water District.[24]

## Water Production and Demand

### Annual Production

Annual water production for the Monterey System from 2000 – 2019 are shown in Figure 2 along with shaded periods added to indicate the influence of mandatory drought restrictions and recession. For this purposes of this report, total water production is assumed to be equivalent to the total annual water demand in the system inclusive of all water use, non-revenue water, and treatment losses.

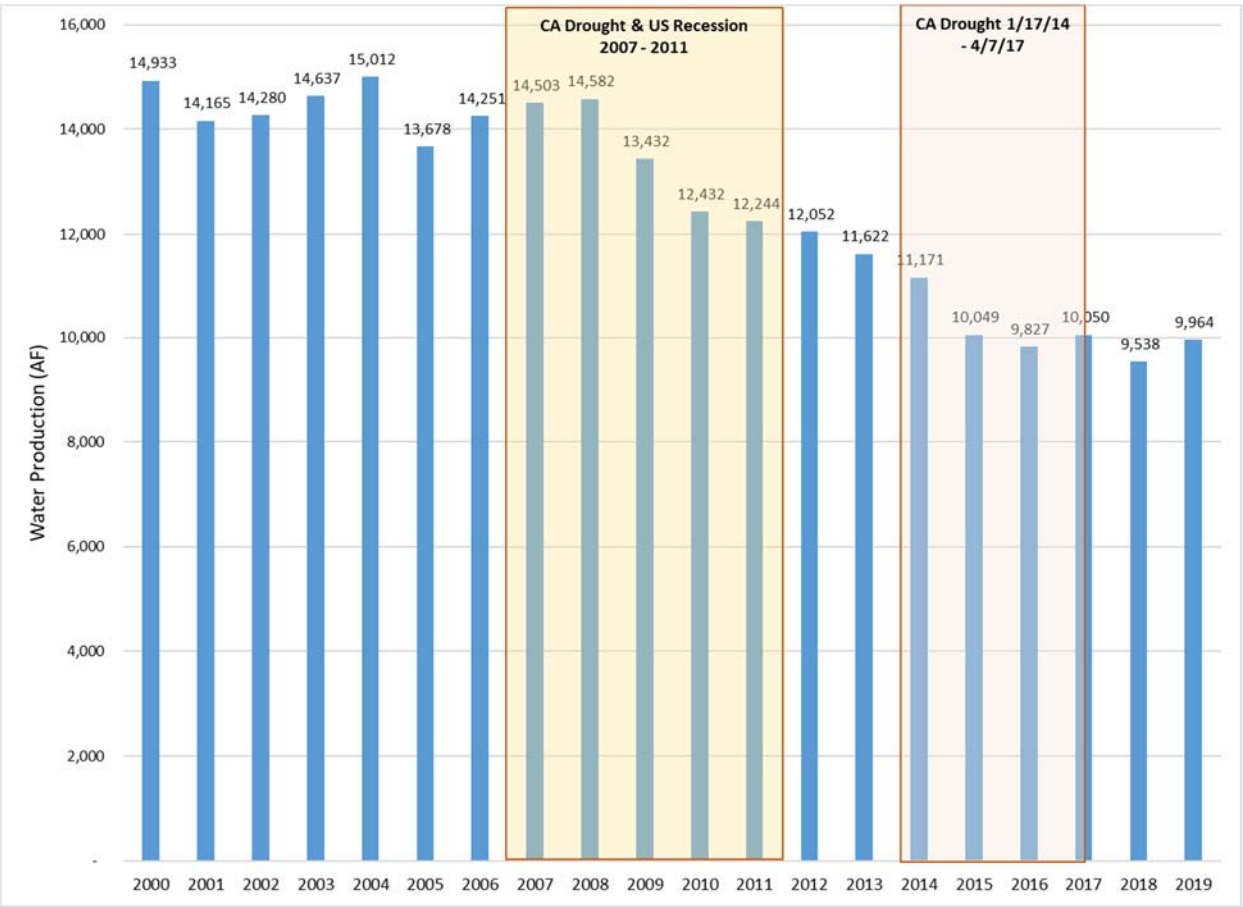


**Figure 2: Cal-Am Monterey Main water production, 2000 - 2019[25]**

[24] Monterey Peninsula Water Management District. 2020. Supply and Demand for Water on the Monterey Peninsula prepared by David Stoldt, General Manager. Appendix A.

[25] 2017 – 2019 From Cal-Am quarterly reports to the California State Water Resources Control Board. 2000 – 2016 From Monterey Peninsula Water Management District. 2019. Supply and Demand for Water on the Monterey Peninsula prepared by David Stoldt, General Manager. Figure 1.

From Figure 2 it is evident water production in the Monterey System was reasonably steady from 2000 – 2008, with the exception of the steep decline in 2005. In 2009 production began to steadily decrease and the decline didn't stop until 2016. During this 8-year period, steep demand reductions occurred during years when California was in an officially declared drought paired with an economic recession, but production reductions also occurred in 2012 and 2013 which were non-drought and recession influenced years. Over the most recent five-year period, 2015 – 2019, water production in the Monterey Main service area averaged 9,885 AF per year.

### Comment on Data Sources

Cal-Am publishes and regularly updates monthly and annual water deliveries for Monterey Main, Hidden Hills, Ryan Ranch & Bishop on its website for the desalination project.[26] Monthly data going back to 2007 are available from the testimony of Ian Crooks (2012)[27]. I compared these published records with the production data set used in the MPWMD Report and (for 2017-19) with Cal-Am's quarterly and annual reports to the California State Water Resources Control Board.

The monthly data published on Cal-Am's website and in Ian Crooks testimony, while very similar was generally lower than the annual values in the MPWMD Report. Production from Cal-Am's quarterly and annual reports to the California State Water Resources Control Board for the three most recent years (2017-2019) was higher than either the delivery values published on Cal-Am's web site or the values in the MPMWD Report.

For the purposes of the demand forecasts prepared in this report, WaterDM used the higher production values reported to the State Water Resources Control Board and the higher production values from the MPMWD Report to establish the starting point for the demand forecast, rather than the lower delivery values from Cal-Am. WaterDM's forecasts are therefore conservative in that they are based on the highest published values of annual water production for the Monterey Main System.

### Monthly Deliveries

While not relied upon as the starting point for WaterDM's demand forecasts, Cal-Am's published delivery data were used to analyze the seasonality of demand on the Monterey Main System. Monthly production is shown in Figure 3 with the period of recent drought declaration highlighted. A linear trendline is also added.

[26] https://www.watersupplyproject.org/system-delivery (accessed 3/25/2020)

[27] Direct Testimony of Ian Crooks Before the Public Utilities Commission of the State of California. Application 12-04-019 (Filed April 23, 2012) (p.9)

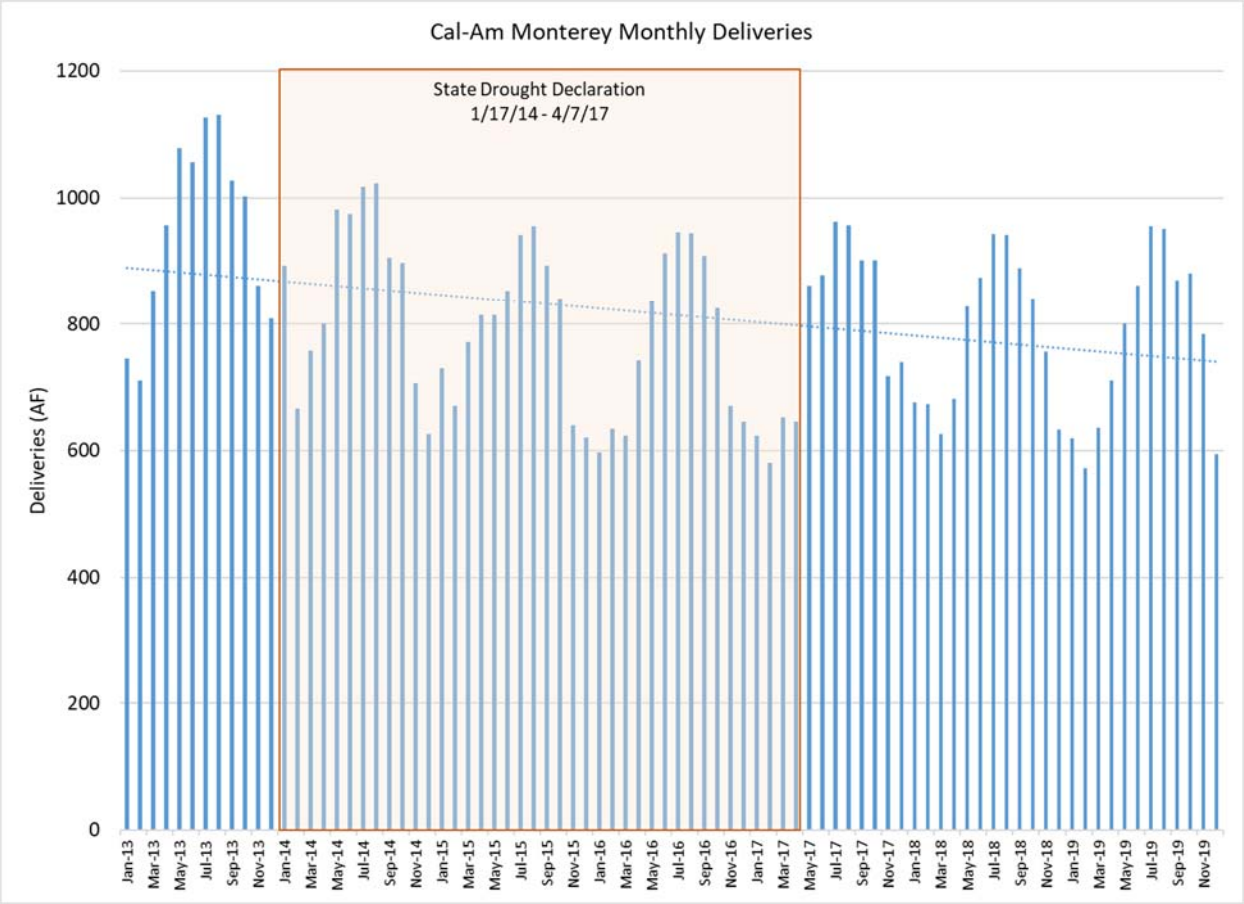


**Figure 3: Cal-Am Monterey monthly deliveries**

Using these published monthly data, I found the minimum and maximum month of delivery for each year. The average annual non-seasonal (predominantly indoor) deliveries for each year was calculated as the average water use in January, February, November and December multiplied by 12. Seasonal production for each year was calculated by subtracting non-seasonal from total production. These data and results are shown in as a chart in Figure 4 and in Table 1.

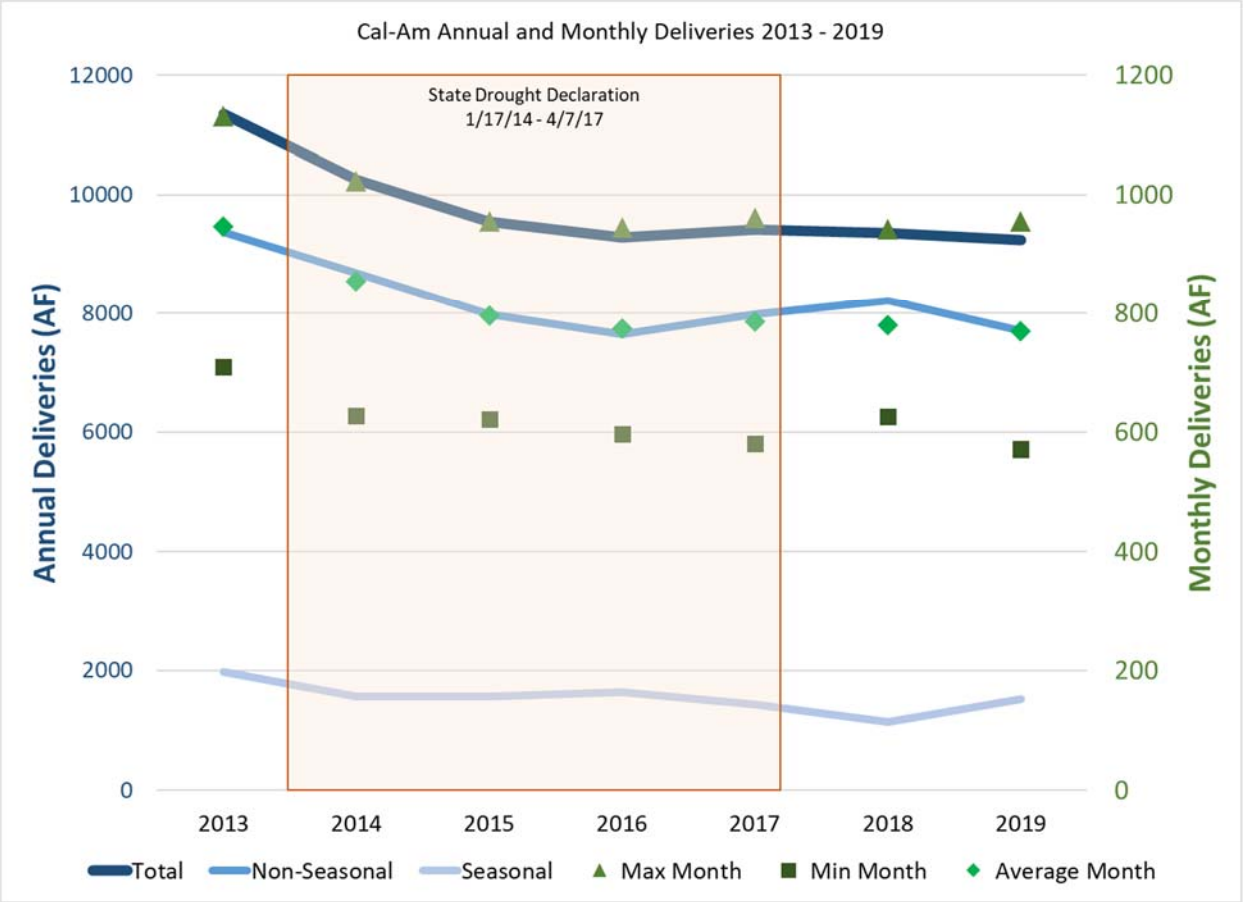


**Figure 4: Cal-Am Monterey annual and Monthly Deliveries, 2013 - 2019**[28]

Seasonal deliveries provide an estimate of summertime demand including outdoor irrigation and summertime tourism use. Non-seasonal deliveries provide an estimate of baseline indoor use and non-revenue water that occur throughout the year.

On average, seasonal deliveries accounted for 15.8% of Cal-Am's total across these seven years and ranged between 12.3% and 17.7%. Non-seasonal deliveries accounted for between 82.3% and 87.7% of usage from 2013 – 2019.

This analysis shows that the demand reductions achieved from 2013 - 2016 were largely in the non-seasonal (predominantly indoor use) category. Seasonal demand did decline during this period, but not nearly as much as non-seasonal demand.

Both the minimum and the maximum month deliveries for each year has also been declining since 2013. The minimum month of delivery in 2019 was the lowest of any of the past seven years. Notably, 2019 also had the higher annual precipitation in the region than any of the other years shown.

[28] From production data published at: https://www.watersupplyproject.org/system-delivery (accessed 3/25/2020)

### Table 1: Cal-Am monthly deliveries and annual statistics[29]

| Month | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Jan | 745 | 893 | 730 | 597 | 624 | 676 | 620 | 628 |
| Feb | 710 | 667 | 671 | 635 | 581 | 673 | 572 | 650 |
| Mar | 853 | 757 | 771 | 623 | 653 | 626 | 636 | |
| Apr | 957 | 800 | 814 | 742 | 645 | 682 | 710 | |
| May | 1079 | 982 | 814 | 836 | 861 | 828 | 801 | |
| Jun | 1056 | 975 | 853 | 912 | 878 | 874 | 861 | |
| Jul | 1127 | 1018 | 942 | 946 | 962 | 943 | 955 | |
| Aug | 1131 | 1023 | 956 | 944 | 957 | 941 | 951 | |
| Sep | 1027 | 906 | 893 | 909 | 902 | 889 | 870 | |
| Oct | 1002 | 897 | 840 | 826 | 901 | 841 | 881 | |
| Nov | 861 | 707 | 640 | 670 | 717 | 756 | 784 | |
| Dec | 809 | 627 | 621 | 646 | 740 | 633 | 594 | |
| **Total Annual Deliveries** | 11,356 | 10,250 | 9,545 | 9,285 | 9,421 | 9,362 | 9,234 | |
| **Maximum Month** | 1131 | 1023 | 956 | 946 | 962 | 943 | 955 | |
| **Minimum Month** | 710 | 627 | 621 | 597 | 581 | 626 | 572 | |
| **Average Month** | 946.4 | 854.3 | 795.4 | 773.8 | 785.1 | 780.2 | 769.6 | |
| **Annual Non-Seasonal** | 9,375 | 8,682 | 7,986 | 7,644 | 7,986 | 8,214 | 7,710 | |
| **Annual Seasonal** | 1,981 | 1,568 | 1,559 | 1,641 | 1,435 | 1,148 | 1,524 | |
| **%Seasonal** | 17.4% | 15.3% | 16.3% | 17.7% | 15.2% | 12.3% | 16.5% | |
| **Total Annual Production (from Figure 2)** | 11,622 | 11,171 | 10,049 | 9,827 | 10,050 | 9,538 | 9,964 | |
| **Difference between Production and Deliveries** | 266 | 921 | 504 | 542 | 629 | 176 | 730 | |
| **% Difference** | 2.3% | 8.2% | 5.0% | 5.5% | 6.3% | 1.8% | 7.3% | |

### Note on Data Differences

The volume of water produced by Cal-Am annually as shown in Figure 2 are based on Cal-Am's quarterly and annual reports to the State Water Resources Control Board (2017-2019) and the

[29] From delivery data published at: https://www.watersupplyproject.org/system-delivery (accessed 3/25/2020) Includes: Monterey Main, Hidden Hills, Ryan Ranch & Bishop.

MPWMD Report and are higher than the delivery values reported on Cal-Am's website (Figure 3, Figure 4, and Table 1).

As noted above, for the purposes of forecasting future production reflecting the needs of the community, WaterDM used the higher values reported to the State Water Resource Control Board for 2017, 2018, and 2019. For Years 2000- 2016 WaterDM used the MPWMD Report values (also higher than Cal-Am's monthly reports) so that the highest reported baseline production values were used to consider baseline consumption.

### Per Capita Water Use

WaterDM prepared an independent calculation of per capita water use based on the production volumes shown in Figure 2 and population data from AMBAG. System per capita use is calculated as the total volume of water produced at the source divided by the service area population and the number of days in the year. This calculation of system per capita use is based on production and thus inclusive of all water use, non-revenue water, and treatment losses.

System per capita use in the Cal-Am Monterey Main System in 2010 was 127.0 gpcd. This was highest level of gpcd over the past 10 years. In 2019, system per capita use was 97.3 gpcd and in 2018 it was 93.6 gpcd. Ten years of daily system per capita use for the Monterey Main System in shown in Table 2.

**Table 2: Per capita water use, 2010 - 2019**

| Year | Population | Production | Per Capita | Source of Production Data |
|---|---|---|---|---|
| **2010** | 87,419 | 12,432 | 127.0 | MPMWD Report |
| **2011** | 87,866 | 12,244 | 124.4 | MPMWD Report |
| **2012** | 88,312 | 12,052 | 121.8 | MPMWD Report |
| **2013** | 88,759 | 11,622 | 116.9 | MPMWD Report |
| **2014** | 89,205 | 11,171 | 111.8 | MPMWD Report |
| **2015** | 89,652 | 10,049 | 100.1 | MPMWD Report |
| **2016** | 90,098 | 9,827 | 97.4 | MPMWD Report |
| **2017** | 90,545 | 10,050 | 99.1 | SWRCB Quarterly Reports |
| **2018** | 90,991 | 9,538 | 93.6 | SWRCB Quarterly Reports |
| **2019** | 91,438 | 9,964 | 97.3 | SWRCB Quarterly Reports |

### Water Demand by Sector

Cal-Am's 2019 water demand by sector is shown as a pie chart in Figure 5, based on data presented in 2019 testimony.[30] As shown in Figure 2, 2019 was not a drought year nor was it

[30] Direct Testimony of David Mitchell Before the Public Utilities Commission of the State of California. Application 19-07-004 (Filed July 1, 2019)

impacted by economic recession. Residential use including single- and multi-family customers used 58% of the total produced in 2019. Commercial and industrial customers used 30%, the public / other sector used 5%, and non-revenue was 7%. Non-revenue water includes real and apparent water loss as well as authorized and unauthorized uses for which the utility does not collect revenue.[31]

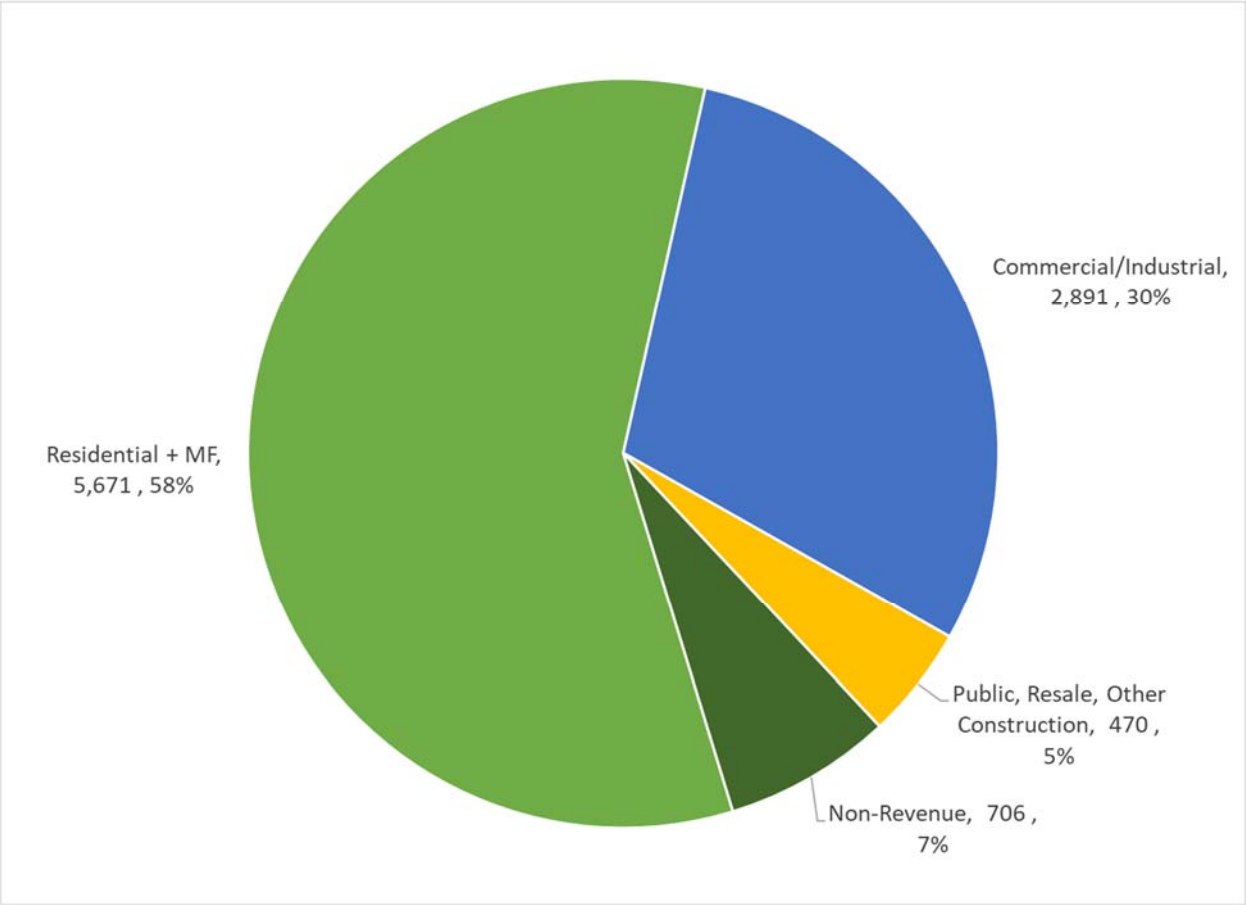


**Figure 5: 2019 Cal-Am Monterey Main System demand by sector[32]**

[31] In 2009 the residential sector used 59%, commercial/industrial sector 22%, non-revenue 9%, public/other 8%, golf course irrigation 2%.

[32] Direct Testimony of David Mitchell Before the Public Utilities Commission of the State of California. Application 19-07-004 (Filed July 1, 2019)

## Water Demand Management

Water demand management includes five core components:[33]

1. **Technical efficiency** - reducing the quantity or quality of water required to accomplish a specific task (e.g. a high-efficiency toilet).
2. **Behavioral efficiency** - Adjusting the nature of the task so it can be accomplished with less water or lower quality water (e.g. take a shorter shower).
3. **Water loss and leakage control** - Reducing losses in movement from source through use to disposal including reducing leakage in the distribution system and customer-side leaks.
4. **Peak management** - Shifting time of use to off-peak periods.
5. **Drought response** - Increasing the ability of the system to operate during droughts.

Both Cal-Am and the Monterey Peninsula Water Management District implement active, far-reaching, and effective water demand management programs that address all five of these core components. The water demand data presented in the previous section of this report and in particular Figure 2 show a steady reduction in water demand in the Cal-Am Monterey Main system which was achieved through the active and intentional water demand management efforts implemented in the region. The reduction in per capita use over the past 10 years shown in Table 2 is further indication of increased water use efficiency.

The Monterey region has been regarded as a model for water conservation programs for many years. Cal-Am and the Monterey Peninsula Water Management District implement an array of effective demand management policies and programs that are likely to extend water efficiency gains. Cal-Am implements an active water conservation program including a steeply inclining five-tier block rate pricing structure and customer incentives for installing drought tolerant landscapes and high-efficiency fixtures and appliances. Cal-Am also implements a rigorous utility-scale water loss control program aimed at reducing real losses in its distribution system. Local development regulations ensure that all new and remodeled buildings are equipped with high-efficiency fixtures and appliances.

Cal-Am acknowledged the level of effort, significance, and impact of this conservation program in recent testimony. “California American Water has expended significant effort and resources to encourage conservation in the Monterey County District through a variety of methods. Most important has been the tiered rate design, which features steeply inclining block rates to encourage efficient water use.” – Direct Testimony of Christopher Cook, July 1, 2019.

Mr. Cook’s testimony is backed up by testimony from Stephanie Locke, Water Demand Manager for the Monterey Peninsula Water Management District, and the significant financial resources Cal-Am continues to apply toward water conservation in the region. In its most

[33] Adapted from Brooks, D.B. 2007. An Operational Definition of Water Demand Management. International Journal of Water Resources Development. Volume 22, 2006 - Issue 4

recent General Rate Case, Cal-Am proposed a $1.845 million three-year budget ($615,132 per year) to fund water conservation programs in the Monterey service area. Locke's testimony notes that many of the conservation programs budgeted in the General Rate Case and in the prior Cal-Am rate filings focus on reductions in outdoor water use, on reductions in demand areas that have not previously been extensively targeted, and on maintaining the current low water use fixtures that have been installed to date.

Cal-Am's local efforts are in parallel to broader policy measures at the state level, designed to further increase efficiency. The State of California has implemented a series of laws and directives to ensure future water efficiency across the state including Assembly Bill 1668 and Senate Bill 60 which effectively mandate an ongoing reduction in per capita use. Cal-Am's continued compliance with these regulations and its active efforts to reduce customer water demand in the future are likely to gradually further decrease per capita water use across the service area.

Peak demand management to shift the timing to off peak periods is already being practiced to some degree in the Cal-Am service area but could be expanded and adjusted if necessary. Peak demand days usually occur during the hot and dry part of the year when outdoor irrigation occurs simultaneously across the service area. Currently Cal-Am restricts outdoor irrigation between 9 a.m. and 5 p.m. on any day. Irrigation is only permitted on two specific days per week (Wednesdays and Saturdays) unless the customer is equipped with a weather-responsive "smart" controller that automatically adjusts irrigation to meet prevailing climate conditions. These are all effective measures but focusing some irrigation demand on Wednesdays and Saturdays could have the unintended impact of creating peaks on those particular days. Cal-Am does not report measured peak day demand data so it was not possible to determine if this is in fact the case.

Should peak demands become a concern, Cal-Am could choose to implement low-cost peak day and peak hour demand management measures such as requiring automatic irrigation to be scheduled at certain times or on certain days by re-assigning irrigation days of the week to distribute the summertime peak. If smart irrigation controllers are widespread, then more sophisticated approaches to irrigation scheduling and timing could also be employed to harmonize demand with water production and finished water storage conditions (Mayer et. al. 2018).

## Water Demand Forecasts

WaterDM prepared two forecasts for the Cal-Am Monterey Main System to estimate future average annual production, inclusive of treatment losses and non-revenue water. The growth rate in each forecast is based on AMBAG's anticipated population increase from 2020 to 2040.[34]

[34]This likely over-estimates Cal-Am's future growth because it includes new population in portions of the cities of Monterey, Seaside, and Del Rey Oaks within the Fort Ord Buildout that will be served water by the Marina Coast Water District.

Each component of Cal-Am's demand – residential, commercial, public/other/re-sale, non-revenue water, and treatment losses was increased each year proportionally to the increase in population to produce a forecast of future average annual production, inclusive of treatment losses and non-revenue water.

- The "Current gpcd" forecast assumes the current rate of daily per person water usage continues into the future, without any increases in efficiency or conservation reductions.
- The "Continued efficiency" forecast includes the impacts of ongoing efficiency improvements by applying an indoor reduction factor.

These annual demand projections were built up from the analysis of historical production and deliveries presented above. The year 2020 is the first year of the projection, which then continues for 20-years to produce average annual demands in 2040. Over the most recent five-year period, 2015 – 2019, water production in the Monterey Main service area averaged 9,885 AF per year. This level of production was the starting point for the WaterDM forecasts.

Production was split out by sector and future demand was increased proportionally with population increases to 2040. The four sectors included in the model are:

- Residential (single-family + multi-family)
- Commercial and industrial
- Public, resale, other, construction
- Non-revenue water

The summed annual demand of these four categories equals the estimated water supply requirement under average future conditions. The model allows specific factors to be applied to the non-seasonal or seasonal component of annual demand for each demand category, to simulate the impacts of water efficiency and conservation programs.

The two forecasts prepared by WaterDM – "Current gpcd" and "Continued efficiency" are shown in Figure 6 along with the forecast demands included in Cal-Am's filings provided to the CPUC. Notably, WaterDM's 2020 – 2022 forecasts are higher than the forecasts Cal-Am General Rate Case Application forecast which estimated demand for 2021 and 2022 at 9,789 acre-feet per year.

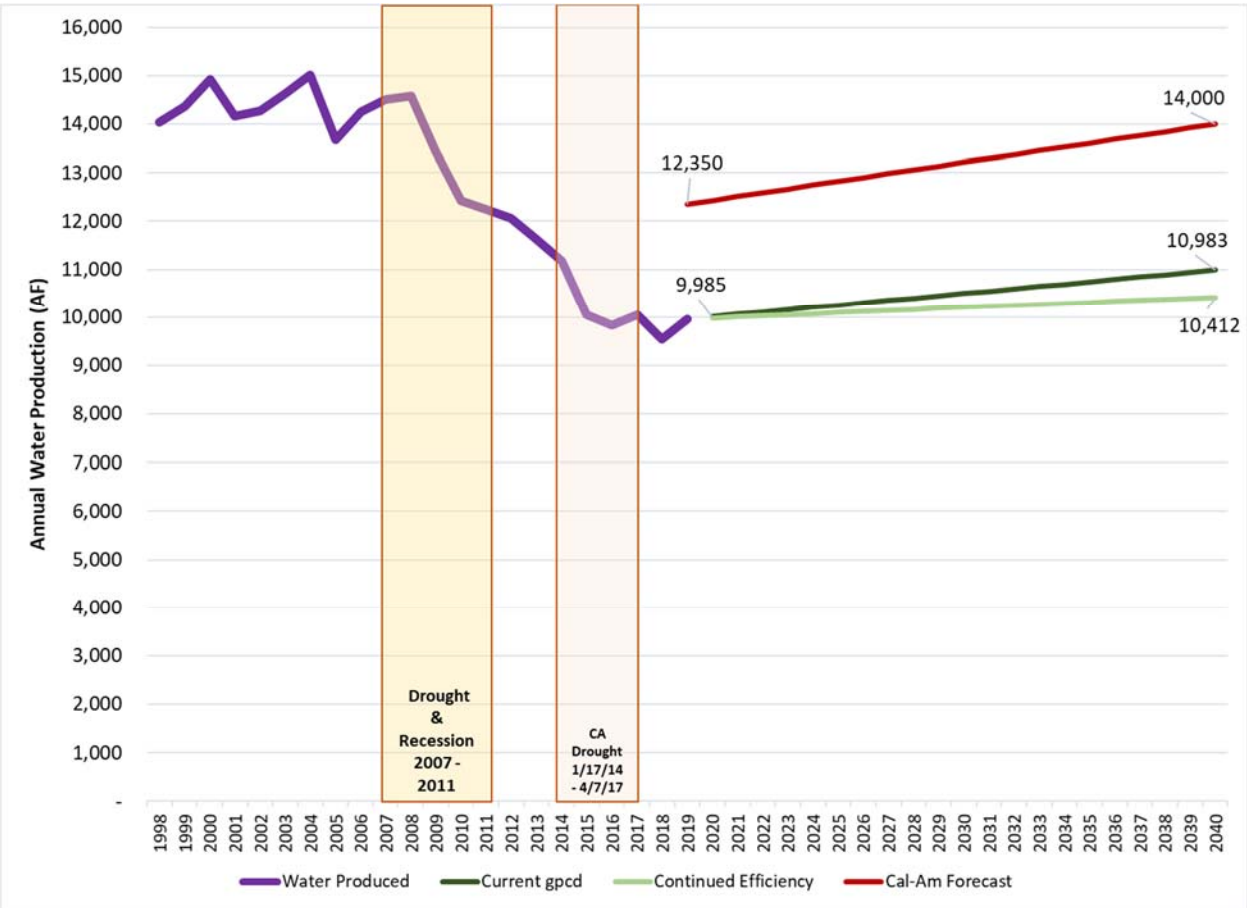


**Figure 6: WaterDM forecasts of future average annual production**

### Current GPCD Forecast

The "Current gpcd" forecast includes ongoing conservation efforts only at levels required to maintain current per-capita water use with no additional savings. This forecast results in a future per-capita water use that is identical to the current level. The 2020 and 2040 statistics for the forecast are shown in Table 3.

**Table 3: Current GPCD Forecast**

| | 2020 | 2040 |
|---|---|---|
| Population | 91,884 | 100,814 |
| Production Forecast | 9,985 AF | 10,983 AF |
| Per Capita Use Forecast | 97.3 | 97.3 |

### Continued Efficiency Forecast

The "Continued efficiency" forecast represents future production assuming slow, steady ongoing demand reductions from existing conservation activities relative to current per-capita use. This forecast results in a per-capita water use in 2040 that is 5.2% lower than current level.

Specifically, the "Continued efficiency" forecast includes the anticipated impacts of continuing the long-term water conservation program measures described in published documents and recent testimony from Cal-Am and MPWMD. It does not assume any drought restrictions or mandatory demand curtailments are applied.

The "Continued efficiency" forecast incorporates a modest level of increased efficiency of about 0.26% per year over 20 years. In my professional judgement, the "Continued efficiency" forecast represents the most likely forecast of future average annual production, inclusive of treatment losses and non-revenue water.

**Table 4: Continued Efficiency Forecast**

| | 2020 | 2040 |
|---|---|---|
| Population | 91,884 | 100,814 |
| Production Forecast | 9,985 AF | 10,412 AF |
| Per Capita Use Forecast | 97.3 gpcd | 92.2 gpcd |

### Cal-Am Demand Forecast

The demand forecast provided to the CPUC as part of Cal-Am's application for the proposed desalination plant are included with the AMBAG population forecast and per capita use for comparison. The Cal-Am forecast includes an estimate of "current" demand and a forecast of demand in 2040.

**Table 5: Cal-Am Forecast**

| | 2020 | 2040 |
|---|---|---|
| Population | 91,884 | 100,814 |
| Production Forecast | 12,350 AF | 14,000 AF |
| Per Capita Use Forecast | 120.0 gpcd | 124.0 gpcd |

Water delivery patterns have changed substantially in the region and perhaps as a result, Cal-Am has produced conflicting forecasts. The Cal-Am forecast submitted to the CPUC differs substantially from Cal-Am's own more recent General Rate Case Application forecast which estimated demand for 2021 and 2022 at 9,789 acre-feet per year.[35] The magnitude of the changes in demand and the differences in the forecasts is significant and has implications for water planning. Cal Am's own most recent forecast estimates 2022 demand to be 20% lower than "current" demand in the CPUC decision.

The Cal-Am forecast also results in an inflated value for gpcd. Using the "current" Cal-Am forecast of 12,350 AF and the current AMBAG population results in a calculated current gpcd of

[35] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004.

120.0 which is 23% higher than WaterDM's fully inclusive calculation of Cal-Am Monterey Main system gpcd in 2019 which was 97.3 gpcd. This forecast doesn't square with Cal-Am's stated intent to spend more than $1.8 million over three years on its water conservation programs and with state regulations and policies that incentivize demand reductions. The Cal-Am forecast doubles down on the problem an inflates per capita use up to 124 gpcd in the year 2040.

A 2040 level of 124 gpcd is extremely unlikely and such a dramatic and remarkable reversal in water use efficiency is inconsistent with the state and local directives and contradicts recent sworn testimony from Cal-Am in its current General Rate Case. Customers in the Cal-Am Monterey service area are among the most water efficient in the state. The outdated Cal-Am forecast unreasonably assumes that these customers will go from being the most efficient to becoming among the least water efficient in California over the next 20 years.

## Water Supply

### Introduction

The November 2019 California Coastal Commission staff analysis considered new information about water supplies (and demands) that were not available for the 2018 CPUC decision. As a result of this new information, the Coastal Commission staff found that there is less need for water from new sources than previously determined and that a project alternative – the expansion of the above-referenced Pure Water Monterey project – had progressed from being too "speculative" for the CPUC to consider as a viable alternative, to being a feasible, well-developed alternative. This Pure Water Monterey Expansion would occur entirely outside of the coastal zone and would cause far fewer environmental impacts than Cal-Am's proposed project.

The recently developed Pure Water Monterey Expansion along with revised water supply and demand information were considered and included in the Staff Report[36] of October 28, 2019 in which the Staff report recommended denying Cal-Am's permit request to construct elements of the desalination project in the coastal zone due to its inconsistencies with the Coastal Act and the Local Coastal Program's habitat protection and hazards policies, its failure of the three tests of Coastal Act Section 30260, and its failure of the alternatives consideration of Section 30233.

I considered the available, reliable water supply sources for Cal-Am Monterey to utilize out to the year 2040 including the existing Pure Water Monterey project and its expansion. Based on this analysis I agree with the conclusions in the 2019 Staff Report. With the addition of the Pure Water Monterey Expansion providing an additional 2,250 acre-feet per year of supply to Cal-Am, the combination of Cal-Am's available and projected water resources total 11,650 acre-feet of reliable supply. This provides sufficient supply potential to meet annual future demand in 2040 by more than 1,200 acre-feet above WaterDM's most-likely "Continued efficiency" forecast.

[36] Staff Report: Recommendation on Appeal Substantial Issue & De Novo Hearing and Consolidated Coastal Development Permit, California Coastal Commission, Application 9-19-0918 / Appeal A-3-MRA-19-0034 (California American Water Co.). (p 7)

## Water Supply for the Monterey Main System

Cal-Am delivers water to its Monterey Main system from a diverse collection of water sources. This will remain true into the future, even with the Pure Water Monterey Expansion or the proposed desalination plant. Figure 7 shows historic and projected deliveries in the Monterey Main system including the Pure Water Monterey projects along with the two water demand forecasts prepared by WaterDM. All of the supply sources shown in Figure 7 and are documented in Table 6. The anticipated available reliable water supply in 2040 from each source is included and the total is 11,650 AF. Each source of water and the volume of available reliable supply is described in detail in the sections below.

Cal-Am has historically relied heavily on withdrawals from the Carmel River water and Seaside Basin groundwater to provide water to the Monterey Main system. In the future withdrawals from both sources must be reduced. Cal-Am must carefully manage its supply portfolio in the coming years regardless of the Coastal Commission's ruling regarding the desalination project. Even under the best of circumstances it will be at least 2022 before either the Pure Water Monterey Expansion or the proposed desalination project are online.

The focus of the Coastal Commission staff analysis and recommendations was on the availability of sufficient water supply to meet the community needs twenty years from now in 2040, and less on how Cal-Am will manage the transition from its reliance on the Carmel River in 2022. The water supply analysis summarized in Figure 7 indicates that with the addition of the full Pure Water Monterey project Cal-Am does have available water supply both in the near term (2020 – 2025) and twenty years from now in 2040. In keeping with the Staff Report, the primary focus of the WaterDM analysis was on the determining the volume of reliable supply available in 2040.

The Pure Water Monterey project with the expansion would provide enough available supply to meet the likely 20-year requirements, but it is still reasonable to expect Cal-Am may need to seek to secure additional supplies in the future beyond 2040. Much will depend upon what happens to the local economy and climate over the coming decade. Over-building infrastructure such as desalination (at its current size) would be an expensive error. The future is uncertain and the impact of COVID 19 and other economic unknowns could well be to reduce future demand in the Monterey Main System from current levels, lessening or eliminating the need for securing additional supply.

**EXHIBIT 4-B**

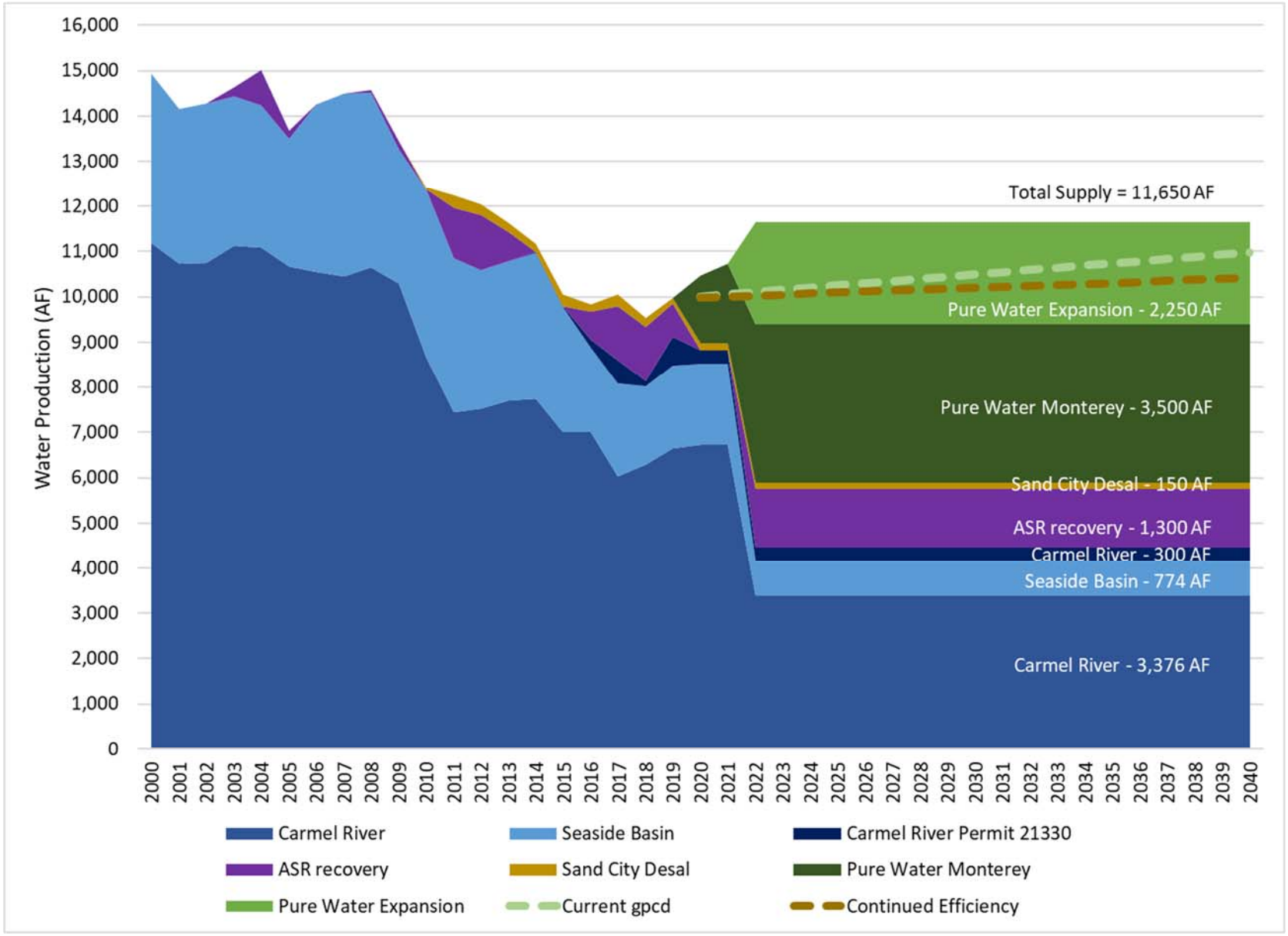


**Figure 7: Cal-Am historic water production (2000 – 2019) and future water supply and demand (2020 – 2040)**

### Table 6: Cal-Am Monterey Main System water supply sources

| Water Source | AF/Year | Notes | Regulator | Data Source |
|---|---|---|---|---|
| **Carmel River – Cease and Desist Order** | 3,376 AF. | 2,179 AF from License 11866; 1,137 AF of pre-1914 appropriative rights; and 60 AF of riparian rights. | SWRCB Order 2016-0016 | Cal-Am reports to the SWRCB |
| **Carmel River – Permit 21330** | 300 AF | Only available Dec. – May. | SWRCB | Cal-Am reports to the SWRCB |
| **Seaside Basin Native Groundwater** | 774 AF | Reflects Cal-Am's 25-year obligation to leave 700 AF of the 1,474 AF it is entitled. | Seaside Basin Watermaster | Watermaster's annual reports. |
| **ASR Recovered Water** | 1,300 AF | Based on long-term historical precipitation and streamflow, ASR system may be capable of recovering an average of 1,920 AF per year. | SWRCB Water Rights Permits 20808A & C | Cal-Am reports to the SWRCB |
| **Sand City Desalination Plant** | 150 AF | 300 AF capacity. Has averaged 209 AF over life of plant. | SWRCB Order 2016-0016 & Division of Drinking Water | Cal-Am reports to the SWRCB |
| **Pure Water Monterey** | 3,500 AF | Withdrawals prior to 2022 will reduce Effective Diversion Limit from the Carmel River. | Division of Drinking Water & Seaside Basin Watermaster | TBD |
| **Pure Water Monterey Expansion** | 2,250 AF | | Division of Drinking Water & Seaside Basin Watermaster | TBD |
| **TOTAL** | **11,650 AF** | | | |

### Carmel River

Withdrawals from the Carmel River, Cal-Am's primary water source, must be reduced in accordance with a cease-and-desist order from the State Water Resources Control Board. The original order, issued in 1995, determined that Cal-Am was extracting over 14,000 acre-feet per year from the river when it had a legal right to 3,376 acre-feet. The State Water Resources Control Board determined that these excess withdrawals were adversely affecting the river's population of federally threatened Central Coast steelhead and riparian habitat. The Board ordered Cal-Am to develop or purchase alternative water supplies so it could end its excess withdrawals. Subsequent orders issued by the Board have included additional requirements, with Cal-Am currently required to end its excess withdrawals and be able to rely on a new source of water by December 2021.

Figure 7 and Table 6 show Carmel River production reducing to the mandated 3,376 AF in 2022. This is the volume to which Cal-Am has a legal right and is comprised of 2,179 AF from License 11866; 1,137 AF of pre-1914 appropriative rights; and 60 AF of riparian rights.[37]

Figure 7 also shows an additional 300 AF of Carmel River supply based on Permit 21330.[38] Cal-Am's annual reports to the State Water Resources Control Board show that it has withdrawn an average of 428 AF per year from 2017-2019 under this permit.

### Seaside Groundwater Basin – Native Groundwater

Along with the Carmel River, the withdrawals of native groundwater from the Seaside Groundwater Basin must also be reduced soon which impacts Cal-Am Monterey. The Seaside Basin was over pumped for many years prior to the issuance of the 2006 Seaside Groundwater Basin adjudication which imposed triennial reductions in operating yield until the basin's "Natural Safe Yield" is achieved. For Cal-Am, the last reduction will occur in 2021 and Cal-Am will have rights to 1,474 acre-feet per year.

Figure 7 and Table 6 show 774 AF of supply available from the Seaside Basin from 2022 – 2040. This reflects the agreement with the Watermaster to leave 700 AF per year of the 1,474 AF it is entitled to for at least 25 years as payback for Cal-Am's over-pumping in the Seaside Basin. For the purposes of this analysis it was assumed that this obligation is triggered once Cal-Am obtains a permanent replacement supply of water (e.g. Pure Water Monterey Expansion or the proposed desalination project).

[37] MPWMD Report (p.3)

[38] "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." MPWMD Report (p.3)

The Seaside Basin Watermaster states Cal-Am's "payback amount is currently estimated to be 18,000 acre-feet", thus 25.7 years of 700 AF per year re-payments would complete the payback.[39]

The Seaside Basin Watermaster's 2019 report to the Court overseeing the groundwater adjudication states that the total usable storage space in the entire Seaside Groundwater Basin is 52,030 AF. The report also describes the current allocation of that usable storage space among the Seaside Basin pumpers and Cal-Am is allocated 28,733 acre-feet.[40] The annual report aligns with the Watermaster's January 2020 letter regarding the Pure Water Monterey Expansion which reiterates the importance of the groundwater payback program. The letter also notes the direct ties between the Seaside Basin and the Pure Water Monterey Expansion project and identifies that "on the order of 25,000 acre-feet of additional storage would need to be injected and left in the Seaside Basin over a period of years in order to achieve protective elevations along the coastline."[41]

After the payback is complete, Cal-Am will be able to produce the full 1,474 AF if needed. During a drought or in the event another supply became impaired, Cal-Am could (with permission from the Seaside Basin Watermaster) utilize its full 1,474 AF in any year or series or years and then extend the payback period.

### Aquifer Storage and Recovery

Cal-AM participates in an aquifer storage and recovery (ASR) project that allows for the capture of excess Carmel River winter flows through wells along the river. This river water is then transferred through existing conveyance facilities, including the new Monterey Pipeline and Pump Station, and stored in the Seaside Groundwater Basin for later extraction. This project operates with four ASR well sites capable of both injection and extraction. Ownership and operation of this source water project has various components split between Cal-Am and the Monterey Peninsula Water Management District.[42]

There are two water rights that support the ASR system: Permit 20808A which allows maximum diversion of 2,426 AF and Permit 20808C which allows up to 2,900 AF for a total potential maximum annual diversion of 5,326 AF.[43] But in reality Cal-Am will only be able to divert, inject, and store the maximum permitted volume in the wettest of years.

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[39] Seaside Basin Watermaster Jan. 8, 2020 Letter to Rachel Gaudion. Subject: Draft Supplemental Environmental Impact Report for the Proposed Modifications to the Pure Water Monterey Groundwater Replenishment Project (Draft Supplemental EIR)

[40] Seaside Basin Watermaster Annual Report – 2019, December 5, 2019

[41] Seaside Basin Watermaster Jan. 8, 2020 Letter to Rachel Gaudion.

[42] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004. Direct Testimony of Christopher Cook. (p.7)

[43] MPWMD Report (p.3)

Based on long-term historical precipitation and streamflow data, the ASR system is designed to allow an average of 1,920 AF per year to be recovered. Figure 7 and Table 6 assume a more conservative 1,300 AF of ASR production per year for 2020 – 2030 as does the MPWMD Report. With the addition of the Pure Water Expansion, Cal-Am will have additional opportunity to inject and store water in the Seaside Groundwater Basin which may allow for increased annual recovery over time.

Cal-Am is allocated 28,777 AF of total storage in the Seaside Groundwater Basin.[44] Careful management of the Seaside Groundwater Basin and optimizing the storage opportunities it provides will help ensure a long-term reliable supply for the Cal-Am Monterey service area. Once the storage reserve is established, Cal-Am could withdraw 1,920 AF (or more) on a regular basis.

### Sand City Desalination Plant

Cal-Am has an operating agreement for the Sand City Desalination Plant, a small facility designed to produce 300 acre-feet of water per year. Due to source water quality issues and discharge permit requirements to date the Sand City plant has never produced the full 300 AF and the maximum that is has ever produced was 276 AF in 2011. Over the life of the plant it has averaged 209 AF of production per year but it has only averaged 188 AF per year of production from 2016 – 2019.[45] Figure 7 and Table 6 conservatively includes 150 AF per year of production well below the long-term average of 209 AF per year.

### Pure Water Monterey

Monterey One Water in partnership with the Monterey Peninsula Water Management District developed the Pure Water Monterey Groundwater Replenishment Project to create a reliable source of water supply to replace existing water supply sources for the Monterey Peninsula.

The primary objective of the Pure Water Monterey Project is to replenish the Seaside Groundwater Basin with 3,500 acre-feet per year of purified recycled water to compose a portion of Cal-Am's water supply and to assist in complying with the State Water Resources Control Board orders. The source water for the Pure Water Monterey Project is wastewater flows from the members of Monterey One Water.

The Pure Water Monterey Project (as initially approved and constructed) includes a 4 million gallon per day capacity water purification facility for treatment and production of purified recycled water that is conveyed and stored in the Basin using a series of shallow and deep injection wells. Project conveyance facilities include ten miles of pipeline from the purification facility to injection wells in the Seaside Groundwater Basin. This pipeline is owned and operated by the Marina Coast Water District.

[44] Seaside Basin Watermaster Annual Report – 2019, December 5, 2019

[45] MPWMD Report

Once injected, the purified recycled water augments existing groundwater supplies and is capable of providing 3,500 acre-feet per year of water for extraction. Pure Water Monterey is operational in 2020 and Figure 7 includes 3,500 AF per year from the Pure Water Monterey project starting in 2022.

### Pure Water Monterey Expansion

Monterey One Water and the MPWMD have proposed expansion of the Pure Water Monterey project to increase the capacity available to Cal-Am. The Pure Water Monterey Expansion is expected to provide an additional 2,250 acre-feet per year to augment existing groundwater supplies.

The source water for the Pure Water Monterey Expansion is municipal wastewater and agricultural drainage water. Analysis of the water sources under four conditions including drought concluded that the project can reliably produce water under each circumstance.[46]

The analysis concluded Monterey One Water would have rights to a sufficient quantity of source water to produce the yield in advanced treated, product water that is anticipated to be produced by the Pure Water Monterey Expansion regardless of whether or not the conditions precedent are met and whether or not it is a dry or drought year or a normal or wet year.[47]

The analysis shows that the Pure Water Monterey Expansion can reliably produce water as proposed. Figure 7 includes 2,250 acre-feet per year from the Pure Water Monterey Expansion project becoming available to Cal-Am in 2022.

With the addition of the Pure Water Monterey Expansion project providing an additional 2,250 acre-feet per year of supply to Cal-Am, the combination of Cal-Am's available and projected water resources total 11,650 acre-feet of reliable supply. This provides sufficient supply potential to meet annual future demand in 2040 by more than 1,200 acre-feet than WaterDM's most-likely "Continued efficiency" demand forecast.

### Peak Capacity

Peak capacity planning is typically based on metered measurements of peak day and peak hour production maintained by the water provider. To my knowledge, Cal-Am does not publicly report its actual peak day or peak hour demands for the Monterey system. Rather than producing actual measurements, Cal-Am relies on a calculated approach to estimate future peak day usage. This approach was described and carried out in both the MPWMD Report and the MPWMD response, using slightly different assumption.

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[46] April 11, 2020. Source Water Operational Plan Technical Memorandum. Prepared by Bob Holden, PE, and Alison Imamura, PE, Monterey One Water

[47] April 2020. Comments on Water Supply and Source Water Availability. FINAL Supplemental Environmental Impact Report for the Proposed Modifications to the Pure Water Monterey Groundwater Replenishment Project. P 3-8

Analyses in the MPWMD Report and MPWMD Response show that Cal-Am has the ability to produce 19.41 million gallons per day and 0.81 million gallons per hour. Calculations of future Maximum Daily Demand (MDD) and Peak Hour Demand (PHD) show that Cal-Am must support an MDD of 19.01 MG/day and a PHD of 0.792 MG/hour (based on a July 2012 maximum month demand). Revised analysis in the MPWMD Response and Final analysis using slightly different demand data showed that Cal-Am must support an MDD of 16.13 MG/day and a PHD of 0.672 MG/hour (based on an August 2014 maximum month demand). Under either demand assumption, from an infrastructure standpoint alone, Cal-Am has sufficient capacity to meet future peak day and peak hour demands even under the highly conservative assumptions embedded in the calculated approach.

If managing the peak day or peak hour becomes an issue in the future, Cal-Am has several options it has yet to implement. From an infrastructure standpoint, Cal-Cam could increase pumping capacity and add finished water storage. Cal-Am could also choose to implement low-cost peak day and peak hour demand management measures such as prohibiting automatic irrigation at certain times or on certain days or by re-assigning irrigation days of the week to distribute the summertime peak. Sophisticated approaches using smart irrigation controllers could also be employed to ensure optimal irrigation scheduling (Mayer et. al. 2018).

## The Hazen Peer Review Report

As part of my investigation I was asked to review and comment on a peer review report prepared by Hazen and Sawyer (Hazen Report) which critiqued the MPWMD Report and the subsequent MPWMD Response.

- *California American Water Peer Review of Supply and Demand for Water on the Monterey Peninsula prepared by Kevin Alexander, P.E. and Cindy Miller, P.E., Hazen and Sawyer (Hazen Report)*
- *MPWMD's March 6 response to the Hazen Report including supporting exhibits prepared by David Stoldt (MPWMD Response)*

The Hazen & Sawyer peer review report is rife with misleading statements leading to incorrect conclusions regarding California codes, Cal-Am's likely water demand in 2040, and the availability and reliability of future water supply sources. MPWMD's March 6 response to the Hazen Report identifies line by line these errors and misleading statements. In this report I focus on the following problems:

### Water Planning

**The Hazen Report repeatedly confuses and conflates peak demand and annual demand planning requirements and offers numerous misleading statements about California codes and standards and AWWA water planning guidance.**

Throughout the Hazen Report the authors confuse and conflate requirements for meeting the peak demand and annual demand planning practices. Planning the infrastructure and treatment capacity requirements for a community to meet the peak day and peak hours of

demand is distinctly different from planning for an adequate long-term water supply for the same community. In my judgement, the MPWPD Report and Response adhered to all applicable codes and industry standards and practices.

I will specifically address the Hazen Report's assertions regarding the following:

- California Code of Regulations (CCR) section 64554
- California Health and Safety Code (CHSC) section 116555
- California Water Code (CWC) sections 10635 and 10631
- American Water Works Association "Water Resource Planning" guidance M50

### CCR §64554

On page 3 the Hazen Report states, "CCR §64554(b), establishes the requirements that California water utilities must use to project demands. This regulation requires that the public water system identify the day, month, and year with 'the highest water usage during at least the most recent ten years of operation.'"[48]

CCR §64554 specifically establishes the requirements for "New and Existing Source Capacity" and provides methods for calculating the Maximum Daily Demand (MDD) for a water system. MDD or peak capacity planning is typically based on metered measurements of peak day and peak hour production maintained by the water provider and 64554 states that, "If daily water usage data are available, identify the day with the highest usage during the past ten years to obtain MDD".[49]

To my knowledge, Cal-Am does not publicly report its actual peak day or peak hour demands for the Monterey system. Rather than producing actual measurements, Cal-Am relies on the calculated approach (method 2 in CCR 64554) to estimate future peak day usage. This approach was described and carried out in both the MPWMD Report and the MPWMD Response, using slightly different assumptions. I reviewed these calculations and under both sets of assumptions Cal-Am has sufficient capacity to meet MDD.

If peak day or peak hour demands were to increase in the Cal-Am system over the next 20 years, additional pumping and local storage capacity could be added to the system to meet the requirements of CCR §64554.

The Hazen Report repeatedly confuses the peak capacity calculation of MDD as specified in CCR §64554 with the very different task of planning for an adequate future water supply on an annual basis. CCR 64554 does not make any provisions for estimating current annual demand or future annual demand. The Hazen Report improperly connects 64554 with annual demand

[48] Hazen Report (p. 3).

[49] CCR §64554(b)(1)

planning on page 3 and page 6 and lacks proper specificity when referring to peak vs. annual supply and demand.

### CHSC 116555

California Health and Safety Code section 116555 states simply that California water suppliers must provide, "a reliable and adequate supply of pure, wholesome, healthful, and potable water."[50]

The MPWMD Report correctly concluded that either project could provide the reliable water supply for the region. The MPWMD's revised analysis shows that even under conservative, randomized climate assumptions, ASR storage will build up a sufficient reserve to meet a 5-year drought.[51]

### CWC Sections 10635 and 10631

Section 10635 of the California Water Code states that, "every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years."

Section 10631 reiterates this requirement in the plan and also requires analysis by the utility of (i) Water waste prevention ordinances; (ii) Metering; (iii) Conservation pricing; (iv) Public education and outreach; (v) Programs to assess and manage distribution system real loss; (vi) Water conservation program coordination and staffing support; and (vii) Other demand management measures.[52]

The Hazen Report implies that the Pure Water Monterey Expansion is speculative and unproven and suggests it should not be considered "as a permanent reliable water source" and instead should be considered a "backup" supply.[53] There are many problems with this analysis specifically:

i. The Hazen Report notably fails to apply the same scrutiny regarding reliability to the proposed desalination project. Frequently desalination delivers less supply than promised at a higher cost than anticipated.[54]
ii. The Hazen Report considers unrealistic and unsubstantiated current and future demand projections based on outdated demand information.

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[50] CHSC 116555 https://codes.findlaw.com/ca/health-and-safety-code/hsc-sect-116555.html

[51] MPWMD Response (Note 15)

[52] http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10631

[53] Hazen Report (p.8)

[54] https://www.voiceofsandiego.org/topics/science-environment/desal-plant-producing-less-water-promised/

iii. Revised analysis from the MPWMD, which I have confirmed, shows that even under conservative, randomized climate assumptions, ASR storage will be built-up and sufficient to deliver forecast volumes through a 5-year drought. If Pure Water Monterey Expansion is completed there will likely be additional water available for injection and carryover storage.

iv. The Hazen Report fails to take into consideration Cal-Am's compliance with Section 10631 and implementation of effective efficiency and conservation measures that have successfully reduced demands and will continue to do so in the future.

### American Water Works Association (AWWA)[55] Manual M50, Water Resource Planning

The Hazen Report repeatedly asserts that analysis in the MPWMD Report is inconsistent with "engineering best-practices" published in the AWWA Manual M50 Water Resources. The M50 is planning guidance manual which offers a broad range of approaches and invites utilities to choose the one that best fits their needs, requirements, and available data. As it strains to defend Cal-Am's outdated "current demand" forecast, the Hazen Report manages to mis-represent both the framework and content of the M50 manual. The Hazen Report assertions are incorrect and misleading for the following reasons.

First, the Hazen Report misrepresents the M50 as a set of "engineering best practices."[56] AWWA Manuals are not "best-practices" documents, but rather are "Manuals of Water Supply Practices" which are distinct and different from "best-practices" in that they offer utilities a wide range of solutions rather than a single "best" approach. AWWA Manuals are "consensus documents focused on providing strategies and steps for water system optimization. They are written, reviewed and approved by members of AWWA volunteer committees."[57]

Second, the Hazen Report cites an old and outdated version of the M50. The most current AWWA Manual M50 Water Resources, 3rd edition was published in 2017, but the citations in the Hazen Report are from the discontinued 2nd edition published in 2007.

Third, regardless of the outdated citation, the Hazen Report critically misinterprets and misrepresents identical guidance provided in the both versions of the M50 manual. Both editions of M50 include the same following language regarding the need for a variety of methods to forecast demand:

> *"No single method of forecasting will satisfy the varied needs of all utilities. The forecasting method used and the data needed to correctly apply the method depend on the situation.*

[55] The American Water Works Association (AWWA) is an international non-profit, scientific and educational association founded to improve water quality and supply. Established in 1881, it has a membership (as of 2012) of around 50,000 members worldwide, including the author of this report.

[56] Hazen Report (p.3)

[57] https://www.awwa.org/Publications/Manuals-of-Practice

*For example, when a forecast of average annual demand is the primary requirement, a simple per capita approach might be sufficient."*[58]

Both versions of the M50 describe the same six approaches to preparing a demand forecast. Based on my review, the MPWMD Report incorporated four of the accepted methods to some degree:

- per capita models
- extrapolation models
- disaggregate water use models
- land-use models

The forecast prepared by WaterDM described earlier in this report also incorporate three of these approaches:

- per capita models
- extrapolation models
- disaggregate water use models

Similar forecasting approaches are regularly employed by Cal-Am as described in sworn Testimony from Ian Crooks.[59]

Finally, the Hazen Report asserts that the M50 manual specifies a 10-year or even 20-year retrospective analysis to establish a demand baseline for a forecast. The Hazen Report then uses this unfounded notion to defend Cal-Am's "current demand" forecast of 12,350 AF submitted to the CPUC in support of the desalination plant application. The quote cited in the Hazen Report in support of this approach[60] appears only in the 2007 edition and was not included in the current edition of M50. Furthermore, the Hazen Report misinterprets the meaning which does not specify a calculation method or planning period, but instead recommends the analysis of 10 years or more of historic data to understand trends and drought impacts.

### Water Conservation and Demand Management

**The Hazen Report makes incorrect statements about water conservation programs and planning and without offering data or analysis and even suggests that per capita water use will increase substantially despite Cal-Am's demand management efforts and prevailing state policy and regulations.**

[58] American Water Works Association (2017, 2007) Manual of Water Supply Practices-M50, Third Edition

[59] Direct Testimony of Ian Crooks Before the Public Utilities Commission of the State of California. Application 12-04-019 (Filed April 23, 2012) (p.7)

[60] Hazen Report (p.3)

Starting on page 1, the Hazen Report makes factually incorrect statements about water conservation programs and policies in California and the Monterey region. The Hazen report states, "MPMWD staff also assumes continued implementation of tiered rates, conservation restrictions, and enforced water use reductions ... all of which have the potential to do continuing harm to the area's businesses and residential customers."[61]

This sentence confuses and conflates on-going water conservation measures such as tiered rates with mandatory curtailment measures that are only implemented when necessary during a declared drought. This error is repeated throughout the Hazen Report.

The MPWMD Report correctly assumed the continuation of tiered water rates and water conservation programs as described earlier in my report. These are ongoing features of the local water supply system and are mandated by California state law. Tiered rates have been implemented by Cal-Am in the Main system and across its other Cal-Am systems (and throughout California) for many years and the Hazen Report presents no evidence in support of the notion that continued implementation of tiered rates will cause "continuing harm" to the community.

The Hazen Report is also incorrect regarding "restrictions" and "enforced reductions". Neither the MPWMD Report or the demand forecasts I prepared for in this report assumed demand restrictions or enforcement beyond the measures Cal-Am already implements during a normal year. Mandatory curtailment is typically only necessary during a declared drought such as 2014 -2017 and was not considered in the WaterDM forecasts or in the MPWMD Report.

On page 4 the Hazen Report repeats the error and includes additional unsupported and incorrect statements:

> *"The conservation and moratorium measures that were implemented in response to drought conditions, including tiered rates, conservation restrictions, and enforced water use reductions, were effective in lowering demand. However, no additional methods are presented in the memo to indicate how further reductions in demands would occur; absent any* ***, it is reasonable to assume everything has already been done on the demand side to reduce levels and further reductions should not be considered in demand forecasting for determining water supply sufficiency****."*[62]

The Hazen Report is again incorrect regarding "restrictions" and "enforced reductions". Neither the MPWMD Report or the demand forecasts I prepared for in this report assumed demand restrictions or enforcement beyond the measures Cal-Am already implements during a normal year. The moratorium on new connections was implemented in response to the cease and desist order. It can be lifted once Cal-Am certifies (and the State Water Resources Control Board concurs) that it has a sufficient permanent replacement supply for its illegal Carmel River diversions.

[61] Hazen Report (p.1)

[62] Hazen Report (p.4) *emphasis added.*

The Hazen Report remarkably ignores the extensive on-going water conservation program being implemented across the Monterey Peninsula and California and the impact these measures are likely to have into the future. Both Cal-Am and the Monterey Peninsula Water Management District implement active, far-reaching, and effective water demand management programs that address all five of these core components outlined earlier in this report. The Monterey region has been regarded as a model for water conservation programs for many years.

Cal-Am acknowledged the level of effort, significance, and impact of this conservation program in recent testimony. "California American Water has expended significant effort and resources to encourage conservation in the Monterey County District through a variety of methods. Most important has been the tiered rate design, which features steeply inclining block rates to encourage efficient water use." – Direct Testimony of Christopher Cook, July 1, 2019.

Mr. Cook's testimony is backed up by testimony from Stephanie Locke, Water Demand Manager for the Monterey Peninsula Water Management District, and the significant financial resources Cal-Am continues to apply toward water conservation in the region. In its most recent General Rate Case, Cal-Am proposed a $1.845 million three-year budget ($615,132 per year) to fund water conservation programs in the Monterey service area. Locke's testimony notes that many of the conservation programs budgeted in the General Rate Case and in the prior Cal-Am rate filings focus on reductions in outdoor water use, on reductions in demand areas that have not previously been extensively targeted, and on maintaining the current low water use fixtures that have been installed to date.

Cal-Am's local efforts are in parallel to broader policy measures at the state level, designed to further increase efficiency. The State of California has implemented a series of laws and directives to ensure future water efficiency across the state including Assembly Bill 1668 and Senate Bill 60. These laws and directives effectively mandate an ongoing reduction in per capita use. Cal-Am's continued compliance with these regulations and its active efforts to reduce customer water demand in the future are likely to gradually further decrease per capita water use across the service area.

### Current Annual Demand

**The Hazen Report asserts that "current" demand in the Cal-Am Main System must be assumed to be 12,350 acre-feet per year. This is far higher than actual current demand and contradicts Cal-Am's own most recent General Rate Case filing which forecasts 2022 demand to be 9,789 acre-feet per year.**

The Hazen Report criticizes the MPWMD Report for developing a demand forecast based on a starting point (aka current annual demand) significantly lower than the value proposed by Cal-

Am to the CPUC.[63] As shown in Figure 6, the Cal-Am "current annual demand" forecast of 12,350 acre-feet is about 2,500 acre-feet higher than Cal-Am's actual annual demand. Based on demand trends in the region 12,350 acre-feet is a gross over-estimate of the actual demand in the Monterey Main System. The authors of the MPWMD Report has good reason to choose a different starting point for the demand forecast and there is nothing incorrect or wrong about their approach.

The "Current Annual Demand" section of the Hazen Report is another place where the authors confuse and conflate requirements for meeting the peak demand and annual demand planning practices as explained earlier in this section. Planning the infrastructure and treatment capacity requirements for a community to meet the peak day and peak hours of demand is distinctly different for planning for an adequate long-term water supply for the same community. In my judgement, the MPWPD Report and Response adhered to all applicable codes and industry standards and practices.

The Hazen Report fails to mention that Cal-Am, in its most recent General Rate Case Application, forecast demand for 2021 and 2022 at 9,789 acre-feet per year.[64] Thus Cal Am's own most recent forecast estimates 2022 demand to be 20% lower than "current" demand in the CPUC decision. Independent estimates of demand developed for the MPWMD Report and developed separately for this report, align closely with Cal Am's recent rate case forecast.

### Water Supply Reliability

**The Hazen Report mischaracterizes the likely future reliability of water supplies available to Cal-Am and in particular the beneficial impacts of the ASR system over time. The Hazen Report ignores the future reliability (and cost) of desalination**

The Hazen Report expresses "concern" about the reliability of the ASR system which it seeks to dismiss as merely "an alternative or backup supply source" and not a reliable long-term supply and it also describes the Pure Water Monterey Expansion as "speculative".[65] The Hazen Report contains inaccuracies and mischaracterizations and notably neglects to apply similar scrutiny to potential reliability issues and construction delays that could be part of the proposed desalination project.

**ASR**

Cal-AM participates in an aquifer storage and recovery project that allows for the capture of excess Carmel River winter flows through wells along the river. WaterDM assumed a conservative 1,300 AF of ASR production per year for 2020 – 2030 like the MPWMD Report. The system has already proven capable of producing near this volume. Cal-Am chose to recover 1,196 acre-feet from the ASR system in 2017, 1,210 acre-feet in 2018, and 744 AF in 2019. Cal-

[63] Hazen Report (p.3)

[64] California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004.

[65] Hazen Report (pp.6-9)

Am ended 2019 with 1,317 acre-feet in ASR storage. With the addition of the Pure Water Monterey Expansion supply in many years Cal-Am will be able to inject and store additional carryover water through this system.

ASR systems, when managed properly, improve groundwater basin management by acting like an underground reservoir where water can be stored during periods of excess supply and withdrawn during periods of short supply.[66] Analysis in the MPWMD Response, confirmed by WaterDM, shows that a build-up of ASR storage based on historical data including wet, normal, and dry years would be sufficient to allow Cal-Am to recover at least 1,300 acre-feet each year during a hypothetical 5-year drought.[67] This analysis is further supported by a Technical Memorandum prepared by Montgomery Associates in late 2019.[68]

During 2020 and 2021 Cal-Am must prepare to wean itself of reliance on the Carmel River and must manage its system differently as it comes to rely on the recently completed Pure Water Monterey supply. The ASR system provides Cal-Am the ability to store excess supply for the future. If the Monterey Peninsula were simultaneously to experience drought during the "buildup period" following the completion of new water supply and assuming the cease and desist order is lifted, ASR might be delayed in building up a drought reserve.[69] However, in reviewing the ASR system, the Hazen Report neglected to consider the impact of the Pure Water Monterey Expansion and the additional water it will make available for injection. Available excess water for injection from the Pure Water Monterey Expansion will enable Cal-Am to store additional water in the Seaside Basin.[70] The proper management of this storage potential and the water supply from the expansion could provide drought-resilience to the Monterey Peninsula for years to come.[71]

**Pure Water Monterey Expansion**

The sources of water for the Pure Water Monterey Expansion are municipal wastewater and agricultural drainage water which are currently discharged to the ocean. The mix of these sources may vary from year to year thus Monterey One Water prepared examples showing the likely annual mixes of source water. In one example the source water consisted of discharge

[66] American Water Works Association (2017) Manual of Water Supply Practices-M50, Third Edition

[67] MPWMD Response (Note 15)

[68] Montgomery and Associates. 2019. Technical Memorandum. Expanded PWM/GWR Project SEIR: Groundwater Modeling Analysis

[69] MPWMD Response (Note 15)

[70] The Seaside Basin Watermaster's 2019 report to the Court overseeing the groundwater adjudication states that the total usable storage space in the entire Seaside Groundwater Basin is 52,030 AF. The report also describes the current allocation of that usable storage space among the Seaside Basin pumpers and Cal-Am is allocated 28,733 acre-feet.

[71] This finding is confirmed by the Montgomery and Associates 2019 memo which demonstrates, ASR is drought-resilient and Pure Water Monterey Expansion provides an additional factor of safety against drought impacts to ASR.

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%).[72]

The Hazen Report questions the reliability of the Monterey Pure Water Expansion project and ignores analysis by the staff of Monterey One Water. This analysis shows that none of the source water for expansion of Pure Water Monterey is speculative, nor comes from Salinas-area wastewater or Salinas valley sources for which Monterey One Water doesn't already have rights.[73]

The source water for the Pure Water Monterey Expansion is municipal wastewater and agricultural drainage water. Analysis of the water sources under four conditions including drought concluded that the project can reliably produce water under each circumstance.[74] The analysis concluded Monterey One Water would have rights to a sufficient quantity of source water to produce the yield in advanced treated, product water that is anticipated to be produced by the Pure Water Monterey Expansion regardless of whether or not the conditions precedent are met and whether or not it is a dry or drought year or a normal or wet year.[75]

The Hazen Report was prepared prior to the release of the April Final Supplemental Environmental Impact Statement for the Monterey Pure Water Expansion and thus the authors may not have had accesses to the full analysis of the reliability of supplies available.

**Reliability and Cost of Desalination Not Considered**

The Hazen Report applies intense scrutiny to the future reliability of the Pure Water Monterey Expansion yet fails to consider the future reliability and cost of the desalination facility Cal-Am has proposed.

Recent desalination projects in California have sometimes failed to produce expected volumes[76] and there many examples world-wide of production problems associated with desalination projects. Cal-Am need look no farther than the local Sand City Desalination plant on which it relies for an example of a facility that has failed to produce at its designed capacity. WaterDM's forecast includes only 150 acre-feet of annual production from the Sand City facility designed to produce 300 acre-feet annually.

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[72] November 12, 2019 M1W presentation to the Monterey County Farm Bureau and the Grower-Shipper Association and the September 30-2019 M1W board meeting

[73] MPWMD Response (Note 19).

[74] April 11, 2020. Source Water Operational Plan Technical Memorandum. Prepared by Bob Holden, PE, and Alison Imamura, PE, Monterey One Water

[75] April 2020. Comments on Water Supply and Source Water Availability. FINAL Supplemental Environmental Impact Report for the Proposed Modifications to the Pure Water Monterey Groundwater Replenishment Project. P 3-8

[76] https://www.voiceofsandiego.org/topics/science-environment/desal-plant-producing-less-water-promised/

Desalination is also the most expensive supply option currently available on the Monterey Peninsula and water from Cal-Am's proposed desalination project would cost at least three times as much as water from the Pure Water Monterey Expansion. The economic track record of desalination is problematic. Desalination plants must be paid for even if they do not produce any water. Victoria Australia's desalination facility, built in response to an intense drought, resulted in ongoing annual service payments of $649 million (Australian dollars), and "annual service payments rise every year, even if no water is ordered."[77]

The Hazen Report chooses to ignore the economic realities of desalination and is disingenuous when it asserts the recycled water proposal is less reliable than the desalination proposal without applying similar levels of scrutiny to both supplies.

### Erroneous Findings in the Hazen Report

**The Hazen Report reaches erroneous conclusions regarding the reliability of future water supplies based on inflated hypothetical demands, misleading statements about planning requirements, and inaccurate characterization of future water supply reliability.**

The Hazen Report includes numerous misleading statements leading to incorrect conclusions regarding California codes, Cal-Am's likely water demand in 2040, and the availability and reliability of future water supply sources. MPWMD's March 6 response to the Hazen Report identifies line by line these errors and misleading statements. In this report I focused on the following problems:

- The Hazen Report repeatedly confuses and conflates peak demand and annual demand planning requirements and offers numerous misleading statements about California codes and standards and AWWA water planning guidance.
- The Hazen Report makes incorrect statements about water conservation programs and planning and without offering data or analysis, and it even suggests that per capita water use will increase substantially despite Cal-Am's demand management efforts and state policy requirements and regulations.
- The Hazen Report asserts that "current" demand in the Cal-Am Main System must be assumed to be 12,350 acre-feet per year. This is far higher than actual current demand and contradicts Cal-Am's own most recent General Rate Case filing which forecasts 2022 demand to be 9,789 acre-feet per year.
- The Hazen Report mischaracterizes the likely future reliability of water supplies available to Cal-Am and in particular the beneficial impacts of the ASR system over time.
- The Hazen Report applies intense scrutiny to the future reliability of the Pure Water Monterey yet fails to consider the future reliability and cost of the desalination facility Cal-Am has proposed.

[77] https://www.dailymail.co.uk/news/article-5749621/Melbourne-desalination-plant-costs-tax-payers-eye-watering-649-million-year-operate.html

## Conclusions

WaterDM conducted an analysis of the historic production trends in the Cal-Am service area and forecast growth in the service area. WaterDM developed an independent forecast of future water requirements based on the Associated Monterey Bay Area Governments (AMBAG) 2018 forecast of future population growth for the Cal-Am service area.

**The WaterDM analysis supports the conclusions in the Staff Report projecting 2040 demands in the Cal-Am service area to be much lower than the CPUC's certificating decision. California Coastal Commission staff have correctly concluded that the Pure Water Monterey Expansion project provides an available, feasible water supply alternative for Cal-Am.**

With the addition of the Pure Water Monterey Expansion project providing an additional 2,250 acre-feet per year of supply to Cal-Am, the combination of Cal-Am's available and projected water resources provides sufficient supply potential to meet annual future requirements in 2040 by more than 1,200 acre-feet (an 11.9% surplus).

The CPUC, in its September 2018 Decision accepted that Cal-Am's "current" demand was 12,350 acre-feet per year and the future demand in 2040 will be approximately 14,000 acre-feet per year. This appears outdated and therefore unreasonably high based on my analysis, the MPWMD Report and Cal Am's most recent forecasts. Cal-Am, in its most recent General Rate Case Application, forecast demand for 2021 and 2022 at 9,789 acre-feet per year. Cal Am's own most recent forecast estimates 2022 demand to be 20% lower than "current" demand in the CPUC decision. Independent estimates of demand developed for the MPWMD Report and developed separately for this report, align closely with Cal Am's recent rate case forecast.

The Pure Water Monterey Expansion provides enough available supply to meet the likely 20-year demands, but it is still reasonable to expect Cal-Am may need to seek to secure additional supplies in the future to meet demand beyond 2040. Much will depend upon what happens to the local economy and climate over the coming decade and over-building infrastructure such as the proposed desalination facility (at its current size) would be an expensive error. The future is uncertain and the impact of COVID 19 and other economic unknowns could well be to reduce future demand in the Monterey Main System from current levels, lessening or eliminating the need for securing additional supply.

Cal-Am's existing peak capacity is sufficient to meet anticipated future maximum daily demand (MDD) and peak hour demand (PHD) and Cal-Am has yet to avail itself of additional low/no-cost peak demand management measures that could reduce future peaks, if necessary.

Analyses in the MPWMD Report and MPWMD Response show that Cal-Am has the ability to produce 19.41 million gallons per day and 0.81 million gallons per hour. Calculations of future Maximum MDD and PHD show that Cal-Am must support an MDD of 19.01 MG/day and a PHD of 0.792 MG/hour (based on a July 2012 maximum month demand). Revised analysis in the

MPWMD Response using slightly different demand data showed that Cal-Am must support an MDD of 16.13 MG/day and a PHD of 0.672 MG/hour (based on an August 2014 maximum month demand). Under either demand assumption, from an infrastructure standpoint alone, Cal-Am has sufficient capacity to meet future peak day and peak hour demands even under the highly conservative assumptions embedded in the calculated approach.

If managing the peak day or peak hour becomes an issue in the future, Cal-Am has several options it has yet to implement. From an infrastructure standpoint, Cal-Cam could increase pumping capacity and add finished water storage. As an option, Cal-Am could also choose to implement low-cost peak day and peak hour demand management measures such as prohibiting automatic irrigation at certain times or on certain days or by re-assigning irrigation days of the week to distribute the summertime peak. Sophisticated approaches using smart irrigation controllers could also be employed to ensure optimal irrigation scheduling (Mayer et. al. 2018).

The Hazen Report contains numerous errors, mischaracterizations, and incorrect conclusions regarding Cal-Am's likely demand in 2040 and the availability and reliability of future water supply sources.

The WaterDM analyses show that the staff of the California Coastal Commission correctly utilized more recent information on available future water supplies and likely future demands in its analysis. Cal-Am's per capita use is likely to decrease between now and 2040 due to ongoing conservation program implementation, conservation pricing, and statewide policy directives to reduce indoor and outdoor use and improve utility water loss control measures. I agree with the staff findings that concluded there exists an available, feasible water supply alternative to Cal-Am's proposed desalination project.

# Appendix A – Materials Considered[78]

## Literature, Reports & Publicly Available Sources

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[78] Materials Considered also includes all materials cited in the footnotes of this Report.

# EXHIBIT 4-B


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Monterey Peninsula Water Management District. 2020. Supply and Demand for Water on the Monterey Peninsula prepared by David Stoldt. (3-13-2020, 12-3-2019, and 9-16-2019)

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## Appendix B - Summary of Qualifications and Experience - Peter Mayer, P.E.

**PETER W. MAYER, P.E.**
Principal
Water Demand Management
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Boulder, CO 80304
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*WORK EXPERIENCE*

Principal, WaterDM - 2013-present. (Registered Professional Engineer, Colorado, PE 0038126)
- Vice President, Partner, and Senior Project Engineer, Aquacraft, Inc. 1995-2012
- Editor, Calvert Independent, 1988-1990
- Coordinator, University of Wisconsin, College Year in India Program, Madurai, India 1991-92
- Educator-Fellow, Oberlin Shansi Memorial Association, Madurai, India 1986-88
- Station Manager, WOBC-FM, Oberlin, Ohio 1985-86

*AFFILIATIONS*

American Water Works Association
- Associate Editor AWWA Water Science
- Member– Customer Metering Practices Committee, Distribution and Plant Operations Division
- Chair – M22 manual 3rd and 4th ed. re-write sub-committee
- Member – M6 manual 6th ed. Re-write sub-committee
- Former Trustee – Water Conservation Division

American Water Resources Association
American Society of Civil Engineers
Alliance for Water Efficiency
Colorado River Water Users Association
Colorado Water Wise
Colorado Water Congress

*EDUCATION*

Master of Science, 1995, Water Resources Engineering, Department of Civil, Environmental and Architectural Engineering, University of Colorado, Boulder.

Bachelor of Arts, 1986, Oberlin College, Oberlin Ohio. Anthropology (Honors).

*SELECTED PROJECTS*

**City of Tucson Water Conservation and Integrated Water Resources Plan (2019-2020)**
Peter Mayer is working with Tucson staff to develop a 10-year water conservation implementation plan to integrate this work with the City's long-term integrated water resources plan being conducted by a large consulting team.

**California DWR Research and Development of Indoor Residential Water Use Standards (2019-2021)**

Peter Mayer is advising the California Department of Water Resources on a series of research projects to investigate indoor residential per capita use for the purpose of reporting to the legislature on future efficiency standards.

**Metropolitan Water District of Southern California Demand Management Cost Functional Assignment (2018 – 2019)**

Peter Mayer developed an analysis of Metropolitan's demand management and local resources development programs for the purpose of functional cost assignment in the ratemaking process.

**New York City Integrated Water Resources Plan (2018 – 22)**

Peter Mayer is leading the water conservation task of this five-year planning project awarded to a team lead by Hazen and Sawyer.

**Northglenn Colorado Integrated Water Resources Plan (2019-20)**

WaterDM is teamed with ELEMENT Water Consulting to prepare an integrated water resources plan for the City of Northglenn, a suburb of Denver.

**Northern Water Conservation Program Planning (2017-18)**

Peter Mayer worked closely with the Northern Colorado Water Conservancy District to plan for the future of their regional conservation program.

**Westminster Rate and Fee Cost of Service Study (2017-18)**

Peter Mayer was a member of the Raftelis Consulting team which developed this extensive cost of service analysis for this Colorado utility.

**Rachio Water Management Implementation and Research (2016 –18)**

Peter Mayer served as an expert advisor and technical consultant to the Rachio irrigation control and technology company. Together, they implemented peak day water management programs.

**FL v. GA, 142, Original (2016)**

Peter Mayer testified as an expert witness on municipal and industrial water use on behalf of the State of Georgia at the US Supreme Court trial held in November 2016. Peter prepared an expert report, expert testimony, testified at the trial, and was deposed in this case.

**Water Resource Foundation #4689 Assessing Water Demand Patterns to Improve Sizing of Water Meters and Service Lines (2016-20)**

Peter Mayer was the Principal Investigator for this research study taking place in Colorado and Arizona that closely examined meter and service line sizing.

**Austin Water Integrated Water Resources Plan (2016-17)**

Peter Mayer was an expert advisor to the CDM/Smith team on water demand and conservation and assisted in preparation of the Austin Integrated Water Resources Plan.

**Colorado State Water Supply Initiative (2009-10, 2016-19)**
Peter Mayer was part of a team that prepared technical analysis of future water demands and requirements in Colorado as part of the State's ongoing planning efforts.

**New York City Water Board Water Demand Management Planning (2014 – 2019)**
Peter Mayer was the lead for this project that prepared ten water conservation plans for wholesale customers of the NYC Water Board located in Westchester County and other upstate NY locations.

**Outdoor Water Savings Initiative, Alliance for Water Efficiency (2014 – present)**
Peter Mayer is the director of research for the Alliance for Water Efficiency's Outdoor Water Savings Initiative. Peter completed a literature review project in 2015, managed the landscape transformation study (2019) and is currently managing the drought response and water savings study (2020).

**Residential End Uses of Water Study Update, Water Research Foundation (2010 – 2016)**
Peter Mayer was the co-principal investigator of this research study that measured residential water use in 25 cities across he US and Canada. Final report is available from the Water Research Foundation.

**Hilton Head PSD Water Demand Management Plan (2015)**
Peter Mayer lead a team that prepared a long term water demand management plan for this coastal island community.

**City of Arvada Expert Witness Services (2016)**
Peter Mayer was hired as an expert witness on municipal and industrial water demands by the City of Arvada. Peter prepared and submitted an expert report in preparation for trial. The report was accepted by both sides and deposition and testimony were not required.

**City of Arvada Water Supply and Demand Study (2014 –2016)**
Peter Mayer led a team that evaluated future water supply and demands for this Denver suburb, under climate change conditions.

**Roaring Fork Regional Water Conservation Planning (2014 - 2015)**
Working with ELEMENT Water Consulting, Peter Mayer prepared a series of water conservation plans for Aspen, Basalt, Carbondale, and Glenwood Springs, Colorado and a regional conservation plan for the entire Roaring Fork Valley. An important goal of these plans was to ensure adequate environmental flows in local rivers and creeks.

**City of Louisville Water Conservation Plan (2015)**

Peter Mayer worked with CH2M to prepare a state approved water conservation plan for the City of Louisville Colorado.

**City of Greeley Water Conservation Plan and Avoided Cost Analysis (2014 –2015)**
Peter Mayer worked closely with the City of Greeley staff to update their water conservation plan for the next 7 years and to complete an avoided cost analysis that evaluates the impact of Greeley's water efficiency efforts since 1992 on customer water rates.

**Senior Technical Advisor, Alliance for Water Efficiency (2007 – 2019)**
The Alliance for Water Efficiency is a national NGO focused on promoting water conservation and efficiency. Peter Mayer helped found the organization and now served as a senior technical advisor and the newsletter editor for 12 years.

**G480 Water Conservation Program Operation and Management Standard (2011-2013, 2018-19)**
The G480 is a voluntary water conservation program operation and management standard approved by AWWA and ASNSI in 2013. Peter Mayer chaired the subcommittee that created the standard and was a key author of the document. He is a member of the subcommittee developing version 2.0.

**Eastern Municipal Water District – Water Efficient Guidelines for New Development (2012-13)**
Peter Mayer prepared a set of detailed, voluntary water efficiency guidelines for new construction in the Eastern Municipal Water District that go beyond current building codes and standards to increase water use efficiency.

**City of Westminster Residential Demand Study and Conservation Plan Preparation (2012)**
Peter Mayer and Aquacraft conducted a residential end use study in Westminster, Colorado to determine water use patterns and the level of water efficiency achieved. This information was then used in support of preparation of new water conservation plan for the City.

**Northern Water Conservation Survey and Plan Development (2011)**
The Northern Colorado Water Conservancy District hired Peter Mayer and Aquacraft to conduct a survey of its' 45 municipal members. The results of the survey were used to update Northern's water conservation plan for the Bureau of Reclamation.

**Colorado Water Supply Initiative Municipal and Industrial Conservation Strategies (2010)**
In support of the Statewide Water Supply Initiative (SWSI), the Interbasin Compact Committee (IBCC), and other water conservation efforts throughout the state, the CWCB contracted with Peter Mayer and Aquacraft to develop the conservation strategies section of the 2010 SWSI update.

**Best Practices Guide for Colorado Water Conservation (2010)**

Colorado Water Wise contracted with Peter Mayer and Aquacraft to research and produce a guidebook on water conservation best practices for Colorado. The guide was published in 2010 and is available for free download.

**Evaluation of California Weather-Based "Smart" Irrigation Controller Programs (2005-2009)**
Smart irrigation controllers that use prevailing weather conditions to adapt water applications to the actual needs of plants represent a significant advancement. Peter Mayer was the principal investigator on this study for the California Department of Water Resources, the California Urban Water Conservation Council, and approximately 30 participating water agencies examined the impact of 3,112 smart controllers on water use in northern and southern California.

**Water Conservation: Customer Behavior and Effective Communications (2006 – 2009)**
Peter Mayer and Aquacraft subcontracted to ICF International on this AwwaRF research project which examined water conservation social marketing programs and measured the impact of utility outreach efforts on customer behavior. The study examined water conservation communication campaigns in terms of customer recognition, attitudinal changes, behavior modification, and verifiable water use reductions and recommended the most effective methods and techniques for designing and implementing water conservation social marketing campaigns.

**Water Budgets and Rate Structures: Innovative Management Tools (2005-2007)**
Water budget rate structures are an innovative and increasingly popular tool for water utilities trying to convey an effective water efficiency message. This AwwaRF Tailored Collaboration project co-lead by Aquacraft and A&N Technical Services examined all aspects of water budgets and how they fit into the pantheon of water rate structures.

**Water Conservation Plan Development and Demand Forecasting (2006–2010)**
The State of Colorado requires that utilities seeking loans file a water conservation plan that includes detailed demand forecasts that incorporate water conservation. Aquacraft has developed conservation plans and demand forecasts for the cities of Aurora, Fort Collins, Glenwood Springs, Westminster, and Greeley, Colorado. In addition, Peter Mayer was contracted by the Colorado Water Conservation Board to review submitted conservation plans for compliance with statute.

**Expert Testimony NEORSD Wastewater Case (2008)**
Working with the Department of Justice, Peter Mayer developed a detailed research plan for the City of Cleveland to help them determine the contribution of wastewater flows from single-family, multi-family, and non-residential customers.

**US EPA National Water Efficiency Market Enhancement Program (2004-2005)**
The EPA is interested in starting a water efficiency program comparable the Energy STAR program. This project involves investigating potential product categories and product lines that

improve water efficiency and could be including the EPA program, such as weather-based irrigation control technology.

**City of Carnation Water Conservation Demand Analysis (2004-2005)**
In late 2004 Peter Mayer worked with the Pacific Institute, Carollo Engineers, and King County, Washington to determine the conservation potential evaluate the cost-effectiveness of water conservation in new and existing homes and businesses in the City of Carnation. Carnation is a small town that is currently not sewered. The County and the City are working together to provide a sanitary sewer system and treatment facility.

**National Multiple Family Submetering and Allocation Billing Program Study (2002-2004)**
Charging residents in multi-family house separately for water is growing trend in the United States. Peter Mayer was the principal investigator for this study which looked at the entire phenomena of submetering and allocation billing techniques and examined the potential water savings, regulatory issues, utility concerns, water rates, and regulatory climate.

**Tampa Retrofit Project (2002-2003)**

**Colorado Department of Human Services Water Rights Study (2003)**

**Pinellas County Utilities Water Conservation Opportunities Study, (2002)**
**Virtual Water Efficient Home Web Site, (2001-2002)**

**East Bay MUD Conservation Retrofit Study, (2001-02)**

**CII Demand Assessment and Conservation Plan, Westminster, CO, (2000-01)**

**Seattle Home Water Conservation Study, Seattle Public Utilities and EPA, (1999-2000)**

**Commercial and Institutional End Uses of Water, AWWARF, (1998-2000)**

**Water Conservation Plan, City of Thornton, CO, (1998-2000)**

**Demand Analysis for the University of Colorado, (2000)**

**Water Conservation Futures Study, City of Boulder, CO, (1998-1999)**

**Water Efficiency in Water Wise and Standard New Homes, (1999-2000)**

**Residential End Uses of Water Study, AWWARF, (1996-1999)**

**Comparison of Demand Patterns among CI and SF Customers, Westminster, (1997-1998)**

**Analysis of Southern Nevada Xeriscape Project, (1998-2000)**

**Westminster, Peak Use Study, (1996)**

**Westminster Residential Water Use Study, (1995-1996)**

*PUBLICATIONS AND PRESENTATIONS*

Rupprecht, C., M.M. Hamilton, and P.W. Mayer. 2020. Tucson Examines the Rate Impacts of Increased Water Efficiency and Finds Customer Savings. Journal of the American Water Works Association. January 2020, pp. 33-39. https://awwa.onlinelibrary.wiley.com/doi/10.1002/awwa.1429

Mayer, P.W., S. Davis, S. Buchberger, C. Douglas. 2020. Assessing Water Demand Patterns to Improve Sizing of Water Meters and Service Lines. Final Report of Project 4689. Water Research Foundation, Denver, Colorado. https://www.waterrf.org/research/projects/assessing-water-demand-patterns-improve-sizing-water-meters-and-service-lines

Douglas, C., S. Buchberger, and P. Mayer. Systematic Oversizing of Water Meters. 2019. AWWA Water Science Journal. December 2019. https://awwa.onlinelibrary.wiley.com/doi/abs/10.1002/aws2.1165

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Mayer, P.W., and R. Smith. 2017. Peak Day Water Demand Management Study. Alliance for Water Efficiency. Chicago, IL.

Mayer, P.W., et. al. 2017. Peer Review of the Water Conservation Programs of the Metropolitan Water District of Southern California. Alliance for Water Efficiency. Chicago, IL.

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Mayer, P.W. 2017. Water Conservation Keeps Rates Low in Gilbert, Arizona. Alliance for Water Efficiency. Chicago, IL.

Mayer, P.W. 2016. Water Research Foundation Study Documents Water Conservation Potential and More Efficiency in Households. Journal of the American Water Works Association. October 2016 108:10.

Mayer, P.W. 2016. American Water Demand Trends and the Future of Conservation. Keynote Address- Gulf Coast Water Conservation Symposium, Houston, TX.

DeOreo, W.B., P. Mayer, J. Kiefer, and B. Dziegielewski. 2016. Residential End Uses of Water, Version 2. Water Research Foundation. Denver, CO.

Shimabuku, M., D. Stellar, and P. Mayer. 2016. Impact Evaluation of Residential Irrigation Audits on Water Conservation in Colorado. Journal of the American Water Works Association. May 2016, 108:5. Denver, Colorado.

Mayer, P.W., P. Lander, and D. Glenn. 2015. *Outdoor Water Use: Abundant Savings, Scant Research.* Journal of the American Water Works Association. February 2015, 107:2. Denver, Colorado.

Mayer, P.W. 2015. American Water Use Trends 1995-2015 and Future Conservation Potential. WaterSmart Innovations Conference. Las Vegas, NV.

Mayer, P.W. 2015. Introducing AWWA's New M22 Manual - Sizing of Water Service Lines and Meters. Proceedings of the AWWA Annual Conference and Exposition. Anaheim, CA. and North American Water Loss Conference. Atlanta, GA.

Mayer, P.W. et. al. 2014. *Conservation Efforts Limit Rate Increases for Colorado Utility*. Journal of the American Water Works Association. April 2014, 106:4. Denver, Colorado.

Mayer, P.W. et. al. 2013. Conservation Limits Rate Increases for a Colorado Utility. Alliance for Water Efficiency, Chicago, IL.

Mayer, P.W. 2013. Residential Water Use Trends in North America: Results from the Residential End Uses of Water Study Update. Proceedings of the AWWA Annual Conference and Exposition. Denver, Colorado.

ANSI/AWWA. 2013. G480 *Water Conservation Program Operation and Management* Standard (First Edition). American Water Works Association. Denver, CO.

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DeOreo, W., & P.W. Mayer. 2012. *Insights into Declining Single Family Residential Water Demands*. Journal of the American Water Works Association. June 2012. Vol. 104, No. 6.

Mayer, P.W. and S. Feinglas. 2012. Evaluating Changes in Water Use and Conservation Effectiveness. WaterSmart Innovations Conference. Las Vegas, NV.

Maddaus. M. and P.W. Mayer. 2011. Demand Hardening: Assessing Potential Impacts with End Use Models. WaterSmart Innovations Conference. Las Vegas, NV.

Mayer, P.W. and M. Dickinson. 2011. The Alliance for Water Efficiency's Home Water Works Website. WaterSmart Innovations Conference. Las Vegas, NV.

Mayer, P.W. 2010. Demand Hardening: Big Myth, Small Reality. WaterSmart Innovations Conference. Las Vegas, NV.

Mayer, P.W. 2010. Guidebook of Best Practices for Municipal Water Conservation in Colorado. WaterSmart Innovations Conference. Las Vegas, NV.

Mayer, P.W., et. al. 2010. *Improving Urban Irrigation Efficiency By Using Weather-Based "Smart" Controllers.* Journal of the American Water Works Association. February 2010. Vol. 102, No. 2.

Mayer, P.W. 2009. Do Weather-Based Irrigation Controllers Save Water? Results from a large field study in California. American Water Works Association 2009 Annual Conference and Exposition. San Diego, CA.

Mayer, P.W. et. al. 2009. Water Efficiency Benchmarks for New Single-Family Homes. WaterSmart Innovations Conference. Las Vegas, NV.

Mayer, P.W. et. al. 2009. Evaluation of California Weather-Based "Smart" Controller Programs Results and Perspective on a Large Field Study. WaterSmart Innovations Conference. Las Vegas, NV.

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Mayer, P.W. et. al. 2009. Evaluation of California Weather-Based "Smart" Irrigation Controller Programs. California Department of Water Resources, Sacramento, CA.

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Mayer, P.W. et. al. 2008. *Water Budgets and Rate Structures: Innovative Management Tools*. Journal of the American Water Works Association. May 2008. Vol. 100, No. 5.

Mayer, P.W., et. al. 2008. Cost Effective Conservation Programs. Proceedings of the AWWA Water Sources Conference. Reno, NV.

Mayer, P.W., et. al. 2008. Water Use in New and Existing Single-Family Homes - Update on EPA Benchmarking Study. Proceedings of the AWWA Water Sources Conference. Reno, NV.

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Mayer, P.W. 2006. Submetering Billing Programs in Multi-Family Housing. Proceedings of the Water Sources Conference 2006, Albuquerque, NM.

Mayer, P.W. 2006. WaterWiser - Progress and Change, Benefits and Capabilities of an On-Going On-Line Resource. Proceedings of the Water Sources Conference 2006, Albuquerque, NM.

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Mayer, P.W, et. al. 2004. National Submetering and Allocation Billing Program Study – Project Overview and Preliminary Results. Proceedings of the Water Sources Conference 2004, Austin, TX., Proceedings of the AWWA Annual Conference, Orlando, FL.

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DeOreo, W.B., M. Gentili, and P.W. Mayer, 2004. *Advanced Cooling Water Treatment Pays for Itself in Urban Supermarkets.* Proceedings of the Water Sources Conference 2004, Austin, TX.

Mayer, P.W., W. DeOreo, and W. West, 2003. *Conservation Opportunities - A Florida Community Takes Stock*. Proceedings of the AWWA Annual Conference Anaheim, CA.

Mayer, P.W. et. al. 2002. *Great Expectations – Actual Water Savings with the Latest High-Efficiency Residential Fixtures and Appliances.* Proceedings of the Water Sources Conference 2002, Las Vegas, NV.

Mayer, P.W., W.B. DeOreo, & D. Kaunisto. 2002. *Raw Water Irrigation – System Sizing Poses an Interesting Problem.* AWWA Annual Conference Proceedings. Denver, CO.

Mayer, P.W., W.B. DeOreo, A. Dietemann, and T. Skeel. 2001*. Residential Efficiency: The Impact of Complete Indoor Retrofits*. AWWA Annual Conference Proceedings, Washington, D.C.

Maddaus, L.A., & P.W. Mayer. 2001 *Splash or Sprinkler? Comparing Water Use of Swimming Pools and Irrigated Landscapes.* AWWA Annual Conference Proceedings, Washington D.C.

W.B. DeOreo, A. Dieteman, T. Skeel, P. Mayer, et. al. 2001. *Retrofit Realities.* Journal American Water Works Association, March 2001.

DeOreo, W.B., P.W. Mayer, J. Rosales, et.al. 2000. *Impacts of Xeriscape on Single Family Residential Water Use.* Proceedings of Fourth Decennial National Irrigation Symposium, Phoenix, AZ.

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Mayer, P.W., W.B. DeOreo, et. al. 1998. *Residential End Use Study Progress Report: Year 2*. AWWA Annual Conference Proceedings. Dallas, TX.

Mayer, P.W., W.B. DeOreo, R. Allen, et. al. 1997. *North American Residential End Use Study: Progress Report*. AWWA Annual Conference Proceedings. Atlanta, GA.

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Mayer, P.W. and W.B. DeOreo. 1995. *A Process Approach for Measuring Residential Water Use and Assessing Conservation Effectiveness*. AWWA Annual Conference Proceedings. Anaheim, California.

Mayer, P.W. 1995. *Residential Water Use and Conservation Effectiveness: A Process Approach*. Master's Thesis. University of Colorado, Boulder.

*AWARDS*

- 2019 AWE Distinguished Service Award – "In Recognition and with Appreciation for His 12 Years as Editor of the Water Efficiency Watch Newsletter 2007 – 2019).
- 2013 AWWA Water Conservation Division Best Paper Award – "Insights into Declining Single Family Residential Water Demands."
- 2013 Quentin Martin Best Research-Oriented Paper Award, ASCE-EWRI Journal of Water Resources Planning and Management, March 2013. Awarded for "Estimating and Verifying United States Households' Potential to Conserve Water" by Franciso J. Suero, A.M.ASCE;

Peter W. Mayer; David E. Rosenberg, A.M.ASCE

- 2010 AWWA Water Conservation Division Best Paper Award – "Improving Urban Irrigation Efficiency by using Weather-Based 'Smart' Irrigation Controllers."
- 2008 AWWA Water Conservation Division Best Paper Award – "Water Budgets and Rate Structures: Innovative Management Tools."
- 2006 AWWA Water Conservation Division Best Paper Award – "Third Party Billing of Multi-family Customers Presents New Challenges to Water Providers"
- 1996 Montgomery-Watson Master's Thesis Award, Second Place
- 1996 American Water Works Association Academic Achievement Award, Honorable Mention

**WATER DEMAND COMMITTEE**

## 6. DISCUSS METHODS FOR IMPLEMENTATION OF ENHANCED WATER CONSERVATION MEASURES FOR NON-CALIFORNIA AMERICAN WATER PUMPERS IN THE CARMEL VALLEY ALLUVIAL AQUIFER

| | | | |
|---|---|---|---|
| **Meeting Date:** | **May 7, 2020** | **Budgeted:** | **N/A** |
| **From:** | **David J. Stoldt, General Manager** | **Program/ Line Item No.:** | **N/A N/A** |
| **Prepared By:** | **Stephanie Locke** | **Cost Estimate:** | **N/A** |

**General Counsel Review: N/A**

**CEQA Compliance: This action does not constitute a project as defined by the California Environmental Quality Act Guidelines section 15378**

**SUMMARY:** Water use from the Carmel Valley Alluvial Aquifer (CVAA) directly impacts the flow of the Carmel River, including the health of the steelhead trout and California red-legged frogs. As California American Water (Cal-Am) reduces its demand on the system, it would be prudent for the District to look at ways to reduce pumping from non-Cal-Am Wells in the CVAA.

All water Users[1] within the District are subject to the water efficiency standards of Regulation XIV and Regulation XV, including retrofit upon resale requirements, Well metering, and prohibitions on Water Waste. Well Users within the CVAA are also subject to permitting requirements that include establishment of production limits and reductions in those limits when converting from agricultural use to other types of use.

The Board received the District-Wide Annual Water Production Summary Report for Water Year 2019 ("WY19") at its April 20, 2020 meeting. That report includes information about the location of wells (source area) in the District and the amount of water produced during the period of October 1, 2018 through September 30, 2019. District Rules and Regulations require well owners and operators to submit annual water production information to the District. Well production is calculated by either the Land Use or Water Meter reporting method.

There are approximately 200 Wells in the CVAA, with approximately 30 Inactive Wells and another 15 that are non-compliant with the metering/reporting requirements. During WY19, approximately 1,333 Acre-Feet ("AF") of water was produced from the CVAA, with 236 Wells metered and 74 reporting via the land use method.

**RECOMMENDATION:** Staff recommends the Water Demand Committee begin discussion about potential programs to reduce water use from non-Cal-Am producers in the CVAA, including:

[1] Most capitalized terms refer to District definitions under its Rule 11.

1. Requiring Water Meters (and reporting requirements) on CVAA Wells;

2. Target CVAA Well Users with outreach, such as:

    a. Residential/Domestic Use: Rebate program and availability of free conservation devices, water-wise landscape concepts;

    b. Irrigation Only: Promote use of Automatic Irrigation Controllers and efficient irrigation practices, including availability of rebates and resources. Workshops/training on efficient irrigation. Review permit requirements for agricultural irrigation, including how water rights may preclude or affect efficiency requirements.

**EXHIBIT**
None